

RECALL OF NARRATIVE MATERIAL IN FIVE YEAR OLDS

by

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ABSTRACT

The recall performances of two groups ($n = 16$ in each) of kindergarten children (ages 4-11 to 5-10) who encountered narrative material under two different conditions were compared. The children who enacted the story with puppets while listening to it recalled significantly more story elements and both explicit and implicit information than did children who merely listened to the story narration. This was the case at post tests given 30 seconds and one week after the narrative material was encountered. Alternative interpretation of the results are discussed and suggestions about pedagogical implications and future studies are provided.

TABLE OF CONTENTS

CHAPTER		Page
	ABSTRACT.....	ii
	LIST OF TABLES.....	v
	LIST OF FIGURES.....	vi
	ACKNOWLEDGEMENTS.....	vii
I	INTRODUCTION.....	1
	General Problem and Delimitation.....	2
II	THEORETICAL ORIGINS OF THE PROBLEM.....	3
	Review of Related Literature	3
	Derivation of Basis for Present Study.....	7
III	DERIVATION OF CURRENT POSTULATES AND HYPOTHESES.....	9
	Hypotheses.....	10
IV	METHODS.....	11
	Subjects.....	11
	Apparatus.....	13
	Procedure.....	14
	Introduction of Subjects.....	16
	Passive Experience Group.....	16
	Active Experience Group.....	16
	a. Training Session.....	16
	b. Listening to Brief Story.....	19
	Post Test-1.....	19
	Post Test-2.....	21
	a. Part One.....	21
	b. Part Two.....	22
	Analysis.....	22
V	RESULTS.....	24
	Analysis of Data, Part One: Evaluation of Hypothesis One, Two, and Three.....	25
	Analysis of Data, Part Two: Evaluation of Hypothesis Four, Five, and Six.....	28
	Analysis of Data, Part Three: Evaluation of Answers, PT-2, Part Two.....	31
	Analysis of Data, Part Four: Evaluation of Teachers' Rating of Ability; and Age of Children Between Groups.....	32
VI	DISCUSSION.....	34
	Interpretation and Implications.....	34

	Page
BIBLIOGRAPHY.....	37
APPENDIX A.....	44
APPENDIX B.....	46
APPENDIX C.....	47
APPENDIX D.....	48
APPENDIX E.....	49
APPENDIX F.....	50
APPENDIX G.....	51
APPENDIX H.....	52

LIST OF TABLES

TABLE		Page
I	Teachers' Ratings of Ability: Data by Schools.....	12
II	Age and Sex: Data by Schools.....	13
III	Means and Standard Deviations on Category Measure by Children in AE and PE Groups at PT-1.....	25
IV	Means and Standard Deviations on Explicit Information Measure by Children in AE and PE Groups at PT-1.....	26
V	Means and Standard Deviations on Implicit Information Measure by Children in AE and PE Groups at PT-1.....	27
VI	Means and Standard Deviations on Category Measure by Children in AE and PE Groups at PT-2.....	28
VII	Means and Standard Deviations on Explicit Information Measure by Children in AE and PE Groups at PT-2.....	29
VIII	Means and Standard Deviations on Implicit Information Measure by Children in AE and PE Groups at PT-2.....	30
IX	Means and Standard Deviations on Answers by Children in AE and PE Groups at PT-2, Part Two.....	31
X	Ratings of Ability: Data by Group.....	32
XI	Age and Sex of Children: Data by Group.....	33

LIST OF FIGURES

FIGURE		Page
1	OUTLINE OF PROCEDURE.....	15

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CHAPTER I

INTRODUCTION

It has been reported that young children's (as defined in Appendix A) ability to recall some types of information is not as efficient as that of their elders (Danner & Taylor, 1973; Jablonski, 1974, Kail, 1976). In order to find methods of improving this recall ability, especially where it might apply in school situations, some writers have presented material in what is considered to be the children's preferred mode (Bruiniks & Clark, 1970; Dauzat, 1970; Williams, Williams, & Blumberg, 1973). Generally, the mode of presentation in studies has followed that which is usually found in school instruction: visual and/or verbal forms.

Recent research (Brown, 1975; Paris & Lindauer, 1976) has been concerned with the younger child's ability to recall narrative material in the form of short prose passages. Again, the mode of presentation still appears in visual or verbal form, although, some visual forms include pictures in story sequence, much like the form of a comic strip (e.g. Brown, 1975). It appears, then, that researchers are still following school instructional methods of presenting material in visual or verbal forms. The alternative of concentrating on child development factors, which may suggest other means of maximizing recall of material that children encounter (and alternative procedures which change the manner in which children assimilate and organize the material one expects them to recall), may be more fruitful.

Jean Piaget (1967) has postulated six stages of development which mark the appearance of successively constructed structures (motor or

intellectual and affective), which are the organizational forms of mental activity. A five year old child, according to Piaget (see Flavell, 1963), would possibly be in a subperiod of simple representations or intuitions, and may still be more efficient with sensory-motor activity (which may be related to learning), especially if his past experience has been mostly sensory-motor (physical activity with action on objects). Piaget (e.g. Flavell, 1963) has also postulated that a child should interact directly with his material and social environment; that is he should in particular touch, feel, and otherwise be actively engaged in his surroundings if he is to learn effectively.

General Problem and Delimitation

The present study is based on the proposition that instruction geared toward a child's active engagement with material will enhance his recall of information about that material. Specifically, an instructional method entailing a sensory-motor (physical activity with action on objects) organization of information by each child is prepared as a treatment which may be superior to one in which the child merely listens to the information prior to testing for recall. This study was limited to an investigation of the recall performance of children in an enactive experience approach (as defined in Appendix A), as compared to children in a passive experience approach (as defined in Appendix A). This study compares free recall performances between two such groups.

CHAPTER II

THEORETICAL ORIGINS OF THE PROBLEM

Review of Related Literature

Recently, narrative material has become the focus for research on children's free recall. Narrative materials are often presented in sentence or brief story form. Indications are that young children exhibit poor recall of such material (Brown, 1975; Brown & Smiley, 1977; Paris & Lindauer, 1976; Paris & Upton, 1976).

Young children's poor recall is often attributed to either (a) their age (Brown, 1975; Danner & Taylor, 1973; Ehri, 1976; Elkind, 1971; Flavell, 1971; Rosenberg, Jarvella, & Cross, 1971), (b) the handicaps of early forms of egocentrism (Anastasiow, 1971; Brown, 1975; Elkind, 1971; Piaget, 1969), (c) their relatively underdeveloped coding system (Elkind, 1971; Lange & Jackson, 1974; Locke, 1973; Millar, 1972; Piaget, 1976; Piaget & Inhelder, 1973; Trabasso & Riley, 1973), or (d) the absence of learned strategies (Chi, 1976; Flavell, 1971; Kristzer, Leonard, & Flavell, 1975; Paris & Lindauer, 1976).

The information from narrative material which children do recall is more often explicit than implicit (Paris & Lindauer, 1976; Stein & Glenn, 1975). Moreover, they appear to be more adroit at reconstructing or recognizing pictorial content than they are at recalling verbal material (Brown, 1975). Not surprisingly, these findings have moved some researchers to ask how performance might be improved. Attempts to discover means of improving recall performance have produced the following conclusions: First, recall may be increased if children are told to remember rather than merely listen (Yussen, Gangne, Garriulo, & Kunen, 1974), or if they

are instructed to look for ways that (stimulus) items go together (Rosner, 1971).

Second, rather than leaving young children to their own devices (not instructing the children on what to do), if one manipulates or effectively induces the adoption of learning strategies (instructing the children or requiring them to do something in connection with the presented material), some of which include rehearsing, imagining, or touching, performance improves (Danner & Taylor, 1973; Levin, Ghatola, DeRose, Wilder, & Norton, 1975; Levin, Lesgold, Shimron, & Guttman, 1975; Paris & Lindauer, 1976; Paris & Upton, 1976; Tenney, 1975; Wilder, 1971). Third, if children are forced to code in specific ways (Trabasso & Riley, 1973) or given a code to work with (Cannizzaro, Cecchini, & Musatti, 1975), performance is increased (within specified age ranges). Fourth, and last, but for the present study not least significant is the evidence which suggests that the methods of presenting material may influence the amount recalled (Bijou, 1976; Brown, 1975; Debes, 1974; Hoving, Konick, & Wallace, 1975; Lehman, 1972; Stacy & Ross, 1975; Trabasso & Riley, 1973; Tulving, 1968; Underwood & Freund, 1968; VanDam, Peeck, Brinkerink, & Gorter, 1974; Webster & Cox, 1974; Wilder & Levin, 1973).

Reflection devoted to the last point suggests the possibility that the method of encoding information from narrative may be a source of the difficulties young children experience in attempts to recall such material. Elkind (1971), for instance, suggests that young children may devise their own coding system for language and communication. Similarly, Jablonski (1974), reported that, "There is little evidence to suggest that the encoding schemes of children will follow those of adults..." (pg. 253).

However, the nature of children's encoding processes is not well understood. There are several disputes over the nature of children's encoding practices. Some writers report evidence of children's ability to encode material in specific as well as in more general taxonomic classes (Kail, 1976), even though their verbal concepts are less well organized and relatively imprecise as compared with those of their elders (Lange & Jackson, 1974; Saltz, Dunin-Markiewicz & Rourke, 1975). Others cite evidence (Ehri, 1976; Jablonski, 1974) which causes them to deemphasize the organizational differences and emphasize the role of experience, such as the production deficiency model which suggests that mediators are available for children to use, but are not used by them unless continually prompted to do so (see Jablonski, 1974). Perhaps both organizational immaturity and inexperience in using conceptual systems are implicated in young children's difficulties in recalling verbal narrative material. In other words, the young children's relatively unintegrated or fragmented conceptual systems might produce encoding difficulties not faced by an older person whose conceptual systems are more coherent and better organized. In any case, children's encoding practices may hamper recall.

In addition to the above, young children's encoding procedures may also be restricted by their egocentric nature. Flavell, (1963) defining egocentrism, states that "It denotes a cognitive state in which the cognizer sees the world from a single point of view only-his own-but without knowledge of the existence of viewpoints or perspectives and, a fortiori, without awareness that he is a prisoner of his own." (pg. 60) Furthermore, Kamii (1975) suggests that because of this egocentric nature, the reality the child sees is not the same reality the adult sees.

What the child perceives and attends to may not be what an adult is seeking when asking a child to recall information. An example of this was apparent in a recent study by Brown and Smiley (1977), who reported that the units in prose passages judged most important by young children dominated their recall attempts. Therefore, a child's egocentric nature may not allow him to abide by rules from without and only attend to information that interests him. Thus, this may also be an explanation for some of his poor recall performance. (Brown, 1975; Elkind, 1971; Piaget, 1969).

To return to the question of what might improve recall performance, one can take account of those studies which have reported performance gains of various kinds, as a consequence of inducing motor activity. Levin, Ghatala, DeRose, Wilder, and Norton (1975), for example, reported that motor-induced imagery appeared to constitute a highly effective discrimination learning strategy (with children in the fifth and sixth grades). Moreover, Therrien (1977) has shown how use of play improved recall of story sequence. Similarly, Rubin and Pollack (1969) taught kindergarten boys to play games with objects as sounds, and in this way increased their auditory perception. Rubin and Pollack (1969) emphasized the effect of visual and visual-motor experience in the five year olds' ability to intergrade multi-modal inputs. Likewise, Penman, Christopher, and Wood (1977) reported that learning to use capitalization and punctuation by third grade children was greater when active games involving physical body movement and involvement was used as compared to a passive (seat work) presentation and a control group (not receiving any special presentation). Furthermore, other researchers have generally reported that inducement of active motor movement usually seems to produce superior

performance over other teaching strategies such as those which rely heavily on visual and oral presentation (Jones, 1972; Levin, McCabe, & Bender, 1975; Paris & Lindauer, 1976; Silvern & Yawkey, 1977).

Further, visual encounters entailing the presentation of visual stimuli appear to be associated with performances which are superior to those connected with aural presentation. This was the case in learning word recognition (Dauzat, 1970), in learning paired associate word lists (Bruiniks & Clark 1970; Drew & Brooks, 1976; Reese, 1965; Rohwer, 1970), and in following directions (Williams, Williams, & Blumberg, 1973).

Piaget has related the idea of active engagement with the environment as possibly being connected to cognitive development (Flavell, 1963). In addition, Inhelder, Sinclair, and Bovet (1974) suggest that active engagement may be related to encoding, organizing, and recall. Furthermore, Bruner (1964) has reported that enactive representation of information ontologically preceeds symbolic representation, where enactive representation is defined as, "a mode of representing past events through appropriate motor response." (pg. 2). It appears then that these authors suggest the entailment of enactive engagement with material for cognitive development, which may, in turn, affect recall.

Derivation of Basis for Present Study

A review of the literature appears to indicate that performance on memory measures may be improved if five year olds are induced to encode and organize information through their own physical intercourse with the subject matter. Bruner (1964), in discussing memory, states that, "...memory is not storage of past experience, but rather the re-

trieval of what is relevant in some useable form." (pg. 2). It follows that enactive representation, or "a mode of representing past events through appropriate motor responses" (Bruner, 1964, pg. 2), might be expected to enhance children's performance on memory measures which require retrieval of symbolic representations. Such that, enactive representations may entail organization of the information into a system which is built on action schemes (Bruner, 1964).

CHAPTER III

DERIVATION OF CURRENT POSTULATES AND HYPOTHESES

From a consideration of the literature, the following postulates were derived:

- (1) A young child's actions center his attention on the objects of his actions.
- (2) A child's own actions are a major means by which information about the world upon which such actions are exercised is assimilated.
- (3) A child's actions are central to his point of view.
- (4) Actions on objects enhances assimilation of information about the objects.
- (5) Organization of information simplifies recall of that information.
- (6) Motor activity organizes information and hence enhances probability of recall of that information.
- (7) Motor activity is a type of rehearsal of constituent motor schemes.
- (8) Rehearsal enhances remote matching performance.
- (9) Recall is a form of matching performance.

The following inference is drawn from the postulates which are listed above. Since actions are the content of enactive representations and enactive representations form a basis of iconic and symbolic representation, recall of information which is organized through a subject's actions may be enhanced due to such organization. It follows then, that if

a five year old encountered narrative material and through enactive experience with it, organized the material through his actions, his recall of that narrative material might be expected to be superior to the recall of those who merely listen to a verbal narration of the material. Specifically, if a child was presented a brief story, and induced to act out that story while listening to it, his recall of it may be enhanced. On the basis of the foregoing, the following hypotheses were formulated for this study:

Hypotheses

- (1) At post test one (PT-1) the children acting out a story with puppets while listening to the story (active experience (AE)) would demonstrate significantly more recall of the narrative material than would those children sitting and listening to the story (passive experience (PE)).
- (2) At PT-1, the children in the AE group would demonstrate significantly more recall of explicit information than would those children in the PE group.
- (3) At PT-1, the children in the AE group would demonstrate significantly more recall of the implicit information than would those children in the PE group.
- (4) At PT-2 (one week delayed), the children in the AE group would demonstrate significantly more recall of the narrative material than would those children in the PE group.
- (5) At PT-2, the children in the AE group would demonstrate significantly more recall of the explicit information than would those children in the PE group.
- (6) At PT-2, the children in the AE group would demonstrate significantly more recall of the implicit information than would those children in the PE group.

CHAPTER IV

METHODS

Subjects

A sample of thirty-five children ranging in age from 4.75 to 5.83 years were selected from three kindergartens in Vancouver, British Columbia. Ten children were from a private kindergarten. Sixteen were from a university kindergarten; and nine were from a university operated Child Study Centre kindergarten, at the University of British Columbia.

The children from the University kindergartens were mostly students drawn from a University housing area whose parents are for the most part graduate students or faculty members at the University. Children from the private kindergarten were reported to be from middle to upper middle class families.

All children had English as a first language except one, whose parents spoke Cree at home but who used English quite fluently.

One child from the private kindergarten and one from the university kindergarten were dropped because of absence at PT-2. In addition, one child from the university kindergarten was dropped because of non-participation in the recall tests. This made a total of 32 children for the present study.

Each child was randomly assigned to one of two groups with the restriction that children from each school were approximately equal in each group.

Following PT-2, teachers rated (from 1-3) their students on ability,

performance, intellectual skills, and overall intelligence. The totals from each of those measures were then grouped for a single score for each child. The scores from each school were then averaged and compared, which do not indicate differences (Cypress House kindergarten as compared to the University kindergarten, $t(21) = 1.6$, $p > .05$; Cypress House as compared to the Child Study Centre, $t(16) = 1.22$, $p > .05$; and for the University as compared to the Child Study Centre, $t(21) = .188$, $p > .05$). Data from these ratings on ability can be seen in Table 1.

TABLE 1
Teachers' Ratings of Ability: Data by Schools

School	Range	Mean	Standard Deviation
Cypress House	1.75-2.875	2.22	.471
University	1.812-3.0	2.44	.388
Child Study Centre	2.0-2.875	2.47	.331
Total	1.75-3.0	2.38	.400

The ages of the children in each school also indicated no significant between School differences (Cypress House as compared to University, $t(21) = .05$, $p > .05$; Cypress House as compared to the Child Study Centre, $t(16) = .02$, $p > .05$; and for the Child Study Centre as compared to the University kindergarten, $t(21) = -.05$, $p > .05$). Data from the ages, and

the sex of the children by schools can be seen in Table II.

TABLE II
Age and Sex: Data by Schools

School	Range	Mean	Standard Deviation	Boys	Girls
Cypress House	4.92-5.75	5.47	.269	6	3
University	5.08-5.92	5.48	.538	7	7
Child Study Centre	4.83-5.83	5.47	.518	3	6
Total	4.83-5.92	5.48	.457	16	16

All children were tested by a male experimenter.

Apparatus

Two cotton sock puppets (a deer and a rabbit) were used. The deer was made from a man's dark brown cotton-polyester sock, it had a round half circle dark brown leather button for a nose, two round half circle white plastic buttons for eyes, and antlers cut from light brown tag board. The rabbit was similar except the eyes were painted pink, there were whiskers below the nose, there was a white cotton ball for a tail, there were white ears instead of antlers, and the sock was a lighter brown. All items were sewn on except the rabbit's whiskers which were stuck through the sock.

A painted set which included colorful scenery mounted on cardboard, was used with the puppets. The scenery was in two parts. One part stood up and had clouds, hills, grass, trees for a forest, and a house on it. The other part laid flat and was a scene of a garden with rows of corn, lettuce, carrots and peas. In the left corner was a brown circle for a hole, and through the middle of the garden was a road which went from the bottom of the picture to the top and then to the right side towards the house. Both parts were placed together to make a folding scene.

A tape-recorded narration of forty seconds duration was used. (see Appendix B). The narration was taken from the reading series Rockets (Durr, LeePere & Alsin, 1976, pg. 72). Two alternate stories (see Appendix C) were produced from this source. In the first revised story the word 'perked' was replaced by the word 'stood'. In the second revision, the words 'perked, rabbit, hopped, and hole', were replaced by the words 'stood, deer, jumped, and forest'.

A Lloyds automatic level control compact cassette tape recorder with an external mike was used both to deliver the narrative material and to record the recall responses. The experimenter read directions and questions which were in script from on a single page.

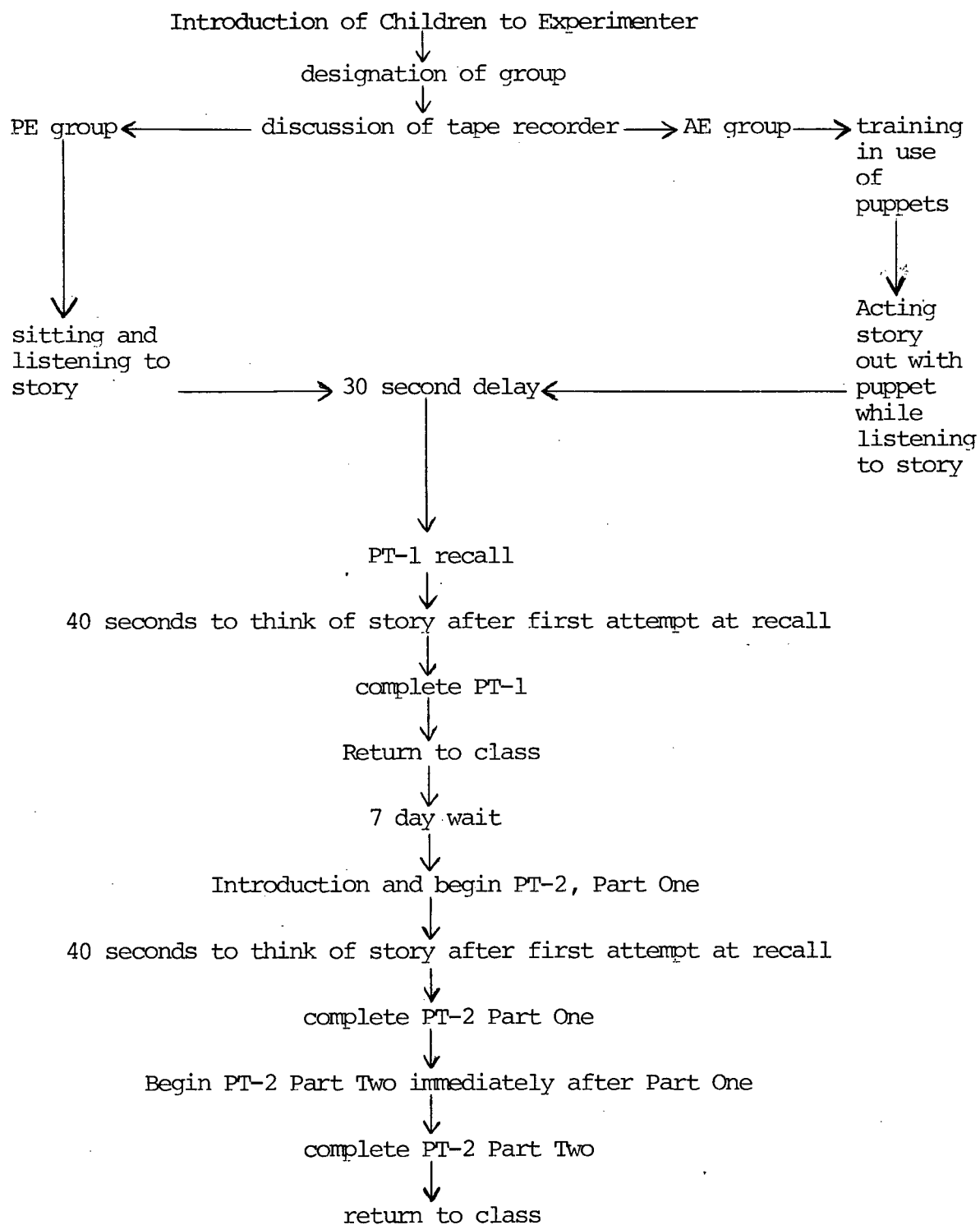
The children were tested in a room isolated from their class but located within their Kindergarten building. Positioned in the room was a flat table on which was placed the tape recorder, blank tapes, and question sheet.

Procedure

An outline of the procedure can be seen in Figure I.

FIGURE 1

OUTLINE OF PROCEDURE



All children were either introduced to the experimenter in the classroom and then taken to the testing room, or were brought to the testing room by the teacher and introduced. As soon as the child was introduced, he was asked to sit down at the table in the testing room. If the experimenter brought the child into the room, upon entering, the experimenter pointed to a chair and asked the child to sit down. The experimenter then said, "(Child's name), this is a tape recorder. Have you ever used one before?" The operation of the tape recorder was discussed. The child was then told, "I have a story on the tape recorder that I would like you to listen to. Would you like to hear it?" After the child responded positively, the brief story (as outlined below) was presented.

1. Passive Experience Group

After discussion of the tape recorder, each child in the PE group was told, "Listen very carefully to the story." As soon as the tape recorder was turned on the experimenter again said, "Listen very carefully to the story." When the story was finished, the experimenter, without saying anything, rewound the story tape; took the cassette out of the tape recorder; and put in a blank tape. This procedure took 30 seconds. PT-1 then began.

2. Active Experience Group

a. Training Session

For the AE group, after the tape recorder had been discussed the

experimenter said, "But first I would like you to look at something." This began the training session for AE children in the use of a puppet enacting a story. For the training session, if the child was to listen to a story about a rabbit during the experience condition, the child was given training with a deer puppet. If the experience condition was to be with a deer story, training was with a rabbit puppet.

When the training began, the experimenter took out a puppet from a paper sack and put it on his hand. He then said, "This is a puppet, what kind of animal do you think it is?" The child responded with "mouse" or "rabbit" for the rabbit puppet; "moose" or "deer" for the deer puppet. The identity for the puppet was established at this time. With the puppet on the experimenter's hand, the experimenter demonstrated how to make the puppet work by making it breathe, make a face, jump up and down, and run across the table. While the experimenter was doing this he said, "These are some things you can make the puppet do: breathe; make a funny face; jump; or run across the table." As soon as the experimenter finished the demonstration, he said, "Would you like to try it?" The experimenter then took the puppet off his hand and helped the child put it on the child's hand. The experimenter then said, "Can you make it breathe?" The experimenter waited until the child tried to make the puppet breathe, and said, "That is very good. What are some other things you can make it do?" As the child made the puppet move around or do something, the experimenter reacted to each movement with, "That is very good. You can really make the puppet do a lot of things." Only two children needed prompting by the experimenter. For these children the experimenter took the child's hand holding the puppet, and moved the hand around the table, making the puppet jump and run. While doing this the experimenter said, "This is

how you can make the puppet jump, and this is how you can make the puppet run across the table." The experimenter continued with, "I would like to see how well you can make the puppet act out a sentence while you listen to it. Would you like to try?" Some of the children asked what a sentence was, to which the experimenter responded, "I am going to say some things, and while I say these things can you make the puppet do them?" As soon as the child replied that he or she would try, the experimenter began the sentence. Two sentences were used in the pre-training condition (see Appendix D). The first sentence was used to observe the child's responses. If assistance was required the experimenter would take the child's hand and go through the motions of the sentence as it was being told. The first sentence was repeated three times, and in three cases three children needed it repeated more than three times. Two children needed the sentence repeated four times; and one child needed the sentence repeated five times. All other children were able to make the puppet act out the first try. When the child experienced difficulty on the first try the experimenter would say, "Pretend the table is the woods and over here (pointing) is the home." After the first statement was given the third time, and the child was able to act it out with some movement, the experimenter continued with, "Let's try a different sentence, but this time I won't help you. Do you think you can do it?" As soon as the child responded positively, he was told, "Listen very carefully and try to make the puppet do what the sentence says." The experimenter gave the passage. If the child enacted the events represented in the passage the training was concluded; if the child had difficulty, as in one case, it was repeated. The second statement was repeated twice for five children to insure their proficiency,

and four times for one child.

b. Listening to Story:

After the training, the story was given. The experimenter took the training puppet from the child and put it back into a paper sack on the floor. He then placed a scenery on the table, brought out the appropriate puppet for the story, and said, "Here is another puppet, would you like to put this one on?" When the child agreed, the experimenter helped him put the puppet on his hand and stated, "I am going to play a story that is on the tape recorder. I want you to make the puppet act out the story while you are listening to the story. Do you think you can do that?" As soon as the child gave a positive response, the experimenter, turning on the tape recorder, stated, "Listen very carefully to the story, and make the puppet do what the story says." As soon as the story was finished, the scenery was removed from sight, the puppet was taken from the child's hand and placed into a paper bag, the story tape was removed from the tape recorder and a blank tape put in place. This procedure took 30 seconds. PT-1 then began.

Post Test-1.

When the AE and PE groups were finished listening to the story, and after a 30 second pause (described earlier), PT-1 began. While turning the tape recorder on to record the experimenter stated, "I have some questions I would like to ask you about the story you just heard." "First, can you tell the story back to me just as you heard it?" If the child was silent but appeared to be thinking about the story, the experi-

menter remained silent until the child either produced his account of the story or said he could not remember. When he remained silent for more than twenty seconds the experimenter said, "Tell me everything or anything you remember about the story." When the child was finished, either by stating he could not remember or through a period of silence (twenty seconds), the experimenter said, "I am going to give you a minute to think about the story, and if there is anything you would like to tell me, or anything you may want to add to what you have already told me, you can do it then. Think about the story for a minute." The experimenter turned off the tape recorder at the mike switch and waited forty seconds. When the time had lapsed the experimenter turned the recorder on and said, "Is there anything you want to tell me about the story or anything you want to add to what you have already told me?" When the child stated that he had told all he remembered, that he was finished, or there was a long period of silence (20 seconds), the experimenter said, "Is that everything you remember?" After the child responded, the experimenter turned the tape recorder off. For all responses, the experimenter responded with 'O.K.' or "all right," if the child asked if that was right or waited for a reply from the experimenter.

As soon as the tape recorder was turned off the experimenter said, "Thank you for listening to the story. I would like you to help me, if you would. Do you know how you can help me? Don't tell anyone in your class what we did in here today. If they ask, you can say that you listened to a story on the tape recorder, but you are not supposed to tell them the story. Maybe we can make this our secret. O.K.?" When the child finished answering, the experimenter told the child to return to the classroom. This concluded PT-1.

Post Test-2

One week after each child had heard the story, he was again tested on his recall of the story. This comprised PT-2 and it was composed of two parts.

a. Part One

Part One was a free recall test. The experimenter took the child into the same room he had heard the story and asked him to sit down. The child was then told, "Last week you heard a story on this tape recorder (pointing to the tape recorder). I would like you to tell me that story just as you heard it." If the child stated he could not or that he had forgotten the story, the experimenter said, "Tell me everything or anything you remember about the story." The child then responded, stated he could not remember anything, or remained silent. After twenty seconds of silence the experimenter stated, "I am going to give you a minute to think about the story, and if there is anything you would like to tell me, or anything you may want to add to what you have already told me, you can do it then." All children able to respond to the first question were asked, "Is there anything you might have forgotten to tell me, or anything you would like to add?" When a child was silent for 20 seconds after responding, or stated he could not remember any more, he was given one minute to think about the story. Following a 40 second interval, the experimenter said, "Is there anything you want to tell me about the story or anything you want to add to what you have already told me?" After the child responded and stated he could not remember any more, or said 'no', the first part of PT-2 was completed.

b. Part Two

The second part of PT-2 was given immediately after the child's last response to the free recall test. The experimenter said, "I am going to ask you some questions about the story. The experimenter then began to read a set of questions for the child to answer (see Appendix E).

Since some of the questions overlapped, if a child was able to answer a question that also answered the next question, the second question was not asked. When all questions had been asked, the experimenter thanked the child for coming in again, and asked him not to tell his class or friends about the test (as was done at the end of PT-1).

At the end of PT-2, each child was asked if he had kept his secret (of not telling his classmates what he had done during the first story and post test). Each child stated he had not told any of his classmates what he had done. Further, prearrangements were made to support this, in that after the testing of each child (PT-1 and PT-2), the child's teacher was allowed to remind him, in the classroom, not to discuss the story he had heard.

Analysis

The story was categorized into Rumelhart's (Stein & Glenn, 1975) schema for analysis of the brief story (Appendix F). As can be seen, this brief story was broken down into 14 categories. Since, either one does or does not recall a given instance of information, the data was treated as nominal data and recall of same was scored as one point while failure to recall was indicated by zero.

If a child transposed a category but gave the the general meaning, the category was counted as correct. For example, this was the case when the child said, "He went in a garden" for the statement, 'A little brown rabbit (deer) hopped (jumped) into a farmer's garden.' Similarly, the substitution of "He looked for some food" for the statement, 'It looked all around for something to eat.' was accepted. Each child received two scores for this procedure, one at PT-1 and one at PT-2. This comprised the counting for total narrative content of the brief story.

Explicit information scores were tallied using a predetermined list of the explicit items in the passage (see Appendix G). Implicit information scores were obtained in the same manner as the explicit scores from a list of predetermined implicit items (see Appendix H).

Because the hypotheses to be tested were concerned only with results at the end of each post test, a oneway analysis of variance was used for each measure (categories, explicit information, and implicit information); the post test measures being the dependent variables and the experimental conditions the independent variables.

CHAPTER V

RESULTS

The present study was designed to discover whether differences in recall performance would be produced by varying the manner in which children interacted with narrative material. Specifically, the study attempted to test the hypotheses that mean recall performance of children who enacted the narrative (AE) as it was heard by them would be superior to mean recall performance of children who merely listened (PE) to the same narrative. In order to test these hypotheses, two comparisons of three performances were made between two groups. That is, performances of two groups at 30 seconds and one week after encounters with the material were compared. To reduce the probability that any difference on performances were attributable to spurious factors, a oneway analysis of variance was used to compare between group differences of age and teachers' ratings of the children's ability.

The oneway analysis of variance between groups on the three performance measures (narrative content, explicit information, and implicit information), and on both post tests, indicated that the AE group recalled significantly more narrative material, explicit information and implicit information than the PE group. Furthermore, between group comparisons of age and of teachers' ratings of ability revealed no significant differences. Analysis of the two group performances on each post test, comparisons of children's age, and teachers' ratings of ability between groups, follows.

Analysis of Data, Part One: Evaluation of Hypothesis

One, Two, and Three

The first hypothesis predicted that children who enacted a brief story would demonstrate significantly more recall of narrative material than would those children sitting and listening to it at PT-1. The recall of narrative material was measured by enumerating the number of information units--categorized according to Rumelhart's (as cited in Stein & Glenn, 1975) schema for stories--which were present on recall performances.

For the performance on the category measure (at PT-1), the means and standard deviations are presented in Table III.

TABLE III

Means and Standard Deviations on Category
Measure by Children in AE and PE Groups at
PT-1

Group	Mean	SD
AE	5.125	1.995
PE	2.75	1.653
Total	3.938	2.169

As can be seen from Table III, the AE group had a higher rate of recall than the PE group on the category measure at PT-1. The analysis of variance indicated this to be a significant difference ($F(1,30) = 13.437, p = .0009$). Pooled variance estimate also indicated there was a significant difference between the means for the category measure at PT-1 ($t(30) = 3.666, p = .001$). Furthermore, homogeneity of variance was checked using Bartlett's procedure. This post-hoc test indicated no differences of variance between the groups (Bartlett-box $F = .512, p = .475$) at PT-1. (Post-hoc tests were used to satisfy any argument that variance differences could be the contributing factor to significant differences of analysis of variance between the means for all tests on measures in this study).

Hypothesis Two predicted that children who enacted a brief story would demonstrate significantly more recall of explicit information in the story than would those children sitting and listening to it at PT-1.

The mean number of responses and standard deviations for each group, at PT-1, on the explicit information measure can be seen in Table IV.

TABLE IV

Means and Standard Deviations on Explicit Information

Measure by Children in AE and PE Groups at PT-1

Group	Mean	SD
AE	9.75	3.624
PE	4.875	3.052
Total	7.313	4.123

Table IV shows that the AE group had more recall of explicit information than the PE group. Analysis of variance of the means indicated that this was a significant difference ($F(1,30) = 16.938, p = .0003$) at PT-1. Pooled variance estimate also indicated significant differences between the means ($t(30) = 4.116, p = .000$). Homogeneity of variance was also significant (Bartlett-box $F = .426, p = .514$) for no differences of variance between the groups on this measure at PT-1.

The third hypothesis predicted that at PT-1, children who enacted a brief story would demonstrate significantly more recall of implicit information in the story than would those children sitting and listening to it.

Implicit information recalled at PT-1 is summarized in Table V. As can be seen, the AE group had more recall of implicit information than the PE group.

TABLE V

Means and Standard Deviations on Implicit Information
Measure by Children in AE and PE Groups at PT-1

Group	Mean	SD
AE	1.125	.957
PE	.500	.516
Total	.813	.821

This difference was significant at PT-1 ($F(1,30) = 5.282, p = .029$). The pooled variance estimate indicated that the differences between both means are significantly different ($t(30) = 2.298, p = .029$). Homogeneity of variance (Bartlett-box $F = 5.222, p = .022$) was not significant indicating differences of variances between the groups.

Analysis of Data, Part Two: Evaluation of Hypothesis

Four, Five, and Six

The results of the oneway analysis of variance at PT-2 were similar to those results at PT-1.

The fourth hypothesis predicted that at PT-2, children who enacted a brief story would demonstrate significantly more recall of narrative material than would those children sitting and listening to it (one week later).

The mean number of responses and standard deviations for each group on the category measure at PT-2 is summarized in Table VI.

TABLE VI

Means and Standard Deviations on Category Measure
by Children in AE and PE Groups at PT-2

Group	Mean	SD
AE	3.563	2.128
PE	1.375	1.455
Total	2.469	2.11

As can be seen from Table VI, the AE group had a higher rate of recall on the category measure than the PE group. The differences of these recall rates were significant at PT-2 ($F(1,30) = 11.520$, $p = .002$). Pooled variance estimate also indicated significant differences between the means ($t(30) = 3.394$, $p = .002$).

Homogeneity of variance on the category measure between the groups was also significant, indicating that the variances were the same. (Bartlett-box $F = 2.052$, $p = .152$) at PT-2.

Hypothesis number five predicted that at PT-2, children who enacted a brief story would demonstrate significantly more recall of explicit information than would those children who merely listened to it.

There was more recall of explicit information by the AE group than the PE group on the explicit information measure (see Table VII). This was a significant difference between the group means ($F(1,30) = 11.95$, $p = .0017$).

TABLE VII

Means and Standard Deviations on Explicit Information
Measure by Children in AE and PE Groups at PT-2

Group	Mean	SD
AE	6.5	3.983
PE	2.375	2.63
Total	4.438	3.926

The pooled variance estimate was also significant indicating no difference between the means ($t(30) = 3.457$, $p = .002$) on the explicit measure. Homogeneity of variance also indicated there was no difference in variance between the groups on the explicit measure at PT-2 (Bartlett-box $F = 2.434$, $p = .119$).

The last hypothesis, number 6, predicted that children who enacted a brief story would demonstrate significantly more recall of implicit information than would those children who merely listened to it (at PT-2).

Implicit information recalled at PT-2 is outlined in Table VIII.

TABLE VIII

Means and Standard Deviations of Implicit Information
Measure by Children in AE and PE Groups at PT-2

Group	Mean	SD
AE	.563	.629
PE	.125	.342
Total	.344	.545

As can be seen in Table VIII, the AE group had a superior performance in recalling implicit information as opposed to the PE group. The oneway analysis of variance indicated that this difference was significant at PT-2 ($F(1,30) = 5.976$, $p = .021$). The pooled variance estimate was

also significant at PT-2 ($t(30) = 2.445$, $p = 0.21$). Homogeneity of variance indicated that there was a difference in group variance at PT-2 (Bartlett-box $F = 5.118$, $p = .024$).

Analysis of the Data, Part Three: Evaluation of Answers,
PT-2, Part Two

The oneway analysis of variance on the responses to the questions (see Appendix E) asked at the end of PT-2 (this was PT-2, part two), indicated that the AE group recalled significantly more information about the story than did the PE group. This can be seen in Table IX.

TABLE IX
Means and Standard Deviations of Answers by Children
in AE and PE Groups at PT-2, Part Two

Group	Mean	SD	$F(df) =$	$p =$
AE	15.813	4.215	6.042 (1,30)	.020
PE	11.375	5.867		
Total	13.594	5.506		

Further, pooled variance estimate resulted in no difference between the means $t(30) = 2.248$, $p = .020$. Homogeneity of variance also indi-

cated there was no difference of variance between groups on the children's answers at PT-2, Part Two (Bartlett-box $F = 1.556$, $p = .212$).

Analysis of the Data, Part Four: Between Group Comparisons
of Age and Teachers' Ratings of Ability

Each child was rated by his teacher on a three point scale with regard to each of the following: Ability, performance, intellectual skills, and overall intelligence. The ratings for each child on each of the foregoing were combined to form a composite ability rating. These composite scores for each group were then compared. Analysis of the ratings by teachers (as shown in Table X) yielded no significant between group differences ($F(1,30) = .483$, $p = .492$) indicating that no difference existed between groups on the combined measure of ratings by the teachers.

TABLE X
Ratings of Ability: Data by Group

Group	Mean	SD
AE	2.386	.394
PE	2.398	.365
Total	2.39	.374

Likewise, a oneway analysis of variance between groups on comparisons of children's age also indicated no significant between group differences ($F(1,30) = .007, p = .932$); can be seen in Table XI.

TABLE XI
Age and Sex of Children: Data by Group

Group	Mean Age	SD (Age)	Boys	Girls
AE	5.51	.235	9	7
PE	5.45	.335	7	9
Total	5.48	.286	16	16

These data, together, suggest then, that group differences with regard to age and ability, as quantified, are not spurious sources of between group differences on the dependent measures.

CHAPTER VI

DISCUSSION

The present study examined the effects of two types of encounters with narrative material on young children's recall performances. The effects were examined by comparing the amount of free recall at two times after the encounters and by the responses to questions answered at the end of the second time period (PT-2, part two).

Data from all measures at both post tests indicate that children who enacted a brief story with puppets (AE group) recalled more narrative material, explicit information, and implicit information from the brief story than did those children who merely listened to it (PE group). Furthermore, the results of a check for any spurious sources of performance differences enhanced confidence in the conclusion that the performance differences can be attributed to differences in experimental treatment since no significant between group differences were found in teacher ratings of ability or age. Accordingly, since it was concluded that the groups were from the same age and ability population, and all differences in performances were as predicted, all hypotheses were accepted.

Interpretation and Implications

The results of the present study suggest motoric organization of narrative content enhances recall (of that narrative material). However, one may ask whether the results are equivocal due to the fact that on one measure (the implicit measure) there were significant differences between group variances at both post tests. Closer examination of the variance data, however, allows one to put this doubt

aside. For a small number of children in the PE group (9 in PT-1 and 2 in PT-2) recalled the implicit information. The rest of the children in the PE group did not recall any implicit information which resulted in many scores as zero (7 in PT-1 and 14 in PT-2). By contrast, the children in the AE group more consistently recalled information on this measure (11 in PT-1 and 8 in PT-2). Accordingly, the AE group had fewer scores as zero (5 in PT-1 and 8 in PT-2). Further, since the children's ages and ratings of ability did not differ significantly between groups, a difference of a younger age and/or a lower ability rating could not be regarded as contributing to the low scores (amount of zeros as scores) on this measure. Therefore, the amount of low scores (zeros) appears to be the reason for the variance differences. Such was the reason further analysis of resetting the confidence intervals (i.e. resetting the probability to .02 or .001) and/or transposing the scores to decrease the amount of variance between groups, did not appear to be warranted.

A second question about the results of this study should also be discussed. This question concerns the possibility that rehearsal effects may confound the effects of the predictor variable (motor organization) in this. Since the children of the enactive group were necessarily rehearsing the substance of the story as they acted it out, and children in the alternative condition did not have to rehearse the material, one must consider the possibility that performance differences on the post test measures are attributable to possible advantages gained by the AE children from rehearsal (Bandura & Jeffery, 1973).

Unfortunately, the design of this study does not enable one to partial out such effects as might be attributable to rehearsal. Future

research in this area could use a design which enables one to avoid confounding effects of rehearsal with those that may be associated with enactive organization of the material to be recalled. Such a design may entail the use of a group that is induced to rehearse the material without enacting it subsequent to hearing it. Furthermore, control for the possibility of a Hawthorne effect (regarding the use of puppets), may also be achieved through a design which includes a group which watches the puppets enacting the story as is being read. The performance of the above groups could then be compared to such groups as were in this study. Such designs should be contrived and used in a study which would clarify the theoretical significance of the present findings.

While a more complete theoretical explanation for the present results will depend upon future research which clarifies the extent to which a rehearsal effect is implicated in recall gains exhibited by children who act out stories, teachers may take note that this study has shown that children who do organize information through their actions appear to recall more of such information than do those who merely listen to it. Accordingly, where pedagogical techniques require the recall of information, superior gains may be obtained if the teacher uses an enactive experience approach with young children rather than merely telling the child and/or reading the information; and these gains may also be made with no loss in instruction time.

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APPENDIX A

DEFINITION OF TERMS

In this study, the following terms were used.

- Active Experience: A child listens to a brief story and simultaneously makes a hand puppet act out the sequence of the story on a background.
- Explicit Information: Information in a brief story that is said and stated, for example, in 'The Little Brown Rabbit....,' little, brown and rabbit are explicit.
- Implicit Information: Information that is not said in a brief story but which the story may imply, for example, in 'He looked for something to eat,' may imply 'he was hungry.'
- Narrative Material: The overall content of the brief story presented. This content was then categorized into six parts according to Rumelhart's 'Schema' (Stein & Glenn, 1976). For the categories of the story used in this study see Appendix F.
- Passive Experience: A child sits and listens to a brief story. This does not mean he has to listen however.
- Post Test-1: The means of asking a child to tell back a story. (Free recall) In this study Post-test I was thirty seconds delayed after hearing a brief story in an active or passive experience situation. (Immediate recall was not used because of the time needed to put all referents out of sight in the active experience situation).
- Post Test-2: As in Post Test-1 except the children were reminded of 'a story' on the tape recorder and then asked to tell it to the experimenter. Post Test-2 consisted of two parts. These parts were:

- (1) Free recall and
- (2) Answering of questions (given in that order). Post Test-2 was given seven days after hearing the brief story.

Young Children:

And 'children'; 'child'; and 'younger children', are terms used in this study to denote children of the ages Four to Eight, unless otherwise specified.

APPENDIX B

BRIEF STORY IN ORIGINAL FORM

A little brown rabbit hopped into a farmer's garden. It looked all around for something to eat. The rabbit ran over to a patch of lettuce. As it nibbled on some lettuce, its ears perked up. A dog was barking in the distance, and the barking noise was coming closer and closer. The rabbit hopped out of the farmer's garden and into a nearby hole.

APPENDIX C

REVISED VERSIONS OF ORIGINAL BRIEF STORY

RABBIT STORY

A little brown rabbit hopped into a farmer's garden. It looked all around for something to eat. The rabbit ran over to a patch of lettuce. As it nibbled on some lettuce, its ears stood up. A dog was barking in the distance, and the barking noise was coming closer and closer. The rabbit hopped out of the farmer's garden and into a nearby hole.

DEER STORY

A little brown deer jumped into a farmer's garden. It looked all around for something to eat. The deer ran over to a patch of lettuce. As it nibbled on some lettuce, its ears stood up. A dog was barking in the distance, and the barking noise was coming closer and closer. The deer jumped out of the farmer's garden and into a nearby forest.

APPENDIX D

ACTIVE EXPERIENCE STORY CONDITION--TRAINING SENTENCES

When the rabbit puppet was used in the pre-trial, the following two statements were used:

- (1) "A rabbit was walking through some woods when he heard his mother calling him to come home as fast as he could."
- (2) "A rabbit was going down the forest trail when he saw some friends, stopped to say hello, and then went on again."

The following alternative sentences were used with the deer puppet:

- (1) "A deer was walking through some woods when he heard his mother calling him to come home as fast as he could."
- (2) "A deer was going down a forest trail when he saw some friends, stopped to say hello, and then went on again."

APPENDIX E

QUESTIONS OF PART TWO

	<u>Possible Score</u>
(1) What animal was the story about?	1
(2) What animals were in the story?	2
(3) What did the rabbit (deer) do first?	3
(4) Where did the rabbit (deer) go?	2
(5) When the rabbit (deer) got into the garden, what did he do?	4
(6) What did the rabbit (deer) look for in the story?	2
(7) Why was the rabbit (deer) looking for something to eat?	1
(8) What did the rabbit (deer) find?	2
(9) When the rabbit (deer) was eating the lettuce, why did his ears stand up?	2
(10) What did the rabbit (deer) hear as it was eating the lettuce?	1
(11) What was the dog doing?	2
(12) Was the dog trying to get the rabbit (deer)?	1
(13) What did the rabbit (deer) do then?	3
(14) Where did the rabbit (deer) go?	3
(15) Why did the rabbit hop into a nearby hole? (Why did the deer jump into a nearby forest?)	1
(16) How do you think the rabbit (deer) felt?	1
(17) Why do you think the rabbit (deer) felt this way?	1

APPENDIX F

STORY CATEGORIZED IN RUMELHART'S 'SCHEMA'

- (1) Setting: A little brown rabbit hopped into a farmer's garden.
- (2) Activity: It looked all around
- (3) Internal response (goal): for something to eat.
- (4) Activity: The rabbit ran over
- (5) Internal response (goal): to a patch of lettuce.
- (6) Activity: As it nibbled on some lettuce
- (7) Event: its ears stood up.
- (8) Event: A dog was barking
- (9) Internal response (cognitive): in the distance,
- (10) Event: and the barking noise
- (11) Internal response (cognitive): was coming closer and closer.
- (12) Activity: The rabbit hopped out
- (13) Internal response (cognitive): of the farmer's garden
- (14) Consequence: and into a nearby hole.

APPENDIX G

EXPLICIT ITEMS IN STORY

1. Little
2. Brown
3. Rabbit (Deer)
4. Hopped (Jumped) into
5. Farmer's
6. Garden
7. Looked
8. Around
9. Eat
10. Ran
11. Patch
12. Lettuce
13. Nibbled
14. Ears
15. Stood up
16. Dog
17. Barking
18. Distance
19. Closer and closer
20. Hopped (Jumped) out
21. Nearby
22. Hole (Forest)

APPENDIX H

IMPLICIT ITEMS IN STORY

1. Rabbit (Deer) hungry
2. Looking for food
3. Saw the lettuce
4. Found the lettuce
5. Did not eat much lettuce
6. Heard a noise
7. Dog barking at rabbit (deer)
8. Dog after rabbit (deer)
9. Rabbit (Deer) scared or frightened
10. Farmer's garden not safe
11. Hole is safe