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PATRONS IN GOOD AND POOR GRADE FOUR READERS' 
RHYTHM DISCRIMINATION, ATTENTION TO LANGUAGE FREQUENCIES 
AND PITCH DISCRIMINATION RELATED TO 
LISTENING ABILITIES AND LITERARY EXPERIENCES 

DISSERTATION 

Presented in Partial Fulfillment of the 
Requirements for the Degree Doctor of Philosophy 
in the Graduate School of The Ohio State University 

By 

F. Jean Malloch, A.R.C.T., B.A., M.A. 

* * * * * 

The Ohio State University 

1984 

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Background of the Study</td>
<td>1</td>
</tr>
<tr>
<td>Theoretical Basis of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Listening</td>
<td>5</td>
</tr>
<tr>
<td>Reading</td>
<td>21</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>23</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>24</td>
</tr>
<tr>
<td>Definitions</td>
<td>25</td>
</tr>
<tr>
<td>Delimitations</td>
<td>27</td>
</tr>
<tr>
<td>Limitations</td>
<td>27</td>
</tr>
<tr>
<td>II. RELATED RESEARCH AND LITERATURE</td>
<td>30</td>
</tr>
<tr>
<td>Listening for Meaning</td>
<td>30</td>
</tr>
<tr>
<td>Listening and Speech</td>
<td>36</td>
</tr>
<tr>
<td>Listening and Reading</td>
<td>40</td>
</tr>
<tr>
<td>Listening and Literature</td>
<td>48</td>
</tr>
<tr>
<td>Listening and Learning Styles</td>
<td>51</td>
</tr>
<tr>
<td>Implications for Research</td>
<td>57</td>
</tr>
<tr>
<td>III. PROCEDURES</td>
<td>60</td>
</tr>
<tr>
<td>Population</td>
<td>60</td>
</tr>
<tr>
<td>Sample</td>
<td>62</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>65</td>
</tr>
<tr>
<td>Design</td>
<td>70</td>
</tr>
<tr>
<td>Collection of Data</td>
<td>73</td>
</tr>
</tbody>
</table>
IV. PRESENTATION OF DATA .............................. 86
  Research Hypothesis #1 .............................. 89
  Research Hypothesis #2 .............................. 90
  Research Hypothesis #3 .............................. 91
  Negative Hypotheses .................................. 92
  Research Hypothesis #4 .............................. 95

V. INTERPRETATION ....................................... 108
  Summary .................................................. 108
  Discussion ............................................... 109
  Conclusion .............................................. 118
  Recommendations ....................................... 122

BIBLIOGRAPHY .............................................. 124

APPENDIX A ................................................. 134

APPENDIX B ................................................. 151

APPENDIX C ................................................. 153

APPENDIX D ................................................. 155
LIST OF TABLES

1. A Comparison of Spache Reading Comprehension Scores for Good and Poor Grade Four Readers .......... 64
2. Gender, Language and Socioeconomic Level of Good and Poor Grade Four Readers .............................. 66
3. Statistical Procedures Used to Test the Hypothesis That There is a Difference Between Listening Ability of Good and Poor Readers ............................................... 80
4. Statistical Procedures Used to Test the Negative Hypothesis that There is no Difference in Listening Ability Between Good Readers with Different Language Backgrounds ................................................................. 81
5. Statistical Procedures Used to Test the Negative Hypothesis that There is no Difference in Listening Ability Between Poor Readers with Different Language Backgrounds ................................................................. 82
6. Statistical Procedures Used to Test the Negative Hypothesis that There is no Difference in Listening Ability Between Male and Female Good Readers .............................. 83
7. Statistical Procedures Used to Test the Negative Hypothesis that There is no Difference in Listening Ability Between Male and Female Poor Readers .............................. 84
8. Summary of Data For Good Readers ........................................ 87
9. Summary of Data for Poor Readers ........................................ 88
10. A Comparison of Mean Scores on Seashore Rhythm Test for Good and Poor Readers ............................ 89
11. A Comparison of Mean Scores on Attention to Language Frequencies for Good and Poor Readers ............ 90
12. A Comparison of Mean Scores on Pitch Discrimination for Good and Poor Readers ......................... 91
13. A Comparison of Mean Scores on Rhythm Discrimination for Good Readers With E.S.L. and English Language Background ............................................................... 156
14. A Comparison of Mean Scores on Rhythm Discrimination For Poor Readers with E.S.L. and English Language Background ............................................................... 156
15. A Comparison of the Mean Scores on Attention to Language Frequencies for Good Readers with E.S.L. and English Language Background ...................................................... 157
16. A Comparison of the Mean Scores on Attention to Language Frequencies for Poor Readers with E.S.L. and English Language Background ...................................................... 157
17. A Comparison of the Mean Scores on Pitch Discrimination for Good Readers with E.S.L. and English Background ............................................................... 158
18. A Comparison of the Mean Scores on Pitch Discrimination for Poor Readers with E.S.L. and English Background ............................................................... 158
19. A Comparison of the Mean Scores on Rhythm Discrimination for Good Female and Good Male Readers ............ 159
20. A Comparison of the Mean Scores on Rhythm Discrimination for Poor Female and Poor Male Readers ............ 159
21. A Comparison of the Mean Scores on Attention to Language Frequencies for Good Female and Good Male Readers ............................................................... 160
22. A Comparison of the Mean Scores on Attention to Language Frequencies for Poor Female and Poor Male Readers ........................................ 160

23. A Comparison of the Mean Scores on Pitch Discrimination for Good Female and Good Male Readers .......... 161

24. A Comparison of the Mean Scores on Pitch Discrimination for Poor Female and Poor Male Readers .......... 161

25. A Simple Analysis of Variance of Rhythm Discrimination Scores for Good Readers From Three Socioeconomic Levels ........................................ 162

26. A Simple Analysis of Variance of Rhythm Discrimination Scores for Poor Readers from Three Socioeconomic Levels ........................................... 162

27. A Simple Analysis of Variance of Attention to Language Frequencies Scores for Good Readers from Three Socioeconomic Levels ..................................... 163

28. A Simple Analysis of Variance of Attention to Language Frequencies Scores for Poor Readers from Three Socioeconomic Levels ..................................... 163

29. A Simple Analysis of Variance of Pitch Discrimination Scores for Good Readers from Three Socioeconomic Levels ........................................... 164

30. A Simple Analysis of Variance of Pitch Discrimination Scores for Poor Readers from Three Socioeconomic Levels ........................................... 164

31. Summary of Responses to Questionnaire by Good and Poor Readers ......................................................... 95
LIST OF FIGURES

1. Graph Showing One Subject's Listening Curve ........ 75
2. Graph Showing One Subject's Ability to Discriminate Pitch .............................. 78
CHAPTER I
INTRODUCTION

Background of the Study

During the 1970's, the Ontario Ministry of Education encouraged the establishment of Special Education classes. Psycho-educational consultants were hired by most boards of education to help in the assessment of students' needs. It was evident that many bright children were not functioning well academically. Children who showed high performance scores and low verbal scores on the WISC-R were therefore placed in Learning Disability classes. Many of these students have been receiving help for years yet the growth of special education classes in an era of declining enrollment indicates that they have not been helped significantly. After four or five years of support in the elementary and junior high school, they usually "graduate" into special vocational programs at the high school level where reading is not essential to their studies.

It is proposed that one of the underlying causes of reading problems may be poor listening ability. The purpose of this study is to investigate the relationship between listening and reading
ability and between listening and literary experiences. Several studies have already demonstrated that many early experiences with books correlated with good reading and language ability. This study will attempt to determine whether or not there are differences between good and poor readers in literary experiences and listening ability.

In the Globe and Mail on October 10th, 1983, it was reported that students will no longer be able to graduate from grade twelve vocational programs unless they complete thirty courses, sixteen being compulsory. More English courses will be required. Government appointed advisors felt that the best preparation for a student would be traditional skills - an ability with language and numbers, a sense of responsibility and an ability to get along with other people. Mr. Lambie, Director of Senior and Continuing Education, is quoted as saying "What we are trying to do is bring some focus to education and some uniform standards". Mr. Edward Breman, head of the guidance counselling at Brockton Vocational School, said that the changes will be "really tough" for students at the basic level school.

In both the United States and Canada, attention has been drawn to the high number of functionally illiterate adults in the population. In spite of the philosophy of "education for all" many
individuals are unable to function without help in our society. Administrators and parents have responded with a cry of "back to the basics" yet that is what the focus of Special Education teachers has been. The children, identified through careful assessment, have been given hours of practice in reading and math skills. Kits have been published which sequence learning into smaller and smaller steps expecting that smaller steps and more practice will help these students to "catch up". But there is little evidence of the effectiveness of such programming.

Academic assessments have shown that the students are lacking in skills but little attention has been paid to the underlying cause of their inability to learn. There is a plethora of studies which have been directed toward determining the deficits of poor readers. Several have shown that poor readers obtain poor results on tests of auditory discrimination and quite often, they show deficits in expressive and receptive language. The psychologist, after noting these problems in listening and language, may recommend an audiometric examination. Usually, the report indicates normal hearing and, in most cases, the children are able to articulate well. Why then are they having listening problems?

These children are often diagnosed as having auditory perception problems. It is assumed that there are no "mechanical"
problems with hearing but that the problem lies in perceiving and retrieving auditory information. Perhaps these problems stem from an inability to integrate auditory stimuli with all the other sensations.

The child uses his body as a totality, he doesn't distinguish between that which is given by the eye, etc. There is no multiplicity of sensations (Sardello, 1974).

Children, consciously and unconsciously, use all of the senses which are receiving and sending messages in their search for patterns. When children are unable to use one of their senses, learning is more difficult. Those with auditory deficits compensate by relying more on visual information and may therefore be less likely to develop inner references.

Problems arise in school when language becomes the mode of instruction. The teacher may not demonstrate each task; therefore, the child cannot follow directions. Greater problems emerge when reading is introduced since reading requires the integration of listening with all the other senses and with the experiences which the child has had. In order to determine the reason for these problems, auditory tests are administered by educators. These tests focus on particular skills and do no more than confirm the fact that the children are having difficulties. Perhaps the problems are much more general.
It is hypothesized that good readers are good listeners, who have enjoyed the experience of listening to stories, are able to differentiate between the sounds of language and the sounds of the environment, and are able to hold one sound in short term memory long enough to compare it with another.

**Theoretical Basis of the Study**

Several studies which will be reviewed in Chapter II have indicated that poor readers have auditory problems. There has been very little research into the reason for the apparent strong link between listening and reading nor has there been research to help in the understanding of the development of listening. In order to provide a theoretical framework for this study, it may be helpful to provide a theory of listening and review the theory of reading which supports the premise that listening is related to reading.

(a) **Listening**

Listening begins before birth. Ostwald and Peltzman (1974) reported that the auditory capacity of the fetus may be present by the fifth month since the middle ear and inner ear structures have attained full adult size at that stage. Birnholz and Bennacerraf (1983) in a study of 236 fetuses between 16-32 weeks of gestational age, found, through ultrasound imaging, that the fetus responded
to sound with eye blinks. Those who lacked this spontaneous movement were found at birth to have serious primary hearing impairment or significant depression of the central nervous system.

In another study of fetal development, Boklage (1980) noted that the language area of the right hemisphere of the brain is larger than the left at four months. Critchley's (1962) studies with adults have shown that lesions to the right hemisphere affect the rhythm of speech. It would seem that the fetus is equipped to hear the sounds in his/her environment - the rhythmic body sounds and the rhythm and intonation of the mother's voice. These rhythmic sounds will be soothing since they link with the rhythmicity of the fetus' developing body. Lashley (in Lenneberg, 1967) stated that rhythmicity is the only non-plastic element of the brain. The fetus, then is able to hear a rhythmic sound which matches his inward rhythmicity and is comforted. Langer (1953) says "The most characteristic principle of vital activity is rhythm. All life is rhythmic" (p. 126).

Piaget (1964) states that rhythm lies at the junction of organic and intellectual development. Perhaps the linking in utero of sound to body rhythmicity is the beginning of intellectual development. The fetus, in attending to sound and in trying to make sense of this stimulus, may be developing brain functions
in the left hemisphere. Lashley maintains that brain functions develop through use and the concept that this development is begun in utero is supported by Geshwind's (1970) study. He found that most infants were born with the language area of the left hemisphere more developed than the right. That a change had occurred in utero is evident since Boklage's study indicated that, in the fourth month of the gestational period, the right hemisphere area was larger.

Salk (1973) suggested that there is a possibility that the infant in utero builds an association between the rhythmic heart beat and the tension free state. Attention to similar rhythms in later life, he claims, may have a functional connection with the original experience. Could it be that attention becomes associated with relaxing and enables the individual to learn? Langer (1953) feels that the rhythm of attention links all the other rhythms of life - organic, emotional and mental. She feels that it is too simplistic to think of this rhythm as a backward and forward or on and off function but rather it is "endlessly complex and sensitive to every sort of influence" (p. 126).
The infant then brings into the world with him/her the memory of the rhythm and intonation of the mother's voice. While the voice the infant hears after birth differs from the sound heard in utero, he or she is still able to identify the same rhythm and intonation. That the infant is responding to language is shown by Condon and Sander's (1974) studies. They found that infants' movements are synchronized with the speech of the caretaker. It was obvious to the observers that the infants received enjoyment in this interaction.

Kaye and Charney (1980) have noted that the mothers, in establishing patterns of dialogue, make use of the biological rhythm in the infant's on-off cycles underlying sucking, attention and arousal. When the infant pauses in sucking, the mother chats to him or her. Brazelton and Tronich (1980) showed how the infants' focus of attention drew attention from the mothers.

For most infants the joyful body response to the caretaker's voice fosters a loving interchange. The infant's reaction encourages the caretaker to speak and speaking stimulates the child's activity. Thus the child, in a secure comfortable environment will respond and this response helps to establish neuronal patterns which link mind and body. Luria (1966) explains that the differentiation of the cortex and the lower relay systems parallels that
of the body surface. As the infant moves to the sounds of language, his or her activity links this neuronal network. In this interaction, the inseparability of affective and cognitive development is manifested.

During the first months of life, the infant utters cries and sounds which do not exist in the environment.

The vocal play of the infant fills his world with audible actions, the nearest and most completely absorbing stimuli because they are both inner and outer, autonomously produced yet unexpected, inviting that repetition of accidental motions which William James deemed the source of all voluntary acts. (Langer, 1942, p. 124)

The mother soon learns to recognize meaning in the child's gesture and focus of attention. She articulates this meaning for the child. Young children perceive through movement and thus the synchronized movements help to establish language patterns.

In actual life gestures function as signals or symptoms of our desires, intentions, expectations, demands and feelings ... This self-expressive aspect is akin to the tone of voice in speech. (Langer, 1953, p. 175)

The infant, enjoying the social interaction with a loving adult, is listening not to particular words but rather to the intonation and rhythm of language. Dorothy Butler (1979) relates the story of a severely handicapped infant who could only be
consoled by her parents reading to her. The text of the books read held no meaning but the sound of language brought comfort. Moskowitz (1978) noted that it is this intonation rather than specific babbling sounds which are carried into later language. The child, for example, uses a rising intonation when a response is expected.

Halliday (1969) through observation of his own child discovered that the functions of language are present before the child is able to articulate many words. The child's ability to use intonation demonstrates how well he or she listens and how well the child can attach meaning to the sounds heard.

When children are unable to hear they soon cease their babbling. Moskowitz (1978) observed a child with normal hearing born to deaf parents. This child was encouraged to watch television since asthmatic condition confined him to his home. By age three, he could use sign language but neither understood nor spoke English. It appears to be essential that the child hear language and also interact with persons using the language.

If the infant, from the beginning moves in precise, shared rhythm with the organization of the speech structure of his culture then he participates developmentally through complex, sociobiological entrainment processes in millions of repetitions of linguistic forms long before he later uses them in
speaking and communicating. By the time he begins to speak he may have already laid down within himself the form and structure of the language system of his culture. (Condon and Sander, 1974)

The first words of the infant are those which are naturally accented in the parents' speech.

"Do you want some milk?" or "Here's a cookie."

The child picks up these words and then through intonation is able to direct meaning.

"Milk" could mean -"I want some milk"or"I spilt my milk"or "See the milk."

As the child gradually differentiates more and more words in the flow of language heard, he or she is able to store experience in memory.

A word fixes something in experience and makes it the nucleus of memory, an available conception. Other impressions group themselves round the denoted thing and are associatively recalled when it is named. (Langer, 1942, p. 135)

Ruth Weir's (1962) account of her son's vocalizing in the crib when he was alone provides evidence that he was taking the role of spectator (Britton, 1970) as he brought to memory things he had experienced.
As the infant hears language in a social context, he or she is relating sounds to meanings previously expressed through gesture. Without attention to sound, the infant would not be able to link the two experiences. Because he or she cannot understand the words heard, it is the rhythm and intonation which provide the scaffolding for attention and unity of meaning.

As the child develops, listening continues to play an important role in the ability to differentiate the components of language—intonation, rhythm, pitch, conversation, genre, affect and words. Between the ages of 13 and 18 months, it is evident that infants are becoming more attentive to words (Bennedict in Bornstein, 1979). Bennedict (1976) found that the listening ability at 13 months paralleled the level of production at 19 months. As the child develops the ability to speak, language begins to serve him or her in the quest to make sense of the environment and by providing the means for reflection. The child is now able to attach an experience to a word and by recalling the word can relive experience. It is likely that the young child's recall prompts him or her to say the word aloud in order to bring back the experience. Oral language accompanied with movement within the social and environmental context provides for perceptual development. As the child listens to his own voice, he reaffirms the sound of the
word and also integrates it with the meaning both contextually and affectively. With the later development of inner speech (Vygotsky, 1962) the word will bring to mind perceptions as well as sound. The child who has experienced the word "jump" as he or she responded to a parent's invitation to "jump" will have meaning to attach to the word when it is heard within the framework of whole language.

The stage of undifferentiated functions in infancy is followed by the differentiation and development of perception in early childhood and the development of memory in the preschooler ... attention which is the correlate of the structuring of what is perceived and remembered, participates in this development. (Vygotsky, 1962, p. 92)

Listening plays an important role both in the initial attraction to stimuli and in the focussing during the experience. Observation of the young child during his or her play, reveals a constant stream of vocalizing relating to his activity. The child is listening to his or her own voice.

Expressive talk is not just an expression of self but a way to work on common culture. (Applebee, 1978)

Without this audible imprinting, the child would be limited in his later ability to use inner speech.

The language of the child is thus construed through communication with adults who take his or her language and extend it so
that it is heard in a natural rhythmic sentence. It is important to note that it is the child who directs his or her construction of language. The two year old who is constantly asking "Wassat" needs an interested adult to answer and to reciprocate by asking "What's that?" so that the child will use the words he has heard. Liberman (1982) says that speech perception is dependent on an imprinting of voice production and Gubarini (1968) recognized that the rhythm of speech was part of the imprinting. Listening thus depends upon a prior imprinting of the sounds and rhythms of language. The infant grasped meaning in intonation and gesture. Now the young child must hear how words fit into the phrases in order to develop language for more complex thinking. He or she could get along with gesture as did the twins in Luria's (1956) study but without the awareness of words the child will be inhibited in learning (Vygotsky, 1962).

Dorothy White (1954) showed how books helped to expand the child's interest and vocabulary. She found that certain books appealed at a particular age. It is likely that this appeal depended upon prior experience with language.

Both rhythm and form involve a pattern of expectation, both for the satisfaction and the modification of the expected pattern. Stories for very young children embody a pattern of events within this rhythm or form. (Harding in Squire, 1968, p. 13)
As the child listens to stories, he or she will interpret, through the memory of his/her own experience. Listening then stimulates the ability to reflect, to feel the experience without saying the word, to hear again language which matches his or her own cognitive level, to broaden their world, to extend their vocabulary and to begin to develop a sense of story. Applebee (1978) maintains that the child becomes increasingly aware of story form. Thus the child with a legacy of listening to stories has the scaffolding on which all new stories can be built.

Listening to stories and music also provides a wholeness or unity of experience which holds the child's attention. He or she learns to disregard irrelevant sounds in the environment, to organize the events within the structure of story or song, to predict and hypothesize. There are several studies which will be reviewed in Chapter 2 which indicate that children who have been read to before they enter school will be more ready for academic work. They come to school having learned to link sounds in the environment with their inner experience, to express meaning through intonation and gesture, and to differentiate language so that it can serve them in many different functions. They also come with a perception of story and a familiarity with the language
of books. Listening has played an important role in this learning and according to Lundsteen (1979) may provide the key to unlocking progress in all subject areas.

The sense of story which the child has now acquired provides a way of organizing information. For as Langer has said "Literature projects the image of life in the mode of virtual memory" and also, unless a child can place new information in some schema, it will belong "to the present or recollection in a timeless past" (Langer, 1953, p. 306). When information is encoded in a pattern, it can be retrieved. Sense of story, because it provides for a wholistic recording of events in which every element is organically related, allows the child to reflect.

Life is incoherent unless we give it form. Usually the process of formulating our own situations and our own biography is not (markedly) conscious ... We tell it to ourselves so that our minds can enact all its important moments. (Langer, 1953, p. 400)

The basis of this imaginative work is the poetic art we have known, from the earliest nursery rhyme to the most profound or sophisticated or breath-taking drama and fiction. (Langer, 1953, pp. 400-401)

The child who has listened to many stories is more likely to have established this sense of story which will enable him or her to remember new information and reflect upon it. Piaget (in Vygotsky, 1942) says
To become conscious of a mental operation means to transfer it from the plan of action to that of language, i.e., recreate it in the imagination.

Wells' (1982) study showed that the best predictor of a child's success in primary grades was his or her literacy level. Children who had heard many stories had had many more opportunities to recreate experience in the imagination. Olson (1977) maintains that children have difficulty in school because their language does not match the language of the text or the teacher. It is important then to extend the child's listening before asking the child to read texts, for unless the rhythm and intonation of book language is established first, the child will have great difficulty in making sense of print.

Often the child who is having difficulty in reading is not identified until he reaches age 9 or 10. The ability to decode the words on the page and the simplistic language of many early readers has enabled him or her to cope; however, as more complex language and content is encountered, the problems arise. Unless the child is reading phrases and sentences rather than words, the meaning is lost.

Text is barren of all the support that oral communication provides. Punctuation provides some clues but the reader must
impose his own awareness of rhythm in order to feel the pulse of the passage. More than this, the reader must hypothesize the writer's intent in order to select the intonation which should accompany the rhythm. There must be a synchrony between the writer and the reader.

Condon and Ogston (1971) in studying body gestures during conversation found that there was synchrony between body movements in the speech of adults.

The total organism seems to participate in this, for body motion changes emerge synchronously with the physical articulatory changes of speech and at a variety of dimensions (p. 157).

He also found that, between participants in conversation, there was synchrony in the interaction.

A hearer's body was found to "dance" in precise harmony with the speaker (p. 158).

For the reader, this synchrony must be between the past experience or internalized contexting and the external context which comprises the situation or setting which the text describes. It is unlikely that a child will be able to sense this synchrony unless he has first experienced it in conversation. Reading is listening to the writer's message.

Reading may depend so completely upon listening as to appear to be a special extension
of listening ... Reading is normally superimposed on a listening foundation ... the ability to listen seems to set limits on the ability to read. (Lundsteen, 1979, p. xi)

Liberman (1982) discovered that reading was not a linear decoding of print but rather a discovery within the reader of the pattern of language presented. Just as learning to speak in sentences is not imitative so reading must be a combination of mental processes. Bayne Logan at a recent conference in Toronto reported a study conducted at Ottawa University which showed that both hemispheres of the brain were involved in reading. He felt the left was handling the decoding while the right was "making spaces". The spaces or pauses indicated units of meaning. The fact that this was not a linear process is shown when an individual is asked to report on what was read. The sequence is usually accurate but the words are the reader's not the writer's. The reader has interpreted the message in the light of the inner and outer context and has created something new.

The development of listening is a life long process. Every new experience brings a language of its own but before one can move in synchrony with it, one must be aware of the context. It follows that there is a necessity for continuity. If as Vygotsky has proposed, each new experience must be linked to a previous
one, too much difference between new experience and old experience will inhibit the synchronous response.

... man probably synchs everything he does and when he is out of phase, this is a sign that something is very very wrong. (Hall, 1976)

The philosophy of Leibnitz (1714) presents the notion of being "in synch" in a much broader way. He wrote of the order and harmony of the universe and how that order is represented in the soul/mind of man. While other philosophers argued for the separation of mind and body, Leibnitz believed in their unity. He called the soul and body a "monad" which mirrored the whole of the universe. To the degree that the individual is unable to internalize the environment, there are degrees of distortion.

It is important then to present literature to the children which will reflect their world view. Norma Schlager's (1978) study showed that children of various socio-economic and ethnic backgrounds were able to respond to literature which matched their cognitive development. Even though they would have difficulty understanding all the words, they were able to find a match with their own experience.

To understand another's speech, it is not sufficient to understand his words, we must understand his thought. But even that is not enough - we must also know its motivation. (Vygotsky, 1952, p. 151)
Listening is first of all relating to the speaker's intent, then to the intonation and phrasing, and finally to the words.

(b) Reading

What has been said about listening is also true for reading. The reader must first relate to the intention of the writer, then the phrases and sentences and finally the words. To understand this process, it is helpful to observe the child who learns to read before entering school.

Reading begins with the child's first experience with books. Lap reading blends the pleasure of social interaction with the rhythmic sound of words. The appearance of a book then brings expectations of pleasure. Books provide opportunities for the child to extend his search for language. The two year old enjoys pointing and asking "Wassat?" and the three year old relates to books depicting simple actions that he has already experienced. It isn't long before the child has a favourite book which has been memorized. A hurried adult is unable to skip a word let alone a page. Huey (1908) maintained that a child would learn to read without the conscious effort of the part of an adult if enough examples of meaningful print were available. A child who has grasped the meaning is able to develop his or her own strategies for making sense of print.
Reading, like language, develops from unity to differentiation — from meaning to words. In this search for meaning, the child does not discover a one to one correspondence of letter to sound but rather ways of integrating all of his experiences with the print.

Reading is not primarily a visual process. Two kinds of information are involved in reading, one that comes from in front of the eyeball, from the printed page, that I call visual information and one that derives from behind the eyeball, from the brain, that I call non-visual information. Nonvisual information is what we already know about reading, about language, and about the world in general. (Smith, 1973, p. 6)

Liberman (1982) concludes that reading is not a linear process but rather an awakening of the pattern seeking processes of the brain. To the text, readers bring their sense of language, their attitudes, their feelings, their hypothesizing, their whole being. Paterson (1982) reflects on her feelings as a writer. She says:

I don't just want a young reader's time, I want his life. I want his senses, his imagination, his intellect, his emotions, and all the experiences he has known breathing life into the work upon the page (p. 330).

Research has shown that children, who have had many experiences of listening to stories, who have been captured by their magic, will learn to read early. Listening comes first for unless the
rhythm and intonation of book language is established, the child will have great difficulty in making sense of print. If the child is familiar with stories, learning to read should be just as natural as learning to talk.

How can children who have not been attracted to reading and who are experiencing difficulty be helped? Children in grade four may have problems which were not addressed in the primary grades. It may have been thought that their problems were due to immaturity; on the other hand, perhaps the children were able to mask their difficulties when dealing with easy texts. Unfortunately, by age eight, according to Petzold (1963), the listening patterns will likely be habituated making remediation very difficult. In order to provide programs for these children, it is necessary to determine whether or not listening ability distinguishes between good and poor readers and if so what techniques could be used to overcome and prevent this discrepancy. A study of good and poor readers in grade four should, therefore, provide insights into differences in listening ability and into background experiences which may have contributed to listening development.

Purpose of the Study

Many children with reading difficulties have been identified but there is little evidence that existing special education
programs are meeting their needs. It is hypothesized that one of the underlying causes of reading problems may be poor listening ability. In order to modify the special education programs to include listening development, it must first be determined if there are differences in listening ability between good and poor readers and also what background experiences may be fostering good listening.

Statement of the Problem

Is there a difference in listening ability between good and poor readers? Is there evidence that previous literary experiences have affected listening development? The theory of listening presented in this chapter indicates that listening demands a wholistic response in a meaningful social context. Some aspects of this response can be measured and will be examined in this study. The first is the ability to attend to the sound frequencies used in language, the second is the ability to listen for rhythmic patterns and the third is the ability to discriminate pitch.

Literacy background has already been correlated with reading abilities (Chomsky, 1972), this study will investigate the effect of early experiences with books on listening ability.

The following questions will therefore be addressed in this study.
1. Is there a difference between good readers and poor readers in their ability to discriminate rhythm patterns?

2. Is there a difference between good readers and poor readers in their attention to language frequencies?

3. Is there a difference between good readers and poor readers in their ability to discriminate pitch?

4. Is there a difference between good readers and poor readers in their self-reported experiences with stories and books?

Definitions

1. Learning Disability Class

Before students are admitted to a learning disability class in North York Board of Education, they must have been identified by their classroom teacher as having learning problems and been involved in some form of program modification. When this is proved insufficient to meet their needs, a full academic and psychological assessment is obtained. If this testing reveals a discrepancy in scores, the data is presented to a review committee including the principal, supervising psychologist and assistant superintendent of schools. If this committee recommends placement in the learning disability class and the parents give written consent, the student is enrolled.
2. Special Education Resource Teacher

Special Education Resource Teacher is defined by North York Board of Education as a teacher who is assigned to a number of schools with the responsibility of administering academic assessments to children with learning problems and recommending program modifications to the regular class teacher.

3. Electronic Ear

The Electronic Ear, developed by M.D.S. Laboratories, looks like an amplifier but the sound is transmitted through two channels, one for high frequencies and one for low. As the tapes are played, the electronic ear picks up alternate channels. Since the low frequencies can be felt through bone conduction and high frequencies require a cortical response, it is hypothesized that the alternating of these two frequencies will provide a physiotherapy of the brain stem resulting in improved attention and response to sound.

4. Level I and Level II Schools

North York Board of Education has established some criteria for identifying schools with special needs. **Level I** schools are those with the most needs and are therefore allotted extra staff such as guidance counselors, E.S.L. and Special Education teachers. **Level II** schools also have needs but they are not as
demanding as the Level I schools. The following criteria are used to identify needs.

- two parent families - both parents working
- single parent families
- cultural origins
- multiple dwelling housing
- mobility
- public assisted housing
- student enrollment

Delimitations

In this study, two aspects of language will be addressed - reading and listening. While listening may have an impact on speaking and writing, these will not be considered in this study.

Limitations

The population of this study was limited to three elementary schools in North York, Ontario. While these schools appear to represent three different socioeconomic levels, they were not randomly selected from these levels. The reader, therefore, must not conclude that the results may be generalized to all schools identified in this way. The total population consisted of six grade four classes, 180 students, which is a very small percentage of the total number of grade four students in North York; therefore, the results of
the study do not apply to all grade four students in North York. It must be emphasized that the reader should not generalize these results to grade four students in other areas. North York's citizens are approximately 50% foreign born and there are many different socioeconomic milieus.

The sample was also limited. Teachers were asked to identify some good readers and some poor readers. One teacher may have identified more good readers and another more poor readers. This discrepancy could have been due to a policy of streaming within the school which placed the top grade four students in a grade four-five class and the poorer grade four pupils in a regular grade or a grade three-four. Only the children identified by their teachers, 55 in all, were given the Spache Diagnostic Reading Test. Without special directions to the teachers, students were selected from both English and English as a second language backgrounds. Since the sample is small, conclusions may not be applied to all students from a particular background.

Thus neither the population nor the sample was randomly selected. Since the researcher has access to these particular schools and not to all schools in North York, the study was confined to them. Because the teachers' identification of the
students was supported by the results of the Spache Test, it was deemed unnecessary to test every grade four student in these schools.

It was impossible to collect all the data on the same day for all the tests so there may be contaminating factors due to excitement in the class, the classroom teacher's interaction with the child or problems at home. Although care was taken to assess the children during their regular reading period, some children may have perceived this as missing something important.

The use of a questionnaire introduced an element of subjectivity into the study both from the students and from the researcher. In responding to the questionnaire, the children may or may not have given an accurate description of their experiences with books and stories. While the researcher attempted to keep the degree of subjectivity to a minimum, it is possible that the manner in which the questions were presented could have been leading and the students may have tried to please.

This research may be valuable in assessing whether or not the theory of listening presented and its relationship to reading and literary experiences can be supported. The results should be used as a guide for further exploration rather than determining causal relationships.
In order to understand the interaction between listening and reading, it will be necessary to review literature and research in the areas of listening for meaning, listening and speaking, listening and reading, listening and literature and listening and learning.

**Listening for Meaning**

I shall propose that the child communicates before he has language ... These primitive communicative acts are effected by gesture, vocalization, and the exploitation of context.

... There is a progressive development of these primitive procedures for communicating, and typically they are replaced by less primitive ones until eventually they are replaced by standard linguistic procedure. (Bruner, 1978, p. 65)

Bruner (1975) in his study of infants with their mothers was able to determine that infants by their gesture and focus of attention were relaying messages to their mothers. He believes that language develops not because of an innate tendency to speak but rather a predisposition of the infant to respond to and
interact with an adult. This need to communicate is universal to human society and it is upon this interaction that language and culture are encoded.

Mundy-Castle (1980) after studying the results of a study of Lagos mother-infant interaction felt that there was support for the phenomenological approach that personality, thought and self grow out of social interactions. Like Halliday (1975) who observed his own son's gestures and babbling, he believed that the infant showed meaning before speech by manipulating the contextual structure of his actions, according to rules acquired in joint activities with others, particularly the mother (p. 248).

Halliday and Bruner through their observations and studies have supported the premise of Vygotsky (1962) who held that thought and language grow from the communication of the meaning in gesture.

How then is this meaning communicated? Both Sapir (1949) and Merleau-Ponty (in Sardello, 1974) felt that language was based on listening with babbling and intonation taking on the tone of conversation.

Speaking originates through being immersed in a medium which elevates these organs (which have other functions) to the human order. (Sardello, 1974, p. 415)
But the child cannot do this on his own. Bruner speaks of adults providing scaffolding and Halliday of adults sharing the "language creating" process.

It does not mean they are making the same noises, serving the child's own expressions back to him or her. They are addressing the child in their own tongue, the mother tongue. But they are also there on the inside of the child's head, so to speak; not only do they know what he or she means, but they also know what the child understands. (Halliday, 1975, p. 10)

In this close relationship, the adult learns the child's meaning and articulates it for him or her. What the child hears confirms his or her meaning.

The first evidence that infants are actively listening to speech is demonstrated in Condon and Sander's (1974) study. Films were taken of infants as adults spoke and it was found that they synchronized their body movements to the speech.

To ensure that it was not the adults responding to the infant, they used tape recordings and noted similar responses. They also found that American children responded to Chinese as well as to English; however, disconnected vowel and tapping sounds "failed to show the degree of correspondence associated with natural, rhythmic speech".
Since infants perceive through movement (Piaget and Bruner), their rhythmic response to speech ensures that they will internalize meaning. This is evident as they begin to use intonation to express themselves. MacNamara (1972) notes that infants use a rising pitch when they expect a response but not when just amusing themselves.

Condon and Ogston (1971) studied adults by filming them as they spoke. They report:

As a normal person speaks, his body "dances" in precise and ordered cadence with the speech as it is articulated ... There are no sharp boundary points but on-going, ordered variation of change in body which are isomorphic with the ordered variations of speech. This has been called self-synchrony (p. 153).

When the same observation techniques were used on two individuals in conversation, they found that:

a hearer's body was found to "dance" in precise harmony with the speaker ... the speaker and hearer look like puppets moved by the same set of strings (p. 158).

Condon and Ogston (1971) observed this interactional synchrony consistently in normal interaction including several cross cultural films. Perhaps Langer (1953) provides an answer to the ability to be in synch even though languages differ.
The rhythm of language is a mysterious trait that probably bespeaks biological similarities of thought and feeling which are entirely unexplored yet (p. 258).

Since the mind is a "dynamic, constantly active system or rather a composite of many interacting systems" (Lashley, 1960, p. 526), the underlying body rhythm is the organizer or directs the search for meaning.

Body rhythm according to Langer (1953) is not just a repetitive action but rather a result of the build up of need for satisfaction and then returning to need; for example breathing occurs as a natural need for oxygen and gradually the need builds again. The brain is constantly searching for novelty and pattern. As this search is satisfied a period of integration occurs which then creates a need for more information. Lashley (1957) refers to Brown who suggested that the "mechanism of reciprocal enervation, rather than simple reflex, is the unit of organization of the whole nervous system" (p. 519).

The brain is waking and with it the mind is returning. It is as if the Milky Way entered upon some cosmic dance. Swiftly the head-mass becomes an enchanted loom where millions of flashing shuttles weave a dissolving pattern though never an abiding one; a shifting of subpatterns. (Sherrington, 1951, p. 153)
Langer (1942) mentions an "optimal period of learning".

... and this is a stage of mental development in which several impulses and interests happen to coincide: the lalling instinct, the imitative pulse, a natural interest in sounds, and a great sensitivity to expressiveness of any sort. Where any of these characteristics is absent or is not synchronized with the others, the linguistic intuition miscarries (pp. 122-3).

Condon and Ogston (1971) have shown that individuals with problems such as aphasia, petit mal, autism, retardation and schizophrenia are not able to synchronize their body with speech. Wolff's (1968) study of infant sucking indicated that those with a history of perinatal stress show abnormal sucking patterns. He speculates on the correlation between disturbances of sucking rhythm in early infancy and later disturbances in voluntary rhythmical actions such as speech and gait.

Rhythm, according to Lashley (in Lenneberg, 1967), "is the organizing principle that underlies speech and language" (p. 107) and tends to spread to every other concurrent activity. Condon's work clearly demonstrated the connections between body gesture and speech. Individuals who could not listen to themselves or others were those who lacked self awareness and were out of step with society.
Listening and Speech

Auditory imagery and the correlated motor imagery leading to articulation are, by whatever devious ways we follow the process, the historic fountain-head of all speech and of all thinking. (Sapir, 1949, p. 21)

From the work of Bruner, Halliday and MacNamara, it has been shown that the infant emulates the intonation of adult speech. This ability is generally followed by finer differentiation which leads to the acquisition of vocabulary. Vygotsky (1962) reminds us that in inner speech "a single word is so saturated with sense that many words would be required to explain it in external speech" (p. 148). Differentiation then not only refers to the phonemic quality of the word but to nuances of meaning gathered from inner and outer context.

In a review of research on language disorders, Ludlow (1980) noted that several studies had shown that preschool children, having been diagnosed as having language problems, continued to have problems in later childhood. Children with speech problems however generally caught up with their peers. She refers to Wiig and Semel's studies which identified the more subtle development in language that occurs during the school years but notes that little attention is paid to this since standardized instruments
are not available for evaluation of these aspects of linguistic development.

The results of Frumkin and Rapin's (in Ludlow, 1980) study were interesting. They studied two subgroups of language-impaired children, one impaired in speech articulation as well as language and the other without articulation problems. The former could not discriminate consonant-like stimuli while the latter had difficulties "identifying steady-state vowels" (p. 501).

Tallal (1976) found similar results. In a study of a group of dysphasic children, she found that there was no impairment in discriminating steady-state vowels but the discrimination of consonant stimuli was inferior; however, when the consonant sound was extended, they could discriminate well.

Kimura's (1961) study showed that the right ear, because there is a more direct route from it to the left hemisphere, is more dominant than the left ear in the processing of verbal information. She also showed this was most evident when stop consonants were presented. This was not the case when steady-state vowels were introduced. Tallal (1976) refers to A. Liberman's hypothesis that

the right ear advantage indicates that specific verbal material must be processed in the left hemisphere and that this lateralization results from processing that occurs beyond the level of acoustic analysis (p. 322).
Ludlow (1980) reported on Molfese' (1977) research in which speech-like stimuli were presented monaurally to infants. E.E.G.'s showed more auditory evoked potentials in the left hemisphere. When nonspeech sounds were presented the evoked potentials were greater in the right hemisphere. Reference was also made to Cutting and Eimas study which demonstrates that infants of 1 month of age could distinguish between "b" and "p". These findings are exciting because they suggest that although the newborn may not "understand" what is being presented, its brain is already equipped with specialized centers that will be responsible for processing these sounds at deeper levels later in life. (Springer/Deutsch, 1981, p. 135)

These recent studies support the results of Geschwind's (1970) study which showed that the language area of the left hemisphere was larger than the right in 65% of adults. He reported that Wada found similar differences in infants.

It is apparent that the left hemisphere is dominant for some aspects of language but recent studies of cerebral blood flow have shown that both right and left hemispheres are involved in listening and speaking. Lassen (1978) noted that specific areas of the left hemisphere were active; whereas, the right was more undifferentiated.
In 1982 A. Liberman published a paper which presented a "vertical" view of language. An attempt to teach blind children to read by transposing print to sounds failed. He concluded that they had failed to see that the principles they sought were not simply auditory. A new hypothesis for speech perception was presented which took into consideration the many processes involved including memory and learning. He concludes that:

a link between perception and production constrains the process as if by knowledge of what a vocal tract does when it makes linguistically significant gestures (p. 151).

Liberman's belief that there was a link between production and perception supports Piaget and Bruner's ideas of the infant perceiving through movement. The neuronal activity is laying down patterns of speech through the child's production of speech. Kimura (1961) noted that the route from the right ear to the left hemisphere was more direct than left ear to left hemisphere. It would seem, then, that as the child differentiates more precisely, the left hemisphere is more involved. The right hemisphere continues to listen for intonation and rhythm. Shankweiler and I. Liberman's (1976) study of children's abilities to analyze words in syllables and phonemes demonstrates this gradual differentiating process. They found that at age 4, 50% could segment by syllable. By age 6,
70% could segment by phoneme and 90% were capable of segmenting by syllable. They also referred to Monroe (1932) and Savin (1972) who found that children with problems in reading had problems in rhyming.

Support for A. Liberman's hypothesis was found in a study by Matthews et al (1981). They found that tests of auditory discrimination did not distinguish between learning disabled and non-learning disabled children unless both groups also had problems in articulation. When children were articulatory defective the ability to discriminate intrapersonally differentiated between the learning disabled and the non-learning disabled. The children were asked to listen to a word, say the word and then indicate whether they sounded the same or not. Other auditory discrimination tests revealed no significant difference. In order to improve the children's perceptions, the children need more experience in saying the words.

It is obvious that self-monitoring abilities and listening skills will affect a child's progress not only in speaking, but also reading (p. 11).

Listening and Reading

In Chapter I, a psycholinguistic theory of reading was presented as a basis for this study. A review of the research on
listening and reading, revealed that, until recently, there had been very few studies dealing with auditory perception and reading. Unfortunately, most of the researchers had accepted decoding as reading and therefore their results will have limited bearing on this study.

Hammill and Larson (1974) in a review of the studies relating auditory perceptual skills and reading indicated serious doubts about the findings and conclusions of previous research. Their concerns were with the understanding of auditory perception. Most tests given to the students were related to isolated auditory skills such as discrimination, memory, blending and auditory-visual integration.

An interesting study by Deutsch considered socio-economic status and auditory discrimination.

... The discrepancy in incidence of reading retardation between middle-class and lower-class children is large and it may be that a portion of this discrepancy is attributable to differential difficulties in auditory discrimination (p. 294).

It was suggested that lower-class children tolerate a higher noise threshold; however, the affects of language and literature were not taken into consideration. Perhaps the lower-class children had had less exposure to literature.
Other studies reported by McGovern (1979) also noted that poor auditory discrimination is associated with reading disabilities and low socio-economic status. She mentions Jensen (1967), O'Grady (1968), Sardy (1970) and Howard (1970). A copy of the summary of her findings is found in Appendix A. (Used by permission)

Harper (1981) also reviewed the research on the relationship between auditory perception and reading. She felt that auditory closure and sound blending were two aspects of auditory perception that needed further investigation. After studying the scores of 75 children identified as learning disabled on tests of auditory closure and sound blending, she found that the relationship between auditory closure and reading has practical relevance.

The reading scores in the above study were based on the decoding of words. Harper seemed surprised that children whose scores were low in reading were high in auditory closure and that the opposite was true of good readers. If reading scores had been based on comprehension of a passage, she may have found that good readers were using closure on phrases and sentences rather than words.

Allington (1980) studied 24 first and second grade teachers from four school districts and found that poor readers were given less opportunity to read and were corrected frequently on words
read incorrectly. The fact that they were being directed to correct "words" would force them to attend to the phonemics rather than meaning and this would certainly make it essential that they develop a skill of auditory closure on words. The fear of being corrected would also create tension and thus, according to Logan's (1984) unpublished research, the children would be unable to use word attack skills, sense of language and meaning simultaneously.

A study of Marslen-Wilson (1975) was directed at the underlying perceptual processes which are prerequisite for any learning. He studied sentence perception by presenting sentences in which a target word, used out of context, was unchanged, or used in context but changed in the 1st, 2nd, or 3rd syllable. The subjects were asked to repeat the sentence as they heard it. He concludes:

That sentence perception is most plausibly modeled as a fully interactive parallel process: that each word, as it is heard in the context of normal discourse, is immediately entered into the processing system at all levels of description, and is simultaneously analyzed.

Most studies are still directed toward defining specific problems yet if, as Marslen-Wilson says, it is a fully interactive parallel process then attempts to be specific will not likely be successful. Stanovitch (1980) presents a theory of an interactive
reading process which employs both the orthographic structure and sentence context. He maintains that both good and poor readers use context but good readers are superior in word recognition. These results may be taken as support for teaching and drilling decoding skills but they could also indicate that readers, who have had less attention to drill, have developed superior word recognition skills. More exposure to reading and listening to stories would strengthen the interactive parallel process. There is a need to monitor reading behavior over a longer period of time in order to interpret test data more efficiently.

At the conclusion of a study to discern "Some Common Causes of Literacy and Numeration" Bulcock and Beebe (1981) were surprised to find that

reading and numeration, though highly responsive to one another, were not particularly responsive to children's cueing strategies or basic skill performances (p. 19).

Their premise was that speech perception was necessary for both reading and mathematics. They refer to Neisser, (1976) who pointed out

listening necessarily involves the ability to generate hypothesis that are unlikely to be disconfirmed (p. 32).
Bulcock and Beebe accepted the psycholinguistic theory of reading, referring to Smith (1973) and Goodman (1967). They used the Reading Miscue Inventory of Goodman and Burke (1972) to assess the students' reading. Only syntactic weaknesses were counted as errors in syntax and only a distortion of meaning was considered a semantic error. Data for language and arithmetic were gathered from scores of Canadian Test of Basic Skills. While scores in reading and numeration co-varied, the results were not responsive to those in basic skills. Their study raised a number of questions and proposed that studies in aural recognition analysis would be helpful since this precedes both numeration and reading.

In assessing children's auditory skills, Tallal (1980) used nonverbal tests. She was particularly interested in discrimination and temporal order perception. Stimulus tones were presented at different rates. The results indicated that there was no difference between the experimental and control groups unless the stimuli were presented quickly. Scores on a phonic reading test and general reading ability correlated with those made when the stimuli were presented quickly. In a previous study Tallal and Piercy (1973) (in Tallal, 1980) found that deficits in discriminating rapidly presented stimuli affected higher order processes such as ability to sequence. Dorman, Cutting and Raphael, 1975 (in
Tallal, 1980) found that inability to discriminate at rapid rates was evident in children with speech problems. Tallal (1976) concludes:

Children with severe developmental language disorders are severely impaired in their ability to analyze rapidly changing acoustic information. Furthermore a subgroup of children with specific reading disabilities are also impaired in this same aspect of acoustic processing, although to a lesser extent (p. 320).

These studies seem to support Condon's (1971) work which showed that those with severe problems did not synchronize body gestures with speech. When he delayed the sound of the films taken, then the voice and gestures were in synch. A delay in auditory processing seems evident. Kimura's (1961) theory of listening delay when the left ear is dominant also provides a reason for the inability to listen to rapidly presented auditory stimuli. Tomatis (1972) also points to the need for right ear dominance in listening to language.

Tomatis devised a program using the Electronic Ear to re-educate the ear. This program involved the children in listening to tapes of their mother's voice. Only the rhythm of the speech was apparent. The children did not hear words nor were they aware that it was their mother. As they listened, they relaxed.
Interspersed with this tape were tapes of Mozart symphonies. The purpose was to stimulate listening to the high frequencies. After the children were relaxed and 'open' to these frequencies, they were asked to listen to words and phrases with the Electronic Ear set so that more input was directed to the right ear. As the children repeated these words and phrases, their ability to self listen was strengthened.

The only published study using this technique is that of Gillis and Sidlauskas (1977). Their subjects were nine dyslexic children who, when compared to a control group, showed an improvement in reading comprehension. Barbara Wilson of Cornell University and Byron Bourke of Windsor University are currently conducting studies.

In 1983, Dr. M. Perkins, Chief Psychologist for North York Board of Education, studied the Electronic Ear program used in North York by comparing it with another special education class. Results of this unpublished study indicate that there was a greater improvement in reading comprehension and self confidence in the experimental group. Even though the tests of both groups were academically based and the listening program offered no academic instruction, the researcher noted that both groups made similar gains in other scores. Listening improvement, audiometrically
measured, was noted only in the experimental group; however, these results were not valid since the control group had had fewer listening tests than the experimental group. It appears that a study designed to examine the listening abilities more precisely is needed.

**Listening and Literature**

Early contact with stories and poems has the greatest single effect on a child's linguistic development. (Meek, 1982, p. 38)

Meek's statement is supported by observations of primary teachers and many research studies. Durkin (1966) investigated more than 4,000 first grade students to identify children who learned to read before instruction was given in school. All of these children were read to. They were followed over a period of 3 years and were found to maintain superior reading skills.

A similar study was conducted by Clark (1976). She also found that early readers had come from homes where books were valued and read. The children were assessed with the I.T.P.A. and the WISC-R. An analysis of the subtests on the I.T.P.A. showed that the early readers were more successful on auditory tests rather than visual. On the WISC, they were superior in tasks involving completion in a language context area. Clark maintains that reading to children sensitizes them to book
language and is a "more valuable preparation for school than any attempts at teaching the child phonics" (p. 104). After interviewing the parents and comparing the academic success of other children in the family, she concludes:

If we are to improve the teaching of reading and the related skills, it seems important to consider reading in a language context - a context which includes both school and home (p. 106).

Cohen (1968) felt that poor reading ability resulted from a lack of book experience and inadequate language. She tested her hypothesis with grade two children in seven elementary New York City schools. Teachers were given fifty books to read to the children and suggestions for accompanying activities. The experimental group shows significant gains in vocabulary, word knowledge, reading comprehension but not in word discrimination.

This study was extended by Cullinan, Jaggar and Strickland (1974). They tested 500 children from kindergarten to grade three. Both the control and experimental group were read to but the latter was also involved in related activities. These children made the greatest gains especially at the kindergarten level.

Chomsky's (1972) study of children between the ages of six and ten also revealed that reading exposure correlated strongly with language development. Huck's *Taking Inventory of Children's*
Literary Background was used to assess reading exposure. The results indicated that listening to books read aloud is positively related to linguistic development at the pre-reading stage. Memory of content of books read, and I.Q. also correlated with language development.

Not only is the child's language extended through listening but also his or her sense of story. Applebee (1978) discovered that 70% of two year olds used two of three story conventions - an opening phrase, an ending or use of the past tense. Five year olds used all three of the story conventions and their stories included characters from stories and were about events other than their own personal experience. By six years of age 27% were able to recognize fantasy by nine 86% did.

Rosenblatt (1978) says that past literary experiences serve as subliminal guides as to the genre to be anticipated, the details to be attended to, the kinds of organizing patterns to be evolved (p. 56).

In her transactional theory of reading she stresses that the text is necessary but not sufficient to carry the message. The reader must attend, synthesize, empathize, predict and reflect. Listening to a story stimulates the child to respond in this wholistic way and find pleasure in the meaning discovered.
Rosenblatt's description of efferent and aesthetic reading provides insights into the reading process. Efferent refers to the knowledge that remains after the book has been heard or read. Aesthetic relates to the experience itself.

(The reader pays) attention to the sound and rhythm of the words in the inner ear, attention to the imprints of past encounters with these words and their referents in differing life and literary contexts, attention to the overtones of feeling, the chiming of sound, sense, idea and association (p. 26).

Wells (1982) seven year study of children's language from preschool into the primary grades indicated that the main predictor of a child's success in school was his or her literary level. He found that most children came to school with language that was functional but that the difference in children who did well academically was exposure to books and quality of conversation.

Listening and Learning Styles

... the nervous system provides both the anatomical structure and physiological activity essential for satisfying the definition of a clock; and the person with these mechanisms working normally and harmoniously has a reliable clock for the direction of all his activities. (Gooddy in Critchley, 1977, p. 138)

Sokolov (1963) proposed a neurophysiological theory that describes the physiological effects of attention. A study of 48
eleven year old boys was conducted by Levine (1976). The subjects were classified as normal, primary who rotated the designs on the Bender 25° or less and secondary who rotated figures 26° to 54°. As they read, electrophysiological measures were recorded. Heart rate deceleration, an indication of attention, occurred only in the normal and secondary groups. The secondary group who evidenced a high level of attention apparently overattended and this interfered with cognitive processing. The primary group showed no evidence of deceleration and therefore were not attending.

Harrer and Harrer (in Critchley, 1977) note that perceptual and emotional musical experiences lead to changes in blood pressure, pulse rate, respiration, the psycho-galvanic reflex and other autonomic functions. They measured E.M.G.'s of Herbel von Karajan when he was conducting a symphony and when he was executing a difficult manoeuvre flying a jet. The former produced a stronger autonomic response. Music appears then to focus the attention and to stimulate cortical activity which encompasses both hemispheres.

Electrophysiological studies have shown that when the stimulus is first presented, there is general excitement in the brain and then it is localized in particular areas. Reading, however, stimulated activity in both hemispheres. Lund, 1977 (in Frostig and Maslow, 1979).
Literature according to Rosenblatt (1978) can provide a focus for the child's attention and, as Britton (1970) suggests, appeal to both hemispheric functions. Rosenblatt believes that there is a circular process involving both reader and text during this aesthetic experience.

The concept of selective attention is central to my definition of the aesthetic experience. It is helpful also in eliminating the notion of a necessarily conscious choice. The selective process operates in weighting responses to the multiple possibilities offered by the text and thus sets the degrees of awareness accorded to the referential import and to the experiential process being lived through (p. 43).

Each child will respond in a different way since his or her previous experiences have been varied. Yet within the framework of a story there is a unity which draws the child's attention and reaches his mind and heart (Rosenblatt). Schickendanz (1978) also discusses the relationship between affect and cognition

In other words, a story reading situation that is loaded with positive affect is the same situation that is loaded with information for the child (p. 54).

Frostig and Maslow (1979) believe that emotional and attentional processes are inseparable from those which are cognitive. This belief has grown from their study of anatomic and physiological
research. It is important, they feel, that educators realize that the brain can change and that the teacher, by providing a rich and varied environment, can stimulate the child to use different brain functions.

In reviewing Goldstein and Blackman's (1978) Cognitive Style, it was evident that most studies indicate that cognitive styles are developed and modified by maturation and environment. Witkin (in Goldstein and Blackman) found that field independence develops with age and also with verbal and performance intelligence. It is difficult to ascribe a particular style to each individual since different situations and varying cues, symbols, imaginary or sensory, affect the response. With this knowledge, the teacher will create an environment where children are free to respond in their own way. Daily drills of words and sounds, for example, may have the effect of forcing the child to find answers outside himself. This unilateral training (Goldstein and Blackman, 1982) restricts perceptions and responses and forces the child to use less complex strategies for integrating. Anderson et al (1977) (in Goldstein and Blackman, 1982) also concluded that insistence upon accurate decoding discourages high level strategies.

Elkind (1983) warned that inappropriate curriculum was creating learning disabled students. Research continues to show that
most six year olds discriminate via perceptible attributes rather than conceptual. Ingison and Levin (1975) (in Goldstein and Blackman, 1982) concluded that the child's cognitive set was powerful enough to interfere with or to enhance learning.

Lyons (1983) discovered that individuals with the most integrated cognitive styles were better achievers. Can these strategies be taught? Torrance (1970) conducted a study of 5 year olds who were involved in three different programs. One was a regular kindergarten, another attempted to develop visual and auditory awareness and the third was a highly structured cognitive approach. Although there was no difference in achievement, there certainly was in attitude. The cognitively structured group was apathetic and inattentive, the aesthetic group fought and bickered while the regular class seemed enthusiastic and organized. Larsen (1975) attempted to teach conservation to a group of five year olds. Her results showed that the children gained more without teacher support.

It appears that children need to discover how to learn. Activities which provide optimum cortical stimulation, linking affective and cognitive development will help the child develop a variety of strategies. Clark and Frisby (1980) compared learning disabled and non-learning disabled children and found that those with
disabilities were lacking in strategies to interpret verbal material. The researchers noted that the able readers were processing by analysis and synthesis.

Learning style may be expected to reveal consistency based on deep structures such as neural organization or personality and gradual changes consistent with life-span development and life experience. (Languis, 1981, p. 3)

In Chapter I, a theory of listening development was presented which began with attention to the rhythm of language in a warm social context and gradually to finer differentiations of the components of speech. Similarly, reading was shown to move from the whole concept of reading to finer differentiations in making sense of print. The review of the literature has supported the hypothesis that listening and reading involve the same processes and that these may be developed through early experiences with books.

Because these processes require individuals to draw on all their previous experiences and because they have developed different strategies for integrating these experiences with new information, it is impossible to teach listening skills. The teacher must provide an environment in which the individual will experience the desire to listen and read and be free to develop his or her own strategies for determining meaning.
Implications for Research

There seems to be no doubt that children with difficulties in auditory perception are often poor readers. McGovern's (1979) review of the literature has provided evidence that educators have been aware of this problem for many years. Efforts have been made to diagnose specific difficulties in order to provide remediation. Unfortunately, most of the tests used to evaluate auditory perception are measuring a linear process; for example, comparing two similar words, breaking words into syllables and remembering the order of digits. The research of Liberman (1982) and Marslen-Wilson (1975), however, has shown that listening is a parallel or vertical process rather than linear. This parallel process is impossible to measure since it involves all of the individual's previous experience with language including both affective and cognitive aspects. In order to provide remediation based on the verticality of language, studies must be directed toward measuring the evidence of the parallel processing before programs can be devised which will encourage the individual to develop good listening habits.

Some evidence of processing which is not linear are attention to language frequencies, attention to rhythm and attention to intonation. If the child has been developing an interest in
communicating with others, it may be evident, through a listening test, that language is considered more important than other sounds in the environment.

Attention to language also implies attention to phrases and sentences. As Smith (1973) has noted, meaning can only be established through attention to the rhythmic components of speech. The fact that this is not a linear process is evident when the individual repeats a sentence by conveying meaning rather than the exact words. Similarly, if an individual tries to remember each component of a rhythmic pattern, he or she will have difficulty in comparing it to another pattern. There needs to be a sense of feeling the parts within the whole.

Another aspect of listening involves intonation. A sentence such as "Now I'm going to get it perfect" could have several meanings based on the intonation.

Now I'm going to get it perfect.
Now I'm going to get it perfect.
Now I'm going to get it perfect.

An individual who does not listen to the intonation will have great difficulty in establishing meaning. The ability to discriminate pitch in the frequencies used in language may indicate whether or not this aspect of language is being given attention.
It may be that early experiences with books and stories have fostered the development of still another aspect of this parallel process in listening because they have involved the child affectively. In Chapter I, it was suggested that these experiences enhanced the development of listening and much of the research presented in this chapter appears to support this premise.

This study will attempt to compare the listening abilities and literary experiences of good and poor grade four readers by addressing the following questions:

1. Is there a difference between good and poor readers in their ability to discriminate rhythm patterns?
2. Is there a difference between good and poor readers in their ability to attend to language frequencies?
3. Is there a difference between good and poor readers in their ability to discriminate pitch?
4. Is there a difference between good and poor readers in their self-reported experiences with stories and books?
CHAPTER III

PROCEDURES

Chapter I presented a theory of the relationship between listening and reading which is based on the oral tradition of story and Chapter II reviewed the research and literature related to the theory. It is hypothesized that children who have had few experiences with books and stories may be poor listeners as well as poor readers. This study will compare the listening abilities of good and poor readers and also some of the literary experiences which they can recall. Chapter III is concerned with the method and procedures which were used to determine if differences existed between good and poor readers. It describes the population sample, the instrumentation, the collection of the data and the statistical design.

Population

The population of this study was limited to grade four students in three schools in North York, Ontario, Canada. North York is a city of 600,000 within the area of Metropolitan Toronto. This metropolis with a population of 3,000,000 is the commercial and manufacturing centre of Ontario. In the 1981
Statistics Canada report, it was shown that 44.3 percent of Metropolitan Toronto's population was foreign born. The largest proportion of immigrants live in the city of North York where 51 percent were born outside Canada.

The North York Board of Education has a total enrollment of 27,885 with a student-teacher ratio of 27.87 to one. Three elementary schools, each having grades Junior Kindergarten to six and under the leadership of the same Assistant Superintendent of Schools, were selected. The researcher was an itinerant Special Education Resource Teacher for five schools. Three of these were chosen because they were each located in a different socioeconomic area. School #1 with an enrollment of 302 students and a staff of seventeen is a Level I school. Many of the families live in subsidized housing and are not new immigrants who speak very little English. They are Greek, Italian, Vietnamese, Korean, Portuguese, Chinese, and Indian.

School #2 is a Level II school with 200 students and 9 teachers. The children come from mainly single family dwellings but there is some subsidized housing as well. It is classified as a Level II school because many children come from single parent homes. Many parents are poorly educated and many have English as a second language.
School #3 is not classified as a special needs school. There are 258 students with 14 teachers. This ratio appears high because there are two classes for the multiply handicapped, each with an enrollment of six, and four classes for gifted students each with an enrollment of 16. The school is in a more affluent area with well maintained detached single family dwellings. The parents are mostly professionals who are English speaking and there are few students with English as a second language.

Sample

The researcher was a Special Education Resource teacher for each of the schools used in the study and was, therefore, well known to the staff and students. With the principals' permission, the grade four teachers were asked, in January, 1984, to select some good readers and some poor readers for the study. The teachers knew the students quite well since they had been teaching them since September and were, therefore, able to judge their reading ability in relation to the other students in the class. It was suggested that the good readers should score at grade level (4.5) or above and the poor readers at least a year below level. The only other guideline given to the teachers was that the children must all have been born between January and December 1974. Grade four children, born in that year, would
have progressed through the grades normally. Those born earlier would have repeated a year and those born later would have skipped a grade.

The teachers selected a total of 55 students and did not list the readers as good and poor. The Spache Diagnostic Reading Scale (1963) was used to identify from this group a total of twenty students with the highest scores and twenty students with the lowest scores. The score used was the average between the students' instructional and independent reading level. The Spache Test is used in North York by the Psychoeducational Consultants and Reading Specialists to assess students and reading. It was felt that the results of this test would therefore be acceptable and it was also possible to ensure that none of the children in the study had had a recent assessment.

The Spache Diagnostic Reading Scale was developed over a period of eight years to provide standardized evaluation or oral and silent skills. The tests are to be administered individually and are used to determine proficiency of normal and retarded readers at the elementary school level. In standardizing the scales, 1,939 children were tested to establish norms and 1,269 of these students provided the silent reading comprehension standards. The students were enrolled in rural and urban schools
in Florida, Georgia, New York and Rhode Island. Seventy-five students were tested on the alternate passages and the reliability coefficient was found to be .99. Further test-retest measures were gathered over an interval of ten weeks and the reliability coefficient was .88.

The students were tested in a single 40-minute session during their regular reading period so that anxiety about missing other activities would not confound the data. The lunch room, which was familiar to the children and not being used during class time, was used for the testing in each school. The means and standard deviations of the scores for good and poor readers may be found in Table 1. A t test revealed that there was a significant difference between groups (df = 19, p < .001).

| TABLE 1 |
| A COMPARISON OF SPACHE READING COMPREHENSION |
| SCORES FOR GOOD AND POOR GRADE FOUR READERS |

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Spache Scores</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Readers</td>
<td>20</td>
<td>.51</td>
<td>5.7</td>
<td>17.39</td>
</tr>
<tr>
<td>Poor Readers</td>
<td>20</td>
<td>.51</td>
<td>2.9</td>
<td>17.39</td>
</tr>
</tbody>
</table>

*p < .001
The two independent variables, the good and poor readers were thus clearly identified. From each school, both good and poor readers were represented in the sample. In both groups, there were boys, girls, children with an English speaking background and children whose second language was English (Table 2).

**Instrumentation**

The tests used in this study to compare good and poor readers were the Seashore Rhythm Test (Seashore et al, 1939), two audiometric measures of listening ability and a questionnaire.

(a) Seashore Rhythm Test

The Seashore Rhythm Test is a subtest of the Seashore Measures of Musical Ability which is a component of the Halstead Reitan Battery (1966). The source of the stimuli is a beat frequency oscillator set at 500 cycles. The tempo is constant at the rate of 92 quarter notes per minute. There are thirty recorded pairs of rhythm patterns which are to be identified as the same or different. These items are arranged in three increasing levels of difficulty, each level having ten items. Subjects are presented with three samples items before formal testing to assure that they understand the meaning of same or different. Items are presented via a record player.
TABLE 2
GENDER, LANGUAGE AND SOCIOECONOMIC LEVEL
OF GOOD AND POOR GRADE FOUR READERS

<table>
<thead>
<tr>
<th>Socioeconomic School Level</th>
<th>Good Readers</th>
<th></th>
<th>Poor Readers</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>E.S.L.*</td>
<td>English</td>
<td>E.S.L.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1 1</td>
<td>0 2</td>
<td>3 2</td>
<td>3 1</td>
<td>13</td>
</tr>
<tr>
<td>II</td>
<td>3 2</td>
<td>3 1</td>
<td>1 3</td>
<td>2 0</td>
<td>15</td>
</tr>
<tr>
<td>III</td>
<td>1 4</td>
<td>0 2</td>
<td>1 2</td>
<td>1 1</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>4 7</td>
<td>3 5</td>
<td>5 7</td>
<td>6 2</td>
<td>40</td>
</tr>
</tbody>
</table>

*English as a Second Language
3,476 grade four students from a number of American States completed the test. The authors stress that only internal validity may be assumed. It is inappropriate to assume that, because a student does well on the rhythm test, he or she will be a good musician. The internal consistency coefficient (Kuder Richardson Formula 21) was found to be .67. From a possible score of 30, the mean for grade four was 22.6 with a standard deviation of 4.

Gordon (1969) found that the scores on the Seashore Test correlated with academic ability and Languis and McGivern (1981) found them to be significantly different for normal and dyslexic children. Since it is a standardized listening test, it was thought valuable for this study.

(b) Listening Tests

A Maico Audiometer, a small portable audiometer, was used to measure each child's attention to language frequencies and ability to discriminate pitch. Since these tests are not standardized, it is important to emphasize the reasons for administering these two tests.

(1) As reported in Chapter II, the students in the North York study who showed an improvement in reading also showed an improvement in listening. This study will use similar audiometric tests to those used in the North York research.
(2) Henry (1947) using a Maico Audiometer, found that high tone hearing loss is one of the causes of reading deficiency. She concludes that acute hearing of the high frequencies is more important than acute hearing of the low frequencies.

(3) Ewers (1950) administered 47 different auditory tests such as syllabication word clozure, sentence clozure, digit span to 140 students in grades 9-13, and then compared these scores with their reading scores. She found that pitch discrimination correlated most highly with reading ability.

(4) Petzold (1969) concluded that auditory perception reaches a plateau no later than grade three. In a longitudinal study, he found that low scores in auditory perception in grade 1 were predictive of low scores in grade 6.

(c) Questionnaire

In order to assess the impact of previous experiences with books and stories, a questionnaire (Appendix B) was constructed to gather information from the children relating to their enjoyment of reading, the kinds of books they liked, the number of books in the home, their experiences of listening to stories, their knowledge of well known stories and the frequency of their visits to the public library. The questionnaire was designed to be presented orally to the students so that any problems
that might have been created by having to read a questionnaire would be avoided. Since many of the parents did not speak English, it would have been difficult for the researcher to conduct interviews with them without alarming them or without an interpreter.

While the questionnaire was not pretested, the items were selected very carefully. The researcher had used questions 1-6 over a number of years when assessing children's reading abilities. Questions 7-10 are similar to those in Taking Inventory of Children's Literary Background (Huck, 1966). Since Chomsky found this measure to be a good predictor of language and reading development, questions relating to familiar stories were also included in this study. Three of the questions related to familiar fairy tales which are translated into many languages and the fourth was open ended. The children could respond with any story about a monkey. It was theorized in Chapter I that listening is essential for reading and that children develop listening skills by listening to stories. If this is true, children with English as a second language should also have the necessary listening skills for reading if their parents have read to them in their own language. Their scores on the listening tests and their responses to the questionnaire may indicate whether or not this is so.
According to Kerlinger (1964), a good questionnaire has a variety of types of questions - fixed alternative or closed, open end and scale. In the questionnaire used in this study, questions 1, 6, 7 and 9 were closed, 2, 3, 4, 5, 10 and 8 were open and 3 and 6 were scale. Question one was loaded with social desirability and it is likely that every child will answer "yes." There is merit in beginning the interview in this way since the child is not threatened by the question, tends to relax and has time to adjust to the procedure being used. This question, however, does not help in the task of identifying differences.

Design

In order to ascertain differences in listening ability and literary experiences of good and poor readers, two kinds of data were collected. The scores on the rhythm test, attention to language frequency and pitch discrimination lend themselves to a statistical analysis and the responses to the questionnaire, a descriptive analysis. Since the study was investigating an existing condition, it was necessary to choose a design which allowed for an empirical inquiry without manipulation of any of the variables and without randomly selecting the population and sample. Ex Post Facto research allows for these conditions and is often used in education when a true experiment is not viable.
Such research should only be undertaken to test a hypothesis and caution must be exercised in drawing conclusions (Kerlinger, 1964). In order to strengthen the design, alternative negative hypotheses should be tested. In this study the data will also be used to investigate the following negative hypotheses:

a) There is no difference between E.S.L. good readers and English language good readers in their ability to discriminate rhythm patterns.

b) There is no difference between E.S.L. poor readers and English language poor readers in their ability to discriminate rhythm patterns.

c) There is no difference between E.S.L. good readers and English language good readers in their ability to attend to language frequencies.

d) There is no difference between E.S.L. poor readers and English language poor readers in their ability to attend to language frequencies.

e) There is no difference between E.S.L. good readers and English language good readers in their ability to discriminate pitch.

f) There is no difference between poor E.S.L. readers and poor English language readers in their ability to discriminate pitch.

g) There is no difference between good female readers and good male readers in their ability to discriminate rhythm patterns.

h) There is no difference between poor female readers and poor male readers in their ability to discriminate rhythm patterns.
i) There is no difference between good female readers and good male readers in their ability to attend to language frequencies.

j) There is no difference between poor female readers and poor male readers in their ability to attend to language frequencies.

k) There is no difference between good female readers and good male readers in their ability to discriminate pitch.

l) There is no difference between poor female readers and poor male readers in their ability to discriminate pitch.

m) There is no difference between good readers of various socioeconomic levels in their ability to discriminate rhythm patterns.

n) There is no difference between poor readers of various socioeconomic levels in their ability to discriminate rhythm patterns.

o) There is no difference between good readers of various socioeconomic levels in their ability to attend to language frequencies.

p) There is no difference between poor readers of various socioeconomic levels in their ability to attend to language frequencies.

q) There is no difference between good readers of various socioeconomic levels in their ability to discriminate pitch.

r) There is no difference between poor readers of various socioeconomic levels in their ability to discriminate pitch.
Collection of Data

All of the data were collected during the months of February and March, 1984. The principals and teachers were pleased to support the researcher in this study since she had always been willing to assist them with children having learning problems. The children were all anxious to "have a turn" whenever the researcher appeared in the classroom. All of the testing was done by the researcher in the lunch room of each school since the children were familiar with this room. There were enough individual tables and chairs which could be well spaced for the group test. Each test was completed in the three schools before beginning the next. Care was taken to administer the tests during the regular reading period. All subjects completed the Seashore Rhythm Test and the two listening tests; however, two poor readers moved away just before the questionnaire was given.

(a) Seashore Rhythm Test

The rhythm test was administered as a group test. Each child was given a numbered paper (Appendix C) on which to mark their answers. A good quality record player was used to ensure good sound reproduction. The practice questions p 1, p 2, and p 3 were done as a group.
Researcher: I am going to tap two rhythm patterns. See if you can tell me if they are the same or not.

Children: Respond orally.

Researcher: Yes, they were the same. You can mark "Y" for yes beside P 1.

Now I'm going to tap two more. Tell me if they are the same or not.

Children: Respond orally.

Researcher: No, they're not the same so you can mark "N" beside P 2.

Now I'll tap two more. You decide yourself whether to mark "Y" or "N" beside P 3. (Answers checked)

Researcher: Now you'll hear patterns on the record. I will call the number. You write "Y" or "N" beside it. If you miss one, don't worry. Leave it out. Listen for the next number. Be sure to write your answer beside the correct number.

This test was done in the mornings of the same week for each school.

(b) Listening Test - Attention to Language Frequencies

The children came individually to the lunch room during their regular reading time for the listening tests. The child put on the head set and the researcher used the Maico Audiometer to present the sounds. The child was instructed to say "Yes" as soon as he or she heard a sound. Beginning at 4000 hertz, a
sound at the minimum decibel level was presented. Then gradually, the decible level was increased until the child responded. The response was recorded on a graph (Figure 1) unobserved by the children.

FIGURE 1: GRAPH SHOWING ONE SUBJECT'S LISTENING CURVE

Explanation of the Graph.

(a) Horizontal Axis - Frequencies measured 125 to 4000.

Low (125) to high (4000)

For the purpose of this study, 125, 250 and 500 will be considered low frequencies. The commonly accepted language frequencies, 750-4000, will be interpreted as high frequencies.
(b) Vertical Axis - The Decibel Level (Loudness)

The minimal sound is labelled -20. If the child requires 40 or 50 decibels in order to hear the sound, he or she is having severe problems.

A study of Figure 1 shows that the subject heard the sound at 4000 hz. at 10 decibels. Each frequency was treated in the same way and a graph was made of the student's listening for both left and right ear.

Scoring Attention to Language Frequencies

Turning to Figure 1 again, it may be seen that the subject heard the sound at 2000 hz. at the 10 decibel level and the sound at 500 hz. at 15 decibels. This ability to hear the higher sound at a lower decibel level indicates that the student is more attentive to the high sound. Each time a higher frequency (750-4000) was heard with fewer decibels than any of the low frequencies (125-500), the student received a point. A possible score of 12, 6 for each ear, could be obtained.

Figure 1 would be scored as follows:

Right Ear: A point was given for each of 1000, 1500, 2000 and 4000. 4 points
750 and 3000 were not heard sooner than 500 and lower; therefore no points were given.

Left Ear: Points were given for each of 1000, 1500, 2000, 3000, and 4000. 5 points
750 was not heard with fewer decibels than 250; therefore no point was given.

Total Score for Attention to Language Frequencies is 9.
(c) Listening Test - Pitch Discrimination

Before beginning the test of pitch discrimination, the child was asked to "Make a high sound" and "Make a low sound". Any confusion was cleared up before continuing the test. Pitch discrimination was measured by presenting two consecutive sounds of different frequencies at a decibel level which the first test had shown was easy for the child to hear. The child was told:

You will hear two sounds. Tell me which is the high sound - the first or the second.

Sounds to be compared were presented at 4000 and 3000, 3000 and 2000, 2000 and 1500, 1500 and 1000, 1000 and 750, 750 and 500, 500 and 250, and 250 and 125. Both ears were tested. The child with no errors received a score of 16. If there was an error, the graph was shaded in. A point was given for every unshaded column (Figure 2).
FIGURE 2: GRAPH SHOWING ONE SUBJECT'S ABILITY TO DISCRIMINATE DIFFERENCES IN PITCH

Scoring of Figure 2

Right Ear - 5 unshaded columns, 2000-1500, 1000-750, 750-500, 500-250, 250-125. 5 points.

Left Ear - No unshaded columns. 0 points.

Total Score for Pitch Discrimination is 5.

(d) Questionnaire

The questionnaire (Appendix B) was the last evaluation to be completed. It was administered individually in the lunch room in a twenty minute session and the children were seated in the
same seat as they were when the Spache Test was administered. They were told:

    You've been helping me to find out about children's reading and listening. Now I need some help to find out what books children like.

The questions were asked orally so that any problems with reading would be avoided. The researcher asked:

    "Do you like reading?"

The student replied orally and the researcher wrote down the response on the questionnaire. The researcher then asked:

    "What kind of books do you like?"

The researcher wrote down the response given by the student.

    The researcher continued to ask the questions and write down the student's responses. Care was taken not to involve the children in any discussion of their responses nor to draw out more explicit answers than the child offered.

**Statistical Procedure**

A score was obtained for each student for the tests of rhythm discrimination, attention to language frequencies and pitch discrimination. The mean score for the good readers and the mean score for the poor readers was found for each test. In order to determine if there was a significant difference
between the mean score of good and poor readers on each test, three t-tests were administered (Table 3).

1. A t-test to compare the means of good readers and poor readers on the Seashore Rhythm Test.

2. A t-test to compare the means of good readers and poor readers on the Attention to Language Test.

3. A t-test to compare the means of good readers and poor readers on a test of Pitch Discrimination.

**TABLE 3**

STATISTICAL PROCEDURES USED TO TEST THE HYPOTHESIS THAT THERE IS A DIFFERENCE BETWEEN LISTENING ABILITY OF GOOD AND POOR READERS

<table>
<thead>
<tr>
<th>Test</th>
<th>Good Readers</th>
<th>Poor Readers</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seashore Rhythm Test</td>
<td>$\bar{x}_1$</td>
<td>$\bar{x}_2$</td>
<td>t-test</td>
</tr>
<tr>
<td>Attention to Language Frequencies</td>
<td>$\bar{x}_3$</td>
<td>$\bar{x}_4$</td>
<td>t-test</td>
</tr>
<tr>
<td>Pitch Discrimination</td>
<td>$\bar{x}_5$</td>
<td>$\bar{x}_6$</td>
<td>t-test</td>
</tr>
</tbody>
</table>
Tables 4 to 7 present the statistical procedures used to test the negative hypotheses that the differences in listening ability did not arise from differences in language or sex.

**TABLE 4**

**STATISTICAL PROCEDURES USED TO TEST THE NEGATIVE HYPOTHESIS THAT THERE IS NO DIFFERENCE IN LISTENING ABILITY BETWEEN GOOD READERS WITH DIFFERENT LANGUAGE BACKGROUNDS**

<table>
<thead>
<tr>
<th>Test</th>
<th>Good Readers</th>
<th>Good Readers</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E.S.L.</td>
<td>English</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=8</td>
<td>N=12</td>
<td></td>
</tr>
<tr>
<td>Seashore Rhythm Test</td>
<td>$\bar{x}_1$</td>
<td>$\bar{x}_2$</td>
<td>t-test</td>
</tr>
<tr>
<td>Attention to Language</td>
<td>$\bar{x}_3$</td>
<td>$\bar{x}_4$</td>
<td>t-test</td>
</tr>
<tr>
<td>Frequencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch Discrimination</td>
<td>$\bar{x}_5$</td>
<td>$\bar{x}_6$</td>
<td>t-test</td>
</tr>
</tbody>
</table>
TABLE 5

STATISTICAL PROCEDURES USED TO TEST THE NEGATIVE HYPOTHESIS THAT THERE IS NO DIFFERENCE IN LISTENING ABILITY BETWEEN POOR READERS WITH DIFFERENT LANGUAGE BACKGROUNDS

<table>
<thead>
<tr>
<th>Test</th>
<th>Poor Readers E.S.L. N=8</th>
<th>Poor Readers English N=12</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seashore Rhythm Test</td>
<td>$X_1$</td>
<td>$X_2$</td>
<td>t-test</td>
</tr>
<tr>
<td>Attention to Language Frequencies</td>
<td>$X_3$</td>
<td>$X_4$</td>
<td>t-test</td>
</tr>
<tr>
<td>Pitch Discrimination</td>
<td>$X_5$</td>
<td>$X_6$</td>
<td>t-test</td>
</tr>
</tbody>
</table>
TABLE 6

STATISTICAL PROCEDURES USED TO TEST THE NEGATIVE HYPOTHESIS THAT THERE IS NO DIFFERENCE IN LISTENING ABILITY BETWEEN MALE AND FEMALE GOOD READERS

<table>
<thead>
<tr>
<th>Test</th>
<th>Good Readers</th>
<th>Good Readers</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male N=8</td>
<td>Female N=12</td>
<td></td>
</tr>
<tr>
<td>Seashore Rhythm Test</td>
<td>X₁</td>
<td>X₂</td>
<td>t-test</td>
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<tr>
<td>Attention to Language</td>
<td>X₃</td>
<td>X₄</td>
<td>t-test</td>
</tr>
<tr>
<td>Frequencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch Discrimination</td>
<td>X₅</td>
<td>X₆</td>
<td>t-test</td>
</tr>
</tbody>
</table>
TABLE 7

STATISTICAL PROCEDURES USED TO TEST THE NEGATIVE HYPOTHESIS THAT THERE IS NO DIFFERENCE IN LISTENING ABILITY BETWEEN MALE AND FEMALE POOR READERS

<table>
<thead>
<tr>
<th>Test</th>
<th>Poor Readers Male N=11</th>
<th>Poor Readers Female N=9</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seashore Rhythm Test</td>
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<td>$\bar{x}_2$</td>
<td>t-test</td>
</tr>
<tr>
<td>Attention to Language Frequencies</td>
<td>$\bar{x}_3$</td>
<td>$\bar{x}_4$</td>
<td>t-test</td>
</tr>
<tr>
<td>Pitch Discrimination</td>
<td>$\bar{x}_5$</td>
<td>$\bar{x}_6$</td>
<td>t-test</td>
</tr>
</tbody>
</table>

To test the negative hypothesis that there would be no significant differences in the scores of good readers from three socioeconomic levels three simple analyses of variance were completed for 1) rhythm discrimination, 2) attention to language frequencies and 3) pitch discrimination.

To test the negative hypothesis that there would be no significant differences in the scores of poor readers from three socioeconomic levels, three simple analyses of variance were
completed for rhythm discrimination, attention to language frequencies and pitch discrimination.

Questionnaire

The students' responses to the questionnaire which were recorded in writing by the researcher were marked according to the criteria in the questionnaire (Appendix B). Individual responses were examined to see if there was any pattern in the types of answers given by good and poor readers; for example; was there any similarity in the types of books they liked, in their comments about the numbers of books they had, in the persons whom they recalled reading to them or telling them stories, or in their perceptions about the frequency of their visits to the library.
CHAPTER IV
PRESENTATION OF DATA

Forty grade four students, twenty good readers and twenty poor readers, were scored on tests of discrimination of rhythm patterns, attention to language frequencies and pitch discrimination. Table 8 presents the scores for the good readers and Table 9, the poor readers. These scores, together with the responses to a questionnaire (Table 31), were analyzed to test the following hypotheses:

1. There is a difference between good and poor grade four readers in their ability to discriminate rhythm patterns.

2. There is a difference between good and poor grade four readers in their ability to attend to language frequencies.

3. There is a difference between good and poor grade four readers in their ability to discriminate pitch.

4. There is a difference between good and poor grade four readers in their experiences with stories and books.
## TABLE 8

### SUMMARY OF DATA FOR GOOD READERS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
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<td>14</td>
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<td>Eng.</td>
<td>3</td>
<td>6.5</td>
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<td>14</td>
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<td>Eng.</td>
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<tr>
<td>10.</td>
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<td>Eng.</td>
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<td>ESL</td>
<td>3</td>
<td>6.0</td>
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<td>9</td>
<td>16</td>
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\[ \bar{x} = 5.7 \quad \bar{x} = 25 \quad \bar{x} = 10.4 \quad \bar{x} = 14.7 \]
TABLE 9
SUMMARY OF DATA FOR POOR READERS

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<td>3.5</td>
<td>22</td>
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<tr>
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<td>Eng.</td>
<td>3</td>
<td>3.5</td>
<td>22</td>
<td>12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>7. M</td>
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<td>2.5</td>
<td>28</td>
<td>9</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8. F</td>
<td>Eng.</td>
<td>2</td>
<td>3.5</td>
<td>26</td>
<td>9</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>9. M</td>
<td>ESL</td>
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<td>2.8</td>
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<td>10</td>
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</tr>
<tr>
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<td>2.8</td>
<td>21</td>
<td>9</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>12. F</td>
<td>ESL</td>
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<td>2.3</td>
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<td>6</td>
<td></td>
</tr>
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<td>5</td>
<td>2</td>
<td></td>
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<td>2.3</td>
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<td>1</td>
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<td>2.8</td>
<td>16</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>16. F</td>
<td>Eng.</td>
<td>2</td>
<td>2.3</td>
<td>14</td>
<td>7</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>17. F</td>
<td>Eng.</td>
<td>2</td>
<td>2.5</td>
<td>24</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18. M</td>
<td>Eng.</td>
<td>2</td>
<td>3.5</td>
<td>18</td>
<td>11</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>19. M</td>
<td>ESL</td>
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<td>3</td>
<td>25</td>
<td>7</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>20. M</td>
<td>ESL</td>
<td>3</td>
<td>2.8</td>
<td>18</td>
<td>11</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

\[ \bar{x} = 2.8 \quad \bar{x} = 20.75 \quad \bar{x} = 8.8 \quad \bar{x} = 6.35 \]
Hypothesis #1

There is a difference between good and poor grade four readers in their ability to discriminate rhythm patterns.

In order to compare the ability of good and poor readers’ ability to discriminate rhythm patterns, the Seashore Rhythm Test was administered. Table 10 shows the means and standard deviations of the scores of both good and poor readers. The good readers scored a mean of 25 while the poor readers scored a mean of 20.75. A t-test indicated that there was significant difference in means (df = 38, p < .001). It is interesting to note that the Seashore Rhythm Test gives 22.6 as the mean for grade four students. The poor readers in the study scored 1.85 below the mean and the good readers scored 2.4 points above the mean.

<table>
<thead>
<tr>
<th>TABLE 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A COMPARISON OF MEAN SCORES ON SEASHORE RHYTHM TEST FOR GOOD AND POOR READERS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Readers</td>
<td>20</td>
<td>2.61</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Poor Readers</td>
<td>20</td>
<td>4.24</td>
<td>20.75</td>
<td>3.82*</td>
</tr>
</tbody>
</table>

*p < .001
Hypothesis #2

There is a difference between good and poor readers in their ability to attend to language frequencies.

Table 11 shows the means and standard deviations of the scores for the good and poor readers on the test to measure attention to language frequencies. Out of a possible score of 12, the good readers scored in a range of 6-12 with a mean of 10.4 and a standard deviation of 1.71. The poor readers scored in a range of 4-12 with a mean of 8.8 and a standard deviation of 2.25. A t-test to determine if this difference was significant was completed. An analysis of the data revealed that the mean score for the good readers was significantly different than that of the poor readers, (df = 38, p > .02).

TABLE 11

A COMPARISON OF MEAN SCORES ON ATTENTION TO LANGUAGE FREQUENCIES FOR GOOD AND POOR READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Readers</td>
<td>20</td>
<td>1.71</td>
<td>10.4</td>
<td>2.54*</td>
</tr>
<tr>
<td>Poor Readers</td>
<td>20</td>
<td>2.25</td>
<td>8.8</td>
<td></td>
</tr>
</tbody>
</table>

*p > .02
Hypothesis #3

There is a difference between good and poor readers in their ability to discriminate pitch.

The means and standard deviations of the scores of the good and poor readers on ability to discriminate pitch may be found in Table 12. The total possible score was 16. The good readers achieved a mean score of 14.65 with a standard deviation of 1.71. While they scored in the range of 9-16, 18 of the 20 students scored between 14 and 16 with 9 scoring 16. The poor readers achieved a mean score of 6.35 with a standard deviation of 3.09. They scored in the range of 1-11 with four students achieving a score of 1 or 2. A t-test showed that the mean score of the good readers was significantly different than that of the poor readers (df = 19, p > .001).

**TABLE 12**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>NUMBER</th>
<th>STANDARD DEVIATION</th>
<th>MEAN SCORE</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Readers</td>
<td>20</td>
<td>1.71</td>
<td>14.64</td>
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<td>Poor Readers</td>
<td>20</td>
<td>3.09</td>
<td>6.35</td>
<td>10.51*</td>
</tr>
</tbody>
</table>

*p > .001
Negative Hypotheses

The following negative hypotheses were also analyzed using the data in Tables 8 and 9 to see if there were any differences in mean scores.

a) There is no difference between E.S.L. good readers and English language good readers in their ability to discriminate rhythm patterns.

b) There is no difference between E.S.L. poor readers and English language poor readers in their ability to discriminate rhythm patterns.

c) There is no difference between E.S.L. good readers and English language good readers in their ability to attend to language frequencies.

d) There is no difference between E.S.L. poor readers and English language poor readers in their ability to attend to language frequencies.

e) There is no difference between E.S.L. good readers and English language good readers in their ability to discriminate pitch.

f) There is no difference between E.S.L. poor readers and English language poor readers in their ability to discriminate pitch.

g) There is no difference between good female readers and good male readers in their ability to discriminate rhythm patterns.

h) There is no difference between poor female readers and poor male readers in their ability to discriminate rhythm patterns.

i) There is no difference between good female readers and good male readers in their ability to attend to language frequencies.
j) There is no difference between poor female readers and poor male readers in their ability to attend to language frequencies.

k) There is no difference between good female readers and good male readers in their ability to discriminate pitch.

l) There is no difference between poor female readers and poor male readers in their ability to discriminate pitch.

m) There is no difference between good readers of various socioeconomic levels in their ability to discriminate rhythm patterns.

n) There is no difference between poor readers of various socioeconomic levels in their ability to discriminate rhythm patterns.

o) There is no difference between good readers of various socioeconomic levels in their ability to attend to language frequencies.

p) There is no difference between poor readers of various socioeconomic levels in their ability to attend to language frequencies.

q) There is no difference between good readers of various socioeconomic levels in their ability to discriminate pitch.

r) There is no difference between poor readers at various socioeconomic levels in their ability to discriminate pitch.

Tables 13-18 present the means and standard deviations used in testing the negative hypotheses (a) to (f). Through three t-tests, it was found that when good readers in both E.S.L. and English language groups were compared on the rhythm discrimination
test, the attention to language test and the pitch discrimination test, there were no significant differences. The same results were obtained when poor readers in these groups were compared.

Tables 19-24 (Appendix D) present the means and standard deviations used to test the negative hypotheses (g) to (l). It was found, through the administration of t-tests, that no significant differences in male and female good readers were found on the tests of rhythm discrimination, attention to language frequencies and pitch discrimination. When poor readers were compared according to sex, the results were similar.

Tables 25-30 (Appendix D) present the results of the analysis of variance for the negative hypotheses (m) to (r). These tests compared good readers at each socioeconomic level on the rhythm discrimination test, the ability to attend to language frequencies and pitch discrimination. A similar comparison was made of poor readers. There were no significant differences in any test for either the good or poor readers.

In summary, it is evident that differences in language, sex and socioeconomic level were not shown in listening ability. Good readers from every group were good listeners and poor readers from every group were poor listeners.
Hypothesis #4

There is a difference between good and poor grade four readers in their experiences with stories and books.

The children's responses to the questionnaire designed to evaluate their experiences with literature have been summarized in Table 31.

TABLE 31
SUMMARY OF RESPONSES TO QUESTIONNAIRE BY GOOD AND POOR READERS

<table>
<thead>
<tr>
<th>Question</th>
<th>Good Readers</th>
<th>Poor Readers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=20</td>
<td>N=18</td>
</tr>
<tr>
<td>1. Do you like reading?</td>
<td>Yes</td>
<td>20</td>
</tr>
<tr>
<td>2. What kind of books do you like? (Answered using genre or authors)</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>3. Do you have any books at home?</td>
<td>Many</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Few</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>What are the names of some of your books. Named 3 or more.</td>
<td>20</td>
</tr>
<tr>
<td>4. Did anyone ever read stories to you at home?</td>
<td>Often</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>2</td>
</tr>
</tbody>
</table>
**TABLE 31 (continued)**

SUMMARY OF RESPONSES TO QUESTIONNAIRE BY GOOD AND POOR READERS

<table>
<thead>
<tr>
<th>Question</th>
<th>Good Readers</th>
<th>Poor Readers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=20</td>
<td>N=18</td>
</tr>
<tr>
<td>5. Did anyone ever tell you stories?</td>
<td>Yes</td>
<td>19*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9**</td>
</tr>
<tr>
<td>6. Do you have a library card?</td>
<td>Yes</td>
<td>15</td>
</tr>
<tr>
<td>How often do you go?</td>
<td>Often</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Correct Response</td>
<td></td>
</tr>
<tr>
<td>7. Who visited the three bears?</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>8. What happened to Little Red Riding Hood?</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>9. Who looked in a mirror on the wall?</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>10. Do you know a story about a monkey?</td>
<td>18</td>
<td>9</td>
</tr>
</tbody>
</table>

*10 reported that father or grandfather told them stories.
**2 reported that father or grandfather told them stories.

All of the children reported that they liked reading. When asked what kind of books they liked 18 out of 20 good readers referred to genre or authors in their response while only 4 of the poor readers used these categories. The following are the responses given by the children:
Good Readers:

1. "Hokus Pokus Dilema, Jokes, Riddles, Curious George"
2. "Agatha Christie and Hardy Boy Books"
3. "Fairy Tales"
4. "Fairy Tales"
5. "Adventure"
6. "Mysteries"
7. "Adventure Stories"
8. "Hardy Boys"
9. "Adventure"
10. "Fiction"
11. "Beverly Cleary"
12. "Mystery, Roald Dahl's books"
13. "The Littles"
14. "Adventure"
15. "Mysteries, Nancy Drew, Sweet Valley High"
16. "Short Mysteries"
17. "Judy Blume Books"
18. "Novels, Books without pictures"
19. "Mystery"
Poor Readers:

2. "Judy Blume's"
3. "Pinocchio"
4. "Picture Books"
5. "Cat in the Hat"
6. "Cinderella"
7. "Easy Books"
8. "Small Books"
9. "Ghost Said Boo"
10. "Readers, Monster Wants a Job"
11. "Joke Books"
12. "Story Books"
13. "Mysteries"
15. "Go-Cart Books"
16. "Stories with pictures"
17. "Mathematics"
18. "The Mystery of the Lost Skeleton - I got it from the school library."
19. "Cowboy Books"
20. "Carnival"

When asked about the number of books they had, all of the good readers indicated that they had many books at home and were able to name at least three. The poor readers, on the other hand,
had fewer books. Six of them said that they had many books, eight said that they had a few and four said that they had none. Only the six who reported having many books were able to name at least three books. Here are their responses:

Good Readers:

1. "Lots. Sesame Street, Bible, Encyclopedia"

2. "Lots - We buy them at W.H. Smith's. Hardy Boys, Agatha Christie, Choose Your Own Adventure."


4. "Just a few. I gave some easy books away to my cousin. Rescuers, Kids from B, Books about Horses, Peter Rabbit."


8. "Lots - Terry Fox, Superman, Return of the Jedi."

9. "Lots - Flowers in the Attic, Beverly Cleary, Persons of Block I."

10. "Millions - Rowboats and Roller Skates, Nancy Drew, Bridge to Terabithia."


12. "Lots - Hardy Boys, Alfred Hitchcock, Three Investigators."
13. "Yes a few. Littles (2 books), some easy books I got at the Book Fair. Choose Your Own Adventure."

14. "Quite a few. Remember Me, Sweet Valley High, Fairy Tales."

15. "Lots. Secret Garden, Nancy Drew (I have 6 of them), Chocolate Touch. Fairy Tales."

16. "Two Shelves - Ramona the Pest, Tales of a Fourth Grade Nothing, Henry and Ribsy."

17. "70 - Bobsy Twins, Choose Your Own Adventure, Hardy Boys."


Poor Readers:

2. "Lots - Girl With the Silver Eyes, Blubber, Sheila the Great. I got them for presents."


5. "Lots. No Elephants Please, Nursery Rhymes, Old Egypt."


7. "I'd say 20. Cowboy Tommy, If I Had a Circus, Books I-10. My father bought them."


9. "Yes. Just hard books. 'Where do you keep them?' They're all on shelves. They match."
In response to the question about being read to at home, 17 out of 20 good readers reported affirmatively with one child recalling being read to "sometimes" and two "never". Of the 18 poor readers, four reported being read to often, 9 sometimes and 5 never. They responded as follows:

**Good Readers:**

1. "My mom read to me."
2. "My mom read to me every day and sometimes my dad."
3. "Mom read to me lots of times."
4. "My mom always read to me and sometimes my dad."
5. "My mom read to me - chapter books."
6. "No."
7. "My mom read Greek books to me."
8. "Sometimes my mom read to me."
9. "Mom read to me."
10. "My mom read to me at bedtime."
11. "My mom told me stories."
12. "My mom read to me - English and French books."
13. "My mom read to me in Greek."
14. "Always my mom read to me when I was little."
15. "My father read fairy tales to me."
16. "Grandma read Greek books to me."
17. "No."
18. "My brother read me all the fairy tales."
19. "My mother read to me in English and Greek."
20. "Maybe my mom did."

Poor Readers:

2. "Sometimes. Not after I learned to read. My dad works at night."
4. "My mom did a couple of times."
5. "Mom and dad did a few times. They're busy."
Sixteen of the good readers and nine of the poor readers recalled stories being told to them. Table 31 also shows that 10 good readers and only two poor readers remembered their father or grandfather as the story teller. The following are the responses:

6. "My sister reads to me sometimes."
7. "My mom read to me every day."
8. "My mom and sister did."
9. "No."
10. "No."
11. "My sister read to me."
12. "No."
13. "No."
14. "I don't remember. I read by myself."
15. "I don't remember. I read to my dad."
16. "Sometimes, if my mom had time."
17. "My mom used to sometimes. We don't have the books now 'cus we gave them away."
18. "Before I came to school, my mom did sometimes."
19. "Maybe my mom did. I don't remember."
20. "My mom read to me every day."

Seventeen of the good readers and nine of the poor readers recalled stories being told to them. Table 31 also shows that 10 good readers and only two poor readers remembered their father or grandfather as the story teller. The following are the responses:
Good Readers:

1. "Mom told me stories."
2. "My dad told funny stories he made up."
3. "Dad told me stories about when he was a little boy."
4. "My mom told me stories her father told her."
5. "My grandparents tell stories. They're good."
6. "My dad told me Greek stories."
7. "Dad told me stories in our language."
8. "No."
9. "My mom and my sister tell stories."
10. "My grandma told me stories."
11. "My mom told me stories her mom told her and my dad told me stories."
12. "My grandpa and my mother told me stories."
13. "Mom told me stories in Greek and English."
14. "My mom told me good stories about when she was little."
15. "My grandparents and my mom."
16. "My grandpa told me stories."
17. "My grandma and my mom did."
18. "My grandmother told me a story in Greek. She always told me the same story. It was good."
19. "My mom told me stories in Greek and English."
20. "Not now. My dad used to tell stories."
Poor Readers:

"No." (Eight children gave this reply - 9, 10, 11, 12, 13, 15, 17, 18)

2. "Sometimes my grandmother told me stories."

4. "My friends tell me stories and sometimes my Dad does."

5. "My aunt and Uncle sometimes tell stories when they come and sometimes my Mom and Dad."

6. "My sister told me stories."

7. "My mom told me a lot."

8. "Sister and cousins tell me stories."

14. "Sometimes but not very often."

16. "My cousin tells me stories when he comes over."

19. "No - Oh, my aunt told me one once."

When asked if they had a library card, 15 of the good readers and 7 of the poor readers reported that they had one with 12 good readers and 5 poor readers indicating that they visited the library often. Their responses were:

Good Readers:

1. "Yes. My mom takes me to change my books."

2. "Yes. I go by myself on Saturday."

3. "Yes. Usually I go on Saturday."

4. "Yes. My mom doesn't have time to take me."

5. "Yes. I go often."
6. "Yes. Every week-end."
7. "No."
8. "No."
9. "Yes. I go a lot."
10. "Yes. Sometimes when I do projects at school."
11. "No. The school library doesn't have cards. Does it?"
12. "No. I lost it, but I asked my Mom to get me another one."
13. "Yes. When I have to do a project."
14. "Yes. I go on Saturday."
15. "Yes. I go with my brother when our books are due."
16. "Yes. We go every week-end."
17. "Yes. We go nearly every week."
18. "No. I use my brother's card. We go all the time."
19. "Yes. I go to the one on Bathurst every week."
20. "Yes, when I have a project."

Poor Readers:

"No." (Eight gave this reply - 7, 10, 11, 12, 13, 14, 15, 18)
2. "Yes. I go with my sister all the time."
4. "Yes. My dad takes me. He gets books too."
5. "I use my dad's card. We go all the time to get books."
6. "Yes. We go every week when my mom goes shopping."
8. "Yes. I don't go now though."

9. "Lost it. I liked going before we moved. I'm going to get a card in the summer."

16. "I just got one."

17. "Lost it. No."

19. "Yes. Not very often. When I do projects."

20. "No. I just go to the library in school."

In recalling the four familiar stories, the good readers scored higher than the poor readers. All of them remembered *The Three Bears* while only 12 of the poor readers did. Much the same difference was shown in their ability to remember *Little Red Riding Hood*. The story of *Snow White* was known by 17 of the good readers and 12 of the poor readers. The last question relating to stories required the child to respond with any story he or she knew about a monkey. Most of the children were able to remember *Curious George*; however, only 9 of the poor readers were able to respond compared to 18 of the good readers.

In summary, it appears that the responses to the questionnaire reflect distinct differences between good and poor readers in the literary experiences which they could recall. On every question, the scores of good readers were higher than the poor readers.
CHAPTER V

INTERPRETATION

In this chapter, a brief summary will be presented followed by a discussion of the findings and recommendations for further study.

Summary

It has been observed that many poor readers who have been given help in special education programs have not overcome their problems; however, two studies which have focussed on the development of listening through the use of the Electronic Ear seemed to have led to an improvement in reading comprehension. The purpose of this study was to further investigate the relationship between listening and reading as well as listening and experiences with books.

Twenty good readers and twenty poor readers, born in the year 1974 and enrolled in grade four in North York Board of Education, Ontario, Canada were identified by their teachers and by their scores on the Spache Reading Diagnostic Scale. These students were drawn from three different socioeconomic areas but care was taken to ensure that some good readers and some poor
readers were selected from each school as well as some with English speaking background and some with English as a second language background.

Both good and poor readers were given three different listening tests and also asked to respond orally to a questionnaire. It was found that there was a significant difference between the mean scores of good and poor readers for the Seashore Rhythm Test, a test of attention to language frequencies and a test of pitch discrimination. The responses to the questionnaire also appear to reflect differences in literary experiences.

Discussion

It was theorized in Chapter I that listening develops through the oral tradition of hearing stories within the context of a warm social environment. In order to understand the background of the students in this study, the discussion will address the responses to the questionnaire before reflecting upon the results of the listening tests.

(a) Questionnaire

The summary of the results of the questionnaire which is seen in Table 3 shows that good readers recalled more experiences with books. A review of the individual responses reveals some possible reasons for this. As was expected, every child replied
affirmatively to the first question. The researcher felt that the students were comfortable as the interview began.

In their reply to the question concerning what kinds of books they liked, good readers mentioned mystery books, fiction, novels, fairy tales, Encyclopedia Brown, Hardy Boy books, Dahl books, Judy Blume and Beverly Cleary. Only four of the poor readers referred to genre or authors. Several replied with the name of an easy reader such as Pets and Puppets. From the responses, it appears that good readers had had a greater variety in their experience with books, so much so that they were able to categorize them in some way. Poor readers, on the whole, were still naming particular books.

Good readers all reported that they had many books at home. Their responses indicated that the parents were likely involved in helping them buy books. One child reported buying books at W.H. Smith's, another said that he ordered them from the Book Club and another from the Book Fair. Only six poor readers claimed to have many books. Two mentioned receiving them from teachers. Only one of the poor readers indicated that he bought books and these were workbooks. One child said she got books for presents. It appears that the parents' role is important in providing books for the home and that the children would
appreciate books. Even many of the poor readers could tell which books they had and they remembered teachers who had given them books.

It is usually the parents who arrange to have their young children obtain a library card and find opportunities for them to visit the public library. The good readers in this study appear to have had more library experiences. Fifteen reported having a card but some of those who didn't indicated that they had access to a card or were replacing a lost card.

"I use my brother's card."

"I lost it but I asked my mom to get me another one."

Poor readers who did not have cards generally responded "No" with no explanation or interest. Of the seven who said they had cards, most indicated that they visited the library with a family member.

That the acquiring of books is a social activity is indicated by the responses to the questions about books in the home and library experiences. The children's replies often included the name of a family member who shared the experiences by giving them books or taking them to the library. Perhaps a specific question about how the books were acquired would have given more specific information.
It is possible that a home could have many books without them being read, yet the results of the questionnaire showed that the good readers had read many books. The books they read were more advanced in story structure and language than those mentioned by the poor readers. All of the good readers could name at least three books. A few mentioned were Black Stallion, Pinocchio, The Bible, A Wind in the Door, The Bobsey Twins, Nancy Drew, A Wrinkle in Time, Return of the Jedi, Encyclopedia Brown, and Choose Your Own Adventure. Of the poor readers who said that they had 'lots' of books, six were able to name three. Some of these were The Cat in the Hat, Peter Pan, Pets and Puppets, Monster Wants a Job, The Mystery of the Lost Skeleton, and Mr. Whiskers. Many of the books mentioned by the poor readers were school readers. In their answer to the previous question, children recalled some teachers giving them books. Since the books were readers, it is doubtful whether they were given or not but obviously they were treasured by the children and perhaps this "give-away" is a valuable educational expense.

It was noted in Chapter II that the research of Durkin (1966), Cohen (1968) and Clark (1976) had shown that children who had been read to were better readers. This study supports their findings. An examination of the responses to the question
regarding being read to shows that good readers had had more experiences with books. Those who could not recall being read to remembered that they had been told stories. All of them reported that mother, father or grandparents had either read to them or told them stories. Most of the poor readers could not remember this experience yet none gave the impression that they wouldn't have enjoyed it. Some gave excuses for their parents. "They're too busy" or "My Dad works at night."

The responses to the question about story telling drew similar responses to those regarding being read to. All of the good readers remembered mother, father or grandparents telling stories. Nine of the poor readers had memories of stories but not many mentioned parents as the story tellers. They named friends, cousins, aunts. Story telling experiences seemed to be occasional for the poor readers and much more regular for the good readers. Poor readers responses included:

"My aunt told me one once."

"My cousin tells me stories when he comes over."

Good readers of E.S.L. background had heard stories in their own language. Several children replied by mentioning that their grandparents had told stories in their own language. One
child reported that her grandmother always told the same story. Several good readers recalled that their mom told stories that she heard when she was a little girl. It is also interesting to note that ten good readers and only two poor readers remembered their father or grandfather as the story teller. The families of good readers seem to have a tradition of story telling with the children enjoying stories about when their parents were little.

In Chapter I, a theory of listening was proposed which indicated the importance of early experiences with stories and books. It would seem, from the results of this study, that good readers had close family members - mothers, fathers and grandparents - to read and tell them stories. Poor readers did not appear to have the advantage of having parents read to them or tell them stories consistently from early childhood. These data emphasize again the importance of the social context in listening and reading.

The children's recollections of familiar stories provided more evidence that good readers had had more exposure to stories. In all four questions, good readers scored higher than the poor readers. Many of the poor readers who responded correctly to the question about Snow White said that they had seen it on T.V. The last question asked "Do you know a story about a monkey?"
This question allowed the children to respond with any story they may have heard. The other questions, however, presupposed knowledge of a particular story which may or may not have part of the child's cultural background. It might have been expected that the questions about the monkey would have been easier for some children yet the results indicated that the poor readers scored even lower on this question.

Children who have enjoyed the social experience of listening to stories will likely have developed a pattern of listening which is more attentive to language. Because their attention is directed to the story, they learn to "tune out" other sounds in the environment. They would also listen to the intonation to catch the meaning and would learn to listen to finer differentiations and nuances in the text. The results of the three listening tests appear to support this theory.

(a) Seashore Rhythm Test

McDermott's (1976) study of the differences between the attention given by black and white students shows how important is the need to be aware of the rhythm of language in order to listen well. Attention to rhythm is also important in reading. According to Smith (1978) good readers attend to phrases and sentences in order to comprehend the text. When an individual
reads word by word it is usually necessary to reread the passage in order to grasp the meaning. Similarly, when listening to a rhythm pattern, it is important to feel the whole pattern rather than the individual components. It was hypothesized in Chapter III that children who are listening to phrases and to the accented words should be able to discriminate rhythm patterns with ease. Good readers, in this study, did score significantly higher on the Seashore Rhythm Test than did the poor readers.

(b) Attention to Language Frequencies

It was suggested earlier that the social experiences of story telling and reading would likely help the child to develop the ability to selectively attend to language. The results of this test seem to reinforce this premise. The good readers were significantly better in attending to the frequencies used in language. Attention demands a wholistic response from the child for it requires the individual to consciously bring to the listening experience all his or her inner resources - the imprints of earlier experiences, the present incoming stimulus, the awareness of powerful affective ties. This test of attention to language is not measuring a linear process but rather the habituated response to sounds in the environment. If language, with all its richness, is more important, then the child will respond
more quickly to its sounds. This study showed that good readers had become more attentive to language while poor readers were not so differentiating.

(c) Pitch Discrimination

The differences between good readers and poor readers in their ability to discriminate pitch was more significant than those found in the other tests. These results confirm the research of Ewers (1950) who found that pitch discrimination of students in grades 9-12 correlated more highly than any other test of auditory perception with reading ability. Halliday (1975) and MacNamara (1972), in their research, showed that it was the evident very early in life that the infant distinguished between the question, a rising tone, and the response. It is the pitch which appears to provide the scaffolding for dialogue and which directs the discourse. If an individual is not hearing these differences in pitch, he is unable to attend to the meaning. An example was given in Chapter I which showed how the meaning is changed when different words are emphasized in the sentence "Now I'm going to get it perfect". It is not surprising that the test of pitch discrimination differentiated between good and poor readers.

Before drawing further conclusions from these results, a study of the results of the tests of the negative hypotheses is necessary. It is interesting that language, sex and socioeconomic
level did not appear to affect listening scores of the children in this study. Good readers with E.S.L. or English language background scored similarly. Poor readers in these groups were also similar on all three tests. The fact that good readers with an E.S.L. background had had stories read and told to them probably encouraged the development of listening which would carry into any language situation.

When boys and girls were compared, good readers both male and female scored similarly to poor readers on all three tests. Often teachers have reported boys having more problems than girls with reading. In this study, sex did not appear to be affecting the listening ability. Good readers, boys or girls, remembered stories being read to them.

In Chapter II, Deutsch's (1964) study as well as some reviewed by McGoven (1979) indicated that socioeconomic level had an impact on auditory perception. It appears, from the data in this study, that it is experiences with story rather than socioeconomic level that are affecting listening.

Conclusions

This study was designed to test the hypothesis that good readers would likely be good listeners and that this ability may have resulted from many experiences with stories and books. From
the data, it has been shown that good readers in this study are significantly better listeners and also appear to have had many more experiences with books. It has also been shown that language, sex and socioeconomic levels do not appear to be confounding the results. With this strong support for the theory of listening and reading presented in Chapter I, the researcher would like to propose that listening and reading may involve the same psycho-social process.

From infancy, the child develops the ability to listen to language when the social interactions are pleasurable. Family members respond to the child's enjoyment of story by continuing to read to him or her and, as the results of this study indicate, take the child to the library and assist in the acquisition of books. The child thus becomes aware of books and, as the parents read to him or her, likely develops a love of books. Just as children learn to listen when they are enjoying communicating, so they will learn to read if they have someone with whom to share this learning experience. Many children who have learned to read on their own have had the experience of having the same book read to them over and over again until it is memorized. They are then able to develop strategies for making sense of print. Both listening and reading are therefore, dependent on social interactions.
Listening and reading become meaningful when the individual brings to a conscious level all of his or her prior experience that relates to the story. St. Augustine states:

Now perception is a movement of the body to meet a movement which has occurred in the body (p. 95).

As children listen actively to stories that relate to their experience, they will unconsciously be acquiring the neuronal imprinting necessary for perception. They will develop a sense of the rhythm of language and the rhythm of story which will allow them to understand, to remember and to create. Attention to the rhythms of language provides a way of linking semantic components, an awareness of syntax and phonetic elements while the rhythm of story ensures a way of remembering and retrieving information and a structure for creating narrative.

Langer (1953) says that unless the individual has a place to store new information it belongs to a "timeless past". Story, poetry and song present a structure which permits the individual to organize his or her thinking. According to Huck (1979)

Literature is the imaginative shaping of life and thought into forms and structures of languages (p. 4).

L'Engle (1982) believes that:

Without a story you have not got a nation, or a culture or a civilization. Without a
story of your own to live you haven't got
a life of your own.

Events of our lives are organized and energized in a rhythmic pattern that mimics the body rhythms. Like a story, they begin with a plot that rises to a climax and lulls into denouement only to rise again in search of new ideas. Learning takes place in the same pattern - searching for something new, finding answers, accommodating these into a world view and then searching again. Each child because of his or her background will respond in a unique way using strategies which he or she has found to be successful but always within the same rhythmic pattern.

Thus listening and reading only become meaningful when the linking of perceptions of past experiences with new experiences is possible. If the child's life has been barren of social situations which would have fostered the development of perception then he or she has little to bring to the task of listening and reading. Without the background which stimulates the psychosocial process, efforts to teach subskills such as phonics and grammar are not likely to improve reading.

The search of the literature revealed some alarming data. Ewers (1950) found that listening patterns had become habituated by age 8 and Henry (1947) found that pitch discrimination continued
to distinguish good and poor readers in grades 9 to 12. Teachers must intervene in a special way in order to help children change these poor listening habits. Instead of drilling sight vocabulary and phonics, teachers should encourage children to use all their senses in a dynamic way in order to effect changes in listening. These children who are having problems are likely tuning out language and therefore need situations in which that can link language with other modalities in order to awaken the mental capacities needed for listening and reading. Drama and mime require children to put into their body the meaning of the text. Singing songs demands an integration of right and left hemispheric functions. Henson (in Critchely, 1977) believes that not only are the right and left hemispheres involved but that intellect and emotion are inseparably bound up in expressive and receptive musical experiences.

In an atmosphere of relaxation and enjoyment, the teacher can be reasonably assured that an impact is being made on the minds and hearts of students. Through their dynamic involvement, the children will consciously and unconsciously be feeling in their body the underlying structures of language and story. If Sapir (1949) is correct in saying that the biological rhythm is the basis for language then we must help our students to build these neuronal patterns by allowing them to experience the rhythm of communication,
the rhythm of gesture, the rhythm of attention, the rhythm of phrase and sentence, and the rhythm of story. With these, the students will be ready to participate in the psychosocial process of listening and reading for they will find communication easier and will have the necessary imprints that will make perception and memory possible.

Recommendations

A study designed to evaluate the effect of literature based programs on listening development would be valuable. In order to focus on the development of a wholistic response to language and to foster the psychosocial process necessary for listening and reading the teachers could:

1. Read aloud literature which would appeal to the child.
2. Encourage the interpretation of meaning in mime, creative movement and drama.
3. Provide personal support for the students as they read by discussing the content, sharing expectations and allowing the children to use their own strategies to make sense of print.
4. Provide more opportunities for all students to read. Allington's (1980) study showed that poor readers had less opportunities and were corrected more frequently.
5. Use a questionnaire similar to that used in this study to determine whether reading problems may stem from a lack of literary experiences. If so, provide more opportunities for listening to stories.
If it can be documented that a program using literature as the focus can successfully encourage good listening, then it may be useful both in preventing and also remediating reading problems in a very enjoyable way. This prevention can begin as early as nursery school with a program which emphasizes reading aloud and a music program which includes song and creative movement.
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Logan, Bayne, Reading and Hemispheric Functioning. Address at Reading '84. Toronto: York University, February, 1984.


APPENDIX A

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PLEASE NOTE:

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These consist of pages:

135-150
1. Do you like reading?
2. What kind of books do you like to read?
3. Do you have any books at home? (20 or less)
   How many do you think you have? Many __ Few __ None __
   What are the names of some of them?
   1. 
   2. 
   3.
4. Did anyone ever read stories to you at home?
5. Did anyone ever tell you stories?
6. Do you have a library card?
   How often do you go? Often ____ (Goes regularly)
7. Who visited the three bears?
8. What happened to Little Red Riding Hood?
9. Who looked in the mirror on the wall?
10. Do you know a story about a monkey?
<table>
<thead>
<tr>
<th>A.</th>
<th>B.</th>
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<tbody>
<tr>
<td>1.</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
<td>6.</td>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
<td>7.</td>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
<td>8.</td>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
<td>9.</td>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
<td>10.</td>
<td>10.</td>
</tr>
</tbody>
</table>

Name _______________________________

Rhythm Patterns

P. 1.

For Practice  P. 2.

P. 3.
### TABLE 13
A COMPARISON OF MEAN SCORES ON RHYTHM DISCRIMINATION FOR GOOD READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good E.S.L.</td>
<td>8</td>
<td>3.07</td>
<td>25.25</td>
<td>.36</td>
</tr>
<tr>
<td>Good English</td>
<td>12</td>
<td>2.23</td>
<td>24.83</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 14
A COMPARISON OF MEAN SCORES ON RHYTHM DISCRIMINATION FOR POOR READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor E.S.L.</td>
<td>8</td>
<td>7.58</td>
<td>17.75</td>
<td>.80</td>
</tr>
<tr>
<td>Poor English</td>
<td>12</td>
<td>4.69</td>
<td>20.0</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 15

A COMPARISON OF THE MEAN SCORES ON ATTENTION TO LANGUAGE FREQUENCIES FOR GOOD READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good E.S.L.</td>
<td>8</td>
<td>1.12</td>
<td>11</td>
<td>1.33</td>
</tr>
<tr>
<td>Good English</td>
<td>12</td>
<td>1.91</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 16

A COMPARISON OF THE MEAN SCORES ON ATTENTION TO LANGUAGE FREQUENCIES FOR POOR READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor E.S.L.</td>
<td>8</td>
<td>1.87</td>
<td>8.38</td>
<td>.61</td>
</tr>
<tr>
<td>Poor English</td>
<td>12</td>
<td>2.43</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 17
A COMPARISON OF THE MEAN SCORES ON PITCH DISCRIMINATION FOR GOOD READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good E.S.L.</td>
<td>8</td>
<td>1.36</td>
<td>15.13</td>
<td>1.05</td>
</tr>
<tr>
<td>Good English</td>
<td>12</td>
<td>1.84</td>
<td>14.33</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 18
A COMPARISON OF THE MEAN SCORES ON PITCH DISCRIMINATION FOR POOR READERS WITH E.S.L. AND ENGLISH LANGUAGE BACKGROUND

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor E.S.L.</td>
<td>8</td>
<td>3.14</td>
<td>6.13</td>
<td>.26</td>
</tr>
<tr>
<td>Poor English</td>
<td>12</td>
<td>3.04</td>
<td>6.5</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 19
A COMPARISON OF THE MEAN SCORES ON RHYTHM DISCRIMINATION FOR GOOD FEMALE AND GOOD MALE READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Female</td>
<td>12</td>
<td>2.78</td>
<td>25.33</td>
<td>.71</td>
</tr>
<tr>
<td>Good Male</td>
<td>8</td>
<td>2.24</td>
<td>24.5</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 20
A COMPARISON OF THE MEAN SCORES ON RHYTHM DISCRIMINATION FOR POOR FEMALE AND POOR MALE READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Female</td>
<td>9</td>
<td>3.80</td>
<td>21.67</td>
<td>.9</td>
</tr>
<tr>
<td>Poor Male</td>
<td>11</td>
<td>4.43</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>Number</td>
<td>Standard Deviation</td>
<td>Mean Score</td>
<td>t</td>
</tr>
<tr>
<td>----------------</td>
<td>--------</td>
<td>--------------------</td>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>Good Female</td>
<td>12</td>
<td>1.50</td>
<td>10.42</td>
<td>.05</td>
</tr>
<tr>
<td>Good Male</td>
<td>8</td>
<td>2.00</td>
<td>10.38</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 22

A COMPARISON OF THE MEAN SCORES ON ATTENTION TO LANGUAGE FREQUENCIES FOR POOR FEMALE AND POOR MALE READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Female</td>
<td>9</td>
<td>2.18</td>
<td>8.11</td>
<td>1.29</td>
</tr>
<tr>
<td>Poor Male</td>
<td>11</td>
<td>2.14</td>
<td>9.36</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 23
A COMPARISON OF THE MEAN SCORES ON PITCH DISCRIMINATION FOR GOOD FEMALE AND GOOD MALE READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Female</td>
<td>12</td>
<td>1.21</td>
<td>14.83</td>
<td>.57</td>
</tr>
<tr>
<td>Good Male</td>
<td>8</td>
<td>2.23</td>
<td>14.38</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 24
A COMPARISON OF THE MEAN SCORES ON PITCH DISCRIMINATION FOR POOR FEMALE AND POOR MALE READERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Standard Deviation</th>
<th>Mean Score</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Female</td>
<td>9</td>
<td>2.31</td>
<td>7.33</td>
<td>1.35</td>
</tr>
<tr>
<td>Poor Male</td>
<td>11</td>
<td>3.39</td>
<td>5.55</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 25

**A SIMPLE ANALYSIS OF VARIANCE OF RHYTHM DISCRIMINATION SCORES FOR GOOD READERS FROM THREE SOCIOECONOMIC LEVELS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>1.5</td>
<td>.5</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>135</td>
<td>7.94</td>
<td>0.063</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>136</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 26

**A SIMPLE ANALYSIS OF VARIANCE OF RHYTHM DISCRIMINATION SCORES FOR POOR READERS FROM THREE SOCIOECONOMIC LEVELS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>25.45</td>
<td>12.73</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>334.3</td>
<td>19.66</td>
<td>0.647</td>
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<tr>
<td>Total</td>
<td>19</td>
<td>359.75</td>
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<td></td>
</tr>
</tbody>
</table>
TABLE 27
A SIMPLE ANALYSIS OF VARIANCE OF ATTENTION TO LANGUAGE FREQUENCIES
SCORES FOR GOOD READERS FROM THREE SOCIOECONOMIC LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>3.91</td>
<td>1.96</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>54.89</td>
<td>3.23</td>
<td>.606</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>58.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 28
A SIMPLE ANALYSIS OF VARIANCE OF ATTENTION TO LANGUAGE FREQUENCIES
SCORES FOR POOR READERS FROM THREE SOCIOECONOMIC LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>14.5</td>
<td>7.25</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>86.7</td>
<td>5.1</td>
<td>1.42</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>101.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 29

A SIMPLEx ANALYSIS OF VARIANCE OF PITCH DISCRIMINATION SCORES FOR GOOD READERS FROM THREE SOCIOECONOMIC LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.72</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>57.83</td>
<td>3.40</td>
<td>1.06</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>58.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 30

A SIMPLE ANALYSIS OF VARIANCE OF PITCH DISCRIMINATION SCORES FOR POOR READERS FROM THREE SOCIOECONOMIC LEVELS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>35.55</td>
<td>17.78</td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>17</td>
<td>155</td>
<td>9.11</td>
<td>1.95</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>190.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>