# RELATING READING AND WRITING:
# A STUDY OF FOURTH-GRADERS USE
# OF STORY SCHEMA

A Thesis

Submitted to the Faculty of Graduate Studies

of the University of Manitoba

In Partial Fulfillment

of the Requirements for the Degree of

Master of Education

by

Annette Carolyn Schewe

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ANNETTE SCHEWE

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ABSTRACT

The purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering the story structure of narrative text.

A descriptive study involving 36 fourth-graders was designed to assess story structure knowledge through analysis of the subjects' recall of text in reading and their production of text in writing. Each subject read two "ideally-structured" passages, retold the stories, and responded to inferential questions following the retellings. Following an instructional pre-writing session, three independent writing samples were collected from each subject. The reading recall protocols and writing samples were assessed for knowledge of story structure. The writing samples were analyzed for quality using an analytic writing scale. Five statistical procedures were used in analyzing the data: correlation, stepwise regression, ANOVA, factor analysis and t-tests.

Results of the study indicated that reading comprehension and writing ability were significantly correlated. Correlational calculations showed a nonsignificant relationship between the

total number of propositions recalled in reading and the total number of propositions produced in writing. Correlation coefficients for the production and recall of the seven story grammar categories studied indicated a significant relationship for only one category - "internal reaction". Further correlation calculations revealed that inferential comprehension abilities in reading and story grammar production in writing were significantly related. Analysis of variance revealed that the subjects' writing ability affected their production of story grammar categories whereas their reading ability did not. Results of t-tests showed that high ability writers used their knowledge of story grammar more effectively in their writing samples than did the average and low ability writers. Correlation and stepwise regression procedures indicated that "mechanics" and "story grammar categories" were the best predictors of overall writing quality. Factor analysis revealed that two separate dimensions of writing were being assessed by the analytic scale used. These two dimensions were best represented by the "style" and "characterization" components of the scale. Qualitative analysis of the data showed that the subjects used their knowledge of story structure in reading and writing text.

The results of this study lead the investigator to conclude that: (1) reading comprehension and writing ability were

correlated and that responses to inferential probe questions were the best predictors of writing quality, (2) the total number of propositional units were not sensitive measures of reading comprehension and writing ability, (3) the ability to recall story grammar categories was not indicative of the ability to produce the same story grammar categories in writing, (4) inferential probe scores were valid predictors of story grammar production in writing, (5) despite reading ability, fourth-graders' story structure knowledge had fully emerged in its influence on text production, (6) only proficient writers' story structure knowledge had fully emerged in its influence on text production, (7) "mechanics" and "story grammar category" components of the writing scale were the best predictors of writing quality, (8) fourth-graders used an internalized story schema (with varying levels of success) to aid in recalling and producing text.

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"Gratitude is the memory of the heart"
Author Unknown

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TABLE OF CONTENTS


| | Page |
|---|---|
| LIST OF TABLES | ix |
| Chapter | |
| 1. PURPOSE AND SIGNIFICANCE OF THE STUDY | 1 |
| Purpose | 1 |
| Statement of the Problem | 6 |
| Significance of the Study | 7 |
| Theoretical Framework | 9 |
| Definition of Terms | 11 |
| Summary | 13 |
| 2. REVIEW OF THE RELATED LITERATURE | 15 |
| Measurement of Productive Language | 16 |
| The Measurement of Syntactic Fluency | 16 |
| Syntactic Fluency as Related to Writing Quality | 18 |
| Evaluating Written Composition | 21 |
| The Reading-Writing Relationship | 28 |
| Correlational Studies | 28 |
| Intervention Studies Seeking to Relate Reading and Writing | 30 |
| Text Structure | 36 |
| Story Grammar Models | 37 |
| The Effects of Text Structure Instruction on Reading and Writing Ability | 42 |
| Summary | 46 |
| 3. DESIGN AND PROCEDURES | 50 |
| The Study | 51 |
| Subjects | 51 |
| Dependent Measures | 51 |
| Materials | 55 |
| Method of Data Collection | 56 |
| The Pilot Study | 59 |
| Analysis of Data | 63 |
| Design | 63 |
| Statistical Procedures | 63 |
| Hypotheses | 64 |
| Summary | 66 |

Page

4. ANALYSIS AND FINDINGS 68

The Relationship of Reading and Writing Abilities - General Question 1 . . . . . 69
The Effect of Ability on Story Grammar Production - General Question 2 . . . . . 76
The Relationships Among TWS Components and Overall Writing Quality Scores - General Question 3 . . . . . 79
A Qualititative Analysis of the Data - General Question 4 . . . . . 85
Summary . . . . . 92

5. SUMMARY AND CONCLUSIONS . . . . . 93

Summary of the Design . . . . . 95
Summary of the Findings and Conclusions . . . . . 96
Discussion . . . . . 101
Limitations . . . . . 105
Implications for Future Research . . . . . 106
Classroom Implications . . . . . 107

BIBLIOGRAPHY . . . . . 109

APPENDICES

A. READING MATERIALS . . . . . 119

Passage A . . . . . 120
Passage A - Propositions and Recall Record . . . 121
Comprehension Check - Passage A . . . . . 123
Passage B . . . . . 124
Passage B - Propositions and Recall Record . . . 125
Comprehension Check - Passage B . . . . . 127

B. WRITING ASSESSMENT . . . . . 128

Guidelines for Scoring Analytic Writing Scale . 129
Analytic Writing Scale Scoring Sheet . . . . . 137

Page

C. OUTLINE OF PROCEDURES FOR DATA COLLECTION . . . . . 139

Reading Instructions . . . . . 140
Writing Instructions . . . . . 142
Chart of Writing Procedures . . . . . 146

D. STORY GRAMMAR CATEGORIES DEFINED . . . . . 147

LIST OF TABLES


| Table | | Page |
|---|---|---|
| 4.1 | Correlation Coefficients for Total Writing Scores and Reading Ability Scores . . . . . | 70 |
| 4.2 | Stepwise Regression for Writing Ability and Predictor Reading Variables . . . . . | 71 |
| 4.3 | Correlation Coefficients for Propositions Recalled and Produced . . . . . | 72 |
| 4.4 | Correlation Coefficients for Seven Story Grammar Categories Recalled and a Production Task . . . . | 74 |
| 4.5 | Correlation Coefficients for Reading Comprehension and Story Grammar Production . . . | 75 |
| 4.6 | ANOVA Scores by Ability Groups in Production of Story Grammar Categories . . . . . | 77 |
| 4.7 | t-Test Scores for Story Grammar Category Production by Writing Ability Groups . . . . . | 78 |
| 4.8 | Correlation Matrix for TWS and the Six Components of the Analytic Writing Scale . . . . . | 81 |
| 4.9 | Stepwise Regression for Writing Ability and the Components of the Analytic Scale . . . . . | 83 |
| 4.10 | Factor Analysis Computed on the Six Variables of the TWS . . . . . | 84 |
| 4.11 | Propositions Recalled by Reading Ability Grouping . | 86 |
| 4.12 | Propositions Produced by Reading Ability Grouping . | 87 |
| 4.13 | Propositions Recalled by Writing Ability Grouping . | 88 |
| 4.14 | Propositions Produced by Writing Ability Grouping . | 89 |
| 4.15 | Mean Number of Episodes Produced Per Story by Writing Ability Groups . . . . . | 92 |

# Chapter 1

# PURPOSE AND SIGNIFICANCE OF THE STUDY

## Purpose

The purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering the story structure of narrative text. It has been shown that reading skills are related to writing skills (Evanchenko, Ollila & Armstrong, 1974; Loban, 1976), and that when the reader possesses an appropriate schema for a written text, comprehension of that text is enhanced (Chodos & Mosenthal, 1978; Mandler & Johnson, 1977; Meyer, 1977). Researchers have suggested that knowledge of appropriate story schema may also affect writing performance (Mosenthal, 1983; Taylor & Beach, 1984).

Language proficiency has been studied extensively over the past two decades, but researchers have only recently begun to seriously study writing, especially at the lower grade levels (Graves, 1980; Hayes & Flower, 1983).

Syntactic fluency has persisted as the primary measure in assessing language ability. The minimal terminal unit (T-unit) which was defined and validated by Hunt (1965), has proven to be a useful index of syntactic growth (O'Donnell, 1976). Syntactic fluency, however, is not synonymous with writing quality as

reported in the works of Crowhurst (1983) and Hay (1984); but, it is one aspect worthy of consideration when assessing writing quality Straw (1981) and Cooper (1975).

It has been suggested that language assessment must consider a number of variables beyond that of syntactic ability (Cooper, 1975, 1983; Mosenthal, 1983). For this reason, a narrative analytic scale was developed for this study so as to consider those variables which were most sensitive to the proposed writing task. Research has suggested that these variables be included in a comprehensive assessment device (Applebee, 1980; Cooper, 1977). Furthermore, Bereiter & Scardamalia (1983) suggested that story grammar research may yield insights into those knowledge structures that direct composing and thus aid in understanding that process. The analytic scale used in this study was developed to assess writing ability at a syntactic and semantic level, while seeking to isolate knowledge of story structure in hope of gaining insight into the composing process.

Research studying the interrelationship between the language processes (i.e. reading, writing, listening and speaking) have added a further dimension to the understanding of the composing process. Jensen (1984) claimed that Loban (1976) had advanced the most compelling argument for the shared bases of the language areas when he reported that children who performed well in one

language area tended to perform well in others. Unfortunately, the nature of the relationship between the language processes remains unclear. Shanahan (1980) and Stotsky (1983) have comprehensively reviewed the research relating reading and writing, and concluded that much remains to be learned regarding this relationship. Galda, (1982), however, suggested that children who were competent in both reading and writing, tried to 'create' meaning in both processes. Squire (1984) concurred that composing and comprehending are interwoven, 'process-oriented thinking skills'. The research question posed in this study sought to examine the relationship between reading and writing based on Squire and Galda's premises.

Previous studies of the reading-writing relationship have used rather general measures of language arts abilities. This study sought to consider the language interactions using text structure as a basis for analysis. The text analysis procedure employed in this study stemmed from Kintsch's proposal (1977) that text could be systematically broken down into propositions or idea units and analyzed so as to permit careful study of what was encoded and recalled by the reader. This method of representing text has proven to be invaluable in research seeking to compare text structure and reader's recall (Tierney & Mosenthal, 1982). Further, text analysis research has suggested that there were

specific aspects of text structure which affected the recall of information. Mandler and Johnson (1977), Rumelhart (1975), and Stein and Glenn (1977) have reported that most readers possess a form of story structure which influences reading comprehension. They have theorized formal models of story grammar which dictate rewrite rules in generating well-formed stories. In this study, Mandler and Johnson's (1977) model of story grammar was used as a basis for assessing reading comprehension and writing quality as it has been suggested that their model holds the most promise for research (Reder, 1980).

Hay (1984), Taylor (1982), and Taylor and Beach (1984) have extended the use of text structure to considering its impact on writing ability. Taylor and Beach (1984) showed that students taught to attend to expository text structure demonstrated superior recall of text, and scored higher in writing quality than did the control subjects. Hay (1984) who studied primary grade children, found that production of certain story grammar structures was developmental and differed across modes of language production. This study sought to extend the above research regarding the relationship between narrative text structure and reader-writer performance at the intermediate grade level.

Finally, an assessment of the relationship between reading and writing necessitated not only a comprehensive, sensitive

measure of writing ability, but a comparable measure of reading comprehension as well. This study has employed free and cued recall, together with inferential comprehension questions in assessing reading ability.

Recently, analysis of free recall has been used in assessing the degree of text based and schema based processing. The assumption is made that recall resulted from various cognitive operations being performed upon propositions in the written text to arrive at propositions encoded and retrieved by the reader (Thomas & Bridge, 1980). In addition, Tierney, Bridge and Cera (1977) have found that minimally cued or probe questions elicited additional information from both good and poor readers. Tierney and Bridge (1979) further suggested that it was in the comparison of the reader's recall of text to the actual structure of the passage itself that the nature of the reader's organizational methods could be assessed. The role played by text structure and how that relates to reader-writer input was of particular interest.

In conclusion, it has been reported that readers selectively recall only parts of the total message conveyed in a passage. Furthermore, these parts correspond directly to well-structured, interrelated units of semantic information as concepts, states or events (Bower, 1976; Mandler & Johnson, 1977; Stein & Glenn,

1977). This observation laid the foundation for the present study.

## Statement of the Problem

The purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering the story structure of narrative text. The following main questions were addressed:

1. What is the relationship between fourth-graders' reading and writing abilities based on free recall, comprehension probe, free recall plus comprehension probe scores and analytic writing scale scores?

2. What are the effects of ability level on production of story grammar categories?

a) Will students who are placed in high, average and low ability groups by their total reading comprehension scores produce different story grammar categories in their independent writings?

b) Will students who are placed in high, average and low ability groups by their total writing scores produce different story grammar categories in their independent writings?

3. What are the relationships among overall writing ability scores and the components of the analytic writing scale (Story Grammar Category, Characterization, Mechanics, Sentence Structure,

Style, and Word Usage)?

4. Will there be qualitative differences in the students' use of story grammar categories in their reading recall protocols and their independent writing samples?

## Significance of the Study

The present study was designed to investigate the nature of the reading-writing relationship in light of the recent psycholinguistic research on text analysis and comprehension. An emerging trend toward viewing language arts instruction and assessment as an integrated entity, combined with recent research seeking to define the reader's comprehension of text as a constructive process have suggested a need for further study of the reading-writing relationship.

Currently, Manitoba teachers are guided by curricula stipulating that the language arts should be taught in a holistic manner. Further, a nationwide trend is emerging in which writing is assessed along with reading when judging communicative competence (Galda, 1982). Practising teachers would be greatly assisted by knowing how reading and writing interact. There has been a great deal of research reported on facilitating reading performance complemented with a growing body of research on the

writing process on the reader's schema for stories, and on text analysis. A minimal amount of research pointing out the causal relationships among the language arts areas was found in the literature. The present study sought to further define the interrelationships between the reading and writing processes considering the reader, writer, text and competence variables.

Further support for this study comes from the needs suggested in previous research. Hammill and McNutt (1981) cited the need for research in defining more precisely the nature of the reading-writing relationship. In addition, Stotsky (1983) pointed to a need for research studying these two language acts beyond the mere measurement of syntactic level to consider other variables affecting writing performance. In relation to reading comprehension, a number of researchers have raised questions regarding assessment methods. The recent work of Rossnagel (1984) has raised concerns as to the effectiveness of questions asked in informal reading inventories. That is, it appears that what is presently accepted as a valid comprehension assessment may be merely reflecting those aspects of comprehension deemed important by the inventory authors rather than a true representation of a generalizable domain of comprehension. Added to this, Gordon (1985) has suggested that answering inferential questions may require the reader to actively construct meaning from text whereby

both textual information and reader's schema are integrated in formulating responses. Both claims need further study. Furthermore, Tierney and Cunningham (1980) have suggested that there is a scarcity of research into effective questioning linked to a model of text or a model of reading.

Moreover, the emergence of formal models of text structure (Mandler & Johnson, 1977; Thorndyke, 1977; van Dijk, 1977), and the assumption that such a structure has a psychological counterpart (schema) existing in the reader's mind (Bower, 1976; Chodos & Mosenthal, 1978), provided a framework for researching the nature of text comprehension, as well as text production. Finally, this study sought to outline what constitutes acceptable narrative writing at a time when 'intuitive judgement' remains the prevailing measure of writing ability (Diederich, 1974).

## Theoretical Framework

Analysis of children's ability to recall an ideally structured narrative after reading may reveal the knowledge of an appropriate story schema which, in turn, may be reflected in the ability to produce well structured (qualitative) writing of narrative text. The assumptions underlying the proposed relationship of reading and writing processes are based on

theories of cognitive psychology regarding text structures and psycholinguistic theories of reading and writing.

Psychologists have proposed that the learner is an active agent constructing meaning from text to be encoded and recalled (Bartlett, 1932; Commission on Reading, 1985). Researchers have proposed various representations of text structures and story grammars along with the generation of rules which defined an ideal story based on those structures most likely to be encoded and recalled by the recipient (Kintsch, 1977; Mandler & Johnson, 1977; Meyer 1977; Rumelhart, 1975; van Dijk, 1977). Furthermore, it has been suggested that children develop an internal story schema comparable to the idealized text structure. This schema is activated when attempting to construct meaning from text.

Psycholinguists have similarly argued that reading involves the reader bringing meaning to the text. Goodman (1970) and Pearson and Johnson (1978) described reading as an interactive process whereby the reader actively constructs meaning from what is printed in the text. In a parallel vein, Britton, Burgess, Martin, McLeod and Rosen (1975) and Applebee (1981) have defined writing as a constructive process which involves the writer seeking to encode and communicate meaning. Mosenthal (1983) further suggested that the structure and content of a writer's

schema are reflected in the very structure and content of what a writer writes. Not only has theory drawn reading and writing together due to a comparable constructive processing base, but it has extended the analysis of text structure so as to outline a processing model for comprehension and production of text.

A second theoretical assumption that must be addressed in this study involves the dilemma of measuring students' performance in hope that their competence is represented by that performance. That is, it is possible to measure the subjects' use of story grammar through calculation and analysis of propositions recalled in reading protocols and produced in independent writing samples. Story schema, however, can only be inferred from the students' performance on the dependent measures used in this study. For the purpose of this study, it is assumed that story grammar components observed in text produced and recalled reflects the student's story schema.

## Definition of Terms

Comprehension Probe Score - (COMP) The reading comprehension score is the mark a subject obtains on the five inferential questions asked after reading the passages. See Appendix A.iii.

Free Recall Score - (PropR) The reading recall score

represents the total number of propositions recalled by a student after reading the passage. See Appendix A.ii.

Propositions - Idea or pausal units into which text can be segmented. Each unit consists of a single idea unit, includes an independent clause which may have a dependent clause appended and represents the surface structure of text. See Appendix A.ii.

Propositions Produced - The PropP score is the total number of propositions written in the independent writing sample.

Story Grammar - Normally a setting (Set), initiating event (IE), internal response (IR), goal (G), attempt (A), outcome (O), and emphatic ending (E). A proposed model representing those syntactic and semantic structures defined as common to simple stories (Mandler & Johnson, 1977). See Appendix D.

Story Schema - The reader's idealized, internal representation of the parts of a typical story and the relationship among those parts that serve to facilitate both encoding and retrieval of information. (After Mandler & Johnson, 1977).

Syntactic Fluency - Syntactic fluency is represented by the mean T-unit length, the extent of the student's ability to use complex grammatical structures in writing (Hunt, 1977).

Total Reading Score - (PCTOT) The sum of the comprehension probe score (COMP) and the free recall score (PropR) obtained by the student after reading the passage.

Total Writing Score - (TWS) The writing score is a certain mark on the analytic writing scale which serves to represent qualitative, narrative writing. The analytic writing scale was designed by the experimenter (based on the Glazer Scale, 1971). The score represents a total of six components subscores: Story Grammar Category (SGC), Characterization (Char), Mechanics (Mech), Style (Style), Sentence structure (Sents), and Word usage (WordU). See Appendix B.

## Summary

This study was designed to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering story structure of narrative text. The basic rationale for this study was founded on a need to investigate the specific nature of the reading-writing interaction. The recent work of psychologists and psycholinguists have provided the basic theories and methods with which to analyze language-user, text-interaction objectively. Both the reader and

writer have been defined as "creators of meaning" by previous researchers. The need to examine the relationship between these two language acts emanated from curricular demands and previous research findings.

The rationale and theoretical framework for this study has been reported in Chapter 1. Chapter 2 provides a review of the literature. The third chapter describes the experimental design, dependent measures and the statistical procedures used. In Chapter 4, the data is reported and the statistical findings are analyzed. Chapter 5 discusses and summarizes the findings, conclusions, and implications reported in the previous chapter.

# Chapter 2

# REVIEW OF RELATED LITERATURE

## Introduction

The main purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering the story structure of narrative text. The literature suggests that reading and writing are related and that the knowledge of an appropriate story schema facilitates reading comprehension. Therefore, it was hypothesized that the knowledge of narrative story schema may provide a connecting link in the interrelationship between reading and writing. That is, knowledge of an appropriate story schema may not only facilitate reading comprehension, but may also result in superior writing ability. The literature reviewed pertains to the measurements of productive language, the reading-writing relationship and the knowledge of story structure as a factor in reading and writing achievement.

## Measurement of Productive Language

Research relating to the measurement of language has been divided into three sections to include studies concerned with measuring syntactic fluency, studies that attempted to relate syntactic fluency to writing quality and studies that analyzed writing quality.

### The Measurement of Syntactic Fluency

A number of researchers have studied the development of productive language ability by analyzing the syntactic nature of children's language samples. These studies have concluded that syntactic fluency is a valid predictor of productive language ability, is developmental and measurable.

Loban (1963) conducted an extensive language study of 338 children from kindergarten through grade six seeking to examine the relationship between the language processes. As a result of his study, a systematic method for measuring language ability was developed. He found that language samples segmented and analyzed using "communication units" (independent clauses) predicted language development in his subjects over the period of the longitudinal study. Each successive grade showed a gain in the average number of words per unit, as well as an increase in the number of actual units produced.

Seeking to pinpoint which specific measure of syntactic ability best predicted language ability, Hunt (1965) conducted a quantitative study of grammatical structures used by children and adults in their writing. He examined the writings of 18 children at three grade levels: 4, 8, and 12; and compared those samples to the writing of magazine journalists. Of the five indices of syntactic maturity calculated, Hunt reported that T-unit length (minimal terminal unit length) was the best predictor of fluency. He concluded that the T-unit was a valid measure of syntactic maturity.

The findings of O'Donnell, Griffin, and Norris (1967) concurred with Hunt's (1965) findings in that T-units were found to be discriminating indicators of syntactic maturity along the developmental continuum for both oral and written language. O'Donnell, Griffin, and Norris (1967), and Hunt (1970) attested to the generalizability of Hunt's (1965) earlier T-unit findings to a larger, more representative sample of children. Despite the passage of twenty years, Hunt's (1965) procedure for measuring the grammatical complexity of language has endured as a valuable tool to be used by language researchers.

Syntactic Fluency as Related to Writing Quality

Equipped with a guage with which to measure syntactic fluency, language researchers turned their attention to issues regarding the acceleration of syntactic development and the effect syntactic ability had on the other language processes. Studies sought to determine whether language fluency could be improved through instructional intervention and whether growth in syntactic fluency resulted in improved writing quality.

O'Hare (1973) carried out an intervention study with seventh-graders to determine whether syntactic maturity and writing quality would improve as a result of experimental intervention. He found that sentence-combining practise did enhance the syntactic complexity of children's writing. Furthermore, this increased complexity was found to have a positive effect on the quality of the compositions as rated by a forced choice of matched pairs procedure.

Combs (1976) extended O'Hare's (1973) work by adding the dimension of a delayed post-test four months after intervention in order to determine the long-term effect sentence-combining had on writing ability. Delayed post-test results revealed that while the experimental group showed a decline in the use of syntactically complex structures, the difference from the control group remained significant. It was concluded that the treatment

group's writings were more complex syntactically than those of the control group; were more mature after intervention; and were judged superior in quality over those of the control group. Further, the writing quality gains made by the experimental group persisted after an eight week delay.

Seeking to determine the degree of relationship between the gains in syntactic maturity and the gains in writing quality, Faigley (1979) conducted an intervention study aimed at improving the writing quality of college students. After instructing the subjects in generative rhetoric, it was found that the treatment group surpassed the control group on the five measures of syntactic maturity (T-unit length, words per clause, clauses per T-unit, percentage of words in free modifiers, and percentage of T-units with final free modifiers). Furthermore, a holistic method of rating compositions reported a significant gain in quality after treatment for the experimental group, but not for the control group. Multiple regression analysis indicated that the five measures of syntactic maturity, along with total essay length, accounted for 22 percent of the variance in quality scores.

Meanwhile, Stewart and Grobe (1979) studied the results of a province-wide writing assessment program in hope of discovering the relationship between syntactic maturity, mechanics and quality

ratings assigned by teachers. An analysis of variance revealed a progressive increase in syntactic development across the three grades studied (5, 8, and 11). Stepwise regression calculations, however, revealed that spelling errors and essay length constituted the majority of variance accounted for in quality ratings. Further, the only syntactic variable to correlate positively with writing quality was T-unit length at the fifth grade level.

Crowhurst (1983) extensively reviewed the literature relating syntactic fluency and writing quality. Two main conclusions were drawn from the research cited: a) that common measures of syntactic fluency, as T-unit or clause length, were not valid predictors of writing ability, and b) although sentence-combining practise appeared to enhance writing ability, there were variables other than T-unit or clause length which influenced that ability. Crowhurst's review further supported the emerging literature suggesting that variables beyond the syntactic level must be considered in analyzing writing quality. Furthermore, she extended what was already known about syntactic ability and writing quality in two subsequent studies which examined the compositions of students in grades 6, 10, and 12. She found that narrative compositions with low T-unit means were rated superior in quality to those with high T-unit means (Crowhurst, 1980a). In

a second study (Crowhurst, 1980b), syntactically complex argumentative compositions resulted in superior quality ratings while syntactically complex narrative compositions did not result in superior quality ratings. It was concluded that the argument mode maximized the writer's syntactic resources, whereas the narrative mode did not.

## Evaluating Written Compositions

Despite a growing interest in the area of writing, research on written composition remains in a relatively infant state. The literature reviewed here shall trace two emerging trends concerning written composition: a) studies dealing with the assessment of written products, and b) studies dealing with the composing process. A final section shall outline the research seeking to merge the product-process trends.

Braddock, Lloyd-Jones and Schoer (1963) published a summary of the research existing in writing. In their report, they cautioned that there were variables affecting writing performance which had been neglected in previous writing research. They named assignment, environment, cognitive development, student interest and perception of audience as uncontrolled variables which may have influenced previous research findings. Further, they specified methods of assessment, namely general impression,

composition scales,and analytical methods, as discriminating measures of writing performance. Subsequent to Braddock, Lloyd-Jones and Schoer's (1963) report, writing research branched into product assessments and process studies.

Beginning in the late sixties and early seventies, writing studies measuring syntactic fluency came under severe criticism: "This research achieves only simplicity; unfortunately, in its quest for simplicity, it renders the definition of classroom writing competence meaningless" (Mosenthal, 1983:46). The measurement of syntactic fluency in assessing language development was specifically criticized for considering linguistic performance while totally ignoring meaning sources. Consequently, composition researchers sought to develop writing assessments which were both sensitive to task requirements and reflective of composition quality (Cooper, 1975; Diederich, 1974; Glazer, 1971; Stahl, 1974). Details of the writing assessments constructed, along with their shortcomings, were reviewed by Cooper (1975, 1977) and shall not be dealt with here. Further, Cooper (1977) outlined six objectives to be addressed when evaluating growth in students' composition writing: standard language usage, syntactic fluency, writing quality, students' willingness to write, students' valuing of their writing, and the actual writing contributions made.

Bauer (1981) analyzed 120 narrative and descriptive

compositions of high school students to determine the most effective method of written product assessment. She found that of the three methods of scoring studied (Diederich's [1974] Analytic Writing Scale, a holistic general impression rating, and a primary trait rating) the analytic scale proved to be the most reliable method, while the holistic rating was, however, the most time efficient.

While writing researchers continued to call for comprehensive, task sensitive measures for assessing written products (Cooper, 1971; Straw, 1981), process-oriented researchers attacked the analysis of written products as opposed to analysis of the writing process on the grounds that writing is a constructive process and needs to be assessed as such (Applebee, 1980). Consonant with this process view of writing was the emergence of descriptive studies. The process studies appeared to cluster around three main areas: a) the stages of writing within the social context of the classroom, b) error analysis studies, and c) studies which examined the writing process as a part of the greater field of language. The following review shall discuss the studies as related to these three categories.

Graves' (1975) research studied writing behaviors displayed within the classroom situation. Through direct observation, analysis of writing samples, interviewing of eight children, and

an indepth case study on one child, Graves drew a number of conclusions regarding what children did during the composing process. He concluded that: a) the purpose, method, and perspective that a child had for writing was highly individual and reflective of personal characteristics; b) many variables interacted to influence the composing process; c) writing process behaviors were developmental and had a greater impact on the writing process than did the context in which the writing was done. Nonetheless, different classroom environments did result in variance of length, frequency, and nature of written products.

Britton, Burgess, Martin, McLeod, and Rosen (1975) sought to define the nature of the writing process through examination of 212 written products from 500 children ranging in ages from eleven to eighteen years. The researchers analyzed writing from two perspectives: a) the sample's function (expressive, poetic, or transactional); and b) audience (self, teacher, or broader audience), in hope of discovering a developmental trend in children's written language. They found that 90% of the written products were intended for a teacher or examiner audience. Of the minimal writings aimed at a more public audience, the majority were of poetic function and tended to decline with increasing grade level. Transactional writing has overwhelmingly the most frequently engaged in by students from seventh grade upward.

Expressive writing, the mode that these experimenters felt best adapted to self-discovery and inquiry, occupied only 6% of fifth-graders' writings; 4% of seventh-graders' writings, and 2% of twelfth-graders' writings. The argument which claimed that expressive writing is a vehicle for problem-solving and creating meaning from experience was echoed by Martin, D'Arcy, Newton, and Parker (1976) and Applebee (1981).

Martin, D'Arcy, Newton, and Parker (1976) reported that the expressive mode constituted only 5 and 4 percent of fifth and seventh grade writings, respectively. Again, transactional writing comprised the greatest portion of the writing samples. A common thread in the previously mentioned research was that expressive writing offers insight into the writing-thinking relationship. Amiran and Mann (1982) extensively reviewed the research dealing with cognitive factors that affect writing. They concluded that for classroom purposes, writing assessment needs to be direct and mindful of task and writer.

Meanwhile, error-analysis researchers began defining methods of process assessments in writing that would tap the behaviors in which writers engage (Barritt & Kroll, 1978; Duke, 1979; and Kroll & Schafer, 1977). This body of literature suggested that in constructing meaning, the writer often generalized or misused his system of rules. They suggested an error-analysis procedure,

based on miscue analysis in reading (Goodman & Burke, 1972) to detect underlying sources of writing errors.

Applebee (1980, 1981) and King and Rentel (1981) extended the analysis of the writing process so as to examine it within the larger context of language. Applebee (1980) used the terms 'participant' and 'spectator' to differentiate the use of language to exchange and create experience. In further explaining the meaning development and exchange involved in writing, Applebee (1981) proposed that writing involves three distinct stages: pre-writing, writing or discovering meaning, and editing.

King and Rentel (1981) studied 72 childen from kindergarten to grade two over a two year period. Their examination of oral and written compositions revealed that story production improved after instructional intervention emphasizing meaning and providing ample exposure to well-written stories. These researchers concluded that oral language proficiency interacted with growing knowledge of written language resulting in improved writing abilities.

Writing researchers in the 1980's are seeking to draw together what is known about both the writing process and the written product in order to further understand written language abilities. Mosenthal (1983) described a contextual model of writing to consider the setting, writer, situation organization

and material variables when assessing writing performance. He stressed that writing competence was dependent on many variables. Nonetheless, the nature of the writing process remains unclear, and product analysis persists as common method of writing performance assessment (Straw, 1981). Present day researchers continue to speculate that a direct link exists between the written product and the composing process. Furthermore, it may be in the analysis of the written work that the composer's schema becomes apparent (Bereiter & Scardamalia, 1983; Mosenthal, 1983).

In summary, writing research has moved from quantitative measurement of syntactic fluency (Hunt, 1965; Loban, 1963; O'Donnell, Griffin & Norris, 1967) to the comparison of syntactic fluency and writing quality (Combs, 1976; Crowhurst, 1983; Faigley, 1979; O'Hare, 1973; Stewart & Grobe, 1979). Simultaneously, a body of research on measuring writing performance grew from assessing syntactic fluency (Hunt, 1965) to assessing writing products comprehensively for quality while considering variables of task requirement, purpose, and control (Mosenthal, 1983). Although product assessments remained under fire by process-oriented researchers (Applebee, 1981; Graves, 1975), the literature attested to a merging of product-process analysis in order to gain maximum insight into language competence (Mosenthal, 1983; Scardamalia & Bereiter, 1983).

## The Reading-Writing Relationship

The research conducted on the reading-writing relationship remains minimal despite growing bodies of work in both areas when considered as separate entities. An extensive review of the literature was reported by Stotsky (1983). The research reviewed here shall be reported in two sections: correlational studies and studies seeking to relate reading and writing through instructional intervention.

### Correlational Studies

Researchers examining the relationship between reading achievement and writing quality have reported a positive relationship (D'Angelo, 1977; Fischo, 1966; Grobe & Grobe, 1977; Loban, 1963). Loban (1963) undertook an extensive study which examined the interrelationship of the four language arts areas. He reported that upper elementary students with high language ability also had above average reading ability; conversely, those students with low language ability generally were below average readers. Nonetheless, Loban's fourth-grade sample did include a number of good readers/poor writers and poor readers/good writers. These combinations tended to decrease with the passage of five years and he concluded that there was a more definite relationship between reading and writing as children grew older. Grobe and

Grobe (1977) studied college students' writing performance and reading achievement, and reported that the capable writer's reading scores exceeded those of the average writers. Further, the results of a multiple regression calculation found that writing performance attributed to .25 of the reading variation.

Other researchers explored the nature of the reading-writing relationship. Studies emerged in the seventies which examined the syntactic writing abilities as they related to reading achievement. Evanechkco, Ollilia, and Armstrong (1974) found that sixth-graders' syntactic maturity and reading achievement were significantly related. Of the thirteen point scale designed to measure syntactic ability the total number of communication units written appeared to be the best predictor of reading achievement. Results of stepwise regression procedures reported that syntactic maturity accounted for less than .30 variance in reading achievement. Evans (1979) studied grades 8, 12, and college students' ability to write specific syntactic structures and their reading achievement as measured by cloze passages. He found that an inverse relationship existed between reading achievement and written syntactic complexity.

A more recent trend which had emerged in correlational work involved the exploration of the behaviors exhibited during the reading and writing processes. Birnbaum (1981) studied 8 subjects

in grades 4 and 8 during reading and writing sessions and qualitatively rated the students' behavior. It was found that students rated as being efficient in one process, were similarly rated in the other language process measured. Further, the efficient readers/writers had better self-concepts as language processors and were more likely to initiate reading and writing than their less efficient peers.

## Intervention Studies Seeking To Relate Reading and Writing

The research attempting to relate reading and writing through experimental intervention has been divided into two subsections: a) the effects of reading on writing performance, and b) the effects of writing on reading achievement.

a) The effects of reading on writing performance. Research in the mid-sixties and early seventies reported a number of studies exploring the effects that extra reading had on writing performance. Christiansen (1965) studied the effect of reading and writing practise on the writing performance of college freshmen. He found that the experimental group, who received increased writing practise, did not produce compositions superior to the control group's, who received extra reading practise. It was concluded that extra reading was equally beneficial to writing practise in enhancing writing ability. Similarly, DeVries (1970)

reported that fifth-graders who were exposed to extra reading showed greater gains in writing performance than did those students who practised writing. The experimenter concluded that providing extra reading had a more positive influence on writing ability than writing practise did.

While extra reading did appear to enhance writing ability, no such trend was found in the studies which sought to improve writing ability through the teaching of reading skills. Calhoun (1971) taught college students various reading skills in hope of improving their composition skills. The results showed that although the experimental group was more aware of writing styles than the control group, this did not result in improved composition abilities. In the same vein, Maat's (1977) experimental intervention involved reading instruction on discourse processing to increase writing performance. The 40 high school students showed gains in reading comprehension, however, writing ability was not significantly affected.

b) Effects of writing on reading achievement. The effects of writing instruction and practise on reading achievement have followed three major paths. One group of studies investigated the effects of a combined reading/writing approach to reading. A second group of studies sought to enhance syntactic writing ability to improve reading. Thirdly, there was a body of research

which sought to teach skills in text organization in writing to enhance reading recall.

Studies of young children have reported that a writing component added to a conventional reading program did not result in superior writing gains. Smith, Jensen and Dillingofski (1971) studied 436 fourth grade students to determine what the effect of two writing approaches, as opposed to simply reading the passage, had on reading recall. They found no significant difference in reading comprehension or attitude toward reading as a result of intervention. It was concluded that a combined reading/writing approach did not prove to be superior to a straight reading approach when assessing reading recall. Oehlkers (1971) reported similar findings with first-graders who were initially instructed with a language experience approach, followed later in the year by an added writing component, as opposed to children who were taught reading through a "creative writing" technique. Word recognition tests administered after a full year of instruction reported no significant difference between group scores.

A number of researchers explored the reading-writing relationship through manipulation of syntactic abilities. The seventies and early eighties witnessed a number of studies that attempted to improve reading comprehension through instruction and practise in sentence-combining. Straw (1979) reviewed this body

of research and concluded that the findings of these studies remained inconclusive. Nonetheless, he suggested that the nature of the reading assessment was a vital factor in these studies. Specifically, reading comprehension measured by standardized tests reported that the control groups either scored higher or no differently from the sentence-combining experimental groups. Cloze tests used to measure comprehension reported conflicting results, while instruments created specifically for the studies reported that sentence-combining resulted in improved reading comprehension. Straw and Schreiner's (1982) findings supported Straw's (1979) claim when they reported that the sentence-combining group was superior to the control group on all measures of comprehension except the standardized reading test.

A third line of research examined the influence of writing on reading achievement. Kulhavy, Dyer, and Silver (1975) reported that high school students who wrote summaries of textual materials scored significantly higher in recall and comprehension of that material than did their counterparts who either read or underlined the material. Taylor (1980) found that subjects who were instructed to write a one sentence summary after reading a content area passage showed greater recall and comprehension of that passage than did either the group who merely read the passage or the group who responded to questions after reading.

Taylor (1982) continued to investigate this line of research by studying 48 fifth-graders' recall and comprehension of materials after summary writing or responding to questions. Her findings concurred with the earlier research. Summary writers demonstrated greater, as well as more organized, recall than did the subjects who merely answered questions after reading. Reading comprehension, as measured by a short answer test, showed no significant difference between groups. Taylor (1982) reported a second study using a different group of fifth-graders and different materials. The results of this study differed from the results of her earlier study, so a detailed analysis of the data was undertaken. She found that more proficient summarizers displayed better recall for text than did their less proficient counterparts. Moreover, the less successful summarizers used their summaries as effectively as did the more capable subjects, but the less skilled simply did not have good summaries from which to study.

Taylor and Beach (1984) further extended research into the reading-writing relationship by considering the role of text processing on reading and writing ability. They studied 114 seventh-graders to determine whether subjects given instruction

and practise in summarizing text would display superior recall and production of text than those subjects who answered questions after reading the text or those who were given no special instructions to accompany the text. Results reported that the experimental group showed significantly superior recall of familiar text over the other two groups and that they outperformed the control group on holistically rated writing assessments.

In summary, correlational studies have moved from early studies which generally related the two language acts (Grobe & Grobe, 1977; Loban, 1963) to a more specific exploration of the nature of the relationship considering a host of variables as syntax and quality in writing (Evanechko, Ollilia & Armstrong, 1974) and assorted measures of reading achievement ranging from vocabulary tests to cloze procedures (Evans, 1979). The most recent trend in this research was the emergence of "process-oriented" correlational studies (Birnbaum, 1981). The correlational studies attested to a relationship between the two language processes, nonetheless, the nature of that relationship remains evasive.

Intervention studies have reported that extra reading improved writing ability as effectively as as writing instruction (Christensen, 1965; DeVries, 1970). Unfortunately, a combined reading-writing approach did not result in superior comprehension

(Smith, Jensen, & Dillingofsky, 1971), or writing ability (Oehlkers, 1971) over approaches which emphasized a single reading or writing approach to early language instruction. Further, direct reading instruction has not proven superior to writing instruction in improving writing performance (Calhoun, 1971; Maat, 1977). Direct writing instruction, however, had resulted in significant gains in reading recall and comprehension as measured by instruments other than standardized reading tests (Straw, 1979; Straw & Schreiner, 1982). Moreover, instruction and practise in summary writing, as opposed to reading and answering questions, had been found to improve recall and comprehension of text (Kulhavy, Dyer & Silver, 1975; Taylor, 1980). The organizational quality of recall written by the summarization group was superior to the non-summarization group (Taylor, 1982). Furthermore, summary writers produced higher quality written compositions than did the subjects given no special textual instructions (Taylor & Beach, 1984).

## Text Structure

The role of text organization, as it affects reading and recall, shall be dealt with in two separate sections. The first section shall outline the development of formal story grammar

models along with their validation studies. A second section shall consider the effect of text structure instruction on reading and writing.

## Story Grammar Models

Formal story grammar models stem from the early work of Bartlett (1932). In one of his memory studies, Bartlett found that subjects tended to restructure prose passages they had read so as to formulate a condensed, coherent, consequential structure at the expense of detail accuracy. Further, he found that the retellings remained relatively static over time. He alluded to the possibility that the reader used some form of idealized internal scheme to facilitate understanding and retrieval of what had been read.

Some forty years later, a number of researchers began formulating theories and models to outline this "internalized scheme for a story" using the descriptor of story grammar. Rumelhart (1975) proposed and researched one of the first formal story grammar models. His grammar was based on problem-solving schema theory. The setting and episode in his grammar was generally characterized by an event befalling the protagonist, who consequently attempted to attain some related goal through problem-solving actions. Rumelhart (1975) and Thorndyke (1977) validated the reader's use of such structures in both summary and

free recall of reading passages written according to the proposed grammar.

Stein and Glenn (1977) sought to improve on Rumelhart's model by combining the semantic and syntactic relations, providing a number of causal links and revising certain categories so as to accommodate folktales. Glenn (1978) reported a number of studies which supported Stein and Glenn's (1977) story grammar episodes as being the key components in the structure. They found that second-graders recalled event and consequent statements most frequently; and 83% of the subjects met the set criteria for recalling complete episodes regardless of story type or length. A second study reported by Glenn (1978) analyzed second-graders' recall of four stories differing in the number of episodes and the relationship among episodes. The results of the second study supported the major findings of the first study. Further, 62% of the subjects accurately recalled two episode stories. The stories in which one complete episode was temporally followed by a second complete episode were more accurately recalled, however, than the two episode stories in which the episodes were interwoven temporally. It was concluded that a story grammar may serve as an accurate model for processing text whereby the sequence of episodes provides an organizational pattern for comprehension and that the very structure of the grammar dictates the manner in

which the story will be recalled.

Mandler and Johnson (1977) refined Rumelhart's (1975) grammar in an attempt to define the structures contained in stories which permit optimal encoding and recall of information. They called these internalized structures "story schema" and stated that such schema are resultant of a reader's experience with story organization, as well as more global knowledge, including causation and sequencing. The story schema operates in a fashion whereby it focuses reader attention; aids in storing what has gone on before, as well as what is most likely to occur next; and provides the gauge for what can be stored as complete and what should be suspended, pending the arrival of new information.

Mandler and Johnson's grammar consists of categories related by positions within the structure, as well as causally and temporally between each other. They elaborated on the rewrite rules of ideally structured stories (Rumelhart, 1975) by suggesting two transformational rules encompassing deletion and reorganization of categories.

In order to provide evidence for their story schema theory, these researchers conducted a study to clarify the role ideal story structure played in recall. They studied the delayed recall of subjects at grade one, four, and university levels. The analysis of results indicated that adults accurately recalled more

propositions than did fourth-graders, who, in turn, recalled more than did the first-graders. The proportion of nodes recalled were similar across groups, as were the ordering of the nodes. Mandler and Johnson (1977) advanced three conclusions: a) even the youngest subjects were cognizant of story structures, and used a schema to aid in organizing and recalling information; b) well-structured stories resulted in well-organized recall; c) the schemata employed in encoding incoming information was similar but not the same as that activated during recall.

Kintsch (1977) outlined a theory of comprehending stories based on the reciprocity of schema-driven and text-driven processing. He proposed that text could be segmented into propositions which listed coherently, constitute "propositional micro-structures". The overall organization that the reader imposes on the propositions were labelled "macro-structures." Moreover, the reader tends to recall the aspects of the story that he actively processed (provided a macro-structure), which constitutes the general "gist" of the story.

In defining the reader's role in comprehension, Kintsch suggested that the reader brings to the text a set schema about stories encompassing an initiating episode followed by some complication. As the reader proceeds, he chunks the textual events into macro-structures and labels them according to his

previously defined schema. The closeness of the fit between the author's and reader's macro-structures constitutes successful comprehension.

Kintsch reported a number of studies as support for his proposed theory. One such study was conducted by Kintsch and van Dijk (1975) and reported in Kintsch (1977). They conducted a series of experiments on comprehension and story summarization. They reported that subjects took longer to read stories with scrambled paragraphs than stories with ordered paragraphs. Given no time constraints, however, the subjects were able to effectively summarize either type. It was concluded that readers organized and recalled well-structured stories in a predictable way despite the format in which the story was presented.

Results of further research reported that subjects wrote more informative summaries of passages deemed to be consistent with their story schema than for passages that followed an unexpected story schema pattern. Similar results were obtained when the study was extended to include recall. It was concluded that reader's comprehension was affected by the possession of an appropriate schema with which to organize incoming information.

## The Effects of Text Structure Instruction on Reading and Writing Ability

A number of articles emerged in the late seventies and early eighties suggesting that instruction in story grammar improved children's ability to comprehend narrative text (Cunningham & Foster, 1978; Gordon & Braun, 1983; McConaughy, 1980; Whaley, 1981). Unfortunately, there was a scarcity of intervention studies to determine the influence of text structure instruction on reading and writing performance.

Dreher and Singer (1980) taught a fifth-grade treatment group to identify the story structures of three passages. The total number of propositions recalled by the treatment group did not significantly differ from the number recalled by the control group. The researchers questioned the value of teaching children to categorize stories into appropriate structural formats.

Contrary to Dreher and Singer's (1980) findings, Gordon and Braun (1982), and Hansche and Gordon (1983) reported that teaching children to use story grammar resulted in improved recall and comprehension of the story read, as well as improved writing performance. Gordon and Braun (1982) taught fifth-graders to effectively analyze text according to story grammar categories and apply those categories in their creative writing. After treatment, the experimental group recalled significantly more story grammar categories, responded more accurately to

comprehension questions after reading, and produced more structured stories in their writings than did the control group.

Hansche and Gordon (1983) collected and analyzed stories written by 16 good and poor readers in grades 1, 4, 8, and 10 for evidence of internalized story schema. They found that story schema knowledge was developmental in that the first-graders produced only the setting, initiating event and consequence categories in their stories; fourth-graders added the response category; both eighth and twelfth-graders included the final two categories - attempt and reaction. Differences between good and poor readers in the production of categories was significant at the first and twelfth grade levels only.

Positive effects of instruction in recognizing and applying text structures have been reported by researchers using expository materials. Taylor (1982) reported that fifth-graders taught to summarize expository text using the author's organizational structure of headings and subheadings recalled more information than did those students who merely read the same material. Further, Taylor and Beach (1984) found that seventh-graders taught to organize expository text into hierarchical summaries recalled more information about unfamiliar passages and produced more qualitative expository compositions than did their peers who were not taught summary skills. The researchers concluded that

middle-grade students can use text structure to enhance their recall for unfamiliar passages and their production of expository writings.

In summary, the research on formal story grammars emanated from the works of Bartlett (1932) who proposed that a "scheme" was used by the reader to deal with text so as to make that text more comprehensible and retrievable. Story grammarians and cognitive psychologists researched the interactions between reader and text structure in the seventies. Text structures involving processing at the word and sentence level, as well as text dealing with modes other than narration, were not of direct relevance to this study and have not been dealt with here. Reder (1980) extensively reviewed this body of literature.

Researchers of story grammar have outlined two major components which constitute a story: setting and episode. These components can be further segmented into categories which even the youngest readers were aware of and employed to aid in comprehending and recalling text (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1977; Thorndyke, 1977). It had been suggested that certain structures within these components were more readily recalled than others (Rumelhart, 1975; Stein & Glenn, 1977). Furthermore, the nature of the story structure will influence the recall and comprehension of that story in that the

more ideally-structured the story, according to the reader's internalized story schema, the better comprehension and recall was (Mandler & Johnson, 1977).

Finally, cognitive psychologists have formulated a theory of how readers process text to explain the reader-text structure interaction. Kintsch (1977) outlined a theory whereby text can be segmented into "micro-structures" upon which the reader imposes an organizational framework called "macro-structures". It was further suggested that the reader had better recall for text which was actively processed to arrive at a macro-structure than for text for which no such processing had occurred (Kintsch, 1977).

The impact of text structure instruction is just beginning to be researched. In the area of narrative text, Dreher & Singer (1980) reported that recall of text was not influenced by awareness of story grammar. Gordon and Braun (1982) and Hansche and Gordon (1983) disagreed. They found that instruction in story grammar enhanced reading recall, comprehension, and writing abilities. Further, story grammar sense was influenced by age and reading ability. Taylor (1982) and Taylor and Beach (1984) have found that recall of expository text improved through instruction emphasizing text structure. They also found that children taught to use text structure organization showed significant gains in writing quality.

## Summary

Three main bodies of literature were reviewed in this chapter. The research these areas were concerned with included: the measurement of productive language, the reading/writing relationship, and text structure. The present study resulted from the interaction among these three areas of study.

Early studies sought to quantify language productions and were primarily concerned with assessing syntactic fluency (Hunt, 1965; Loban, 1963; O'Donnell, Griffin, & Norris, 1967). After defining a valid measure of syntactic fluency (Hunt, 1965), writing researchers found that syntactic complexity could be improved through instruction and resulted in improved overall writing quality (Combs, 1976; Faigley, 1979; O'Hare, 1973; Stewart & Grobe, 1979). Crowhurst (1983) disputed these findings. She suggested that factors, other than syntactic fluency, were operational in influencing writing quality. Similarly, other researchers insisted that writing assessments were influenced by a number of factors beyond syntactic complexity (Applebee, 1981; Braddock, Lloyd-Jones, & Schoer, 1963; Mosenthal, 1983). With the goal of devising a sensitive, comprehensive writing assessment instrument, product researchers created various measures of writing quality specific to the task requirement (Cooper, 1975; Diederich, 1974; Glazer, 1971; Stahl, 1974).

Subsequently, process researchers studied the writer's behavior when engaged in task and concluded that these behaviors were developmental and individualistic (Applebee, 1981; Graves, 1975; King & Rentel, 1981). The nature of the process was defined in terms of purpose, audience (Britton, Burgess, Martin, McLeod, & Rosen, 1975; Martin, D'Arcy, Newton, & Parker, 1976) and the distinct stages involved in the writing process (Applebee, 1981). It has been the combined process and product studies which have provided optimal insights into written language competency (Graves, 1975; Mosenthal, 1983; Scardamalia & Bereiter, 1983).

Meanwhile, another group of researchers formulated various models and grammars for stories to define the role played by text structure in reading recall and comprehension. Various story grammars were proposed and tested in search of the ideal story structure which would most closely resemble the reader's expectation (schema) for stories (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1977). These structures permitted the systematic segmentation of stories into ideas or propositional units which, in turn, could be arranged into story grammar categories. Intervention studies suggested that teaching children to identify and apply the author's text structure in reading and writing enhanced reading comprehension and writing quality in both narrative and expository text (Gordon & Braun,

1982: Hansche & Gordon, 1983; Taylor, 1982; Taylor & Beach, 1984).

As research began to define various components of quality writing assessments and proposed systematic means of controlling the influence of text structure in reading, greater insights were gained into the reading/writing processes. The findings of early language interaction studies reported conflicting results. The reading assessments used included: cloze tests, standardized tests, and/or instruments specifically created for the study (Combs, 1979; Evans, 1979; Straw & Schreiner, 1982), and free recall (Dyer & Silver, 1975; Taylor, 1980; Taylor, 1982; Taylor & Beach, 1984). The single consistent findings was that writing instruction enhanced reading ability as measured by instruments other than standardized reading tests.

The findings of these three bodies of research have provided the direction for the present study. Research in story grammar enabled the effect of text difficulty to be controlled in this study through the use of "ideally structured" stories. Findings of text structure researchers permitted a systematic means of segmenting this "ideally structured" text into units which can be objectively compared to the reader's recall of text so as to gain insight into the reader's use of story schema. Previous research provided the methods (story grammar, propositional units, analytic

writing scale) for objectively studying the text-language user interaction. These methods have yet to be applied in studying the knowledge of text structure in the reading-writing interrelationship. Heretofore, research looked at the effect of text structure upon reading abilities, but little work had been similarly undertaken to analyze the effect of text structuring in writing. The present study sought to extend what is known regarding the reading-writing relationship using the recently proposed research methods.

# Chapter 3

## DESIGN AND PROCEDURES

The purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering story structure of narrative text. The following main questions were asked:

1. What is the relationship between fourth-graders' reading and writing abilities based on free recall (PropR), comprehension probe (COMP), free recall plus comprehension probe (PCTOT) and analytic writing scale (TWS) scores?

2. What are the effects of ability levels on production of story grammar categories?

a) Will students who are placed in high, average and low ability groups, by their total reading scores (PCTOT) produce different story grammar categories in their independent writings?

b) Will students who are placed in high, average and low ability groups by their total writing scores (TWS) produce different story grammar categories in their independent writings?

3. What are the relationships among writing ability scores (TWS) and the components of the writing scale (SGC, Char, Mech, Sents, Style, and WordU)?

4. Will there be qualitative differences in students' use of

story schema categories in their reading recall protocols (PropR) and their independent writing samples (PropP)?

## The Study

### Subjects

The subjects in this study were 36 fourth-grade students in two classrooms within two schools in a suburban Winnipeg school division. Fourth-grade students were selected for this study because children of this age normally demonstrate a relatively well-developed set of expectations about the nature of stories (Mandler & Johnson, 1977). The subjects represented the total fourth-grade population of the two schools studied except for three students who were not included in this study. Two of the students were absent for more than 75% of the sessions, the third student transferred out of the division before testing was completed.

### Dependent Measures

Dependent measures were specifically designed for this study based on previous research findings. The three measures used included recall analysis (PropR) and comprehension probe questions (COMP) to assess reading ability, and an analytic writing scale (TWS) to assess writing performance.

Recall analysis (PropR). Research suggested that readers selectively process text employing both textual information and their own global knowledge in order to construct meaning from these two sources of input (Kintsch & van Dijk, 1978; Mandler & Johnson, 1977). Through a comparison of the reader's recall of text and the actual passage structure itself, the nature of the reader's organizational methods can be assessed (Tierney & Bridge, 1979). Further, recent research has permitted meaningful and consistent scoring for the presence of story grammar elements (Braun & Gordon, 1983; Mandler & Johnson, 1977; Sadow, 1982). Both free and minimally cued recall responses were incorporated into the recall analysis scores, as minimally cued probes have been found to elicit additional information from both good and poor readers, (Tierney, Bridge & Cera, 1977).

Recall analysis protocols were designed for each of the two reading passages and reflected the number, the surface structure and categorical type of propositions in the reading passages (See Appendix A.ii). Cued recall questions were written according to the model used by Goodman and Burke (1972).

The recall analysis scores obtained by subjects could have ranged from zero to 31. The total number of propositions recalled was divided by two (as there were two passages read by each subject) to arrive at a PropR score for each subject. The PropR

score was used in answering research questions one, two, and four.

Comprehension probe questions (COMP). Open ended probe questions have long been recognized as valid measures for assessing reading comprehension (Betts, 1946; Goodman & Burke, 1972; Johnson & Kress, 1965). It has been suggested that additional information about readers' comprehension ability may be elicited through questions seeking a different perspective beyond what had been freely recalled (Anderson & Pichert, 1977). In addition, responding to probes required processing of information beyond the encoding phase (Gordon, 1985; Johnston, 1983). Rossnagel (1984) pointed out the importance of balancing textually explicit and implicit questions in assessment instruments when attempting to make valid comparisons about children's comprehension abilities. Therefore, a uniform set of questions (following Goodman & Burke, 1972; Tuinman, 1971; and Valmont, 1972), requiring textually implicit responses (Raphael & Pearson, 1984) have been included in the comprehension assessment to complement the information attained through recall analysis (See Appendix A.iii).

The five questions following each reading passage include one question addressing the following skills: vocabulary, causal relationship, character evaluation, main idea and theme. Terms used for the vocabulary questions were equated for difficulty

according to their frequency of usage (Carroll, Davies & Richman, 1971). A scoring template was set prior to data collection (See Appendix A.iii).

The cued recall questions constituted the COMP scores. The scores obtained by each subject could have ranged from zero to 10. The total score was divided by two to arrive at a COMP score for each subject. The COMP score was used in answering general questions one, two, and four.

Analytic writing scale. Various researchers have expressed the importance of using a comprehensive writing assessment sensitive to the task requirement, yet systematic enough to ensure objectivity in scoring (Cooper, 1975; Mosenthal, 1983). Further, it had been suggested that analytic scales are efficient measures of writing ability (Bauer, 1981). Therefore, an analytic writing scale was designed to measure writing quality. The analytic scale used (Appendix B) was a modification and extension of the Glazer Writing Scale (Glazer, 1971). The Glazer Writing Scale included five headings: Plot, Theme, Setting, Characterization, and Style. The scale used in this study included six headings: Story Structure, Characterization, Style, Sentence Structure, Word Usage, and Mechanics. Alterations were made to include a component of story grammar analysis and represent those elements of writing deemed essential for a thorough assessment of writing

ability (Cooper, 1975; Straw, 1981).

The TWS was arrived at through summing the totals of the six components comprising the analytic scale. The components included: Story Structure with a possible score of 8-24; Characterization with a possible score of 1-3; Style with a possible score of 2-6; Sentence Structure with a possible score of 3-9; Word Usage with a possible score of 2-6; and Mechanics with a possible score of 4-12. All component scores were converted to scores having equal weight. Each subject's three stories were rated, totalled, and divided by three to arrive at a single TWS for each subject. The possible TWS ranged from 20-60 points. TWS was used in answering research questions one, two, three, and four.

A detailed scoring guide and a scoring sheet were constructed to ensure objectivity in scoring (See Appendix B). The scoring guide extensively outlined the writing criteria for rating the compositions at each of the points on the three point range, and provided examples to further clarify the criteria.

## Materials

The materials used in this study included two reading passages written by the examiner according to the story grammar outlined by Mandler and Johnson (1977) to represent

"ideally-structured" stories. Both stories contained three episodes embedded within the outcome of the temporally preceding episode. Each story contained structures representing setting, initiating event, internal reaction, goal, attempt, outcome and ending. Both passages were equated for the total number of propositions and both were calculated to be at the end of third-grade level according to the Spache readability formula.

The four pictures used to elicit written language samples were taken from the Photo Stories in the Interaction Series (Moffett, 1973). The subjects in the pilot study selected the 4 pictures from a series of twelve to represent photos that they would like to write about. The stimulus picture used for the initial training session was reproduced on an overhead transparency. The remaining pictures were reproduced, in mass and distributed to each student at the beginning of the writing sessions.

## Method of Data Collection

All the data collection was done by the experimenter over a four week period in the final term of the school year. Reading recall and comprehension data were gathered on an individual basis. Writing samples were gathered within the large group setting of the classroom.

In testing for reading ability, each subject was presented

with the first of the two reading passages, a motivational statement (following Burns & Roe, 1980), and was asked to read the passage silently. The subject was asked for a retelling of the story upon completion of the reading (Ringler & Weber, 1981; and Tierney, Bridge & Cera, 1977). After the retelling was completed, the subject was asked the five comprehension questions (See Outline of Data Collection Procedures in Appendix C). The second passage was similarly presented after a two minute delay during which time the examiner recorded background information and informally talked with the subject. The retellings and comprehension responses were tape recorded, transcribed, and analyzed.

Writing samples were collected over four sessions. The first session served as a pre-writing period to familiarize the subjects with the task requirement. The group was shown a stimulus picture on the overhead projector, and was encouraged to brainstorm ideas about what was happening in the picture. Then, through class participation, the ideas were organized, and one group of related ideas was selected for the basis of a group story. Various subjects were called upon to make a sentence using one of the ideas or extend an idea to create the story. The examiner recorded all brainstormed and organized ideas on the chalkboard. The group story was written on an overhead

transparency as the subjects dictated their sentences. The group story was proofread, sentence by sentence, to correct any errors detected by the subjects. The story was then shared with the classroom teacher along with verbal acknowledgement of the class co-operation in compiling the group story.

The first of the three writing sessions began the next day and the subsequent two sessions followed at weekly intervals. At the beginning of each writing session, each subject was provided with writing materials and a stimulus picture. Instructions were given as to the amount of time that would be given to complete the writings along with a review of the task expectations (following the charted steps from the pre-writing stage), a visual display of the expectations was posted at the front of the room (See Appendix C). Questions were encouraged, and answered prior to and during the writing sessions. Individual words were spelled for subjects, if requested. After a thirty-five minute period, the writings were collected. On two occasions individual subjects requested additional time. Permission was granted while the rest of the group went on to other activities. The writings were duplicated, one copy was returned to the subjects to be shared with interested others. The writing samples were segmented into propositions and analyzed for story grammar categories. They were assessed for quality by three independent raters using the analytic scale. The

writings were also rated for syntactic fluency through T-unit analysis so as to calculate a score for the sentence structure component of the TWS and provide data for the qualitative analysis undertaken in research question four.

## The Pilot Study

A pilot study was undertaken to determine whether sampling, data collection procedures, dependent measures, and materials were appropriate.

The subjects used in the pilot study were six fifth-graders who were identified by the classroom teacher as below average readers. The study was carried out over a three week period. The hypotheses for the pilot study were identical to that of the present study except for the present study's omission of one general question regarding the relationship of syntactic maturity and writing quality. The procedure for both studies was identical. The testing materials remained the same for both studies. The materials used to assess both reading and writing differed somewhat due to operational difficulties which arose during the pilot study. One reading passage remained identical across studies while the second had to be modified to equate the total number of propositions per passage. The picture stimuli used for gathering the writing samples were selected story cards

from the Language Development Program (Science Research Associates, 1970). The analysis of data was limited to simple t-tests of the mean scores (Lathrop, 1969).

The main findings were as follows:

1. The t-tests calculated on individual student's scores indicated that the good fifth-grade comprehenders were not necessarily the good fifth-grade writers.

2. Results of t-test calculations on individual student's free recall scores and total number of propositions produced in their independent writings revealed a significant difference in the recall and production of propositions in the ending and development categories, but not in the setting category.

3. Analysis of t-tests calculated on the students' mean T-unit length (produced in their writing samples) and their overall quality writing score (as measured by the analytic scale) revealed a significant difference.

4. The t-tests calculated on each student's TWS and story grammar category score revealed that good fifth-grade writers were not necessarily the most proficient users of story grammar categories.

5. When t-tests were calculated on the overall TWS and each of the scores for the six components of the TWS, it was found that individual's overall quality scores did not differ significantly

from any of his/her scores on five of the six components (the style score differed significantly from the TWS). That is, fifth-graders who received a high overall writing score also scored well on five of the six components comprising the TWS.

It was concluded that children with below average reading ability may not have fully developed a sense of story schema to a point where it influenced the production of narrative stories. Mandler and Johnson, (1977), suggested that the schema for development and ending categories developed later than did the setting category. Further, Rumelhart, (1975), suggested that it is at the grade four and five level that these story structures fully emerged. Intuitively, it would seem likely that the recall of story schema would precede production of the same and hence would have directly influenced the findings of this study. A second conclusion drawn was that five of the six components of the analytic scale, (including story grammar production), were valid predictors of overall writing quality. Finally, it was suggested that T-unit length was not an accurate predictor of narrative writing quality. Research had suggested that narrative writing may not be the mode most representative of the writer's ability to use syntactically mature structures (Crowhurst, 1983).

As a result of the pilot study, a number of changes were made in the materials, hypotheses, and analysis of data. The reading

passages were equated for total number of propositions after discovering a difference of six propositions between passages. The writing stimuli was replaced with an entirely different set of materials because the nature of the initial pictures was found to be inappropriate for two reasons. Firstly, the picture sets contained a number of characters per story and definitely influenced the number of episodes written per story. Secondly, the very structuredness of the 5 picture sets probably influenced the subjects' story organization. It was decided that one single character within a single photo would result in a story more reflective of the author's internalized story schema. The second main question relating syntactic fluency and writing quality was omitted, as it appeared that the narrative mode was not the most desirable mode with which to compare these two aspects of writing. T-unit analysis was still undertaken to provide a score for the Sents components on the TWS. Finally, it was decided that a more indepth analysis of the data needed to be undertaken to further explore the relationship between the dependent variables. Therefore, correlation, stepwise regression, factor analysis and analysis of variance procedures were selected to analyze the data in the present study.

## Analysis of Data

### Design

This descriptive study was conducted for the purpose of comparing reading protocols and writing samples for evidence of story structure. The sample studied included two complete fourth-grade classes within two suburban Winnipeg schools.

The students' scores were grouped by reading and writing ability for the purposes of answering two general questions posed in the study. The high, average and low ability grouping was determined by dividing the reading scores (PCTOT) into quartiles. The first and fourth quartile represented the high and low ability groups, the second and third quartile represented the average ability students. Similarly, writing ability was determined using the total writing scores (TWS) from the analytic scale.

### Statistical Procedures

The dependent variables were compared through a number of statistical procedures: Pearson Product Moment Correlations were calculated for hypotheses 1.1 to 1.10, and 3.1 to 3.6. A one-way analysis of variance was performed for hypotheses 2.1 and 2.2. Since a significant difference was found between writing ability groups, t-tests were calculated for hypothesis 2.2. Stepwise regression procedures were performed for hypotheses 1.1, and 3.1

to 3.6. A factor analysis was also computed for hypotheses 3.1 to 3.6. The .05 level of significance was selected for the acceptance or rejection of all statistical measures. The Statistical Analysis System V (1985) program was used for data analysis.

## Hypotheses

The four general questions posed, along with the concomitant specific null hypotheses are as follows:

1. What is the relationship between fourth-graders' reading and writing abilities based on free recall (PropR), comprehension probe (COMP), free recall plus comprehension probe (PCTOT), and analytic writing scale scores?

1.1 There is no significant relationship between reading ability, based on PropR, COMP, PCTOT; and writing ability, based on TWS.

1.2 There is no significant relationship between students' ability to recall (PropR) and produce story grammar (PropP) propositions.

1.3 - 1.9 There are no significant relationships between the reading recall protocols and the independent writing samples based on the scores for:

1.3 the setting category (Set)

1.4 the internal response category (IR)

1.5 the goal category (G)

1.6 the attempt category (A)

1.7 the outcome category (O)

1.8 the end category (E)

1.9 the initiating event category (IE)

1.10 There is no significant relationship between reading comprehension scores (COMP) and production of story grammar categories in writing (SGC).

2. What are the effects of ability levels on production of story grammar categories? a) Will students who are placed in high, average and low ability groups by their total reading scores (PCTOT) produce different story grammar categories in their independent writings?

2.1 There is no significant difference in the production of story grammar categories (SGC) written by students within high, average and low ability groups based on their total reading scores (PCTOT).

b) Will students who are placed in high, average and low ability groups by their total writing scores (TWS) produce different story grammar categories in their independent writings?

2.2 There is no significant difference in the production of story grammar categories (SGC) in the writing samples and the

total writing ability scores (TWS) within high, average, and low ability groups based on their total writing scores (TWS).

3. What are the relationships among writing ability scores (TWS) and the components of the analytic scales (SGC, Char, Mech, Sents, Style, and Word U)?

3.1 - 3.6 There are no statistical differences between writing ability scores (TWS) and the analytic scale component scores of:

3.1 Story Grammar (SGC),

3.2 Characterization (Char),

3.3 Sentence structure (Sents),

3.4 Style (Style),

3.5 Word Usage (WordU),

3.6 Mechanics (Mech).

4. Will there be qualitative differences in students' use of story schema categories in their reading recall protocols and their independent writing samples?

## Summary

This chapter described the subjects, dependent measures, materials and methods of data collection for the present study. The procedures for data analysis and specific hypotheses were also presented. The pilot study, which was undertaken to determine

whether the materials, methods and test instruments were operational, was outlined. Changes made due to the findings of the pilot study were described. The findings and statistical analysis will be presented in Chapter 4.

# Chapter 4

## ANALYSIS AND FINDINGS

The purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering story structure of narrative text. Four general questions and their specific hypotheses were outlined in Chapter 3. This chapter shall include these hypotheses along with a discussion of the findings relevant to each hypothesis.

The subjects in this study were 36 fourth-graders drawn from two classrooms which represented the entire grade four population of two schools. Reading comprehension (PCTOT) was assessed by free recall (PropR) and comprehension questions (COMP), following the reading of two passages. Writing quality was assessed with an analytic writing scale (TWS). Three stories were written by each subject.

The findings will be reported according to the four general questions posed along with the accompanying hypotheses. Each hypothesis will be followed by a description of the statistical analysis used and the findings of that analysis.

The data for questions one and three were subjected to Pearson Product Moment Correlation analysis and stepwise

regression procedures. Question three was further analyzed through a factor analysis procedure. Question two was analyzed through a one-way analysis of variance and a simple t-test of means by ability grouping. The fourth question was descriptively analyzed based on comparison of various mean scores. The .05 level of significance was selected for the acceptance or rejection of all statistical measures.

General Question 1

What is the relationship between fourth-graders' reading comprehension and writing ability based on free recall, comprehension probe scores; and analytic writing scale scores?

In answering this question, correlation coefficients were calculated for a) the scores on PropR, COMP and PCTOT and b) the scores of the TWS.

Calculation of correlation coefficients showed that reading comprehension and writing ability were significantly related. When the two measures of reading comprehension (PropR and COMP), were considered individually, as well as jointly, the resulting r showed a significant relationship with the writing ability measure.

Hypothesis 1.1 There is no significant relationship between reading comprehension, based on the total number of propositions

recalled, comprehension probe scores, the combined propositions recalled and probe scores; and writing ability, based on the total writing scale score.

The results of a correlational computation indicated a significant relationship between reading comprehension and writing ability, therefore, the null hypothesis was rejected. There was a significant relationship between all three comprehension measures and the writing ability scores.

Table 4.1

Correlation Coefficients for Total Writing Scores and Reading

| Variable | Mean | S.D. | Minimum Score | Maximum Score | Pearson r | Level of Significance |
|---|---|---|---|---|---|---|
| TWS | 32.08 | 6.4 | 19.0 | 46 | - | |
| PropR | 22.44 | 4.1 | 15 | 29 | .36 | .03 * |
| COMP | 6.92 | 2.0 | 3 | 10 | .45 | .006 * |
| PCTOT | 29.36 | 5.7 | 19 | 39 | .42 | .01 * |

n = 36

* $p < .05$

Table 4.1 indicates that the mean comprehension probe scores were significantly related to the writing scores ($r = .45$; $n =$

36; p = .006). Similarly, the total number of propositions recalled was related to writing at a slightly lower level of significance (r = .36; n = 36; p=.03). When both of these scores were combined, the value of the correlation coefficient remained below the calculated comprehension r (r = .42; n = 36; p=.01).

The results of stepwise regression analysis, Table 4.2, indicated that the only reading score significantly contributing to the variance in writing ability was the COMP score, F(1,35) = 8.73, p=.0057.

Table 4.2

Stepwise Regression for Writing Ability and Predictor Reading Variables

| Step | Variable | $R^2$ | F-Value | Significance | B-Value | S.E. |
|---|---|---|---|---|---|---|
| 1 | COMP | 0.20 | 8.73 | 0.0057 | 1.42 | 0.48 |

No other variables met the .15 significance level for entry into the procedure as specified as minimal value by the SAS program.
n = 36

Hypothesis 1.2 There is no significant relationship between fourth-graders' ability to recall and produce story grammar propositions.

Since the results of the correlation coefficient calculations did not reveal a significant relationship between the ability to recall propositions read and produce propositions in writing, Table 4.3, this hypothesis was accepted. There was no significant relationship between the mean recall scores in reading and the total number of propositions generated in writing. Examination of the correlation coefficient revealed a positive, but nonsignificant relationship between the reading and writing totals ($r = 0.09$; $n = 36$; $p=0.6$).

Table 4.3

Correlation Coefficients for Propositions Recalled and Produced

| Variable | Mean | S.D. | Min. | Max. | $R^2$ | Significance |
|---|---|---|---|---|---|---|
| PropR | 22.44 | 4.08 | 15 | 29 | | |
| | | | | | .09 | 0.6 |
| PropP | 40.64 | 18.35 | 17 | 99 | | |
| n = 36 | | | | | | |

Hypothesis 1.3-1.9 There is no significant relationship between reading recall protocols and writing sample scores based on the following story grammar categories: 1.3) setting, 1.4) initiating event, 1.5) goal, 1.6) attempt, 1.7) outcome, 1.8)

end, 1.9) internal response.

The results of a calculation of correlation coefficients on the seven story grammar categories revealed a significant relationship between recall and production of only one category IR. Therefore, hypotheses 1.3 to 1.8 were rejected. Hypothesis 1.9 was accepted. In analyzing the correlation coefficients, Table 4.4, the mean scores for recall and production of the SET, A, O, and E were not significantly related ($r = .02$, $.06$, $.14$, and $.31$, respectively; $n = 36$). The mean scores for recall and production of the G and IE categories were negatively correlated at a nonsignificant level (goal, $r = -.04$; initiating event, $r = -.15$). The only mean scores that revealed a significant but negative relationship was the recall and production of the IR propositions ($r = -.38$; $n = 36$; $p=.02$).

Table 4.4

Correlation Coefficients for Seven Story Grammar Categories and a Production Task

| Category | Mean | S.D. | Range Min. | | Max. | r | Level of Significance |
|---|---|---|---|---|---|---|---|
| Set-PropR | 3.36 | 0.7 | 2 | - | 4 | .02 | 0.9 |
| Set-PropP | 7.17 | 3.4 | 0 | - | 16 | | |
| IE-PropR | 3.25 | 0.8 | 1 | - | 4 | -0.15 | 0.36 |
| IE-PropP | 9.78 | 7.5 | 1 | - | 45 | | |
| IR-PropR | 2.68 | 0.5 | 1 | - | 3 | -0.38 | 0.02* |
| IR-PropP | 1.36 | 1.5 | 0 | - | 6 | | |
| G-PropR | 1.61 | 0.8 | 0 | - | 3 | -0.05 | 0.79 |
| G-PropP | 1.56 | 1.6 | 0 | - | 7 | | |
| A-PropR | 4.08 | 1.3 | 0 | - | 6 | 0.31 | 0.07 |
| A-PropP | 6.75 | 5.2 | 0 | - | 24 | | |
| O-PropR | 5.22 | 1.4 | 2 | - | 7 | 0.14 | 0.43 |
| O-PropP | 12.56 | 7.3 | 2 | - | 28 | | |
| E-PropR | 2.25 | 0.8 | 0 | - | 3 | 0.05 | 0.74 |
| E-PropP | 1.03 | 1.1 | 0 | - | 4 | | |

N = 36

* $p < .05$

Hypothesis 1.10 There is no significant relationship between fourth-graders' reading comprehension and their production of story grammar categories in writing.

The results of a correlation procedure showed that there was a significant relationship between the subjects' mean reading scores and their mean story grammar category scores based on the story grammar component of the analytic scale. Therefore, the null hypothesis was rejected. Reading comprehension and story grammar production are significantly related ($r = 0.45$; $n = 36$; $p=.006$) see Table 4.5.

Table 4.5

Correlation Coefficient for Reading Comprehension and Story Grammar Production

| Variable | Mean | S.D. | Min. | Max. | r | Level of Significance |
|---|---|---|---|---|---|---|
| Story Grammar Score | 11.31 | 2.5 | 7 | 18 | | |
| | | | | | 0.45 | 0.0059* |
| COMP Score | 6.92 | 2.0 | 3 | 10 | | |

n = 36

* $p < .05$

General Question 2

What are the effects of ability levels on production of story grammar categories? a) Will students who are placed in high, middle, and low ability groups by their reading comprehension scores produce different story grammar categories? b) Will students who are placed in high, middle, and low ability groups by their writing scores produce different story grammar categories?

In answering these questions, the raw scores from the story grammar component of the analytic writing scale and the combined recall and comprehension probe scores were submitted to an analysis of variance. Secondly, the story grammar component of the writing scale and the total raw scores of the analytic scale were submitted to an analysis of variance. These results appear in Table 4.6. Analysis of variance revealed that reading comprehension was not a significant factor affecting story grammar production between ability groups. Writing ability, however, was a significant factor affecting story grammar production. A simple t-test revealed that there was a significant difference between high versus low, and high versus medium groups, but not between medium versus low writing ability groups, Table 4.7 presents the detailed data.

Table 4.6

ANOVA Scores by Ability Groups in Production of Story Grammar Categories

| | Sums of Squares | df | Mean Sq. | F-Value | Level of Significance |
|---|---|---|---|---|---|
| COMP | | | | | |
| Ability Groups | 26.097 | 2 | 13.049 | 2.18 | 0.129 |
| Error | 197.542 | 33 | 5.986 | | |
| TWS | | | | | |
| Ability Groups | 48.509 | 2 | 24.255 | 4.57 | 0.017* |
| Error | 175.129 | 33 | 5.307 | | |

n = 36

*p<.05

Table 4.7

t-Test Scores for Story Grammar Category

Production By Writing Ability Groups

| Grouping | N | Mean SGC | Interaction by Groups | |
|---|---|---|---|---|
| | | | Middle | Low |
| High | 9 | 13 | 2.54** | 1.94* |
| Middle | 20 | 11.2 | - | 1.54 |
| Low | 7 | 9.6 | - | - |

* $p < .05$

** $p < .005$

Hypothesis 2.1 There is no significant difference in the production of story grammar categories written by students within low, middle and high ability groups based on their total reading scores.

The results of an analysis of variance showed that the mean scores of the three groups did not significantly differ, therefore, the null hypothesis was accepted. There was no significant difference between the three reading ability groups in the writing of story grammar categories. Analysis of the F-score, Table 4.6, reveals that $F(1,35) = 2.18$, $p=0.129$.

Hypothesis 2.2 There is no significant difference in the production of story grammar categories in the writing samples and

the total writing ability scores of fourth-grade students within low, middle and high ability groups based on their total writing scores.

An analysis of variance was performed on the mean story grammar scores. Since the results indicated that there was a significant difference in the ability groups' production of story grammar categories, the null hypothesis was rejected. Grouping based on writing ability significantly affected the production of story grammar structures. In considering the analysis of variance scores, (Table 4.6), it was found that $F(1,35) = 4.57$, $p<.05$.

A simple t-test was calculated on the mean story grammar scores for the three groups. The results of this calculation, (Table 4.7), indicated that the high ability writing group significantly differed in story grammar writing ability from both the middle and low ability groups, ($t_{35} = 2.54$, $p<.005$; $t_{35} = 1.94$, $p<.05$ respectively). The middle and low writing ability groups, however, did not differ significantly in their abilities to produce story grammar structures ($t = 1.54$).

General Question 3

What are the relationships between overall writing ability and the components of the analytic writing scale (SGC, Char,

Mech, Sents, Style, and WordU)?

To answer this question, the raw scores of the total analytic writing scale (TWS) were subjected to correlational analysis together with the raw scores of each of the component parts of the scale. The results of this analysis are reported in Table 4.8. A stepwise regression analysis was then undertaken to determine which components accounted for the variance in the writing scores. The results of the regression computation are found in Table 4.9. Table 4.10 presents the results of a factor analysis. Correlation coefficients for the segments of the writing scale indicated a significant relationship, between TWS and each component of the writing scale. Results of the stepwise regression procedure indicated that two segments of the scale significantly affected the total writing quality: mechanics and story grammar. Factor analysis results in the clustering of variables around two factors largely represented by the style and characterization components.

Interrater reliability for scoring of the TWS was .82 according to correlation coefficient calculations. When the Spearman-Brown prophecy formula was calculated, interrater reliability rose to .93 (Mehrens & Lehmann, 1975). Diederich (1974) suggested that a reliability coefficient of .80 was considered adequate in assessing written compositions.

Hypothesis 3.1 - 3.6 There are no statistical relationships between writing ability, as measured by the analytic writing scale and the scores on the components of that scale: 3.1) story grammar, 3.2) characterization, 3.3) sentence structure, 3.4) style, 3.5) word usage and 3.6) mechanics.

Table 4.8

Correlation Matrix for TWS and the 6 Components of the Analytic Writing Scale

| | TWS | Mech | Sents | Style | SGC | Char | WordU |
|---|---|---|---|---|---|---|---|
| TWS | 1.0 | .87 | .86 | .77 | .86 | .52 | .67 |
| Mech | | 1.0 | .72 | .56 | .64 | .47 | .54 |
| Sents | | | 1.0 | .70 | .65 | .40 | .50 |
| Style | | | | 1.0 | .69 | .19 | .46 |
| SGC | | | | | 1.0 | .39 | .59 |
| Char | | | | | | 1.0 | .54 |
| WordU | | | | | | | 1.0 |

n = 36

Note: All r-values are significant beyond the .05 level except the Style-Char, r = .19

Correlation coefficient were computed for the mean scores on the analytic writing scale and the mean scores for all the

categories of that scale. Results of the analysis indicated that all of the six categories showed a significant relationship with the overall writing scores, therefore, all six null hypotheses were rejected. The components of the writing scale were related to the overall writing ability scores.

In examining the correlation coefficients, Table 4.8, the component showing the highest r-value was Mech ($r = 0.87$, $p=0.0001$); followed very closely by SGC ($r = 0.865$, $p=.0001$). The third largest coefficient indicating a positive correlation was Sents ($r = .863$, $p=.0001$), followed by Style ($r = .77$, $p=.0001$). WordU and Char also revealed a significant relationship to total writing ability ($r = .67$; $n = 36$; $p=.001$ and $r = .52$; $n = 36$, $p=.0012$, respectively).

Table 4.9

Stepwise Regression for Writing Ability and the Components of the Analytic Scale

| Step | Variable | R | $R^2$ | Significance | S.E. |
|---|---|---|---|---|---|
| 1 | Mech | .87 | 0.75 | 0.0001 | 3.2060 |
| 2 | SGC | .86 | 0.91 | 0.0001 | 0.1687 |
| 3 | Sents | .86 | 0.95 | 0.0001 | 2.3976 |
| 4 | WordU | .67 | 0.96 | 0.0001 | 2.7561 |
| 5 | Style | .77 | 0.97 | 0.0001 | 2.5795 |
| 6 | Char | .52 | 0.97 | 0.0001 | 2.1828 |

n = 36

$p < .05$

Stepwise regression calculations were undertaken to determine which components of the scale accounted for the majority of variance in the total writing scores and thus best predicted writing ability. Analysis of the stepwise regression scores indicated that the component Mech contributed to the majority of variance in the total writing score ($r^2 = 0.7504$, p=.0001), Table 4.9. The second best predictor of writing ability was SGC ($r^2 = 0.9131$, p=.0001). Sents contributed to 5 percent of the variance ($r^2 = 0.9599$; n = 36; p=.001). The final three components made minor but significant contributions to the variability in the

writing scores: WordU: $r^2$ = 0.9668, p=.0001; Style: $r^2$ = 0.9716, p=.0001; Char: 0.9744, p=.0001.

Table 4.10

Factor Analysis Computed on the Six Variables of the TWS

| | Rotated Factor Pattern (Varimax) | |
|---|---|---|
| | Factor 1 | Factor 2 |
| Style | .88 | .09 |
| Sents | .76 | .35 |
| SGC | .73 | .37 |
| Mech | .63 | .49 |
| Char | .14 | .81 |
| WordU | .45 | .58 |

n = 36

Results of the factor analysis procedure are presented in Table 4.10. The components of the TWS cluster around 2 factors represented best by the component of style and the opposing component of characterization. Due to the small sample in this study, these dimensions may not be stable, therefore the statistical results may be invalid. An analysis of the correlation matrix, Table 4.8, however, support the general

clustering of factors in that a ranking of correlations is apparent with Style, Sents, SGC, and Mech correlating highly; while Char, WordU and Mech, to a lesser extent, are significantly correlated.

General Question 4

Will there be qualitative differences in students' use of story grammar categories in their reading recall protocols and their independent writing samples?

The answer to this question shall be discussed under three headings: reading ability, writing ability and story grammar.

Reading ability. An analysis of the mean scores of the type of story grammar categories recalled by students within high, average and low reading ability (based on COMP scores) was undertaken, Table 4.11. The results indicated that high ability students recalled more propositions than did average ability students, whose scores, in turn, surpassed those of low ability students in the A, O, E and total number of events categories. The average ability means for the IE, IR, and G episodes surpassed the high ability group means, which subsequent exceeded the low ability mean scores in those categories. All groups scored equally well in the Set category.

An examination of the mean number of propositions produced in

writing by the three reading ability groups (Table 4.12) indicated that students of average reading ability produce a greater number of propositions than high ability students, who produced more propositions than low ability students in the categories of IE, IR, O, and total number of propositions produced.

Table 4.11

Propositions Recalled by Reading Ability Grouping

| Group | Set | IE | IR | G | A | O | E | Total |
|---|---|---|---|---|---|---|---|---|
| High | 3.4 | 3.5 | 2.5 | 1.5 | 4.9 | 6.4 | 2.5 | 25.6 |
| Average | 3.4 | 3.5 | 2.7 | 1.8 | 4.1 | 5.1 | 2.4 | 22.8 |
| Low | 3.4 | 2.4 | 2.4 | .9 | 3.0 | 4.3 | 1.6 | 17.9 |
| Total Recalled | 121/144 | 118/144 | 96/108 | 58/108 | 147/252 | 178/252 | 81/108 | 799/1116 |
| Mean (%) | .84 | .82 | .89 | .54 | .59 | .71 | .75 | .72 |

n = 36

Table 4.12

Propositions Produced by Reading Ability Grouping

| Group | Set | IE | IR | G | A | O | E | Total |
|---|---|---|---|---|---|---|---|---|
| High | 5.6 | 7.5 | 1.3 | 1.6 | 8.9 | 13.2 | 1.1 | 34.1 |
| Average | 7.9 | 10.9 | 1.5 | 1.4 | 7.3 | 13.5 | 1.1 | 47.0 |
| Low | 5.7 | 7 | 1.1 | 1.8 | 3.7 | 8.9 | 0.6 | 30.4 |
| Total Produced | 258 | 343 | 47 | 56 | 243 | 442 | 37 | 1463 |
| Mean subject | 7.2 | 9.5 | 1.3 | 1.6 | 6.8 | 12.3 | 1.0 | 40.6 |
| Mean story | 2.4 | 3.2 | 0.4 | 0.5 | 2.3 | 4.1 | .3 | 13.5 |

n = 36

Production of G and IR propositions was very similar across groups (high, G = 1.6, IR = 1.3; average, G = 1.4, IR = 1.5; low, G = 1.8, IR = 1.1). An increase in ability grouping revealed a progression in the mean number of A propositions produced in writing (low = 3.7, average = 7.3, high = 8.9). The average ability group means exceeded the comparable high and low ability means in the production of Set propositions. Both high and average students' mean scores surpassed low ability students' scores in the E category (high = 1.1, average = 1.1, low = 0.6).

Writing ability. The mean writing scores of all the subjects were divided into three groups: high, average and low ability based on the raw scores of the analytic scale. These group means were compared across story grammar categories recalled in reading, Table 4.13; and those produced in writing, Table 4.14.

Table 4.13

Propositions Recalled by Writing Ability Grouping

| Group | Set | IE | IR | G | A | O | E | Total |
|---|---|---|---|---|---|---|---|---|
| High | 3.2 | 3.7 | 2.4 | 1.9 | 3.9 | 6 | 2.9 | 24.9 |
| Average | 4.4 | 4.0 | 3.6 | 2.1 | 5.6 | 6.5 | 2.8 | 27.8 |
| Low | 3.1 | 2.3 | 2.3 | 1.1 | 3.1 | 4.1 | 1.4 | 18.1 |
| n = 36 | | | | | | | | |

Table 4.14

Propositions Produced by Writing Ability Grouping

| Group | Set | IE | IR | G | A | O | E | Total |
|---|---|---|---|---|---|---|---|---|
| High | 6.8 | 8.0 | 1.6 | 0.9 | 5.8 | 9.1 | 1.7 | 37.8 |
| Average | 9.1 | 12.1 | 1.0 | 2.1 | 8.5 | 17 | 0.9 | 48.7 |
| Low | 6.3 | 10.9* | 2.3 | 1.9 | 6.6 | 12.9 | 1.0 | 42.1** |

*One subject produced 45 propositions, without this score, the mean would be 5.2.

**One subject's total number of propositions was 99, without this score the mean would be 32.

n = 36

An analysis of the mean scores revealed that average ability writers recall more propositions than do high ability writers, who subsequently recall more than do low ability writers in all story grammar categories except in the E category, Table 4.13. In the E category, both the high and average mean scores, which are essentially equal, (2.9 and 2.8, respectively) exceed the low group's score (1.4).

An examination of the mean number of propositions produced by the three ability groups indicate that the average ability writing

group produces the most propositions, followed by the low ability group and then the high ability group. This was true for the following story grammar categories: IE, G, A, O and total number of propositions written, Table 4.13. In one category, Set, the average group remained the greatest writer of propositions however, the high ability group outranked the low group (A = 9.1, H = 6.8, L = 6.3). The low group, conversely, produced the greatest number of IR, followed by the high, then average writing ability groups (L = 2.3, H = 1.6, A = 1.0). The average group also produced the least number of E propositions, although similar to the low ability writing group, (A = .09, L = 1.0). The high ability group outranked both groups in this category alone (1.7).

Analysis of T-unit length revealed that the most proficient writers produced an average of 10.7 words per T-unit. The average ability group scored a mean of 7.4 words per T-unit, and the least proficient writer produced an average of 7.6 words per T-unit written.

Story grammar. The mean totals were calculated for each of the seven story grammar categories (in both types recalled and produced), Tables 4.11 and 4.12. The total number of propositions recalled, the total number of possible propositions and the mean number of propositions recalled for each category are reported in Table 4.11. The total number of propositions

written, the mean number of propositions within each category for each subject, and the mean number of propositions within each category per story, are recorded in Table 4.11. The mean number of story grammar episodes was also tabulated, Table 4.14.

An analysis of the mean scores indicated that all story grammar categories were recalled in the following rank order: IR, Set, IE, E, O, A and G, Table 4.10. The mean score for the total number of propositions recalled was 72%.

In considering the mean scores of story grammar propositions produced, Table 4.12, the least number of propositions were written in the E, IR, and G categories, (0.3, 0.4 and 0.5, respectively). The categories containing the greatest number of propositions were, in rank order: O = 4.1, IE = 3.2, Set = 2.4, and A = 2.3. The average number of propositions produced per story was 13.5.

An analysis of the mean number of episodes produced in fourth-grades' stories showed a range from less than one to greater than three episodes per story, Table 4.15. Single episode stories were written by 27% of the subjects, while two episode stories were written by 36%. Thirty-one percent of the students wrote multi-episode stories and the remaining six percent (two low ability writers) produced passages containing no qualifiable episodes.

Table 4.15

Mean Number of Episodes Produced Per Story
by Writing Ability Groups

| Groups | Number of Episodes <1 | 1 | 2 | >3 | Total |
|---|---|---|---|---|---|
| High | 0 | 3 | 4 | 2 | 9 |
| Average | 0 | 6 | 7 | 7 | 20 |
| Low | 2 | 1 | 2 | 2 | 7 |
| Total | 2 | 10 | 13 | 11 | 36 |

## Summary

This chapter briefly outlined the study undertaken and then presented the findings of that study. The findings were reported in response to the four general questions and their accompanying hypotheses posed earlier. A discussion and summary of these findings will appear in the following chapter.

# CHAPTER 5

## SUMMARY AND CONCLUSIONS

The main purpose of this study was to determine whether fourth-graders' reading comprehension and writing ability were significantly interrelated when considering story structure of narrative text. Synthesis of the related research had indicated a positive relationship between reading ability and writing performance. The nature of the relationship, however, remained unclear despite the number of studies conducted in this area (Galda, 1982; Shanahan, 1980; Stotsky, 1983). Meanwhile, the emergence of story grammars (Mandler & Johnson, 1977; Thorndyke, 1977; van Dijk, 1977) and the assumption that the reader possess an internalized counterpart (story schemata), (Bower, 1976; Chodos & Mosenthal, 1978) have permitted further investigation into the nature of the relationship between text comprehension and text production.

Researchers who have studied text structure have suggested that the reader's knowledge of an appropriate schema for text can facilitate comprehension of that text (Chodos & Mosenthal, 1978; Mandler & Johnson, 1977; Meyer, 1977). Moreover, it has been suggested that the knowledge of an appropriate story schema may also affect writing performance (Gordon & Braun, 1983; Mosenthal,

1983; Taylor & Beach, 1984). Therefore, it has been hypothesized that the nature of the reading-writing relationship may be specifically defined through the consideration of the story structure found in these two language acts.

The following main questions were asked in this study:

1. What is the relationship between fourth-graders' reading and writing abilities based on free recall (PropR), comprehension probe (COMP), free recall plus comprehension probe (PCTOT) and analytic writing scale (TWS) scores?

2. What are the effects of ability levels on production of story grammar categories? a) Will students who are placed in high, average, and low ability groups by their total reading scores (PCTOT) produce different story grammar categories in their independent writings? b) Will students who are placed in high, average, and low ability groups by their total writing scores (TWS) produce different story grammar categories in their independent writings?

3. What are the relationships among overall writing ability scores (TWS) and the components of the analytic writing scale (SGC, Char, Mech, Sents, Style, and Wordu)?

4. Will there be qualitative differences in students' use of story grammar categories in their reading recall protocols and their independent writing samples?

## Summary of the Design

The subjects in this study were 36 fourth-grade students from two schools in the same suburban school division in Winnipeg, Manitoba, Canada. All the students comprising the fourth-grade population within the two participating schools were included in the study.

Testing instruments were designed to assess each subject's reading ability and writing performance. The reading assessment consisted of two short passages written according to story grammar rules to represent ideally-structured stories (Mandler & Johnson, 1977). The subjects read each passage silently, retold the story to the examiner, and verbally responded to five inferential questions about the passage. The retellings were transcribed and analyzed for presence or absence of propositional units appearing in the story. The propositions recalled were categorized according to story grammar structures. The results of the two passages were averaged to form a single score for each subject.

The writing samples were rated for quality using a three-point analytic scale created by the investigator. Each subject was asked to write three stories from stimulus pictures. The three writing samples collected from each subject were segmented into propositional units and T-units. The propositions were classified according to their corresponding story grammar

categories, and the categories were further analyzed for total number of episodes and ordering of the episodes. Average T-unit length was tabulated for inclusion in the sentence structure component of the writing scale. The three writing sample scores for each subject were averaged to arrive at a single representative score per student.

The results were analyzed using five statistical procedures: correlation, stepwise regression, analysis of variance, factor analysis, and t-tests. The SAS-V (1985) program was used to analyze the data.

## Summary of Findings and Conclusions

The findings and conclusions are summarized as follows:

1. Correlation calculations indicated that reading ability and writing performance were significantly related. All three measures of reading ability: total number of propositions recalled (PropR), comprehension probe scores (COMP), and propositions recalled combined with comprehension scores (PCTOT) correlated at a statistically significant level with total writing performance (TWS). Comprehension probe scores indicated the highest relationship. Further, the results of stepwise regression procedures revealed that comprehension probe scores alone contributed significantly to the writing score variance. It was

concluded that of the three measures of reading ability, inferential probe questions were the most valid predictions of writing quality. Propositions recalled also proved to be valid predictors of writing quality, but not to the degree that the inferential probes were.

2. There was no significant relationship between the total number of propositions recalled in reading protocols and the total number of propositions produced in independent writings. These findings suggested that better readers did recall more propositions than did the less proficient readers. High ability writers, however, wrote shorter stories, and therefore used less propositions than did both average and low ability writers. This was apparent through a qualitative analysis of the data after an analysis of variance resulted in a statistically nonsignificant relationship.

3. Correlation coefficients calculated among the seven story grammar categories (setting, initiating event, internal response, goal, attempt, outcome and end) in the reading recall protocols and writing samples revealed that only the "internal reaction" category showed a significant, negative correlation. The remaining six categories were not statistically related. It was concluded that the ability to recall story grammar categories in reading did not necessarily indicate a similar ability to produce

reciprocal categories in writing. Previous research had indicated that the use of an intact story schema to aid in recalling information was firmly in place by fourth grade (Mandler & Johnson, 1977). On the other hand, only select categories of the schema were apparent in fourth-graders' independent writings (Hansche & Gordon, 1983). Fourth-graders' ability to apply story schema in aiding recall of information preceded their ability to apply that schema to enhance their independent writing.

4. There was a significant relationship between reading comprehension scores as measured by inferential questions and the story grammar scores on the writing scale. Therefore, it would appear that the ability to answer inferential questions was a valid predictor of students' use of story grammar elements in their independent writing.

5. Analysis of variance did not indicate a significant interaction between story grammar scores (SGS), comprehension probe scores (COMP), and reading ability. The same measures did show a significant difference between writing ability groups. Further, t-test results showed a significant difference between high and average writing groups, as well as between high and low writing groups. It was concluded that the use of story structure has fully emerged in its influence of reading ability by fourth-grade level despite differing reading abilities. Written

production, however, did not reveal the use of a fully developed story structure at this level. Less proficient writers have yet to develop their schema so as to produce well-structured narratives in their writings.

6. The six components of the writing scale (story grammar category, characterization, style, sentence structure, word usage and mechanics) were all significantly correlated with the overall writing quality scores. According to correlation calculations, the best predictors of writing ability were as follows, from highest to lowest: "mechanics", "story grammar", "sentence structure", "style", "word usage" and "characterization". Results of stepwise regression calculations revealed that "mechanics" and "story grammar" accounted for .91 of the variance in the overall writing scores. Results of a factor analysis, however, indicated that two separate factors were being measured by the writing scale. Those factors were best represented by the "style" and "characterization" components of the scale. It was concluded that while "mechanics" and "story grammar" account for much of the variation in writing quality, quality writing scores can best be predicted by assessing "style" and "characterization".

7. A qualitative analysis revealed that:

a) Proficient readers who scored high on inferential probes generally recalled more propositions per category than did the

average and low ability readers. Conversely, the average ability readers wrote longer stories than did both high and low ability readers. Similarly, the average ability writers, based on total writing scores, recalled and produced a greater number of propositions than did the most and least proficient writers. The most proficient writers, wrote more syntactically complex sentences than did the average and less proficient writers (average T-unit length: high ability writers, = 10.7; average ability = 7.4; low ability = 7.6).

b) The story grammar categories were recalled in the following order, from high to low: "internal response", "setting", "initiating event", "end", "outcome", "attempt" and "goal". Categories most frequently used in the writing samples ranged from: "outcome", "initiating event", "setting", "attempt", "goal", "internal response" and "end". The mean number of categories produced by all groups in their independent writings revealed that "internal response", "goal", "attempt" and "end" structures appeared less than once per story.

It was concluded that good readers and good writers, as assessed by the number of propositions recalled in reading and produced in writing samples, are not necessarily one and the same. Further, fourth-graders apparently used an internalized story schema, with varying levels of success, to aid in recalling and

producing text.

## Discussion

The findings and conclusions of this study need to be considered within the context of previous research findings. Furthermore, factors which may have influenced the findings of this study need to be addressed at this time.

Previous research had concluded that reading and writing performance are generally related (Shanahan, 1980; Stotsky, 1983). The results of this study support this conclusion and further define the nature of the relationship. The relationship between reading and writing may be more definitive when the level of processing required by the two language acts are similar. That is, Kintsch (1977) reported that forming "macrostructures" involved in-depth processing of text and resulted in increased comprehension and recall of that information. Similarly, inferential questions would demand a higher level of processing than simpler recall tasks. Further, it has been previously suggested that structure in productive writing emerges later than does structure in story recall. Therefore, it is probable that the inferential abilities and story structure production in writing may be related due to comparable levels of processing demands made of the language user. This suggests possible

research implications in that future studies of language relationships need to ensure that the task requirements demand similar levels of information processing. Previous studies of reading and writing may have mismatched task requirements (i.e. recall, recognition, comprehension, etc.) in assessment instruments (Evans, 1979; Loban, 1963; Taylor, 1982). Results of these studies may have been different had the processing demands required by the dependent measures been controlled.

A second variable which may have contributed to the findings of this study involves the theory that story schema is developmental. Mandler and Johnson (1977) suggested that first-graders were able to effectively use their story schema to aid information recall. Hansche and Gordon (1983), however, reported that it wasn't until eighth-grade that students used a fully developed story schema to enhance the production of narrative stories. The results of this study indicated that fourth-grade students recalled events from every story grammar category in their recall protocols, however, they did not produce events for all categories in their independent writings. It would appear that the use of story schema in recalling information emerges well in advance of producing story structure elements in writing.

The findings of this study question whether recalling the

greatest number of propositions in reading and producing the greatest number of propositions in writing are indicative of superior reading and writing abilities. Average ability writers recalled and produced more propositions than did the above average writers. The syntactic complexity of the average and low ability groups were essentially equal while their more efficient counterparts produced text with an average of 3 more words per T-unit. It is conceivable that efficient writers attend to the overall structure and "gist" of the story while omitting minor details. The average writers may have been overattending to details at the expense of overall structure. This suggestion is supported by the high number of event propositions ("initiating events", "outcome" and "attempt" categories) found in average writer's compositions. Stories of this type were frequently characterized by a listing of events rather than a cohesive structuring of relating events.

Writing quality, as assessed in this study, appears to be best predicted by two dimensions: "style" and "characterization". It would appear that "style" along with "sentence structure", "story grammar category", and to a lesser extent, "mechanics", are measuring abilities different from "characterization", "word usage", and, to a certain degree, "mechanics". The "style" cluster seems to be mainly concerned with the learned conventions

associated with writing quality. That is, the function of conventions such as title, organization, sentence variety, cohesive devices and mechanics and overall quality of written products appear to be a common factor in this cluster of writing components. "Characterization" and its related components, however, appear to be assessing the writer's ability to use vocabulary effectively in communication. Therefore, it is suggested that writing assessments need to measure vocabulary development and use of writing conventions, at minimum, when drawing conclusions about writing quality.

Finally, it would appear that fourth-graders use their knowledge of an internalized story schema to direct reading recall as well as writing performance. High ability readers and writers use their schema to direct reading and writing in a similar manner, as evidenced by a comparison of mean propositions recalled and produced per story grammar category (Tables 4.11 to 4.14). It may well be that less proficient writers have not fully developed the ability to incorporate all components of their internalized schema in their independent writings. Future research needs to investigate whether instructional intervention could overcome this lack of structure.

## Limitations

Some of the limitations of this study are as follows:

1. The writing assessment created for this study did not include a number of variables which have been shown to affect writing performance. Mosenthal (1983) suggested that audience, teacher influence and social context influence writing ability. Unfortunately, the nature of this study did not allow for these factors to be controlled.

2. The sample studied was small and isolated to one residential area within a single school division. The results of this study are generalizable only to similar populations.

3. The reading passages were written and structured for this study and hence may not be representative of regular classroom reading tasks.

4. The story grammar used to analyze the reading passages and writing samples may not be generalizable to more complex text. The findings are limited to the materials used in this study.

5. The picture stimuli may have influenced the subjects' writings in that only one character was depicted per illustration. In reality, students may not limit their stories to a single protagonist.

6. The use of story schema can only be inferred as a significant factor influencing reading and writing ability.

Knowledge of story grammar was found to be a factor contributing to reading and writing performance. The existence and role of story schema, however, remains an unmeasurable entity. Other factors, not considered in this study, may also have affected the outcome.

7. This study was limited to measuring language products, as opposed to the actual processes involved in reading and writing. The rationale for studying the writing product emanated from Bereiter and Scardamalia's (1983) suggestion that a direct link exists between the language product and process, and that text analysis can provide valuable insights into the process of composing.

## Implications for Future Research

The results of this study indicate a number of avenues for future research:

1. Much could be learned from adding a process component to the product measure used in this study. An analysis of reading and writing behaviors may further define the role of story schema knowledge in the reading-writing relationship.

2. Intervention studies need to be conducted to determine whether story schema knowledge is affected by direct instruction following the direction taken by Gordon & Braun (1982), and Hansche & Gordon (1983).

3. The study of subjects with varied reading and writing abilities may reveal more precisely the impact of story schema knowledge on written language production.

4. Future research needs to address questions raised regarding the level of processing required by the various language arts tasks. The work of Taylor and Beach (1984), focusing on summary writing of expository material could be extended to narrative material using Kintch's (1977) "macro-structure" formation to compare reading and writing performance.

## Classroom Implications

A number of classroom implications can be drawn based on the findings of the present study:

1. Instruction in text structure organization, specifically story grammar elements, may be of value to middle grade students. This type of instruction may enhance reading and writing performance. This may be of greatest benefit to the less proficient readers and writers.

2. Writing performance assessments need to consider a number of variables. Narrative writing assessments must measure vocabulary usage and knowledge of writing conventions, at minimum, in order to formulate an accurate picture about students' writing

quality.

3. Middle grade teachers could enhance direct writing instruction through incorporating objectives addressing the importance of both word usage and writing conventions in independent writing.

4. Since reading and writing have a shared basis of language, educators need to ensure that integrated teaching approaches are used in language arts instruction.

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# APPENDIX A

## Reading Materials

A. i) Passage A

ii) Proposition Breakdown and Recall Record

iii) Comprehension Check

B. i) Passage B

ii) Proposition Breakdown and Recall Record

iii) Comprehension Check

PASSAGE A

There was once a boy named Tim who went to live in a strange, new city. Tim didn't like his new home and he hated his new room because it had a big, dark closet. He would wake up at night thinking that he could see the closet door slowly opening. He wished he could find some way to feel confident that nothing would come out of that closet and hurt him while he slept. He tried to sleep with the lights on to see if that door was really opening in the middle of the night. But that didn't help because the light kept him awake all night. One evening Tim found a small, shiny bell. He picked up the bell and ran to his room. He tied the bell around the closet door handle. Now he would hear that door opening. From then on, Tim slept very well.

PASSAGE A, Propositions and Recall Record

| | | | Uncued | Cued | |
|---|---|---|---|---|---|
| S | 1. | There was once a boy named Tim. | __ | __ | Who was this story about? |
| S | 2. | Who went to live in a strange, new city. | __ | __ | Where did this story take place? |
| IR | 3. | Tim didn't like his new home. | __ | __ | How did Tim feel about his new home? |
| IR | 4. | And he hated his new room because it had a big, dark closet. | __ | __ | How did Tim feel about his new room? Why? |
| IE | 5. | He would wake up at night thinking that he could see the closet door slowly opening. | __ | __ | What was Tim's problem? |
| G | 6. | He wished he could find some way to feel confident that nothing could come out of the closet. | __ | __ | What did he wish he could do? |
| G | 7. | And hurt him while he slept. | __ | __ | What did Tim think would happen if the door opened? |
| A | 8. | He tried to sleep with the lights on to see if that door was really opening in the middle of the night. | __ | __ | How did Tim try to solve his problem? |
| O | 9. | But that didn't help because the lights kept him awake all night. | __ | __ | Did his solution work? Why not? |
| IE | 10. | One evening Tim found a small, shiny bell. | __ | __ | What did Tim find? |

| | | | |
|---|---|---|---|
| A | 11. He picked up the bell | __ __ | Name 3 things Tim did after he found the bell? |
| A | 12. And ran to his room. | __ __ | |
| A | 13. He tied the bell around the closet door handle. | __ __ | |
| O | 14. Now he would hear that door opening. | __ __ | How did the bell solve Tim's problems? |
| E | 15. From then on, Tim slept very well. | __ __ | How did the story end? |

COMPREHENSION CHECK - PASSAGE A

1. WHAT WOULD BE A GOOD TITLE FOR THIS STORY?
   (Main idea - the title should suggest the main idea of the story. Eg. Tim's Closet, Tim Solves a Problem, A Scary Problem...).

2. WHY DID TIM FEEL BETTER AFTER TYING THE BELL TO THE DOOR HANDLE? (Cause - effect, Answer should connect the bell ringing to Tim's need for assurance that the closet wasn't opening and/or if the door did open, that he could somehow escape harm).

3. WHAT DOES THE WORD 'CONFIDENT' MEAN?
   (Vocabulary - to be sure of oneself - certain of one's ability).

4. WHAT IS THIS STORY TRYING TO TEACH US?
   (Theme - the answer should suggest some general moral related to the story. Eg. Don't be afraid of the dark. All problems can be overcome).

5. DO YOU THINK THAT TIM WAS A BRAVE BOY? WHY OR WHY NOT?
   (Characterization - either yes or no is acceptable provided that the answer is backed up with reasonable evidence from the story).

PASSAGE B

Sam was an old brown bear who loved to eat honey. As he walked through the fields one morning, he came upon a farmer's beehive. The smell of the sweet honey made him feel very hungry. He decided that he wanted honey for his breakfast. So, Sam hit one of the hives with his big paw. The bees all swarmed about, but no honey came out of the hive. So, he jammed his paw into the little doorway in the hive. Sam had to push really hard to get his paw into the hive. But, when he tried to pull his paw out for a lick of honey, he found that the hive was stuck tight to his paw. Poor Sam had to go back home dragging the hive with him. Old Sam was not only hungry, but he also had a very sore paw.

PASSAGE B, Propositions and Recall Record

| | | | | |
|---|---|---|---|---|
| S | 1. | Sam was an old brown bear | ___ ___ | Who was in this story? |
| S | 2. | who loved to eat honey. | ___ ___ | Tell me about him. |
| IE | 3. | As he walked through the fields one morning | ___ ___ | Where was Sam walking? |
| IE | 4. | he came upon a farmer's beehive. | ___ ___ | What did he find? |
| IR | 5. | The smell of the sweet honey made him feel very hungry. | ___ ___ | How did the honey make him feel? |
| G | 6. | He decided that he wanted honey for his breakfast. | ___ ___ | What did he decide to do when he smelled the honey? |
| A | 7. | So, Sam hit one of the hives with his big paw. | ___ ___ | How did Sam try to get the honey? |
| O | 8. | The bees all swarmed about, | ___ ___ | What 2 things that happened when he hit the hive |
| O | 9. | but no honey came out of the hive. | ___ ___ | |
| A | 10. | So, he jammed his paw into the little doorway in the hive. | ___ ___ | Then how did Sam try to get the honey? |
| A | 11. | Sam had to push really hard to get his paw into the hive. | ___ ___ | Tell how Sam got his paw into the hive. |
| O | 12. | But, when he tried to pull his paw out for a lick of honey, | ___ ___ | Name two things that happened after he got his paw into the hive. |
| O | 13. | he found that the hive was stuck tight to his paw. | ___ ___ | |
| O | 14. | Poor Sam had to go back home dragging the hive with him. | ___ ___ | What happened after he couldn't get his paw out? |

| | | | |
|---|---|---|---|
| E | 15. Old Sam was not only hungry, | ___ ___ | How did Sam feel at the end of the story? |
| E | 16. But, he also had a very sore paw. | ___ ___ | |

COMPREHENSION CHECK - PASSAGE B

1. WHAT WOULD BE A GOOD TITLE FOR THIS STORY?

   (The title should specifically suggest the main idea of the story. Eg. Sam Gets No Breakfast, Sam and the Beehive...).

2. WHY DID SAM HAVE A SORE PAW?

   (Cause - effect, the answer should relate the sore paw to either Sam's forcing of his paw into a space too small for it and/or the bees stinging his paw when it was stuck in the hive).

3. WHAT DOES THE WORD SWARMED MEAN?

   (Vocabulary - to fly in large numbers).

4. WHAT WAS THIS STORY TRYING TO TEACH US?

   (Emphatic ending/theme - the answer should suggest some general moral related to this story. Eg. Don't take what's not yours. Don't stick your hand where it doesn't belong...).

5. DO YOU THINK SAM WAS GREEDY? WHY OR WHY NOT?

   (Characterization - either yes or no is acceptable provided the evaluation is backed up with reasonable evidence from the story).

# APPENDIX B

## Writing Assessment

A. Detailed Guidelines for Scoring Writing Samples

B. Analytic Scale Scoring Sheet

## Guidelines for Scoring Analytic Writing Scale

I Story Structure

A. Setting

1. Protagonist indicated in general.
2. Protagonist, time and place are given specifically.
3. Protagonist, time and place are given in descriptive terms, as well as information the reader needs to understand the events that follow.

B. Episode

i) Beginning

1. Beginning includes some general action on the protagonist's part.
2. Beginning specifies some initiating event and generally alludes to the relationship with the protagonist.
3. Beginning specifies a definite initiating event causing some internal reaction (be it simple or complex; inferred or stated).

ii) Development

1. Simple, unimaginative sequence of events with some general indication of a goal and outcome.
2. Events are structured in such a way as to indicate

either an inferred or stated internal reaction on protagonist's part, some form of attempt to reach a given goal (which may be synonymous with internal reaction) and a definite outcome. There is some cause and effect relationship between an attempt and outcome.

3. All events in the episode are clearly connected by causation; there is a definitely stated goal, at least one attempt and a definite outcome. There may be evidence of embedding of event structures.

iii) Ending

1. Lacks closure.

   Lack of reasoning for specific ending.

   Trite ending. Relates only to immediately preceding event.

2. Ending is related to the development of the whole story. Wraps up the story.

3. Ending follows logically from the story. Ending is emphatic and wraps up the story with a flourish. May resemble a moral.

C. Cohesion

1. Story lacks coherence.

   Events told in sequence, but without a cause and effect relationship.

   Unexplained conflict in the logic of the story.

2. Events are related logically, temporally and some evidence of cause and effect.

3. Events and/or episodes of the story are clearly related by cause and effect relationship.

   Embedded event and episode structures are clearly marked with cohesive devices.

D. Ordering of Grammar Categories

1. Nodes out of acceptable order (ie. not following setting, initiating event, attempt, outcome, ending order).

   No marking to indicate a change of order.

2. Some reordering of nodes, but order is marked with explicit statements (eg. flashbacks). All basic structures present: setting, beginning (may be omitted in repeated episodes), development and ending.

3. All nodes are present in the ideal order.

E. Number of Episodes

1. Story contains many episodes (characterized by change in protagonist and/or change in goal pattern) which are not causally or temporally marked in the story.

2. Story contains more than one episode which is temporary related with the use of 'then'.

3. Story contains a single episode.

Story contains more than one episode, subsequent episodes are related causally or are embedded in preceding outcomes.

F. Theme - End Emphasis

1. Story does not have a theme.

2. Theme is stated as a moral at the end of the story, or is summarized in the concluding statements.

3. Theme is an integral part of the story.

II Characterization

1. Characters are identified by name, noun, or pronoun with no further description.

2. Characters are described physically, psychologically, or both.

3. Characters are described physically, psychologically, or both, and act in accordance with the description given.

III Style

A. Title

1. There is no title. The story and title do not match.
2. The title is very general and tells little about the story.
3. The title is interesting or clever, builds desire to read the story.

B. Originality

1. The story is a retelling of a known story, or has obviously been copied.
2. The basic idea and development of the story might be expected from intermediate grade children.
3. The basic idea and development of the story show a new outlook, original thought.

IV Sentence Structure

A. Fluency

1. T-Unit length below level expected for 4th graders (<8)
2. T-Unit length average for grade level (8-9)
3. T-Unit length above average (>9)

B. Variety

1. Sentences are short or choppy. The same pattern may be repeated. Lacks fluency. Lack of sentencing.

2. Sentence read without noticeable breaks, and there is some variety in pattern.

3. There is great variety of sentence patterns, some rather complex.

C. Use of Connectives

1. 'And' is used to create run-on sentences. One connective, such as 'then' or 'so' is used extensively with little intrinsic meaning.

2. The same connective is used repeatedly, but with meaning. The transitions are not particularly smooth.

3. Connectives are used logically and create a smooth transition.

V Word Usage

A. Vocabulary

1. Common, fairly general words are used. The same words may be used repeatedly.

2. Accurate, precise, but not unusual words are used.

3. Vivid, descriptive words are used.

B. Names

1. Characters are not named, are referred to by pronouns.

2. At least one character is named, using actual names.

3. Names are created for imaginary creature, or to match a character.

Unusual names are used.

VI Mechanics

A. Correct Word Usage - Pronouns, Verb Tense

1. Two different pronouns are used to refer to the same antecedent.

There is a confusing change of verb tense.

2. For the most part, pronoun usage and verb tense are consistent with the meaning of the passage.

Some verb inflections may be omitted.

3. For the entire story pronoun usage and verb tense are consistent with the meaning of the passage.

B. Paragraphing

1. No attempt made at separating sentences into paragraphs despite the need for more than one paragraph.
2. Single error in paragraph format.
3. Paragraph format used correctly.

C. Punctuation and Capitalization

1. Many errors in punctuation and capitalization (more than 5 errors).
2. A few errors in punctuation and capitalization (3-4 errors).
3. Capitalizes and punctuates correctly (0-2 errors).

D. Spelling

1. Many misspellings, even of very ordinary words. Detracts from readability.
2. Only a few words misspelled which do not detract from readability.
3. Words are basically spelled correctly (less than 2 errors). Spelling attracts little or no attention.

## ANALYTIC WRITING SCALE - SCORING SHEET

Directions: For each quality listed below, circle the number that best describes the position of this paper on the following scale from high to low.

| | | High | Middle | Low | |
|---|---|---|---|---|---|
| I. | Story Structure | | | | |
| | A. Setting | 3 | 2 | 1 | |
| | B. Episode - Beginning | 3 | 2 | 1 | |
| | Development | 3 | 2 | 1 | |
| | Ending | 3 | 2 | 1 | |
| | Cohesion | 3 | 2 | 1 | |
| | Ordering of Categories | 3 | 2 | 1 | |
| | Number of Episodes | 3 | 2 | 1 | |
| | Theme | 3 | 2 | 1 | |
| | Total Story Structure Score | | | | /24 |
| II. | Characterization | 3 | 2 | 1 | |
| | Total Characterization Score | | | | /3 |
| III. | Style | | | | |
| | A. Title | 3 | 2 | 1 | |
| | B. Originality | 3 | 2 | 1 | |
| | Total Style Score | | | | /6 |
| IV. | Sentence Structure | | | | |
| | A. Fluency | 3 | 2 | 1 | |
| | B. Variety | 3 | 2 | 1 | |
| | C. Use of Connectives | 3 | 2 | 1 | |
| | Total Sentence Structure Score | | | | /9 |
| V. | Word Usage | | | | |
| | A. Vocabulary | 3 | 2 | 1 | |
| | B. Names | 3 | 2 | 1 | |
| | Total Word Usage Score | | | | /6 |

| | | | | |
|---|---|---|---|---|
| VI. | Mechanics | | | |
| | A. Word Usage | 3 | 2 | 1 |
| | B. Paragraphing | 3 | 2 | 1 |
| | C. Punctuation and Capitalization | 3 | 2 | 1 |
| | D. Spelling | 3 | 2 | 1 |
| | Total Mechanics Score | | | /12 |
| | TOTAL SCORE = | | | /60 |

# APPENDIX C

## Outline of Procedures for Data Collection

A. Reading Instructions

B. Writing Instructions

C. Chart of Writing Procedures to be Followed

A. Reading Instructions - One-to-one

I am interested in finding out what children remember about a story after they have read it. I would like you to read 2 stories for me and I will ask you to tell me what you remember about the story when you've finished reading.

I am going to tape our sessions so I can listen to them carefully later.

This is the first story, (student was presented with first passage). I want you to read it carefully to yourself. Remember, when you are finished reading, I want you to tell me, as exactly as you can, all that you remember from the story. I will also ask you a few questions about the story.

Any questions.

Read this to find out what happens to Tim/Sam (passage A/B). (After child had finished reading the passage was taken back).

Now tell me as much as you can remember about the story you just read.

(Propositions recalled were checked off. When the subject no longer offered information spontaneously): Can you think of anything else? (After a 5 second pause, cued recall questions were posed, addressing those propositions not given during free

recall, followed by the 5 comprehension probes).

Upon completion of the first reading task, one to two minutes were taken to collect background information on the subject (name, age, grade, birthdate, address, siblings, teacher's name, interests). Only the student's name and birthdate were recorded for use in the study. The second passage was then presented following the same procedure outlined for passage A.

B. Writing Instructions

i) Prewriting Session - Whole Group

I am interested in learning about how children write stories. I am going to ask all of you to write 3 stories for me over the next 3 weeks.

Today I'm going to show you what I want you to do when you write these stories. First we'll write one story together and then I'll ask you to write your own stories.

I'm going to collect the stories that you write and share them with other people who are also interested in how children write. I will make copies of your stories for you to keep and share with your class, parents, teachers - whoever you'd like.

Let's get started. Now remember to pay attention because this will help you write your own stories later.

1. Here is a picture that we can make up a story about (overhead projector was turned on so subjects could all see the stimulus picture). A very important part of writing is thinking. I'd like you to think about what's happening in this picture. (Examiner paused here to allow for reflection, eager subjects were asked to wait a moment so that everyone had time to get their thoughts together).

2. Let's list the ideas you've come up with. (Examiner recorded key words of all ideas generated by the subjects until no

more space was left on the blackboard). This helps people write because they need to have a number of possibilities so they can choose the ones they like best to write about.

3. We have plenty of ideas, let's organize these ideas. Let's put the same number in front of those ideas that go together. (Beginning with the first idea), do any ideas go together with (first idea) ? (Examiner went through all ideas with subjects in this manner with students responses dictating the groupings).

Now let's eliminate the ideas that say the same thing. (Examiner lead the group through the list, and with group discussion eliminated redundant ideas).

Now let's get rid of the ideas that we don't want to use in our story. (A vote was taken as to which grouping would be chosen, ie. ideas with numbers 1, 2, 3, or 4 ... in front of them).

Remember, you need to prepare what you want to write about before you write so that your story makes sense.

4. Now we can write our story. (Individual students were called upon to generate a sentence from the ideas - key words chosen to be written about. Each sentence was created in this manner. Subjects sometimes chose to extend the sentence given by the previous student. Discussion was permitted when the sentence

violated the grammar of the sentence or the unity of the story, this was never instigated by the examiner. Sentences were recorded by the examiner on the overhead projector as subjects dictated). We need to select the best ideas to be written down in our stories.

5. Let's reread our story to see if it makes sense. What else should we look for when we proofread? (Students generated all of the following in both groups studied: spelling, capitalization, punctuation, good sentences and it needs a title). One subject was asked to read the story aloud, sentence by sentence to permit changes to be made as subjects recognized errors.

6. Our story is complete. (Overhead was turned off). I will have our story typed and I will give it to your teacher to keep.

Now, let's go back to the steps we went through in writing this story. (Students offered the steps verbally while the examiner guided the organization and recorded the steps into a 3 step procedure on the board). This is what I'd like you to do when you write your 3 stories. I will have a copy of these steps for you to remember what we did today.

ii) Writing Sessions 1 - 3

(The examiner posted the chart of the 3 step writing procedure to be followed. One subject was called upon to orally read the steps to the class).

Remember, I would like you to follow these steps when you write your stories. Please don't talk unless you need to ask someone how to spell a word. Most people can't think when someone else is talking, we need to keep the noise down so that everyone can do his/her best.

You are to write a story about the picture that you will be given. It is your story so you can say whatever you want about the picture. If you need help with a spelling or you have some other question, please raise your hand and I will come over to help you.

You will have 30 minutes to write your story, if you are finished before that time, come to the table and take a puzzle to work on. If you need more time, you may stay here and finish your story.

Are there any questions? (Pictures, papers and pens were distributed).

Write your name and today's date at the top of the page, then you may begin.

C. Chart of Writing Procedure to be Followed

** Writing Steps **

1. BEFORE YOU WRITE
   - look at the picture
   - think of as many ideas as you can
   - put your ideas together
   - pick the best ideas
2. WRITE YOUR STORY
3. READ YOUR STORY OVER AND CORRECT MISTAKES

# APPENDIX D

## Story Grammar Categories Defined

Story Grammar Categories - (Mandler & Johnson, 1977)

1. SETTING: Introduces the protagonist and other characters. May include time and locale of the story along with information necessary for understanding the events that follow.
2. INITIATING EVENTS: Something happens which causes the protagonist to react in some way.
3. INTERNAL RESPONSES: A simple or complex reaction on the protagonist's part. Simple reaction may consist of an emotion or engagement in a relatively planless action. A complex reaction - usually a reaction followed by a goal plan.
4. GOAL: A statement of the protagonist's aim which dictates the direction the story shall take. NOTE: Goal paths are recursive and any number of attempts to reach that goal may occur. However, if the protagonist changes that goal, a new episode begins.
5. ATTEMPT: The protagonist's action(s) to find some way to realize the goal.
6. OUTCOME: A local consequence, the immediate result of a particular attempt, it is causally connected to the attempt.
7. ENDING: Should be related to the development as a whole -

not simply an outcome of some event. May refer back to the beginning, the protagonist's reaction or the attempt.