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STORY READING TO PRESCHOOL CHILDREN.

The University of North Carolina at  
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Home Economics

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INTERRUPTED VERSUS UNINTERRUPTED STORY  
READING TO PRESCHOOL CHILDREN

by

Anna Marie Anderson

A Dissertation Submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
in Partial Fulfillment  
of the Requirements for the Degree  
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Approved by

  
Dissertation Adviser

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at The University of North Carolina at Greensboro.

Dissertation  
Adviser

Helen Casaday

Committee Members

Harrett Luge

Norman G. Albansen

Myron B. Johnson

David W. Puddy  
(for Wallace Phillips)

July 25, 1975  
Date of Acceptance by Committee

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The purpose of the study was to determine whether significant differences resulted in the memory and comprehension behavior of three- and four-year-old children at the United Day Care Center in Radford, Virginia, who were read stories under two different methods: interrupted and uninterrupted.

The population consisted of 48 randomly paired Ss, 24 three-year-old children and 24 four-year-old children. Each Ss heard two stories, one under each condition.

Randomization of the 48 subjects and the four stories was meticulously employed resulting in a total of 96 measurements. The results of an analysis of variance revealed that the four stories were not significantly different one from the other. One reader read the 96 stories to the children, and recorded their responses on tape.

A three-factor analysis of variance with repeated measures on two variables (method and cueing phases) was used to compute both the main effects and the interactions among the three variables: age, method, and cueing phases.

Based on the results of the study, it was found that:

1. Reading stories to three- and four-year-old children in a manner free from diverting and distracting influences seems to stimulate them to concentrate on and to

verbalize more of what was heard and understood than did the manner of reading stories which involved interruptions and distractions.

2. Chronological age differences seem to be a factor affecting their comprehension performance with the four-year-old's performing at a higher response level than did three-year olds.

3. Significant interactions between and among the three variables age, method, and cueing phases occur in the story-reading/telling processes at the three- and four-year-old levels.

Both age groups benefitted from the uninterrupted story-reading method, but the three-year-old group, just at the threshold of establishing intellectual comprehension habits and skills, benefitted more dramatically and productively.

Pictures are important to children at this age level, but the significant point brought out by the study seemed to be that it was the manner in which pictures were used in the story-reading process which enhanced the attention-processing skills, the developing cognitive receptivity, comprehension, and memory skills in young children.

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## CHAPTER I

## INTRODUCTION

Stories have been described as "fairy gold" by Sawyer (1962) and are true gifts, for the more one shares, the more one gains. Sawyer (1962, p. 30) suggested that ". . . one who reads or tells stories blows breath and life into the characters . . . a kind of miracle every person must perform when he takes a story from the printed page." She does believe, however, that ". . . the gift for story telling comes as part of our racial heritage . . . and it is not the legacy that is important, it is the way we feel about it and the use we make of it (1962, p. 30).

Since 4000 B.C., when stories were first recorded on Egyptian papyri, they have been significant sources of words and ideas. The first collection of stories, appropriately titled Tales of the Magician, probably held the same magic powers for story tellers, readers, and listeners as the stories of today.

Stories and story reading have been prized as first forms of communication between young children and their older counterparts (Tooze, 1959). But, the impact which stories and story reading have had on young children's developing oral-aural perception and comprehension abilities

appears to have been taken for granted. Adults, seemingly, have automatically assumed that young children were competent, discriminative listeners to adult streams of speech. Further, adults seem to have unconsciously depended on the power of the story to enthrall all listeners from the cradle onward (Smith, 1953).

Since the inception of Head Start in 1965, significant studies examining results of early intervention to stimulate cognitive receptivity and memory in young children have been conducted by numerous investigators. Each study opened new areas, new themes, and new approaches, resulting in a fragmented expanse of thought and speculation (Weikart, 1967; Bereiter & Engleman, 1966; Nimnich & Meier, 1967; Cazden, 1971; Karnes, 1969; Hodges & Spicker, 1967). However, achievement and performance data related to environmental factors are sparse (Bruner, 1973; Kirk, 1966; Hunt, 1961).

A major theme of thought, which most researchers recognize and agree upon, stands out; namely, that the early environment plays a crucial and almost immutable role in children's developing cognition and comprehension receptivity abilities. Burrows (1972) noted that current research indicates vividly how necessary it is that young talkers live and interact with talking adults so they can practice spontaneously and meaningfully this important communicating activity. Olton and Crutchfield (1969) cited great gaps in the research literature, one of which was the

gap between productive thinking potential and productive thinking performance. In their study they tried to organize and integrate the simpler cognitive functions using stories, movies, and other instructional media as instruments. It was found that direct instruction made significant differences in performance.

A review of the literature available produced few studies dealing directly with the young child as the listener or listener/participant. Significant aspects of the child as a listener/participant were found in studies by Neimark (1970); Triesman (1960, 1964, 1969); and Titchener (1966). Studies pertaining particularly to the impact which children's receptive and memory behaviors might have on their ability to recall and reproduce upon request that which they have heard should add significantly to the research in this area.

The present research was designed to study the relationships between the way adults read stories to young children and the way young children listen and comprehend the stories.

Within the construct of Broadbent's (1958) discrimination-inhibition theory, the methodology used by adults who read stories to young children could be a variable of some consequence. The intensity of the interfering stimuli (pictures, contributions, and interruptions) could be of such consequence that the listening and participating

roles children play might be significantly affected. McNeill (1970) concluded that the quantity and quality of cognitive receptivity and memory are affected by the intensity displayed in the acquisition of habits and skills basic to comprehension and discrimination. Phillips (1969) pointed out that Piaget in 1958 found that three- and four-year-old children seem to center on single attributes of incoming stimuli and reason transductively. Choice and selection of incoming stimuli must be recognized as necessary operations for optimum cognitive performance since the human information-processing system has a limited capacity (Moore & Massaro, 1973). Because learning at this early stage depends primarily on discrimination of likenesses and differences, the intensity of incoming stimuli, relevant or not, seemed significant to the choice and selection processes. In accord with Broadbent's (1958) hierarchical-discrimination theory, Melnick (1973) found that the intensity with which young children experienced primary-concrete stimuli (form, color, and brightness) captured, held, and bound response and perception. It appears that young children focus on the more forceful stimuli, relevant or not. The degree of intensity coupled with the novelty and/or familiarity of animate incoming orienting semantic stimuli seemed to be a main source of attraction. These stimuli, in turn, affected children's task performance (Titchener, 1966).



Isolated dimensions of input stimuli have been factored out for study. Among these, Moray and O'Brien (1967) studied spaced auditory messages over time; Triesman (1964) studied messages similar in voice; and Lindsay (1970) and Lindsay, Taylor, and Forbes (1962) studied messages of various modalities of pitch and tone quality. Generally, the findings seemed to reveal agreement pertaining to input stimuli in very young children (e.g., when changes were small, children could retain the identity, but when the changes were gross, they could not identify). These findings lend support to the notion that increases in intensity of various stimuli dimensions do affect task performance. Hunt (1961) and Piaget (1952) suggested that the interaction between cues in the stimuli and the concrete experiences children have had affected their attention-processing potential, cognitive receptivity, and memory.

Examining adult methodology in story reading could yield significant data pertaining to children's attention-processing, organizing strategies, cognitive receptivity, and memory behaviors. Focusing on distractions and interruptions accompanying the story-reading-listening processes could lead to new insights into children's transductive reasoning processes as evidenced by their abilities to recall and retell stories read to them under different methods.

### The Purpose of the Study

The purpose of this study was to determine the effects which different adult story-reading methods had upon preschool children's cognitive receptivity, attention-processing ability, and memory behavior. Specifically, this study sought to ascertain if significant differences resulted in the responses of three- and four-year-old children read stories under two different methods: interrupted and uninterrupted.

To secure the data needed, answers to the following questions were sought:

1. Are there significant differences in preschool children's ability to recall and retell stories read to them in an interrupted manner compared to the same stories read to them in an uninterrupted manner?

2. Is there a differential effectiveness between interrupted and uninterrupted story reading for children of different ages? (Age range 36 months through 59 months).

3. Are there significant differences in preschool children's cognitive receptivity, attention-processing, and memory behavior as a result of the partitioning of the recall task into four phases (i.e., as evidenced by the children's ability to recall and retell stories upon request? (Piaget, 1955, Webster, 1965).

4. Is there a significant interaction between the variables of method, (interrupted vs. uninterrupted)

chronological age (3-year-olds vs. 4-year-olds) and phases (4 phases - adult cueing procedure) as evidenced by children's verbal ability to recall and retell stories upon request?

### Hypotheses

The hypotheses tested were:

(a) Children at each age level (3 & 4 year-old) will show superior story comprehension when stories are read to them in an uninterrupted as opposed to an interrupted method.

(b) Older children (4-year-olds) will have greater story comprehension under both methods of story-reading than younger children (3-year-olds).

(c) There will be significant interaction between the variables of story reading methods, chronological ages, and the amount of cueing necessary for children to show comprehension of the story material the younger children (3-year-olds), under the interrupted method particularly, will require stronger cues to retrieve story content than older children (4-year-olds).

### Definitions

For this study the following definitions were used:

Uninterrupted story-reading procedure described the condition under which children heard a story read to them in a continuous manner without use of book, pictures, distractions, interruptions, or comments throughout the story.

Salient point referred to an idea, concept, or identifiable element in a story that stood out conspicuously from its text.

Sequence referred to the consecutive order of presentation (first and second) of the two paired stories to a subject.

Cueing referred to the adult stimuli given to the child in the form of non-referential questions, pictures, singly and in combinations to assist the child in the recalling and retelling task.

Cognitive receptivity referred to the readiness to receive and transmit stimuli related to the process of knowing and understanding.

Memory behavior referred to the overt conduct showing the ability to recognize, recall, or reproduce what was heard, learned, or retained.

Attention-processing referred to the overt conscious focusing on the selecting and narrowing of pertinent incoming stimuli in a discriminating manner leading toward a particular result.

Listener/participant referred to the subject who heard the story under the interrupted (control) treatment.

Listener referred to the subject who heard the story under the experimental (uninterrupted) treatment.

Intensity referred to the force or emphasis of words, ideas, or actions heightening the possibility of concentration on these elements.

Transductive reasoning referred to the process of transferring stimuli, ideas, and concepts to a new or modified form or system.

Referential question was a query having a connection with story content.

Non-referential question was a query having a connection with the structure of flow of the story but having no story-content information.

Story block referred to the two stories considered a pair established by using the four designated stories in all possible combinations (PQ, PR, PS, QR, QS, RS, QP, RP, SP, RQ, SQ, SR).

P referred to the story Toby Zebra and the Lost Zoo.

Q referred to the story Caps for Sale.

R referred to the story Little Duckling Tries His Voice.

S referred to the story Ask Mr. Bear.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

Stories have been used effectively as instruments to study numerous variables inherent in the preschool children's emerging communication processes. Language acquisition, cognitive receptivity, attention-processing, memory--each of these variables, as well as isolated elements within these variables, have been correlated with various factors of abstract functioning to determine, either separately or in combination, their effectiveness in helping very young children refine their emerging communication skills. The commonly studied factors within the stories have been those pertaining to the structural components: intonation, syntax, word-order, word acquisition, intensity, stress, familiarity, novelty, semantic relevance, routines, distractions, pivot words, and centering (Moray & O'Brien, 1967; Treisman, 1964; Lindsay, 1970; Taylor & Forbes, 1968).

More recently, however, there has been a shift away from structure to content in research studies in child study. Focus has been placed on the mental mode and functioning inherent in the emerging strategies pertinent to young children's developing communication effectiveness (Friedlander, 1973). In these studies researchers used

stories capitalizing on the content, theme, plot, characters, episodes, sequences and flow to study young children's receptive, analytic, and codifying skills. The functions and modes of such variables as output-input of stimuli, organization and control of orienting stimuli, transfer from concrete to symbolic modes of thinking, encoding and decoding involved in auditory perception, convergence and divergence of auditory stimuli, discrimination and inhibition behaviors, and intensity factors were studied (Neimark, 1969).

Studies in auditory perception identified the listener, not the speaker, as the prime director of the learning process since it is he who controls the intake process (Dechant, 1964; Piaget, 1955). The child develops preliminary routines, according to Neimark (1969), to control information input and after that learns what to do with the information. Shipley, Smith, and Gleitman (1969) suggest that young children bypass some of the confusion of language by "tuning out" what is unfamiliar or meaningless. They found that two- and three-year-olds were significantly less attentive and responsive to the more complex and nonsense stimuli than they were to simple commands and responses with form and content just a little more advanced and novel than were their own structures. Both the unfamiliar words and unfamiliar structures seemed to be barriers to young

children's comprehension of what was said and heard (Wetstone & Freidlander, 1973).

Research in verbal acquisition and memory processes in very young children revealed that young children had an exotic language that was all their own (Kolhberg, 1966). Bever (1970) noted that at three years of age chronologically, children developed partial linguistic strategies based either on sequential or semantic cues and that, as children matured, the quality of their thinking became qualitatively different. Bever (1970) further noted that it was not simply that children are older and know more but rather that they do different things with what they know. Changes in various stages of thinking were shown age-related but not age-determined (Piaget, 1955; Lavatelli, 1972). As the child developed mentally, he moved from thinking only in images to thinking in words--symbols of thought. Clarapede (1955, p. 12) noted that "the error made is that child thought has been examined by applying an adult mold and pattern to children's thinking and this can only lead to a blind alley."

It is commonly assumed by most adults that young children perceive events in global fashion barely distinguishing the events from the context or properties of occurrence (Neimark, 1969; Piaget, 1955; Werner, 1948; Hebb, 1949; Hubel & Weisel, 1963). Children's minds have appeared to seek wholes. Their interests have been more personal



than intellectual in nature. The wholes were perceived to vary through story episodes and the salient features were spelled out through story action (Piaget, 1955). Dewey (1956) postulated that the problem for the young child was one of coping with the number of instances or episodes in the story learned independently rather than organized in terms of their properties. Oster and Kofsky (1966) concluded that children handled each instance as a single attribute standing by itself, and Piaget (1955) concurred.

Research studies indicated that very young children use intuition to extract meaning from adult streams of speech. Brown and Bellugi (1964) reported that three-year-old children used an intuitive knowledge of parts of speech as first steps in determining meaning. The stress adults place on the meaning-bearing words was found to help children retain words and to acquire the syntactic structures necessary for comprehension. Brown and Bellugi (1964) noted that children preserved the word-order of sentences even when many of the content words were missing. They found it tenable that young children had a special way of handling grammatical constructions even when they imitated adult models. To young children, the model sentences appeared as total constructions--wholes, not just words, or word lists. (It is likely that this perception is a phenomenon that allows adults to understand young children.) Also, Brown and Bellugi (1964) reported that when adults extended

children's telegraphic sentences, there was not the corresponding increase in sentence length by the children when they were asked to repeat the model sentences. In most cases, Brown and Bellugi (1964) found that the sentence length remained the same, and from this observation they concluded:

Constraint seems to lie in the length of span of the sentence. This isn't a limitation of vocabulary . . . children know hundreds of words. And, it isn't a constraint of immediate memory. It seems to be a limitation of the length of utterance the child is able to program and plan. The narrow span limitation is characteristic of most or all of young children's operations (pp. 133-151).

The intuitive process is probably the phenomenon that helps young children center on the familiar, understandable aspects of adult speech while causing them to disregard and/or discard all that is not understandable or relevant to them.

Nelson, Carskaddon, and Bonvillian (1973) studied the influence of language variables of adult speech on children's concurrent acquisition of syntax. The children in their study were expected to respond to two different methods of handling grammatical sentences. The first, expanded grammatical sentences, were recast in new syntactical forms making sure that the words and the content were the same as they were in the children's original sentences. The second condition called for new sentences constructed with the content words specifically omitted from the subject of the sentence. From their observations it was concluded

that children could learn new and detailed aspects of syntax from the first condition since there was an overlapping of meaning in the recast sentence where content and syntax were modified but not changed significantly. The child could then compare the way he constructed his grammatical sentence with the adult's recast sentence which expressed some of the same underlying structural relationships.

Piaget (1955) used stories and mechanical explanations to study the thought and language processes in young children from six to eight years of age chronologically. His purpose was to discover how young children think, speak, and reason. An essential part of children's intellectual life, said Piaget (1955), takes place on a verbal plane apart from contact with either concrete materials or images. It was his strategy to let children talk rather than having them just respond to questions asked. By letting children talk Piaget (1955) felt that he could "capture what was hidden behind the immediate appearance of things." By analyzing each little remark made by a young child, he felt it might be possible to uncover the secrets of the composition of each remark. This method was described as diagnostic, similar to that used by psychiatrists. Piaget (1955) was the first, however, to admit that what he expected to find might not produce practical solutions to puzzling problems. But he did consider his findings to be "first steps"

to research that could be subjected to more stringent statistical treatment.

In short, Piaget's procedure was to read a story or explain a mechanical drawing to a first child, who would then tell what he had heard and understood to another child. The second child would then tell to the adult reader or explainer what he had heard, understood, and remembered. Piaget classified his findings into two groups: general understanding and verbal understanding. General understanding pertained to the manner in which the whole story was understood, either implicitly or explicitly by the child, since some children seemed to understand what was read or explained but for various reasons could not verbally retell or explain what was heard. Verbal understanding pertained to the degree and manner in which the child retold the story or explanation. It was found that explanations were easier for the children to handle and better understood than were stories between children and adults and children. Piaget (1955) reasoned that the mechanical explanations had a closer relationship with life than did stories, that cues from the drawings helped children reconstruct even if they failed to listen or if the explainer was ineffective in communicating the mechanism to the second child. But, with stories, if the explainer expressed himself badly, the reproducer was at a loss to retell the story since he could not supplement the vague or forgotten aspects of the story.

Piaget (1955) further noted that his subjects tended to be perceptually-oriented and, therefore, made judgments in terms of how things looked to them. He indicated that they lacked the ability to reverse so could not compare what is with what was; and since they apparently concentrated on single attributes as wholes, what to them stood out most was what was remembered by the subjects (Phillips, 1969).

Lively narration and intonation, it appears, are more powerful variables than meaningfulness in story reading and story telling for very young children (Rileigh & Friedlander, 1971; Rileigh, 1972; Bohannon & Friedlander, 1973). In the series of studies to ascertain the effect of intonation on listening preferences of young children, the youngsters were asked to choose between meaningful, normal-syntax stories narrated in a flat monotone, and meaningless, scrambled-syntax stories narrated in a lively intonation manner. Results showed that the children in kindergarten, grades one and two failed to attain significant selective listening preferences for the meaningful, monotone narration, but that the listening selectivity of younger children was significantly better when the story versions differed in both syntax and intonation. From their studies they concluded that meaningfulness alone does not comprise a secure base for language perception, that the receptive language functions can no longer be taken for granted as an essentially meaning-oriented system (Bohannon & Friedlander, 1973).

Both Broadbent (1956) and Bennett (1962) found that errors increased when children continually alternated between the visual and aural signals such as between concentration on pictures in a story and the narration of the story. Since the information-processing system had a limited capacity, the adult streams of speech resulted in language confusion for the young children which, according to Lee (1965), became a major barrier to adequate listening. The listener or listener/participants were not always aware that the speaker was using words that had both factual and judgmental meanings. This condition caused the listener to assume something that may not have been the intent of the speaker. Lee (1965) concluded that feelings as well as words were important elements in the auditory-discriminatory-receptivity act. Moore and Massaro (1973) concurred that dividing the children's attention between auditory and visual tasks had the effect of reducing performance on the auditory task.

Fries and Wilson (1966) found that pictures in books were distracting elements because they furnished clues to meaning. Pictures as clues lead the pupil to guess at words rather than to read them for meaning. Therefore, most of the pictures were excluded from their basal readers in order to help children focus their attention on the reading material itself.

Results of the study by Cullinan, Jaggar, and Strickland (1974) indicated three conditions crucial to successful language development in young children: true acceptance and understanding of children's natural language, a language environment rich with language models, and opportunities for children to listen to language and to use it in realistic situations. Their study was concerned with the effects of a literature-based oral language program using fifty story books. Black children heard stories read to them daily for one school year. After the stories were read, the children were encouraged to do some kind of activity--dramatics, puppetry, discussion, story-retelling--each involving some kind of projection, explanation, or extension with stress placed on the children's creative, spontaneous use of language.

Rileigh (1973) studied children's preferential listening in natural listening situations to ascertain to what extent children at various ages used information about vocabulary, intonation, and syntax for understanding. She was interested in what children did with their listening interests rather than what they could do. English-speaking kindergarten and first grade children were encouraged to choose between listening to a story in English or in German. In the analysis of the data, she looked at the variables of intonation, vocabulary, and syntax. In the second phase of her study the children heard the same stories in English.

However one story was read in a natural manner and the other story in a distorted manner. Intonation was the only variable studied under the condition. In phase three of the study, the same stories were read in a normal manner and in a monotone with no intonation whatsoever. Under this condition, the children were asked to identify the characters, tell the plot in a sequential order, and give a general impression of the story. No significant correlation was found between children's vocabulary, I.Q., and the extent of preference for the natural version of the story. There were no significant differences in the listening patterns of the sexes, but the familiarity variable did prove significant. From these findings, Rileigh concluded that a step-wise hierarchy evidenced itself in children's receptive listening behavior. Children first became aware of vocabulary and the intonational features of language. Then they became aware of and used the syntactical features of language. Supporting her familiarity criterion, Rileigh found that the German samples of language were the most novel and the most unfamiliar, and, as expected, were the ones most rejected.

In summary, the research studies pertaining to the communication and comprehension processes in very young children centered around isolated dimensions of language acquisition, attention-processing, input-output comprehension and memory, both separately and in combinations. Studies dealing with the structural components of the developing



language processes dominated the research until recently. Currently the focus has shifted from structure to content, and the focus of the few studies available was on the speaker rather than the listener or the roles the children play in the listening act.

If the genesis of habit formation of attending to what is said first emerges around the nursery school ages of three and four years, the methods adults use when reading stories to very young children merit investigation. Habits, once formed at this early age, are hard to break. Every effort to structure effective habits of attention-processing, cognitive receptivity, and memory in positive ways in very young children should have a first priority status in the interaction processes involving both young children and the adults working with them.

The major purpose of this research was to examine the relationship between the way adults read stories to very young children and the way young children listen, comprehend, and process what they hear for communication purposes, thus contributing to this first nadiral priority.

## CHAPTER III

### PROCEDURE

A panel of fourteen graduate students, all experienced teachers in programs for young children, selected four stories from a group of six for the study. The classic criteria employed by most authors and evaluators of children's literature were used; namely, theme, plot, characters, action, and author's style (Arbuthnot, 1964; Huck & Kuhn, 1968; Tooze, 1959). The panel also considered such factors as the similarity of story themes and plots, the sameness of characters, actions, and episodes in relation to the subjects' age, sex, and interests. To corroborate the panel's choice, the four selected stories were tested in a pilot study.

#### The Data-Gathering Instrument

A panel of three reading specialists, all holding Doctor of Philosophy degrees in their chosen field, independently read and identified the salient points in each story (Appendix A, page 84). The length of the stories varied but was not considered a significant element for the purposes intended.

From the lists of salient points for each story compiled by the reading specialists, the present investigator

made a composite list which included those salient points identified by at least two of the three reading specialists (Appendix B, page 90). For scoring purposes, if two points were combined in the original list, the investigator divided the two so as to obtain an equal number of salient points for each story.

Care was taken to avoid changing the wording or the intent of the original points when constructing the composite lists. A single analysis of variance test was used to test the four stories for similarity of content and structure.

### Subjects

The subjects chosen for this investigation were a group of 24 three-year-old children (36 months through 47 months chronologically) and a group of 24 four-year-old children (48 months through 59 months chronologically). Those eligible had already had their third or fourth birthday on the day, or prior to the day, the investigation began. The children had not reached their fourth or fifth birthdays respectively, until after the data had been obtained. (See Appendix C, page 94.)

The subjects were chosen from the total group of children enrolled in the only United Day Care Center in Radford, Virginia. Permission to involve the children had been obtained from the Director of the Radford United Day

Care Center and from the parents of the children who participated in the study.

The population, representative of the southwest area of Virginia, included various ethnic groups, both sexes, and a wide range of socio-economic and parental educational levels. The children came from the normal two-parent homes, from single parent homes (divorced, widowed, or unwed), from homes having grandparents, aunts, uncles, and other adults other than/or including "own" parents in them. Some subjects were only children while others had siblings older and/or younger than they. Some subjects came from foster homes.

#### Design

The four stories were randomly assigned the letters P, Q, R, and S. The stories were then combined in pairs, using all possible combinations (PQ, QP, PR, RP, PS, SP, QR, RQ, QS, SQ, RS, SR).

Each pair of stories was read under two different treatments. The first treatment, designated as the interrupted treatment, involved continuous dialogue between reader and listener throughout the story-reading process. The basic features of the interrupted treatment was the inclusion of non-referential cues, pictures, questions, and discussion at any and all points in the story-reading process by either and both participants. The second treatment,

designated as the uninterrupted treatment, involved the structuring of a listening environment wherein the listener heard the whole story from start to finish excluding continuous dialogue, pictures, questions, and discussion.

The subjects at each chronological age level, 36 months through 47 months (3-year-olds) and 48 months through 59 months (4-year-olds), were randomly selected for the study and randomly assigned a partner of their age level. (A table of random numbers was used in all the randomizing processes.) Each pair of subjects was randomly assigned a pair of stories. After the tape recorder and stop watch were introduced and made familiar to each subject, one subject of the pair heard the first story under the interrupted treatment. After a lapse of two school days the same subject heard the second story under the uninterrupted treatment. His partner in the pair heard the first story under the uninterrupted treatment and the second story, after a lapse of two school days, under the interrupted treatment. This plan, yielding a total sample of 96 measurements at each phase of testing for comprehension is illustrated in Table 1, page 26.

The children's recalling and retelling performance was partitioned into four cueing levels titled "phases." Phase I called for spontaneous unassisted recalling and retelling on the part of the listener, followed sequentially by non-referential cueing (Phase II), non-referential cueing

Table 1  
 Story Combinations and Subject Assignments  
 for Three Year Old Children\*

<u>Subjects</u>	<u>Story Combinations</u>		<u>Subjects</u>	<u>Story Combinations</u>	
	First	Second		First	Second
1	P <sub>c</sub>	Q <sub>e</sub>	2	P <sub>e</sub>	Q <sub>c</sub>
3	Q <sub>c</sub>	P <sub>e</sub>	4	Q <sub>e</sub>	P <sub>c</sub>
5	P <sub>c</sub>	R <sub>e</sub>	6	P <sub>e</sub>	R <sub>c</sub>
7	R <sub>c</sub>	P <sub>e</sub>	8	R <sub>e</sub>	P <sub>c</sub>
9	P <sub>c</sub>	S <sub>e</sub>	10	P <sub>e</sub>	S <sub>c</sub>
11	S <sub>c</sub>	P <sub>e</sub>	12	S <sub>e</sub>	P <sub>c</sub>
13	Q <sub>c</sub>	R <sub>e</sub>	14	Q <sub>e</sub>	R <sub>c</sub>
15	R <sub>c</sub>	Q <sub>e</sub>	16	R <sub>e</sub>	Q <sub>c</sub>
17	Q <sub>c</sub>	S <sub>e</sub>	18	Q <sub>e</sub>	S <sub>c</sub>
19	S <sub>c</sub>	Q <sub>e</sub>	20	S <sub>e</sub>	Q <sub>c</sub>
21	R <sub>c</sub>	S <sub>e</sub>	22	R <sub>e</sub>	S <sub>c</sub>
23	S <sub>c</sub>	R <sub>e</sub>	24	S <sub>e</sub>	R <sub>c</sub>

Note: c = control condition (interrupted)  
 e = experimental condition (uninterrupted)  
 \*Entire sequence repeated for four-year-old group.

and pictures (Phase III), and non-referential cueing, pictures, and referential cueing (Phase IV). Each phase was followed by a 30-second waiting period to allow the child time to offer any further information before proceeding to the next phase.

It was assumed that randomization would minimize the effects of extraneous variables such as I.Q., environmental factors, personality, sex, and maturational levels of the subjects. It was also assumed that the "within-subject" procedure, with each subject acting as his own control, would improve the preciseness of the obtained measurements.

#### Sources of the Data

A full-time employee at the Radford United Day Care Center, who worked with the children each day, was the reader for all forty-eight subjects. To minimize the risk of introducing bias into the data, she had no knowledge of the purpose of the study. Each session with each individual child took place during the regular day in a room familiar to the child but away from the rest of the children.

At the appropriate time the reader and the subject went to this familiar room. The reader made every effort to establish a friendly, comfortable rapport with the child prior to the experiment. The tape recorder was introduced to the subject. Its use and the way it worked was explained and demonstrated. When the reader felt the child was ready,

she proceeded to follow, step-by-step, the prepared directions for the treatment designated (Appendix D, p. 96). A stop watch with a sweep second hand was used to time the 30-second waiting period between each of the four phases identified for the retelling procedure. Table 2 identifies the phases and the adult stimuli offered the subject as he attempted to retell the story just read.

Table 2  
Adult Assistance for Story Retelling Procedure

Phase	Adult Stimuli
Phase I	None
Phase II	(1) Non-referential (questions)
Phase III	(1) Non-referential (questions) (2) Referential (pictures)
Phase IV	(1) Non-referential (questions) (2) Referential (pictures) (3) Repetition, (rereading, retelling, offering information)

#### Scoring

Each story had a total possible score of eleven points based on the investigator's compilation of the salient points identified by the three reading specialists (Appendix B, page 90).

Each score on each story resulted from an analysis of the content verbally recalled by the subject upon request.



One point was counted for each salient point bearing upon the causal or logical relations explicitly understood and reproduced verbally upon request. A half point was counted when it was evident to the investigator that the story was implicitly understood by the child, but for one reason or another the child could not, or would not, identify or express accurately a specific character, plot, or episode of the story (Piaget, 1955, p. 104).

Eight sets of scores were obtained for each subject, one set for each of the four phases under each treatment (interrupted and uninterrupted). The four phases were the result of the partitioning procedure into additive parts illustrated in Table 2, page 28.

Phase I involved the procedure wherein the adult asked the subject to retell the story without any assistance in the way of cues, pictures, or questions (e.g., "\_\_\_\_\_, tell me the story"). After a wait of thirty seconds, the reader moved to Phase II. The thirty-second time interval was selected after trials during the pilot study. This time interval was found to be the most satisfactory waiting-time interval between the phases. Phase II involved the use of non-referential questions (e.g., "\_\_\_\_\_, what was the story about?"; "What did he do?"; "Then what happend?"). After a wait of thirty seconds, the reader moved to Phase III. Phase III involved the use of pictures and non-referential questions (e.g., "\_\_\_\_\_, let's look at the pictures and see

if we can tell the story or tell more of the story. Tell me about this picture. What happened here? And then what happened? Who is this? What did he do?"). After a wait of thirty seconds, the reader moved to Phase IV. Phase IV included the use of pictures, non-referential questions, and any and all other cues to stimulate the subject to recall and retell more of the story (e.g., "\_\_\_\_\_, who is this? It's a duck, isn't it? What did he want to do? He talked like all the animals he met, didn't he? Could he do that? That's right. What happened here? Who was this? How did he talk? That's right. Good. That's what the cow said.").

The salient points were those that agreed with the ones listed on the composite list (Appendix B, page 90). The points the child offered were tallied on a specially designed score sheet. The four phases were analyzed separately and tallied separately. Then they were added together to arrive at a total score. (Appendix E, page 100.)

#### Analysis of Data

A three-factor analysis of variance design with repeated measures (Winer, 1971, page 539) was selected as the technique to be used to determine the influence of the independent variables--age (A), treatment (B), and cueing phases (C), with B and C repeated measures--on the story-reading/story-telling performance. This technique permitted utilization of the data (1) to obtain an overall test of the

significance of the differences between the several subgroup means; (2) to improve the estimate of the sampling error by allowing for the variation existing in the classified sub-groups, and (3) to provide a means of testing whether the influence of one variable on another is similar for sub-groups formed on the basis of the third variable.

Other appropriate tests were applied when the results warranted that such be used. The Newman-Keuls Multiple Range Test for Treatment Means was used to test for significant differences among the four phase means. Appropriate t tests were applied when tests of significance between two sample means were sought. And a single-factor analysis of variance test was applied to the test of similarity of the content and structure of the four stories used in the story-reading/story-telling session.

## CHAPTER IV

### RESULTS

The results of this experiment are reported in two parts. Part one includes results of the analysis of the structure and content of the four stories used in the study. The results of the 3-factor analysis of variance, detailing the main effects and the interactions respectively, are reported in the second part.

#### Similarity of the Story Content and Structure

At the outset of the statistical treatment, a single-factor analysis of variance was computed on the four stories used in the experiment to ascertain whether or not they were significantly different with respect to content and structure. The summary statistics are shown in Table 5, page 36. The detailed computations appear in Appendix F, pages 105-106.

The resulting non-significant F ratio permitted the collapsing of the children's comprehension scores across the story variable, thus facilitating the clarification of the interpretation of the statistical analysis.

#### Data Analysis

A three-factor analysis of variance was performed on the data to determine what significant main effects and

interactions were operant among the three experimental variables: age, treatment, and phases. The means to which the analysis of variance was applied are detailed in Table 3, page 34 and Table 4, page 35. The major findings of this analysis were as follows:

1. Each of the main effects--age, treatment, and phases--were found to be significant at or beyond the .05 level.

2. All of the interactions (AB, AC, BC, and ABC) were found significant at or beyond the .05 level.

Present in Table 6, page 37, is the summary results for the analysis of variance. In Figure 1 (page 38) is presented the average of cell means for all three factors (age, treatment, cueing phases). The formulas for the analysis of variance model used in this study are listed by Winer, 1971, page 548.

### Interactions

Age-Treatment (AB). The AB interaction, significant at the .02 level ( $F = 5.94$ ,  $df\ 1/46$ ,  $p = .02$ ) is presented geometrically in Figure 2, page 39. The lack of parallelism in the profiles  $a_1$  (3-year-old children) and  $a_2$  (4-year-old children) reflects the quite different responses of the two age groups to the interrupted ( $b_1$ ) and the uninterrupted ( $b_2$ ) story-reading treatments.  $t$  tests of the differences between corresponding points on the profiles (Table 6, page

Table 3

Mean Number of Points Remembered by Children at  
Each Level of Age (A), Method (B), and  
Cueing Phase Factors (C)

Age - Treatment						
Age	Treatment					
	Interrupted $b_1$	Uninterrupted $b_2$				
3 year $a_1$	3.14	4.01				3.58
4 year $a_2$	4.42	4.50				4.46
$\bar{A}$	3.78	4.26				4.02
Age - Phases						
Age	Phases					
	Phase 1 $c_1$	Phase 2 $c_2$	Phase 3 $c_3$	Phase 4 $c_4$		
3 year $a_1$	.75	3.33	5.38	4.85	3.58	
4 year $a_2$	4.08	3.56	7.60	2.60	4.46	
$\bar{A}$	2.42	3.44	6.49	3.73	4.02	
Treatment - Phases						
Treatment	Phases					
	Phase 1 $c_1$	Phase 2 $c_2$	Phase 3 $c_3$	Phase 4 $c_4$		
Interrupted $b_1$	1.30	3.94	5.66	4.25	3.78	
Uninterrupted $b_2$	3.54	2.96	7.31	3.20	4.26	
$\bar{B}$	2.42	3.45	6.48	3.72	4.02	

Table 4  
 Mean Number of Points Remembered by Children  
 at Each Level of Age (a), Method (b),  
 and Cueing Factors (c)  
 Cell Means  
 n = 12

Age	Phases					
	Treatment	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	$\bar{C}$
3 year a <sub>1</sub>	Interrupted b <sub>1</sub>	.13	3.12	2.75	6.58	3.15
	Uninterrupted b <sub>2</sub>	1.38	3.54	8.00	3.13	4.01
	a <sub>1</sub> b	.75	3.33	5.38	4.85	3.58
4 year a <sub>2</sub>	Interrupted b <sub>1</sub>	2.46	4.75	8.58	1.92	4.42
	Uninterrupted b <sub>2</sub>	5.70	2.38	6.63	3.29	4.50
	a <sub>2</sub> b	4.08	3.56	7.60	2.60	4.46
	ab	2.42	3.44	6.49	3.73	4.02

Table 5

Total and Mean Scores of Four Stories for Analysis  
of Variance of Story Similarity  
n = 24

P (Zebra)	Q (Caps)	R (Duckling)	S (Bear)
$T_P = 186$	$T_Q = 202.5$	$T_R = 195.5$	$T_S = 187.0$
$\bar{X}_P = 7.8$	$\bar{X}_Q = 8.4$	$\bar{X}_R = 8.2$	$\bar{X}_S = 7.9$
$T = 771$	$\frac{T^2}{N} = 6192$	$\sum \frac{T_J^2}{N} = 6199.2$	$\sum X^2 = 6889.5$
$N = 96$	Sum of Squares		
Between	$6199.2 - 6192.0 = 7.2$		
Within	$6889.5 - 6199.2 = 690.3$		

Analysis of Variance for Story Similarity

Source	Sum of Squares	Degrees of Freedom	Variance Estimate
Between	7.2	3	$s_b^2 = 2.4$
Within	<u>690.3</u>	<u>92</u>	$s_w^2 = 7.5$
Total	697.5	95	$F = \frac{2.4}{7.5} = .32$
Critical Ratio (df 3/92) : 2.71			



Table 6  
 Analysis of Variance for Responses on Interrupted  
 and Uninterrupted Story Reading with  
 Three- and Four-Year-Old Children

n = 48, A = 2, B = 2, C = 4

Source	SS	df	MS	F
<u>Between Subjects</u>				
A(Age)	162.49	47		
Subj w. groups	18.82	1	18.32	6.02 <sup>1</sup>
[error(a)]	143.64	46	3.12	
<u>Within Subjects</u>				
B (Treatment)	2886.00	336		
AB	4.28	1	5.28	8.34 <sup>2</sup>
B x Subj w. groups	3.76	1	3.76	5.94 <sup>3</sup>
[error(b)]	29.09	46	.63	
C	218.61	3	72.87	7.01 <sup>4</sup>
AC	106.96	3	36.66	3.53 <sup>5</sup>
C x Subj w. groups				
[error(c)]	1434.16	138	10.39	
BC	54.44	3	18.14	2.76 <sup>6</sup>
ABC	126.56	3	42.18	6.42 <sup>7</sup>
BC x Subj w. groups				
[error(bc)]	907.12	138	6.57	

<sup>1</sup>A(Age): p = .02  
<sup>2</sup>B(Treatment): p = .005  
<sup>3</sup>C(Phases): p = .00  
<sup>4</sup>AB: p = .02

<sup>5</sup>AC: p = .02  
<sup>6</sup>BC: p = .04  
<sup>7</sup>ABC: p = .00

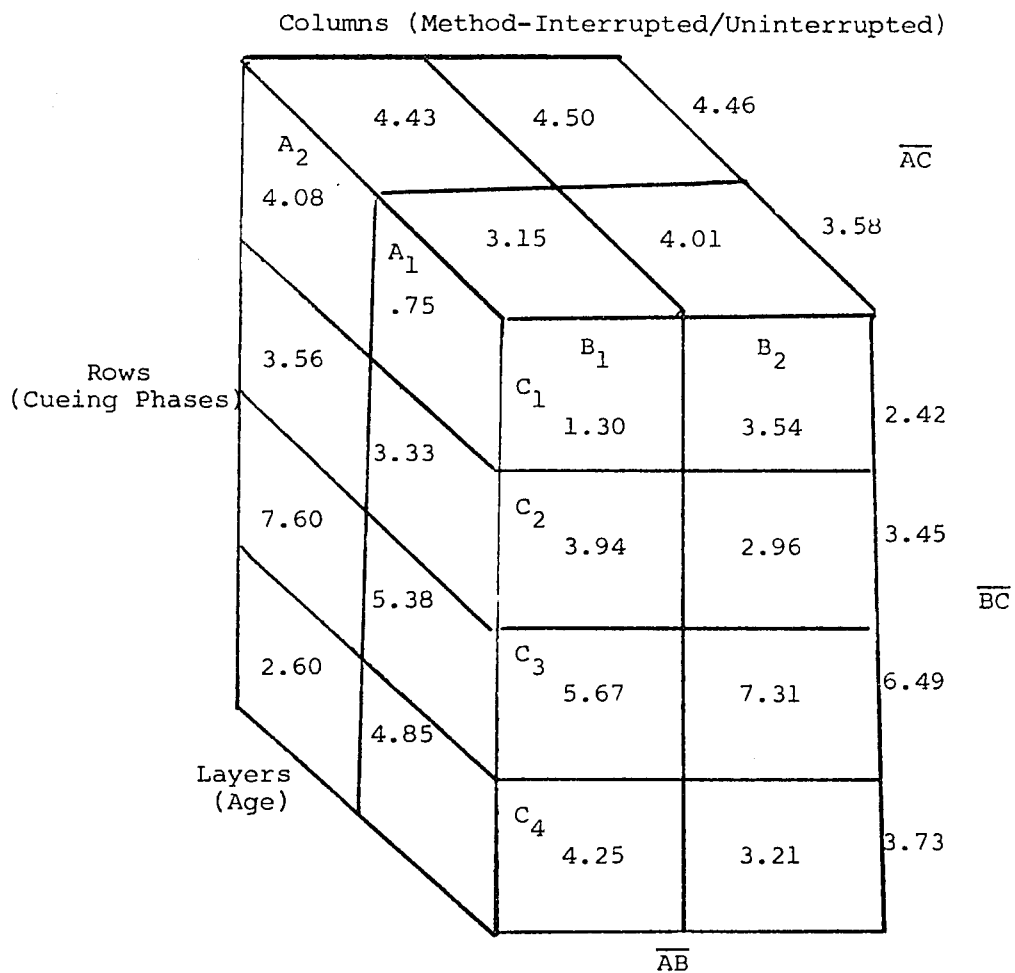


Figure 1. Averages of cell means for the three factors (age-treatment-cueing phases)

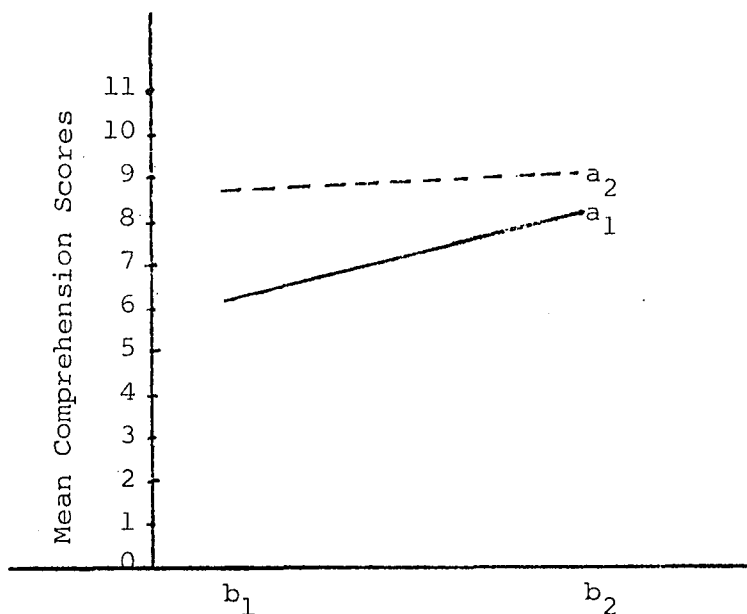


Figure 2<sub>a</sub>. Profiles of AB (age-treatment) interaction ( $a_1$  three-year-old children;  $a_2$  four-year-old children -  $b_1$  interrupted treatment;  $b_2$  uninterrupted treatment)

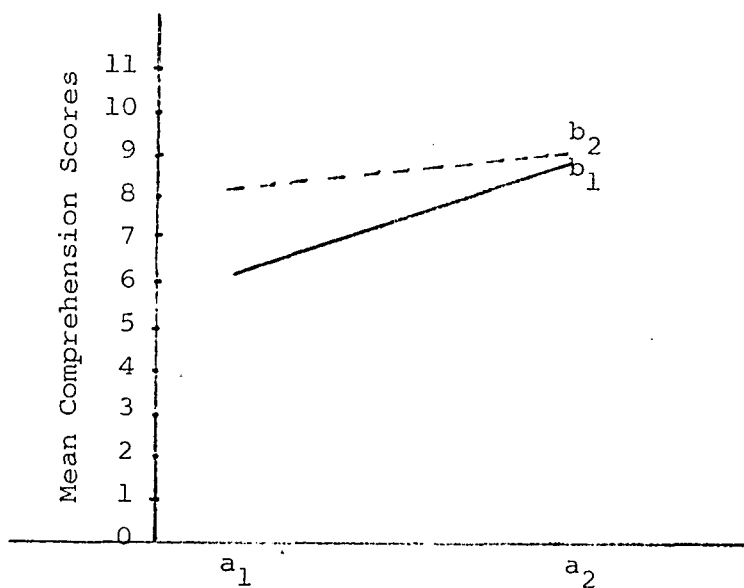


Figure 2<sub>b</sub>. Profiles of BA (treatment-age) interaction ( $b_1$  interrupted treatment;  $b_2$  uninterrupted treatment -  $a_1$  three-year-old children;  $a_2$  four-year-old children)

37, items 3 and 4) showed a significant difference in performance ( $\underline{t} = 7.66$ ) of the two age groups under the interrupted story-reading treatment ( $b_1$ ). The older group's performance was the same under both treatments (Table 6, page 37, items 1 and 2). In Table 7, page 41, the  $\underline{t}$  test results for Means of Significant Interaction Effect on Comprehension responses are shown.

These results indicate that the uninterrupted story-reading procedure advantageously affected the performance level of the younger children (3-year-old), his attainment matching that of the older (4-year-old) children under the same treatment. The older children performed in the same manner under both treatments (interrupted and uninterrupted).

Age-Phase (AC). Inspection of Figure 3 (page 42) graphically showing the lack of parallelism in the two profiles,  $a_1$  (three-year-old children) and  $a_2$  (four-year-old children), reflected the finding that the age-phase (AC) interaction was significant at the .02 level ( $\underline{F} = 7.01$ ,  $df\ 3/138$ ,  $p = .02$ ).

The highest mean score was achieved by both age groups at Phase III. The younger group (three-year-old children), increasingly attained higher scores on Phases I, II, and III. The older group (the four-year-old children) proved erratic with the scores about equal on Phases I and

Table 7

t Test Results for Means of the Significant Interaction  
Effect on Comprehension Responses

	Treatment x Age		
	3-year olds	4-year-olds	df
Interrupted Story-Reading	4.50	3.15	11.3**
Uninterrupted Story-Reading	4.50	4.01	4.34**

Age	Age x Treatment		df
	Interrupted	Uninterrupted	
3-year-olds	4.01	3.15	7.6**
4-year-olds	4.50	4.43	.64

Formula: (Winer, 1971, p. 551)

\*t.95 = 1.98  
\*\*t.99 = 2.63

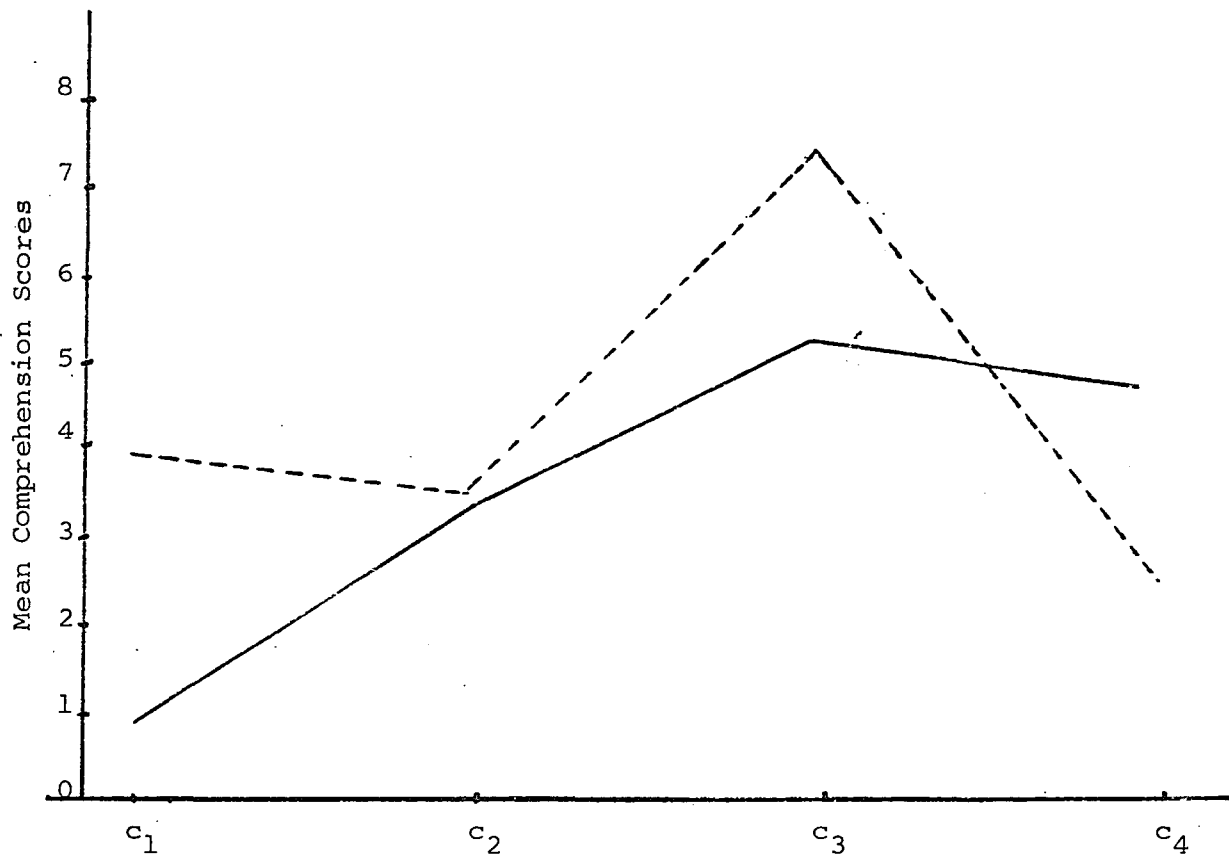


Figure 3. Profiles of AC (age-treatment) interaction (a<sub>1</sub> three-year-old children; a<sub>2</sub> four-year-old children c<sub>1</sub> c<sub>2</sub> c<sub>3</sub> c<sub>4</sub> cueing phases in story telling task)

Table 8

Summary of Newman-Keuls Multiple Range Test  
for the Four Phases

n = 48

Phases Means	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>		
	2.40	3.44	6.48	3.74		
	C <sub>1</sub>	C <sub>2</sub>	C <sub>4</sub>	C <sub>3</sub>	r	q(r,136).05
C <sub>1</sub>	--	2.23	2.86	8.72*	4	3.63 (.05) 4.40 (.01)
C <sub>2</sub>		--	.62	6.53	3	3.31
C <sub>4</sub>			--	5.90	2	2.77
C <sub>3</sub>				--	1	

\*Note: Phase III differs significantly from the other phases. Phases C<sub>1</sub>, C<sub>2</sub>, and C<sub>4</sub> do not differ significantly from each other.

II, catapulting upward dramatically in Phase III, and plunging downward dramatically in Phase IV.

The results of the Newman-Keuls Multiple Range Test for Treatment Means (Table 8, page 43) indicated that Phase III was significantly different from the other three Phases ( $q = 8.74$ ,  $4/136$ ,  $p = 4.40$ ), and that Phases I, II, and IV were not significantly different from each other. (The detailed computations are found in Appendix H, p. 111.)

Tests of significance of differences between corresponding means for the AC interaction were made. (See Table 9, page 45.) The results showed a real difference existing between the mean performance of the three- and four-year-old groups under Phase I ( $p = .01$ ). Real differences in mean scores for Phases III and IV were also found ( $p = .05$ ). Only Phase II showed the two age groups not significantly different in performance. Age, therefore, was shown to be a factor affecting performance under Phases I, III, and IV.

The four-year-old children recall and retell more of what they have heard under Phase I, which offers no cueing, than do three-year-old children. Under Phase III, the four-year-old children recall and retell more of what they have heard when cued by non-referential questions and pictures than do three-year-old children. The four-year-old children also perform better under Phase IV (all cueing techniques) than do the three-year-old children.



Table 9

t Test of Significance of Differences Between Corresponding Mean Points for the Age-Phases and Treatment-Phases Interactions

---


$$\underline{t} = \frac{BC_{1j} - BC_{2j} \quad (\text{and } AC_{1j} - AC_{2j})}{\sqrt{\frac{2(SS_{\text{subj w. groups}} + SS_{\text{Cx subj w. groups}})}{nr [2p(n-1) + p(n-1)(q-1)]}}$$

$$\frac{AC}{4.08 - .75}$$

$$\underline{t}_{c_1} = \frac{2(143.6433 + 1434.169)}{\sqrt{(48)(4) [2(48-1) + 2(48-1)]}}$$


---

	(H <sub>1</sub> ) <u>Decision**</u>
(1) $\underline{t}_{c_1} = 3.33/.934 = 3.56$	Reject (.01)
(2) $\underline{t}_{c_2} = .23/.934 = .24$	Accept
(3) $\underline{t}_{c_3} = 2.22/.934 = 2.37$	Reject (.05)
(4) $\underline{t}_{c_4} = 2.25/.934 = 2.41$	Reject (.05)
 <u>BC</u>	
(1) $\underline{t}_{c_1} = 2.24/.934 = 2.40$	Reject (.05)
(2) $\underline{t}_{c_2} = 1.08/.934 = 1.15$	Accept
(3) $\underline{t}_{c_3} = 1.646/.934 = 1.76$	Accept
(4) $\underline{t}_{c_4} = 1.0415/.934 = 1.12$	Accept

Formula: (Winer, 1971, page 551)

\*\*H<sub>1</sub>: The differences between the corresponding mean points for the AB and BC interactions are due to sampling error.

$\underline{t}_{.95} = 1.98$ ;  $\underline{t}_{.99} = 2.63$

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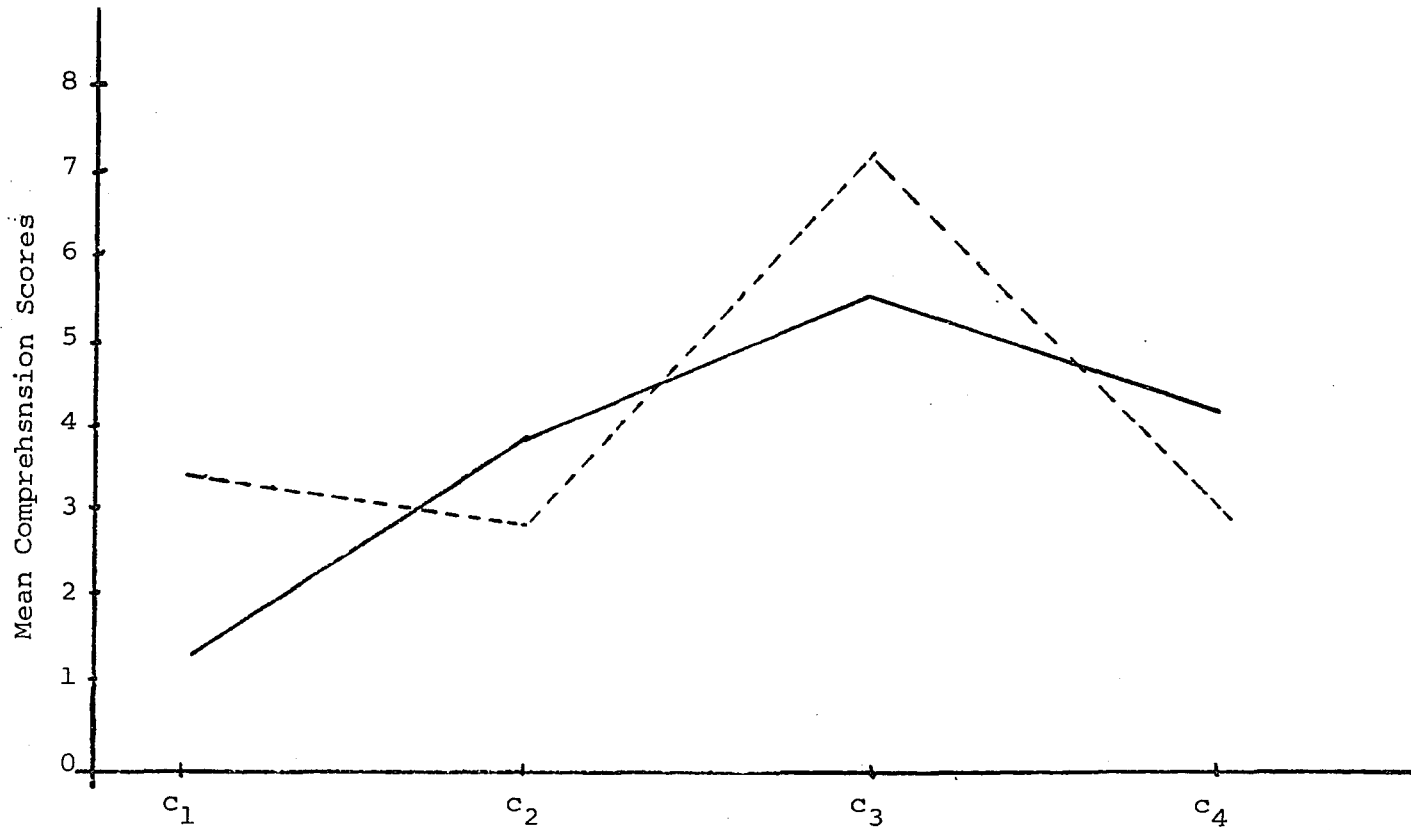


Figure 4. Profiles of BC (treatment-cueing phases) interaction (b<sub>1</sub> interrupted story-reading b<sub>2</sub> uninterrupted story-reading c<sub>1</sub> c<sub>2</sub> c<sub>3</sub> c<sub>4</sub> cueing phases in story retelling task)

Treatment-Phase (BC). A graphic presentation of the BC interaction profiles (treatment-phase), significant at the .05 level ( $F = 2.76$ ,  $df\ 3/138$ ,  $p = .04$ ) is shown in Figure 4, page 46. The profiles depicting the  $b_1$  (interrupted) and the  $b_2$  (uninterrupted) interactions under the first three phases closely parallel the AC (age-phases) interaction profiles.

The response scores in Phases II and IV were almost alike under both treatments. Under the interrupted ( $b_1$ ) treatment, the children attained higher response scores under Phase II than they did under Phase I, and higher scores under Phase III than they did under Phase II. Also, under the interrupted ( $b_1$ ) treatment, the children attained higher response scores under Phase III than they did under Phase IV.

In contrast, under the uninterrupted ( $b_2$ ) treatment, the children scored higher in the first and third phases than they did in the second and fourth phases.

The largest concentration of points for both age groups under both treatments ( $b_1$  and  $b_2$ ) occurred in Phase III (that phase mean which tested significantly different from the other three). (See Appendix G, p. 107).

Tests of significance of differences between corresponding mean points for the BC interaction showed only mean points to be significant for Phase I. (See Table 9, p. 45). The test of mean differences under Phase III failed to

attain significance at the .05 level but did reach beyond the .10 level. There is, therefore, reason to consider that a real difference may exist between the performance levels for the two treatments under Phase III. Treatments, however, were a factor affecting performance under Phase I. The higher scores obtained for  $b_2$  indicated higher cognitive receptivity and memory behavior on the part of both age groups under the uninterrupted story-reading treatment. Under Phase I the  $b_2$  (uninterrupted) treatment proved more productive than the  $b_1$  (interrupted) treatment in eliciting verbal responses from both groups of children in the recalling and retelling tasks.

Age-Treatment-Phase (ABC). ABC interaction effects are shown in Table 10, page 49, Figure 5, page 50, and Appendix I, page 114.

Three distinctive departures from expected means are graphically illustrated in Figure 5, page 50, which shows the profiles for the AB combinations on C. The interaction profile of the  $b_2$  (uninterrupted) treatment for  $a_2$  (four-year-old children) under Phase II (non-referential cueing) in the recall and retelling procedure was divergent from the parallel upward direction of the other three AB combination profiles.

The  $b_1$  (interrupted) treatment for  $a_1$  (three-year-old children) under Phase III (non-referential, questions and pictures) failed to achieve the upward parallel direction of

Table 10

ABC Interaction Departure from Expected  
Means Column Differences\*

Levels	<u>Comparison</u>		<u>Amount</u>
	Row	Column Differences	Departure from Expected Points
Ages	Treatments	Phase 1	2.04
Ages	Treatments	Phase 2	2.79
Ages	Treatments	Phase 3	7.20
Ages	Treatments	Phase 4	4.83
<u>Phases</u>			
I, II	Interrupted	Ages	.68
I, II	Uninterrupted	Ages	5.50
I, III	Interrupted	Ages	3.54
I, III	Uninterrupted	Ages	5.70
I, IV	Interrupted	Ages	7.05
I, IV	Uninterrupted	Ages	4.16
II, III	Interrupted	Ages	4.20
II, III	Uninterrupted	Ages	.20
II, IV	Interrupted	Ages	6.29
II, IV	Uninterrupted	Ages	1.33
III, IV	Interrupted	Ages	10.50
III, IV	Uninterrupted	Ages	1.54
I, II	Ages	Interrupted	.83
I, II	Ages	Uninterrupted	5.66
I, III	Ages	Interrupted	4.00
I, III	Ages	Uninterrupted	5.25
I, IV	Ages	Interrupted	4.70
I, IV	Ages	Uninterrupted	1.92
II, III	Ages	Interrupted	4.83
II, III	Ages	Uninterrupted	4.33
II, IV	Ages	Interrupted	3.88
II, IV	Ages	Uninterrupted	3.75
III, IV	Ages	Interrupted	8.70
III, IV	Ages	Uninterrupted	3.33

\*Legend

- A - Chronological Ages
- B - Treatment
- C - Cueing Phases

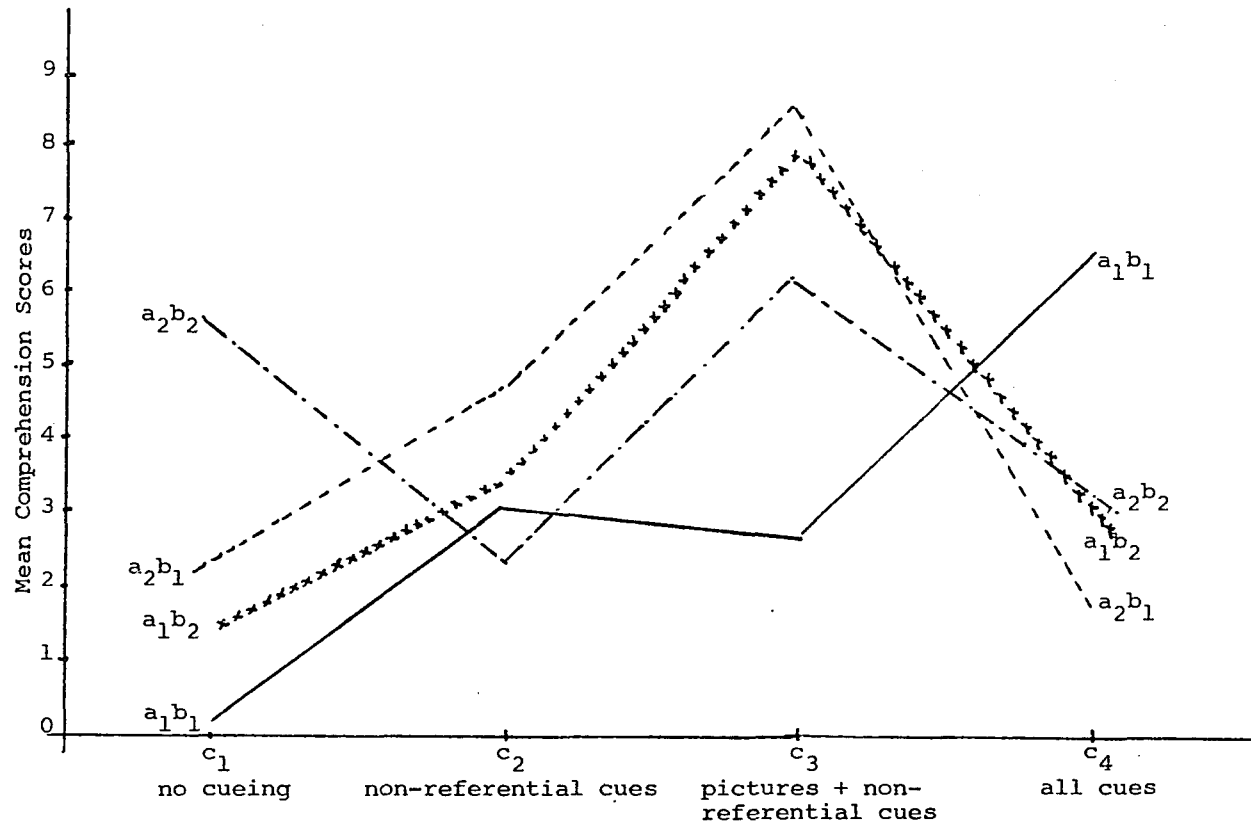


Figure 5. Profiles of AB on C interactions (age and treatment on cueing phases)

Legend:

- $a_1b_1$  (3 yr. old - interrupted)
- $a_1b_2$  (3 yr. old - uninterrupted)
- $a_2b_1$  (4 yr. old - interrupted)
- $a_2b_2$  (4 yr. old - uninterrupted)

the other AB combination profiles. Instead, the mean value attained was almost the same as that attained for the  $a_1b_1$  (3-year-old children, interrupted treatment) combination profile under Phase II (non-referential questions).

This same profile combination again departed from the expected under Phase IV (all cues). The angle of the upward slant was almost the same as that of the other AB combination profile segments but in the opposite direction.

In Table 10, page 49, and Appendix I, page 115, respectively, is shown the extent to which each of the comparisons of one variable level with another at the third variable level, departs from the expected mean value (the mean value needed to achieve parallelism in the corresponding relationships).

The greatest departure from an expected mean is attributed to the comparison of Phase III with Phase IV for the interrupted treatment under age levels. The three-year age level contributed 5.83 of the 10.50 total point differences, and the four-year age level contributed 4.66. Under Phase III three-year-old children out-performed four-year-old children; under Phase IV, the roles were reversed.

Other large point contributions included (1) age comparisons for Phases III and IV with 5.25 points for the former and 3.46 for the latter. Phase III showed three-year-old children performing in a manner on uninterrupted far superior to their performance on interrupted; Phase IV

showed a reverse role with this age group performing better under interrupted than uninterrupted treatments. (2) Interrupted treatment comparisons for Phases I and IV with the three-year age level contributed 2.4 points, and the four-year age level contributed 4.7 points. Four-year-old children showed better performance than the younger group on interrupted treatment under Phase IV. (3) Treatment level comparisons under Phase III showed the three-year age level with 5.25 points and the four-year age level contributed almost two points to the 7.2 point total. Under Phase III the three-year-old children were superior under uninterrupted; the older group performed better on the interrupted.

Minimal contributions were made by the comparisons of (1) both treatments under Phase I and II under age levels; and (2) uninterrupted treatment under Phases II and III under age levels, with the uninterrupted treatment contributing the least of any of the comparisons to the departure from expected total. These small contributions indicated that performance under the variables was parallel, with no one variable affecting any of the others.

The involvement so prominently of both Phase I and III with treatment under second-order interaction is also evident in the results obtained under analysis of the first-order interactions.

The extent to which Phases III and IV contributed to the departure from the expected total re-emphasizes the need



to exercise caution in the interpretation of results of the children's performance at the Phase IV level because of the probability that Phase IV scores have been noticeably affected by the method of scoring responses.

#### Summary of Results

1. The uninterrupted ( $b_2$ ) story-reading procedure advantageously affected the performance level of the three-year-old children, the mean response score attainment matching that of the four-year-old children under the same treatment.
2. Four-year-old children in this study performed in a manner similar under both the interrupted ( $b_1$ ) and uninterrupted ( $b_2$ ) treatments.
3. No significant advantages accrued to either age group under Phases II and IV. Neither of the two phases was significantly different in its effectiveness in eliciting responses to the stories from the children.
4. Four-year-old children responded more readily than three-year-old children to the particular cues relevant to Phases I (no cueing) and III (non-referential cueing and pictures).
5. For both age groups the cues particularly relevant to Phase III initiated more responses than did any of the other three phases.

6. The uninterrupted ( $b_2$ ) treatment proved more productive than the ( $b_1$ ) treatment under Phases I and III in eliciting responses in the children's retelling task.

7. No one variable showed any distinct influence on any of the other variables under Phase II. The uninterrupted ( $b_2$ ) treatment effect for four-year-old children under Phase II evidenced a score below the expected mean. In the interrupted ( $b_1$ ) treatment under Phase III, the three-year-old children showed a score below the expected mean.

8. Scores attained by the three-year-old children under the interrupted treatment for Phase IV were much higher than the expected mean score. (This result should be viewed with caution because of the probable influence of the measuring procedure on the Phase IV scores.)

## CHAPTER V

## SUMMARY AND CONCLUSIONS

Summary

Stories and story-reading, prized as first sources of words and ideas, have been intuitively used to stimulate communication between very young children and their older counterparts (Tooze, 1959). As far back in time as one can remember, adults, seemingly, have automatically assumed that very young children were competent, discriminative listeners since they generally spontaneously interacted or reacted in some manner with the talking adults (Burrows, 1972).

The focus of empirical research in language acquisition has only recently shifted from the structure of children's developing communications patterns to its content. Now the thrust is focused on the mental modes and functioning operating on words and ideas and the meaning these have for very young children (Friedlander, 1973; Neimark, 1969; Dechant, 1964; Piaget, 1958).

Research has pointed to the fact that the very young developing mind is quite different in makeup from the adult mind--quite unique and distinctive in its operation. This means that the child hears, sees, thinks, and responds in a manner all his own--one that cannot and should not be

compared with the adult mind (Kohlberg, 1966; Piaget, 1958; Bever, 1970).

Clarapede (1955, p. 12) targets the above by saying that "in examining child thought, the error made is one of applying an adult mold and pattern to children's thinking" (when in fact, they are not adults and cannot and do not think or react as adults do).

Distractions, interruptions, fragmented ideas and thoughts in the form of visual and aural signals (where the child has to shift his attention from one to the other) were found to be major barriers to listening and comprehending (Broadbent, 1956; Bennett, 1962; Moore & Massaro, 1973; Lee, 1965; Fries & Wilson, 1966).

The purpose of this study was to test the thesis that different story-reading procedures do produce different kinds and quantities of comprehension behavior in very young children. The question to be answered is this: Does the manner in which stories are read to very young children result in responses which indicate that what is gained in the listening and/or listening/participating roles differ enough to cause re-examination of the methods of reading stories to very young children?

Since this fragmented story-reading performance on the part of the adults is so much an integral part of the story-reading process to very young children, a study of its

impact on the very young mind appears to be pertinent and timely.

Two methods of story reading were selected for use in this study. The "interrupted" method described the condition under which children heard a story read to them, encouraging communication by using the book, pictures, distractions, interruptions, and comments at any and all points throughout the reading of the story. The "uninterrupted" story-reading method described the condition under which children heard a story read to them in a continuous manner without reference to the book, pictures, distractions, interruptions, or comments through the entire story-reading process.

From a group of six stories, four were selected for this study by a panel of fourteen graduate students, all experienced teachers. The results of the single-factor analysis of variance test applied to the four stories showed them to be similar with respect to content and structure.

The subjects chosen for this investigation were a group of 24 three-year-old children and a group of 24 four-year-old children. These children were enrollees in the only United Day Care Center in Radford, Virginia. The population was representative of the southwest area of Virginia, including various ethnic groups, both sexes, with a wide range of socio-economic and parental educational levels.

Randomization of subjects and stories was meticulously employed, resulting in a pair of subjects being assigned a pair of stories. One subject of the pair heard the first story under the interrupted treatment. After a lapse of two school days the same subject heard the second story under the uninterrupted treatment. His partner in the pair heard the first story under the uninterrupted treatment and the second story, after a lapse of two school days, under the interrupted treatment. Another pair of subjects heard the same two stories but with the story assignments and treatment assignments reversed. A total of 96 measurements was thus obtained.

A full-time employee at the Radford United Day Care Center, who worked with the children each day, was the reader for all 48 subjects. To minimize the risk of introducing bias into the data, she had no knowledge of the purpose of the study. Each session with each individual child took place during the regular school day in a room familiar to the child but away from the rest of the children.

Each story had a total possible score of eleven points, based on the investigator's compilation of the salient points identified by three reading specialists. Each score on each story resulted from an analysis of taped content verbally recalled by the subject upon request. A score of one was counted for each salient point bearing upon the causal or logical relations explicitly understood and

reproduced verbally upon request. Half points were counted when it were evident to the investigator that the story was implicitly understood by the child.

Eight sets of scores were obtained for each subject--one set for each of the four phases under each treatment. The four phases were the result of a partitioning procedure into additive parts as follows:

<u>Phase</u>	<u>Adult Stimuli</u>
Phase I	None
Phase II	(1) Non-referential (questions)
Phase III	(1) Non-referential (questions) (2) Referential (pictures)
Phase IV	(1) Non-referential (questions) (2) Referential (pictures) (3) Repetition (rereading, retelling, offering information)

A three-factor analysis of variance with repeated measures was used to compute both the main effects and the interactions among the three variables: age, treatment, and phase. Other appropriate tests were applied when the results warranted their use. The Newman-Keuls Multiple Range Test for Treatment means was used to test for significant differences among the four phase means. Appropriate t tests were applied when tests of significance between two sample means were sought.

Examination of the results resulted in the following (summarized) findings:

1. The uninterrupted ( $b_2$ ) story-reading procedure advantageously affected the performance level of the three-year-old children, the mean response score attainment matching that of the four-year-old children under the same treatment.

2. Four-year-old children in this study performed in a manner similar under both the interrupted ( $b_1$ ) and uninterrupted ( $b_2$ ) treatments.

3. No significant advantages accrued to either age group under Phases II and IV. Neither of the two phases was significantly different in its effectiveness in eliciting responses to the stories from the children.

4. Four-year-old children responded more readily than three-year-old children to the particular cues relevant to Phases I (no cueing) and III (non-referential cueing and pictures).

5. For both age groups the cues particularly relevant to Phase III initiated more responses than did any of the other three phases.

6. The uninterrupted ( $b_2$ ) treatment proved more productive than the ( $b_1$ ) treatment under Phase I and III in eliciting responses in the children's retelling task.

7. No one variable showed any distinct influence on any of the other variables under Phase II. The uninterrupted ( $b_2$ ) treatment effect for four-year-old children under Phase II, evidenced a score below the expected mean.



In the interrupted ( $b_1$ ) treatment under Phase III, the three-year-old children showed a score below the expected mean.

8. Scores attained by the three-year-old children under the interrupted treatment for Phase IV were much higher than the expected mean score. (This result should be viewed with caution because of the probable influence of the measuring procedure on the Phase IV scores.)

### Conclusions

On the basis of the results of the study obtained from the data delimited, described, and analyzed in the preceding chapters, the following conclusions are deemed tenable. Any generalizations may apply only to populations which show the same pattern of pertinent properties existing in the sample used in this study.

Conclusion 1. Reading stories to preschool children (three and four years of age) in a manner free from diverting influences stimulates them to verbalize more of what they have heard and understood than does the reading method including interruptions and distractions.

The results of the analysis of cueing phases scores for both age groups, showed that the uninterrupted ( $b_2$ ) treatment proved more productive than the interrupted ( $b_1$ ) treatment under Phases I (no cueing) and III (non-referential

cueing and pictures) in eliciting responses in children's retelling task.

The analysis of treatment results showed that three-year-old children, under the uninterrupted ( $b_2$ ) treatment matched the four-year-old children's performance under the same treatment.

These evidences support the hypothesis that significant differences in pre-school children's ability to recall and retell stories read to them in an interrupted manner and stories read to them in an uninterrupted manner are the results of differences in treatment.

Conclusion 2. The chronological age difference of preschool age children, three-and-four years old, is a factor affecting their performance levels when retelling stories read to them. The four-year-old child performs at a higher response level than does the younger three-year-old child.

The results of the examination of the treatment data showed the four-year-old group attained a mean response score for the interrupted treatment significantly higher than the mean score attained by the three-year-old child.

Analysis of the results of the study of the cueing phases showed the four-year-old children responding at a significantly higher level to the particular cues relevant to Phase I (no cueing) and Phase III (non-referential cueing and pictures).

These indications of superior performance of the four-year-old group support the hypothesis that significant differences in preschool children's ability to recall or retell stories read to them in an interrupted manner and stories read to them in an uninterrupted manner are attributable to chronological age differences.

Conclusion 3. Visual and aural cues in combination are superior to visual and/or aural cues alone in the story-reading process.

The mean score values for both age groups under Phase III, with non-referential and picture cues, was found significantly different from all other Phase mean scores. Phase III included the initial reference to pictures in the format of the cueing Phases.

This result permits acceptance in part of the hypothesis that significant differences in preschool children's cognitive receptivity, attention-processing, and memory behavior result when they are cued for assistance in the recall and retelling procedure. The visual cue does show itself to have value for young children, when verbalizing what was seen and heard in the story-reading procedure.

### Discussion

The results of the study support the hypothesis that stories read in an interrupted manner to three- and four-year-old children result in significantly different

responses from stories read in an uninterrupted manner as evidenced by the recalling and retelling response performance. The differences found in the treatment responses at the two chronological age levels (three and four) was expected. The main interest of the study was on the difference between the interrupted and the uninterrupted story-reading procedures. The uninterrupted story-reading procedure stimulated the children to concentrate on and recall story content better than did the interrupted story-reading procedure.

The fact that four-year-old children performed better than the three-year-old children suggests, not the lack of comprehension on the part of the younger group, but rather the absence of the cognitive receptivity, comprehension, and memory skills needed to process the auditory input for oral communication.

Recognized authorities in the child development field have focused upon some of the problems of children's emerging communication skills. Some of their pertinent findings in abbreviated form are that:

1. Differences in children's thinking stages are age related but not age-determined (Lavatelli, 1972; Piaget, 1955).
2. Children's implicit comprehension of adult speech occurs without explicit oral verbal facility (Piaget, 1955).

3. Children's controlling and processing of the amount and utilization of information input is in a discrimination-inhibition hierarchy (Broadbent, 1958; Bever, 1970; Rileigh, 1973).

4. Children's centering on the different, fleeting, meaning-bearing irreversible but illogical single attributes in a global fashion affects both quantity and quality of young children's thinking (Melnick, 1973).

It is conceivable that for the three-year-old children the flow of the story was too difficult. The structure, sequential order, and stress on words in the many episodes (intertwined with the characters, plots, and themes in various combinations) may have been too complicated and confounding (Dewey, 1956). The research findings of Cazden (1973) and Broadbent (1958) support the assumption that the nature and degree of responses elicited during the recalling and retelling tasks was parallel to the children's discrimination-inhibition position in the developing comprehension behavior hierarchy.

Since the listener, not the speaker, is the prime factor in the communication process and, since listening habits are developed and solidified prior to formal school entrance, the threshold stage (three years of age) when habits of cognition and attending to oral stimulation are just being formed, needs to be re-evaluated in light of the findings of this study. Story reading is an effective

dynamic procedure, basic to most intellectual pursuits for all ages and stages of learning. Further, reading stories to young children from birth onward has been, and still is, encouraged by most child development and language arts specialists as primary sources for effective thinking. The findings of this study fail to support the assumption that reading stories in a fragmented manner to preschool children is an effective method. (Reading stories in a fragmented manner has such widespread acceptance that it could be considered a standard procedure.) Since the information-processing system of young children is limited, and since the young mind is uniquely different from the adult mind, operating in a manner defying comparison, the adult method of story reading to young children should be carefully planned and evaluated. And, the stories chosen for reading should receive the same scrutiny.

The finding that four-year-old children responded more effectively in Phase I (the spontaneous comprehension phase) under both treatments than did the three-year-old children, was not unexpected. But, the drop in responses in Phase II for the four-year-old children compared with the steady score increase for three-year-old children which brought both age levels together at Phase II, was unexpected. A comparison of the relative positions of the Phase I scores points up the difference in the mental mode and functioning of the two age groups in relation to the spontaneous verbal

output which involves cognitive input discrimination, processing, and structuring, present to some degree at age four but not at age three. With guided cueing the three-year-old children did display evidences of comprehension skills but not structuring skills for oral output.

The results of Phase III under both treatments revealed the effectiveness and the need for pictures as cueing techniques together with non-referential question cues to elicit responses from children.

However, the most pertinent discovery was the children's productive response when cues and pictures were excluded in the uninterrupted story-reading procedure. (Pictures were used for the first time in the recalling and retelling task at Phase III.) This procedure proved effective for both age groups, but dramatically so for the three-year-old group.

The partitioning of response performance into four phases revealed elements embedded in the recalling and retelling task within the total score. Phase III (non-referential cueing and pictures) proved to be most significant statistically and most effective performance-wise of all of the phases for both age groups.

Comparison of the fewer response scores of Phase II with those of Phase I for the four-year-old children suggested that in Phase I the children had recalled and retold all they remembered and understood with the result that,

under this performance task, the non-cueing technique became an ineffective device for eliciting more responses. The drop in response score means from Phase III to IV for four-year-old children also suggested that the same kind of phenomenon operated--all was said in Phase III, so there was nothing left to say in Phase IV.

In contrast, the steady rise in response scores for the three-year-old children from Phase I through Phase III indicated that, without cueing, the three-year-old children were unable to spontaneously verbalize what they had heard since the skills necessary for this performance may have been lacking. But with non-referential cueing (Phase II) and non-referential cueing and pictures (Phase III), the three-year-old children performed in a manner closely paralleling that of the four-year-old children--and, in some instances, outperformed them. The drop in response scores from Phase III to Phase IV for three-year-old children might also be attributable to the high response level of Phase III, leaving little to be said in Phase IV.

All cues were effective to some degree for more children at the three-year-old level than at the four-year-old level in Phase IV.

The uninterrupted method of reading stories to three- and four-year-old children proved to be a more effective method for encouraging greater intellectual comprehension on



the part of children than the more standard interrupted method.

The performance scores of three-year-old children under Phase I pointed up their lack of information-processing skills. At the same time they displayed unique comprehension ability when assisted in the recall and retelling tasks by structured cueing in the form of non-referential cues and pictures. Both three- and four-year-old children benefited from the uninterrupted story-reading treatment, but the three-year-old children, just at the threshold of establishing intellectual comprehension habits, benefited more productively and more dramatically than did the four-year-old children.

#### Implications

Parents, teachers, and all aspects of mass media seem to be competing for preschool children's time and attention during their waking hours. Stimuli come to them from all sides through an unharnessed variety of fast, fleeting, fragmented bits and pieces with no identified or structured boundaries, goals, routines, or methods to help them cope and function mentally . . . and, all this at a time when these young children are most fragile, most impressionable, most vulnerable, and most helpless in dealing with it all.

Since the information-processing system in very young children has a limited capacity, guidance and selectivity in

methods and materials needed at this stage should be carefully monitored.

The results of this study showed that the methodology adults use when reading stories made significant differences in young children's comprehension behavior. A major finding of this study was the attainment of the three-year-old children who, under the uninterrupted story-reading procedure, matched the performance of the four-year-old children under this same treatment. Under the interrupted treatment their performance was significantly different, and lower than that of the four-year-old children. This result suggests that the uninterrupted story-reading procedure helped the children significantly to center and concentrate on story content more than did the interrupted story-reading procedure. A second significant result showed non-referential questions and picture cues to be the most effective of the cueing techniques in aiding children in the recalling and retelling task. Therefore, it is essential that consideration be given to when and how pictures are to be used for maximum effectiveness.

Pictures are important sources of information for very young children for they read pictures long before they read words. Pictures help children organize and sequence story themes and plots thus enhancing their emerging comprehension skills. Moore and Massaro (1973) noted that dividing children's attention between auditory and visual

tasks had the effect of reducing their performance on the auditory task. Based on this finding and the findings of this study, it is reasonable to assume that the value of storybook pictures is increased when they are used as aids in the recalling and retelling tasks following the uninterrupted story-reading procedure. By eliminating the need on the part of the very young children to alternate between visual and auditory stimuli, the children will be better able to attend more intensely to what is being read in their listening roles. And, when children attend more intensely, without interruptions and distractions leading to fragmentation of thought, they hear more and are able to process mentally more of what they hear and then communicate it verbally upon request.

Following the lead of Piaget (1955), Rileigh (1971), and Cazden (1973), who were concerned more with what young children actually do with what they hear rather than what they are able to do with what they hear, and from the implications of the findings of this study, the following suggestions are made:

1. Pay close attention to the adult performance--making sure that there is consistency in the story-reading-telling procedures.

2. Give special attention to the structuring with the goal of:

a. eliminating the alternation between visual and aural stimuli in the listening role.

b. using semantically personal and familiar words--attractive, simple, factual--in a clear and lively manner with just a wisp of fantasy--neither too detailed nor too descriptive, based on sensory perception.

c. concentrating on single attributes of the characters and episodes in stories, keeping them simple and direct with one character involved in one or two situations rather than many characters involved in a sequence of situations.

3. Control adult speech so as to more closely resemble that which is heard by the very young children in the everyday home conversations with parents, minimizing the gap between "home talk" and "book talk."

4. Establish criteria to guide those interested in writing, reading, and illustrating the stories to be chosen by those reading to very young children in a manner different from that used traditionally.

Since children at this young age do not think, reason, act, or talk like older children, or adults, they must be given special consideration--be thought of as being in a special, unique stage of intellectual growth and development needing special, unique guidance and assistance.

The results of the research literature identified the three- and four-year-old stage as the period in development when children change more rapidly, more drastically, and more quickly than at any other time in their lives--but still a crucial time when most of the habits that are taking shape are integrated into the total emerging learning behavior. Therefore, special care needs to be taken when providing materials and methods used to stimulate these growing intellectual powers.

#### Recommendations

For those interested in research in the area of the child's emerging communication skills, the following suggestions are proffered:

1. Using an audio-video machine and camera would supply a type of pertinent data since much of pre-school children's early language and communication skills are evident only in body language, facial expressions, gesture--none of which is caught with the tape recorder. Studying the video pictures together with the tapes would reveal pertinent data basic to the understanding of children's emerging communication behavior and strategies now taken for granted.
2. Examination of the word and sentence structures of three- and four-year-old children in relation to certain identified social, cultural, educational, mental, and

aesthetic characteristics of family, environment, and educational backgrounds might yield data pertinent to the quality structuring and functioning of educational programs for pre-school children.

3. A study of subjects using different socio-economic and parental backgrounds would result in insights into children's emerging communicating skills not within the scope of this study.

4. A study to ascertain the effectiveness of techniques teachers use in presenting stories to very young children would provide valuable information for those interested in the training of teachers for the pre-school level.

5. A study utilizing a different scoring procedure would rule out confounding elements not identified in this study.

6. Extending the study to include reading readiness behavior at the two- and five-year-age levels would permit ascertaining in a longitudinal manner the effectiveness of the two methods used in this study as reading readiness procedures.

7. Using criteria consistent with the nature and growth patterns, stories for very young children could (and should) be evaluated by those who consistently and constantly read stories to young children as well as by reading

specialists who use criteria different from but pertinent to those used by the readers.

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APPENDIX A  
READING SPECIALISTS' LISTS OF SALIENT POINTS  
AS CRITERIA FOR SCORING

Stories

Salient points as criteria for scoring as identified by the panel of three reading specialists.

LITTLE DUCKLING TRIES HIS VOICE by Marjorie LaFleur

Evaluator I

1. Little duckling on his journey into the wide world.
2. Meeting the cat--trying to make the sound but could not.
3. Meeting the dog--trying to make the sound but could not.
4. Meeting the bird--trying to make the sound but could not.
5. Meeting the cow--trying to make the sound but could not.
6. The sadness of the duckling because he could not make sounds.
7. Seeing his own Mother Duck.
8. Mother quacking.
9. Little duckling wanting to make the sound.
10. Little duckling finding he could quack very nicely.

Evaluator II

1. Little duck went on a trip.
2. He tried to me-ow like a cat--but couldn't.
3. He tried to tweet like a bird--but couldn't.
4. He tried to moo like a cow--but couldn't.
5. He tried to bow-wow like a dog--but couldn't.
6. His mother said quack--and he could.

Evaluator III

1. Little duckling took a trip on a road.
2. He met some other animals and tried to make their sound.
3. But he couldn't.
4. Child should be able to identify at least two of the animals he met.
5. . . . .
6. The little duckling finally saw his mother.
7. Found that he could make her sound.
8. He liked that sound best of all.

ASK MR. BEAR by Marjorie FlackEvaluator I

1. Finding something for mother's birthday.
2. The meeting of many animals.
3. The offer of a present by each--but mother having it already.
4. The trip to see Mr. Bear.
5. The mother trying to guess the present.
6. Danny giving his mother a big birthday bear hug.

Evaluator II

1. Little boy named Danny.
2. Mother's birthday.
3. Wanted to get a present for his mother.
4. Hen gives egg--mother has egg.
5. Goose gives feathers for pillow--mother has pillow.
6. Goat gives milk for cheese--mother has cheese.
7. Sheep gives wool for blanket--mother has blanket.
8. Cow gives milk and cream--mother has milk and cream.
9. Everybody afraid of bear.
10. Bear tells Danny a secret.
11. Mother couldn't guess secret.
12. Danny gives mother a big bear hug.

Evaluator III

1. Danny's mother has a birthday.
2. Danny wanted to give her something for her birthday.
3. Danny went out to find something.
4. He asked several of his animal friends.
5. None could give anything his mother didn't already have.
6. Mr. Bear finally whispered a secret to Danny.
7. The secret was to give his mother a birthday bear hug, which he did.

CAPS FOR SALE by Esphyr SlobodkinaEvaluator I

1. The peddler sold caps.
2. Carries caps on his head.
3. Nobody wants the caps.
4. Peddler takes a walk into the country and stops under a tree.
5. Peddler falls asleep.
6. The peddler wakes up and finds his caps are gone.
7. The discovery that the monkeys up in the tree stole the caps.
8. The peddler angry but the monkeys only copy him.
9. The peddler pulls off his own cap and throws it to the ground.
10. All the monkeys throw the caps to the ground.
11. The peddler picks up his caps, piles them up on his head and goes back to town to sell caps.

Evaluator II

1. Man sold caps.
2. Nobody wants caps.
3. Went for a walk.
4. Monkeys got all the caps.
5. Monkeys wouldn't give caps back.
6. Monkeys said, "Tez, tez, tez."
7. Man got mad and took off his cap.
8. All the monkeys did, too.
9. Man got them back.

Evaluator III

1. A man had caps for sale.
2. He walked up and down the street trying to sell caps until he got tired and hungry.
3. He went out in the country and went to sleep under a tree.
4. When he woke, all his caps but one were gone.
5. The caps were up in the tree, one on each monkey.
6. The man shouted angrily at the monkeys to give back his caps, shaking his finger at them.
7. The monkeys shook a finger at the man but did not give back the caps.
8. The man finally got so mad, he threw his cap on the ground and started to walk away.

9. The monkeys did like the man and threw their caps on the ground.
10. The man quickly gathered up his caps and returned to the street and began selling his caps again.

TOBY ZEBRA AND THE LOST ZOO by Donna Lugg PapeEvaluator I

1. Toby waking up late at night.
2. All the animals were gone.
3. Toby looking for the animals.
4. Toby going to sleep in the coalyard.
5. Coal dust making Toby all black.
6. Toby looking for his friends.
7. Policeman thinking Toby was a pony.
8. The friend taking Toby to the farm.
9. The rain washing the coal dust off Toby.
10. The discovery that Toby was a zebra.
11. Toby's discovery that his friends had been taken to a new zoo.

Evaluator II

1. Toby woke up.
2. All the animals were lost.
3. Toby went to look for them.
4. He couldn't find them.
5. Got coal dust on.
6. Looked like a pony.
7. Policeman blew whistle to stop cars.
8. Man took Toby home to farm.
9. Rain washed coal dust off.
10. Toby was taken back to the zoo.
11. The zoo had moved.

Evaluator III

1. Toby went to sleep--when he awoke, he was alone.
2. He went looking for the other zoo animals.
3. He went down the street looking in store windows, until he grew tired.
4. He lay down in a coal yard to sleep.
5. When he awoke he was covered with black coal dust.
6. The policeman and man thought he was a black pony.
7. The man put him in a pasture with horses and cows.
8. Rain came and washed the coal dust off.
9. The man took him back to the place where his friends lived.

APPENDIX B  
THE COMPOSITE LIST OF SALIENT POINTS

COMPOSITE SCORE DERIVED FROM THE ORIGINAL SET OF SCORES BY  
THE THREE READING SPECIALISTS.

If two of the three reading specialists had identified the points as one to be considered, the composite uses it.

LITTLE DUCKLING TRIES HIS VOICE by Marjorie LaFleur

1. Little duckling on his journey into the wide world.
2. Meeting the cat--trying to make the sound but could not.
3. Meeting the dog--trying to make the sound but could not.
4. Meeting the bird--trying to make the sound but could not.
5. Meeting the cow--trying to make the sound but could not.
6. Seeing his own mother duck.
7. Mother quacking.
8. Little duckling wanting to make that sound.
9. Finding out that he could make that sound.
10. The sadness of the duckling because he could not make the animal sounds.
11. His happiness when he found he could make his mother's sound--the one he liked best of all.

CAPS FOR SALE by Esphry Slododkina

1. The peddler (man) sold caps.
2. Peddler carries caps on his head.
3. Nobody wants to buy caps.
4. Peddler takes a walk into the country.
5. Peddler falls asleep.
6. Peddler wakes up and find his caps are gone.
7. Peddler discovers the monkeys up in the tree have the caps.
8. Peddler gets mad and the monkeys copy him.
9. Peddler pulls off his cap and throws it to the ground.
10. All the monkeys throw their caps to the ground.
11. The peddler picks up his caps, puts them on his head, and begins selling them again.

TOBY ZEBRA AND THE LOST ZOO by Donna Lugg Pape

1. Toby woke up.
2. He was all alone.
3. Toby went looking for the animals.
4. Couldn't find them.
5. Got tired, went to sleep in coalyard.
6. Coal dust made him all dirty (black).



7. He looked like a pony.
8. Policeman and man took Toby to a farm.
9. Rain washed Toby off.
10. They discovered Toby wasn't a pony, but a zebra.
11. Took him back to the new zoo with all his friends.

ASK MR. BEAR by Marjorie Flack

1. Little boy named Danny.
2. Wanted to get a birthday present for his mother.
3. The hen wanted to give an egg--mother had that.
4. Goose wanted to give mother feathers--mother had that.
5. Goat wanted to give mother milk for cheese--mother had that.
6. Sheep wanted to give wool for a blanket--mother had that.
7. Cow wanted to give milk and cream--mother had that.
8. Cow said, "Go ask Mr. Bear."
9. Bear whispers a secret to Danny.
10. Mother couldn't guess secret.
11. Danny gave mother a BIG BEAR HUG for her birthday.

APPENDIX C  
CHRONOLOGICAL DATA ON SUBJECTS

SubjectsThree-year-olds in months (chronologically)

<u>Boys</u>			<u>Girls</u>		
<u>Birthdate</u>	<u>Age in months</u>		<u>Birthdate</u>	<u>Age in months</u>	
1. 11- 9-71	36 mo.	9 da.	10-26-71	37 mo.	26 da.
2. 11-10-71	36 mo.	10 da.	9-11-71	38 mo.	11 da.
3. 11-19-71	36 mo.	19 da.	9- 5-71	38 mo.	5 da.
4. 11-26-71	36 mo.	26 da.	8-26-71	39 mo.	26 da.
5. 10-10-71	37 mo.	10 da.	8-29-71	39 mo.	29 da.
6. 8-24-71	39 mo.	24 da.	8- 3-71	39 mo.	3 da.
7. 8-30-71	40 mo.		7- 5-71	40 mo.	5 da.
8. 7-17-71	40 mo.	17 da.	6-14-71	41 mo.	14 da.
9. 6- 2-71	41 mo.	2 da.	5-20-71	42 mo.	20 da.
10. 5- 1-71	42 mo.	1 da.	5-20-71	42 mo.	20 da.
11. 5-17-71	42 mo.	17 da.	5-14-71	42 mo.	14 da.
12. 5-31-71	43 mo.		2-22-71	45 mo.	22 da.
13. 4- 5-71	43 mo.	5 da.			
14. 4-19-71	43 mo.	19 da.			
15. 4-26-71	43 mo.	26 da.			
16. 3-19-71	44 mo.	19 da.			
17. 2- 4-71	45 mo.	4 da.			
18. 2-22-71	45 mo.	22 da.			

Four-year olds in months (chronologically)

1. 11- 3-70	48 mo.	3 da.	10- 2-70	49 mo.	2 da.
2. 10-24-70	49 mo.	25 da.	9-30-70	51 mo.	
3. 10-19-70	49 mo.	19 da.	7- 2-71	52 mo.	2 da.
4. 10-19-70	49 mo.	19 da.	6-10-70	53 mo.	10 da.
5. 9-12-70	50 mo.	12 da.	6- 9-70	53 mo.	9 da.
6. 8-14-70	51 mo.	14 da.			
7. 8- 2-70	51 mo.	2 da.			
8. 8- 1-70	51 mo.	1 da.			
9. 7- 8-70	52 mo.	8 da.			
10. 6-24-70	53 mo.	24 da.			
11. 6-11-70	53 mo.	11 da.			
12. 4-22-70	55 mo.	22 da.	4-20-70	55 mo.	20 da.
13. 4-20-70	55 mo.	20 da.	4-18-70	55 mo.	18 da.
14. 4-10-70	55 mo.	10 da.	1-22-70	58 mo.	22 da.
15. 4- 7-70	55 mo.	7 da.	1-15-70	55 mo.	18 da.
16. 4-21-70	55 mo.	21 da.	1-22-70	58 mo.	22 da.
17. 2- 2-70	57 mo.	2 da.	1-15-70	58 mo.	15 da.
18. 1-26-70	58 mo.	26 da.	1-10-70	58 mo.	10 da.
19. 1- 7-70	58 mo.	7 da.	1- 1-70	59 mo.	1 da.
20. 12-26-69	59 mo.	26 da.	12-26-69	59 mo.	26 da.
21. 12-12-69	59 mo.	12 da.	12- 9-69	59 mo.	9 da.
22. 12-19-69	59 mo.	19 da.	12- 8-69	59 mo.	8 da.

APPENDIX D  
DIRECTION SHEETS FOR STORY READING

DIRECTION SHEET 1--(Interrupted)Preliminary Directions:

1. Verify the selection of the appropriate direction sheet.
2. Examine the stop watch to see that it is operating properly.
3. Check and set the tape recorder.
4. Record the following remarks on the recorder (to make the machine a natural part of the child's experience and to obtain the child's full name and age).

READER: "Lisa, this is a tape recorder. When we talk, it remembers what we say. It can talk back while we listen. Lisa, tell your whole name. How old are you? \_\_\_ Now, let's listen and see if it remembers what you said."

Reading the Story--Under Control Condition:

READ THE STORY, encouraging the child to interact with the context and pictures in the traditional fashion (the way stories have been read and are still being read at the Day Care Center). Some suggested cues or question used through the reading are:

What do you see in the picture?  
What is his name?  
What is he doing?

Turn the page and repeat the same types of cues or questions.

Phase I: (The child's telling of the story)

READER: "Lisa, tell me the story from beginning to end."

WAIT SILENTLY WITH NO PROMPTING OF ANY KIND FOR 30 SECONDS AFTER THE CHILD HAS TOLD AS MUCH AS HE CAN. Then,

Phase II: (Using non-informational questions as guides)

READER: "Lisa, what was the story about? What did he do? Then, what happened? What happened next? And then what happened? How did it end?"

WAIT 30 SECONDS FOR THE CHILD TO OFFER ANYTHING ELSE. Then,

Phase III: (Adding pictures as guides)

READER: "Lisa, let's look at the pictures and see if we can tell some more about the story. What happened first? Who was this, What did he do? And then what happened? Look at the picture and tell what you see. What happened next? How did it end?"

AFTER THE CHILD HAS TOLD AS MUCH AS HE CAN, WAIT 30 SECONDS. Then,

Phase IV: (Using all techniques)

READER: Use a combination of all the above: rereading, retelling, asking questions, and offering information.

DIRECTION SHEET 2--(Uninterrupted)

## Preliminary Directions:

1. Verify the selection of the appropriate direction sheet.
2. Examine the stop watch to see that it is operating properly.
3. Check and set the tape recorder.
4. Record the following remarks on the recorder (to make the machine a natural part of the child's experience and to obtain the child's full name and age).

READER: "Lisa, this is a tape recorder. When we talk, it remembers what we say. It can talk back while we listen. Lisa, tell your whole name. How old are you? \_\_\_ Now, let's listen and see if it remembers what you said?"

Reading the Story--Under Experimental Condition:

READ THE STORY.

Phase I: (The child's telling of the story)

READER: "Lisa, tell me the story from beginning to end."

WAIT SILENTLY WITH NO PROMPTING OF ANY KIND FOR 30 SECONDS AFTER THE CHILD HAS TOLD AS MUCH AS HE CAN. Then,

Phase II: (Using non-informational questions as guides)

READER: "Lisa, what was the story about? What did he do? Then, what happened? What happened next? And then what happened? How did it end?"

WAIT 30 SECONDS FOR THE CHILD TO OFFER ANYTHING ELSE. Then,

Phase III: (Adding pictures as guides)

READER: "Lisa, let's look at the pictures and see if we can tell some more about the story. What happened first? Who was this? What did he do? And then what happened? Look at the picture and tell what you see. What happened next? How did it end?"

AFTER THE CHILD HAS TOLD AS MUCH AS HE CAN, WAIT 30 SECONDS. Then,

Phase IV: (Using all techniques)

READER: Use a combination of all the above: rereading, retelling, asking questions, and offering information.



APPENDIX E  
SCORING SHEETS FOR SUBJECT RESPONSES

## SCORE SHEET

NAME \_\_\_\_\_ (Check) \_\_\_ 3-year old  
 \_\_\_ 4-year old

Treatment

<u>Item</u>	<u>Control</u> (Interrupted)	<u>Experimental</u> (Uninterrupted)
Phase I . . . . .	_____ (1)	_____ (1)
Phases I + II . . . . .	_____ (2)	_____ (2)
Phases I + II + III . . . . .	_____ (3)	_____ (3)
Phases I + II + III + IV. . . . .	_____ (4)	_____ (4)
	SUM (11) _____	SUM (11) _____

Sample of Collection and Tabulation  
of Raw Scores

Item	Control (Interrupted)	Experimental (Uninterrupted)
Phase I	_____ (1)	<u>  2  </u> (1)
Phase II	_____ (2)	<u>  2  </u> (2)
Phase III	_____ (3)	<u>  7  </u> (3)
Phase IV	_____ (4)	_____ (4)
	Sum (11) _____	Sum (11) <u> 11 </u>

Child Responses and Adult Cues: (Child responses underlined)

Phase I	"_____, tell me the story."	
	<u>saw cat</u>	1 point
	<u>he tried his very best and couldn't do</u>	
	<u>it</u>	
	<u>So he waddled on and saw a dog</u>	1 point
	He tried to say it but he couldn't	
Phase II	"_____, what was the story about? what happened first?"	
	<u>Saw mother waddling along the road</u>	1 point
	<u>He said, "Quack, quack" very nicely</u>	1 point
Phase III	"_____, let's look at the pictures and see if they can help us tell more of the story."	
	Who was the first person he met? <u>cat</u>	
	What did he say? <u>meow</u>	
	Do you suppose Little Duckling could say that? <u>No</u>	
	Who did he meet next? <u>Dog</u>	
	What did he say? <u>ruf-ruf</u>	

(continued)

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Could Little Duckling say that?	<u>No</u>	
Whom did he meet next?	<u>Bird</u>	1 point
What did he say?	<u>Tweet-tweet</u>	
Could he say that?	<u>He couldn't do that</u>	
What happened then?	<u>Met a cow</u>	1 point
What did he say?	<u>Moo-moo</u>	
Then what happened?	<u>He couldn't say that</u>	
Then what happened?	<u>Saw his mother</u>	1 point
Then what happened?	<u>Waddled across the street</u>	1 point
Then what happened?	<u>So he walked to her</u>	
	<u>Mother Duck-quack- quack</u>	1 point
	<u>Little Duck said quack</u>	1 point
	<u>He could say that</u>	1 point
Phase IV	(No need to use it since story was told) Child offered nothing more.	

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APPENDIX F  
RAW SCORE DATA FOR STORY SIMILARITY

RAW SCORE DATE FOR STORY SIMILARITY

F Test for Similarity of Variances of Four Stories			
P (Zebra)	Q (Caps)	R (Duckling)	S (Bear)
n = 24	n = 24	n = 24	n = 24
$T_P = 186$	$T_Q = 202.5$	$T_R = 195.5$	$T_S = 187.0$
$\bar{X} = 7.8$	$\bar{X} = 8.4$		$\bar{X} = 7.9$
$(\sum X)^2 = 186^2 = 34,596$	$(\sum X)^2 = 41,006.25$	$(\sum X)^2 = 3801.25$	$(\sum X)^2 = 34969$
$\sum X^2 = 1610.50$	$\sum X^2 = 1892.75$	$\sum X^2 = 1721.25$	$\sum X^2 = 1665.00$
$\sum X^2 = 6889.5$			
$\frac{T_J^2}{n} = \frac{34,596}{24} = 1441.5$	$\frac{41006.25}{24} = 1708.6$	$\frac{3801.25}{24} = 1592.09$	$\frac{34969}{24} = 1457.0$
$\frac{T^2}{n} = 6199.2$			
$N = 24 \times 4 = 96$			
$T = T_J = 771$			
$\frac{T^2}{N} = \frac{(771)^2}{96} = 6192$			
	Sum of Squares		
Between	$6199.2 - 6192 = 7.2$		
Within	$6889.5 - 6199.2 = 690.3$		

(continued)

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Analysis of Variance for Story Similarity				
Source	Sum of Squares	Degrees of Freedom	Variance Estimate	F
Between	7.2	3	$s_b^2 = 2.4$	.32
Within	<u>690.3</u>	<u>92</u>	$s_w^2 = 7.503$	
Total	697.5	95		

$F_{.95} = 2.71$  (df 3/92)

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## APPENDIX G

SALIENT POINT SCORE TOTALS FOR THE TWO TREATMENTS:  
INTERRUPTED( $b_1$ ), UNINTERRUPTED( $b_2$ )



SALIENT POINT SCORE TOTALS FOR THE TWO TREATMENTS:  
INTERRUPTED( $b_1$ ), UNINTERRUPTED( $b_2$ )

<u>24 three-year-old children</u>				<u>24 four-year-old children</u>			
Subject	$b_1$	$b_2$	Total	Subject	$b_1$	$b_2$	Total
1	00.5	5.0	5.5	25	11.0	11.0	22.0
2	8.5	4.5	13.0	26	11.0	11.0	22.0
3	3.0	2.5	5.5	27	6.0	8.5	14.5
4	5.5	2.5	8.0	28	7.0	6.5	13.5
5	6.0	6.5	12.5	29	11.0	11.0	22.0
6	7.5	11.0	18.5	30	11.0	10.0	21.0
7	1.0	6.0	7.0	31	7.0	6.5	13.5
8	8.5	7.5	16.0	32	11.0	11.0	22.0
9	5.0	6.5	11.5	33	11.0	7.5	18.5
10	7.5	4.5	12.0	34	6.0	7.0	13.0
11	7.5	11.0	18.5	35	9.0	11.0	20.0
12	6.5	9.0	15.5	36	11.0	11.0	22.0
13	11.0	11.0	22.0	37	11.0	11.0	22.0
14	10.0	10.0	20.0	38	7.5	9.0	16.5
15	4.5	10.0	14.5	39	11.0	11.0	22.0
16	7.0	11.0	18.0	40	7.0	10.0	17.0
17	3.0	6.0	9.0	41	00.5	1.5	2.0
18	11.0	11.0	22.0	42	11.0	10.0	21.0
19	5.5	11.0	16.5	43	11.0	11.0	22.0
20	8.0	11.0	19.0	44	10.0	7.5	17.5
21	7.0	11.0	18.0	45	5.5	8.0	13.5
22	4.0	4.0	8.0	46	9.0	10.0	19.0
23	5.0	9.0	14.0	47	11.0	9.0	20.0
24	8.0	11.0	19.0	48	6.0	6.0	12.0
Total	151.0	192.5	343.5		212.5	216.0	428.5

SALIENT POINT SCORES FOR THE FOUR PHASES ( $c_1c_2c_3c_4$ ) UNDER TWO TREATMENTS:  
 INTERRUPTED( $b_1$ ), UNINTERRUPTED( $b_2$ )

24 Three-year-old Children						24 Four-year-old Children					
Ss	$c_1$	$c_2$	$c_3$	$c_4$	Total $b_1b_2$	Ss	$c_1$	$c_2$	$c_3$	$c_4$	Total $b_1b_2$
1	00.5	00.0	00.0	5.0	5.5	25	1.5	00.0	00.5	00.0	2.0
2	00.0	1.5	7.5	4.0	13.0	26	11.0	7.0	4.0	00.0	22.0
3	00.5	00.0	1.0	4.0	5.5	27	2.0	4.0	8.5	00.0	14.5
4	1.0	00.5	00.5	6.0	8.0	28	00.0	6.0	7.0	00.5	13.5
5	1.0	2.0	5.5	4.0	12.5	29	19.0	00.0	3.0	00.0	22.0
6	2.0	2.5	3.5	10.5	18.5	30	00.0	5.0	8.0	8.0	21.0
7	00.0	1.0	5.5	00.5	7.0	31	00.0	00.5	7.5	5.5	13.5
8	00.0	7.0	00.0	9.0	16.0	32	11.0	7.0	4.0	00.0	22.0
9	00.0	00.0	2.5	9.0	11.5	33	00.0	8.0	1.5	9.0	18.5
10	00.0	00.5	4.0	7.5	12.0	34	1.0	1.0	6.0	5.0	13.0
11	00.0	9.5	00.0	9.0	18.5	35	2.0	3.0	15.0	00.0	20.0
12	1.0	2.0	7.0	5.5	16.5	36	2.0	6.0	14.0	00.0	22.0
13	00.0	4.0	14.0	4.0	22.0	37	00.0	7.0	5.0	10.0	22.0
14	5.0	3.0	12.0	00.0	20.0	38	00.0	6.0	7.0	3.5	16.5
15	00.0	4.0	8.0	2.5	14.5	39	12.0	00.0	10.0	00.0	22.0
16	6.0	8.0	00.0	4.0	18.0	40	1.0	2.0	14.0	00.0	17.0
17	00.0	2.0	5.0	2.0	9.0	41	00.0	1.0	00.0	1.0	2.0
18	00.0	12.0	5.0	5.0	22.0	42	00.0	1.0	17.0	3.0	21.0
19	1.0	6.0	6.5	3.0	16.5	43	15.0	7.0	00.0	00.0	22.0
20	00.0	3.0	10.0	6.0	19.0	44	00.0	2.0	15.5	00.0	17.5
21	00.0	2.0	11.0	5.0	18.0	45	00.0	4.5	00.0	9.0	13.5

(continued)

24 Three-year-old Children						24 Four-year-old Children					
Ss	c <sub>1</sub>	c <sub>2</sub>	c <sub>3</sub>	c <sub>4</sub>	Total	Ss	c <sub>1</sub>	c <sub>2</sub>	c <sub>3</sub>	c <sub>4</sub>	Total b <sub>1</sub> b <sub>2</sub>
22	00.0	1.0	4.0	3.0	8.0	46	00.0	00.0	19.0	00.0	19.0
23	00.0	3.5	6.5	4.0	14.0	47	00.0	6.0	13.0	1.0	20.0
24	00.0	5.0	10.0	4.0	19.0	48	00.0	1.5	3.0	7.5	12.0
T	18.0	80.0	129.9	116.5	343.5	T	97.5	85.5	182.5	63.0	428.5

APPENDIX H  
SUMMARY OF NEWMAN-KEULS MULTIPLE RANGE  
TESTS FOR THE FOUR PHASES

SUMMARY OF NEWMAN-KEULS MULTIPLE RANGE TESTS FOR THE FOUR PHASES

n = 48

Phases	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>		
Means	2.4963	3.4479	6.4896	3.7396		
	C <sub>1</sub>	C <sub>2</sub>	C <sub>4</sub>	C <sub>3</sub>	r	q(r,136).05
C <sub>1</sub>	--	2.236	2.862	8.718*	4	3.633 (.05) 4.40 (01)
C <sub>2</sub>		--	.6264	6.530	3	3.314
C <sub>4</sub>			--	5.905	2	2.772
C <sub>3</sub>				--	1	

\*Note: Phase III differs significantly from the other phases. Phases C<sub>1</sub>, C<sub>2</sub>, and C<sub>4</sub> do not differ significantly from each other.

(continued)

$$q(4,136).05 = 3.633$$

$$q_4 = 1.64$$

$$q(4,136).01 = 4.40$$

$$q_4 = 2.05$$

$$q(3,136).05 = 3.314$$

$$q_3 = 1.54$$

$$q(2,136).05 = 3.314$$

$$q_3 = 1.54$$

$$s_{\bar{B}} = \frac{q_{.05}(r/136)}{s_{\bar{B}}}$$

$$s_{\bar{B}} = \frac{MS_{\text{error}(c)}}{n} = \frac{10.3925}{48} = .4657$$

$$\frac{C_2 - C_1}{s_{\bar{B}}} = \frac{1.0416}{.4657} = 2.236$$

$$\frac{C_4 - C_1}{s_{\bar{B}}} = \frac{1.333}{.4657} = 2.862$$

$$\frac{C_3 - C_1}{s_{\bar{B}}} = \frac{4.0833}{.4657} = 8.718$$

$$\frac{C_4 - C_2}{s_{\bar{B}}} = \frac{.2917}{.4657} = .6264$$

$$\frac{C_3 - C_2}{s_{\bar{B}}} = \frac{3.0417}{.4657} = 6.530$$

$$\frac{C_3 - C_4}{s_{\bar{B}}} = \frac{2.7500}{.4657} = 5.905$$

## APPENDIX I

DEPARTURE FROM EXPECTED MEANS FOR ABC (Age, Treatment, and Cueing Phases) INTERACTION

DEPARTURE FROM EXPECTED MEANS FOR ABC (Age, Treatment, and Cueing Phases) INTERACTION

Levels	Comparison		Amount											
	Row	Column Differences	Departure from Expected Points											
			0	1	2	3	4	5	6	7	8	9	10	
Ages	Treatments	Phase 1	XXXXXXXXXX											
Ages	Treatments	Phase 2	XXXXXXXXXX											
Ages	Treatments	Phase 3	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX											
Ages	Treatments	Phase 4	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
<u>Phases</u>														
1, 2	Interrupted	Ages	XXXX											
1, 2	Uninterrupted	Ages	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
1, 3	Interrupted	Ages	XXXXXXXXXXXXXXXXXXXX											
1, 3	Uninterrupted	Ages	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
1, 4	Interrupted	Ages	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
1, 4	Uninterrupted	Ages	XXXXXXXXXXXXXXXXXXXX											
2, 3	Interrupted	Ages	XXXXXXXXXXXXXXXXXXXX											
2, 3	Uninterrupted	Ages	XX											
2, 4	Interrupted	Ages	XXXXXXXXXXXXXXXXXXXXXXXXXXXX X											
2, 4	Uninterrupted	Ages	XXXXXXXX											
3, 4	Interrupted	Ages	XX											
3, 4	Uninterrupted	Ages	XXXXXXXX											
1, 2	Ages	Interrupted	XXXXX											
1, 2	Ages	Uninterrupted	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
1, 3	Ages	Interrupted	XXXXXXXXXXXXXXXXXXXX											
1, 3	Ages	Uninterrupted	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
1, 4	Ages	Interrupted	XXXXXXXXXXXXXXXXXXXX											
1, 4	Ages	Uninterrupted	XXXXXXXXXXXX											
2, 3	Ages	Interrupted	XXXXXXXXXXXXXXXXXXXXXXXXXXXX											
2, 3	Ages	Uninterrupted	XXXXXXXXXXXXXXXXXXXX											
2, 4	Ages	Interrupted	XXXXXXXXXXXXXXXXXXXX											
2, 4	Ages	Uninterrupted	XXXXXXXXXXXXXXXXXXXX											
3, 4	Ages	Interrupted	XX											
3, 4	Ages	Uninterrupted	XXXXXXXXXXXXXXXXXXXX											