AN INVESTIGATION OF THE RELATIONSHIP BETWEEN READING ABILITY AND THE DEVELOPMENT OF STORY SCHEMA IN ADOLESCENT WRITTEN NARRATIVES

by

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ABSTRACT

The development of story schema in written narratives was correlated with reading comprehension ability. One hundred and two grade eight subjects were given a standardized reading test and asked to write an original story based on a picture stimulus. The stories were analyzed for number of propositions and for frequency of story structure categories according to a story grammar. A nine-point rating scale was employed to rate the narratives for story schema quality.

Significant correlations were found for reading ability scores with frequency of story structure categories ($r = .24$, $p<.01$), number of propositions ($r = .32$, $p<.001$), and ratings of schema quality ($r = .45$, $p<.001$). Further analyses included gender differences, frequency profiles of structural categories and of schema ratings, and a crosstabulation of reading ability by schema quality.

Results were discussed in terms of the implications for narrative schema as an important component for both reading and writing.
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CHAPTER ONE

The Problem

A central issue in the study of language and literacy development is the nature of the relationship between reading and writing. The purpose of the present investigation was to examine narrative schema development as a possible reading/writing connection. The study explored a theory that narrative schema development is related to reading comprehension and that schema development subsequently manifests itself in the structure of written narratives. Specifically, the study was designed to examine the relationship between reading ability and the story schema development of written narratives.

Background to the Study

A resurgence of interest in reading/writing connections is evident in the theoretical and pedagogical literature since 1980. A number of recent educational theories have described developmental or functional similarities in reading and writing as language processes and have inferred connections based on these similarities (Atwell, 1983; Bissex, 1984; Clay, 1983; Goodman and Goodman, 1983; Harste, Burke and Woodward, 1982; Harste, Woodward and Burke, 1984; Squire, 1983; Tierney and
Pearson, 1983). In theory, early reading and writing development in natural contexts evolves through exploration, observation, and hypothesis-testing as does oral language. Educational theorists have grounded their theories in those of cognitive psychologists and linguists such as Piaget (1955), Vygotsky (1962), Britton (1970), Halliday (1975) and others, whose research into the linguistic and psychological development of the child has had a profound influence on the direction of language education theory. In turn, educational theorists are cited in support of pedagogical arguments for an integrated or holistic approach to teaching the language arts (Newman, 1983; Goodman, 1986; Tway, 1986).

Despite interest in the reading/writing relationship, the nature of that relationship is not clearly understood. Research has yet to provide us with explicit information that can inform teachers beyond the philosophical or theoretical level and that can provide research-based support for practice. Although there appears to be a consensus as to the existence and the importance of a relationship between reading and writing, it is still not clearly understood how these processes are related and important questions remain unanswered. Are reading and writing specifically related so that the development and function of one process affects the development and function of the other? Are there aspects of either reading or writing that are unconsciously developed by exposure to or practice in the other process? In other words, is comprehension enhanced by composition or vice
versa? We need more than reasoned assumption if theory is to inform practice in the classroom.

An analysis of the literature has revealed important related issues that need to be considered in designing research which will further our knowledge and understanding of the reading/writing relationship. One issue is the apparent absence of association between extant theoretical observations and research investigations into reading and writing. Current theories about the reading/writing relationship have not been followed by related empirical research. Theories which have posited a relationship because of analogous characteristics of function or development between the two processes have not been subsequently tested through research. Intuition, inference and analogy may build eloquent and appealing theories, but it is necessary to confirm, repudiate, or revise theory with insights from empirical research.

Research on the reading/writing relationship has appeared sporadically over the last four decades (Wilson, 1981; Stotsky, 1983). Much of the past research has examined the relationship through global correlations of general reading and writing ability and has seemed to lack the focus and foundation of a particular premise or theory. Most previous reading/writing studies pre-date theories about the nature of reading/writing interactions and have been exploratory in nature. A synthesis of this research yields generally low positive correlations which cannot be used to support conclusive statements about the nature
of the reading/writing relationship.

This absence of association between extant theoretical and research literature is an important issue to consider in the design of research attempting to clarify reading and writing connections. Research and theory have pursued rather independent paths, a problem which seems to have occurred at least partly because of the inherent complexity of reading and writing. Both reading and writing have been described by recent theorists as multi-faceted, interactive, cognitive/linguistic processes whose primary purpose is to create or to acquire meaning. Certainly reading is defined as a complex, interactive, linguistic process by the authors of a number of carefully articulated descriptive models (Goodman, 1968; Gough, 1972; Rumelhart, 1985). While writing has had less attention over the years, it has also emerged as a complex interactive process in recent literature on developing writers (Calkins, 1983; Emig, 1983; Wilkinson et al, 1980; Graves, 1975, 1982; F. Smith, 1982; Applebee, 1978; Britton, 1977, 1978, 1983). The interrelationship between reading and writing compounds the complexity of the individual processes and makes the task of the researcher a difficult one. Effective research into reading/writing connections needs to untangle the complex web of interaction in order to illuminate the nature of the relationship.

Another issue relevant to developing understanding of the nature of reading/writing relationships is that of 'process versus product'. Theory and research again have differed in this
regard. Whereas theorists have attempted to describe the cognitive/linguistic interaction between the processes, research studies have analyzed and correlated measurable aspects of the processes, in other words, the products of reading and writing. This dichotomy seems to have arisen out of necessity and in itself is not the issue. Rather, what seems important is the extent to which measurable, observable features of reading and writing performance represent the underlying cognitive/linguistic functioning of the processes.

Reflecting the inherent complexity of the processes are the variety of measurement approaches to reading and writing, each representing a different view of what constitutes proficiency in reading and writing. These might be called the measurable 'products' of reading and writing. Reading, for example, has been differentially defined for research purposes. These definitions have included: the ability to recognize words in lists; to sound out nonsense words or syllables; to fill in blanks in sentences; to read selections silently and answer questions correctly; to read selections orally without error and answer questions correctly; and to choose correct definitions for words.

Writing has been variously described in research as: syntactic complexity of sentences; diversity and complexity of vocabulary; number of separate 'thought units'; use of cohesive ties; number of words per sentence; variety of sentence patterns; correctness of spelling, punctuation, and paragraphing; handwriting; ability to fill in the correct word in a sentence;
ability to correct the grammar, punctuation, or capitalization of a given sentence; ability to name parts of speech; or any combination of the above. Often these writing products are measured on standardized tests where the student demonstrates competence by recognizing and choosing among different sentence or paragraph options. Frequently no actual composing takes place, yet the degree of proficiency demonstrated on these measures has been considered by many teachers and researchers to be synonymous with writing ability.

The various approaches to measuring reading and writing have in common the characteristic of accessibility. They measure those salient reading and writing products which are observable, countable, manipulable, and lend themselves readily to objective analysis. These approaches analyze or describe the 'surface features' of language (Shuy, 1981). For the purposes of analyzing the relationship between reading and writing, it is necessary to ask if these measurable surface features actually represent the essential communicative nature of the underlying processes.

Although the issue of representation has been addressed in the design of reading measures, it has been largely ignored in the design of writing measures. The use of comprehension questions at different meaning levels, the analysis of miscues during oral reading, and the analysis of oral retellings, are examples of methods used by researcher to access the communicative nature of the reading process. However, attempts to
measure writing beyond the surface level have not appeared in the literature until recently. Because so many important aspects of writing ability are difficult to objectify, researchers often have relied on a combination approach which includes both objective or 'count' measures of surface features along with subjective or interpretive measures. Measurement of features such as audience awareness, prose effectiveness, creativity, imagination, and originality, have been complicated by the inherent subjectivity of analysis. Results of combining objective and subjective measures have been confounded by concerns about the relative weighting of the individual measures and a lack of focus in the characterization of writing proficiency (Cooper and Odell, 1977; Shaughnessy, 1977). Holistic or general impression methods are often used effectively but they are too global for the purposes of exploring specific reading/writing interactions.

Only recently have researchers considered the viability of the measured written product as a representation of the communicative process called writing. One example is the 'think aloud' protocol of Flower and Hayes (1980, 1981) where the writer talks aloud while writing and the researcher records and analyzes the behaviours of composition. Another example is the use of story schema analysis to analyze the structural organization of written narratives (Hansche and Gordon, 1983; Kroll and Anson, 1984; McConaughy, 1985a, 1985b). Story schema analysis is an attempt to access the deep structure with which a
writer makes meaning in a story.

Empirical research into connections between reading and writing needs to discover those characteristics of communication which are observable and measurable but also representative of the acquisition of the 'meaning-making' ability inherent to the two processes. Unless measured products in research truly represent the communicative essence of reading and of writing, it will not be reasonable to infer that any relationship observed between the products can actually represent the relationship between the processes.

In summary, the key issues which have emerged while considering the status of knowledge about the relationship between reading and writing are as follows: the absence of association between theory and research; the compounded complexity of a relationship between multifaceted cognitive/linguistic processes; the separation of product from process in research investigations. For future research to be effective in providing insight into the reading/writing relationship, it needs to address these important issues. Empirical research into the reading/writing relationship should be specific in focus; driven by relevant theory; and designed so that measurable products are connected to the process they represent. It is the intention of the present study to meet these criteria in its design.
Rationale

An examination of reading/writing research and theory supports the conceptual framework and specific focus of the present investigation.

Conceptual Framework

The present study is rooted in theories about the reciprocal interaction between the development of reading and writing processes. Support for assumptions of interactive development of reading and writing is found in research into emergent literacy and the development of oral storying.

In theory, the child uses in writing what she has experienced from reading, and vice versa (Goodman, K. and Goodman, Y., 1983). Observations of the writing behaviours of very young children have led theorists to assume that input from one process influences performance in the other (Harste, Burke and Woodward, 1984). Children were observed to incorporate in their writing structural aspects of environmental print and their own story-reading experiences (Bissex, 1980, 1984; Calkins, 1983).

Similar observations were made by researchers who examined the oral stories of children (Applebee, 1978; Botvin and Sutton-Smith, 1977). Analysis of children's stories revealed that children incorporate in their own stories those structural aspects of narrative expected in traditional simple stories. The child's concept of a well-formed story is assumed to develop during reading and listening experiences with stories (Applebee,
From these and other similar research observations about young children, theories about the reciprocal interaction of reading and writing development have emerged. The present study is designed to examine further this assumption of reciprocal interaction.

**Specific Focus**

If input from story experiences influences story production, there may be a relationship between reading ability and written story production. Previous research on this relationship has not produced conclusive evidence to support theories about reading/writing connections. A survey of the literature reveals that most studies were not specifically focussed in their definition and measurement of writing. The present study sought to find a writing measure that would be tied to a theory relevant to both reading and writing investigations. Narrative schema theory has provided a specific framework for the present reading/writing investigation.

Theories about narrative schema development have appeared in psychological research to describe cognitive processing (Bartlett, 1932). A narrative schema is described as a set of expectations for stories that facilitates the comprehension, recall and production of narratives (Mandler and Johnson, 1977). By definition, a narrative schema seems synonymous with 'story knowledge' and 'concept of story' as described by educators. All three constructs attempt to define an individual's implicit
knowledge about the structural elements of narratives.

Narrative schema development often has been measured by a story grammar. Story grammars, or sets of narrative structural categories, have been used in research to describe evidence of narrative schema organization in memory (Rumelhart, 1977; Stein and Glenn, 1979; Stein, 1982). Story grammars also have been used in comprehension research and to a lesser extent in writing research. They have been accepted in research as being viable representations of the cognitive construct of narrative schema (Black and Bower, 1980). It is assumed in the present investigation that the measurable product of narrative structures in written stories, as measured by a story grammar, can also represent the process of narrative schema development in writing. A story grammar will be used in this study to describe and quantify evidence of narrative schema development in written narratives. A discussion of previous research on narrative schema development follows.

Narrative Schema and Reading Comprehension

The assertion that narrative structure facilitates comprehension supports theories about the essential role in reading comprehension of prior knowledge including knowledge of text (Adams and Bruce, 1982; Squire, 1983; Wittrock, 1983). In theory, prose comprehension requires prior knowledge of story structure as well as prior knowledge of human action and behaviours (Glenn, 1980). According to theory, individuals
mobilize a narrative schema during comprehension as they align their expectations for stories with narrative input during reading or listening.

Research which has examined narrative schema development has recognized the influence of repeated exposures to narrative structures including both oral and written stories (Brown, 1977; Poulson, Kintsch, Kintsch, and Premack, 1979; McGee, 1982; King and Rentel, 1983). In theory, repeated exposure to stories during reading and listening experiences influences the development of a schema for narratives, which in turn enables production and comprehension.

A small number of studies have investigated relationships between reading comprehension ability and the ability to comprehend, recall and reorder structural aspects of traditional narratives (McClure et al, 1979; Hoover, 1982; Fitzgerald and Spiegel, 1983; Fitzgerald, 1984; McConaughy, Fitzhenry-Coor, and Howell, 1983; McConaughy, 1985a). Findings from this research indicate the presence of a relationship between narrative schema development and reading ability. These findings tend to confirm theory that prior knowledge of narrative structures is essential to comprehension.

It should be noted that this prior knowledge of narrative structure need not be explicit in nature. Rather, it is characterized as an innate cognitive schema which is activated during the reading or writing process. The focus of this research was to identify an implicit knowledge of story structure which
emerged as the subjects recalled or reordered stories.

Research which has previously examined the relationship between reading ability and schema development did not attempt to describe narrative schema manifested in original stories, but relied on recall, summarization, and reordering tasks. It would seem that in order to examine narrative schema development, it would be most useful to examine original narrative production. Original written narratives may provide the opportunity for a more direct analysis of the process of narrative schema development.

Narrative Schema and Writing

Although research findings suggest that narrative schema development is primary to comprehension and development of oral storying, the role of narrative schema development in writing remains largely unexplored. The precedence for this research on narrative schema in writing is primarily found in research on the development of narrative concepts in oral stories.

Research observations of children's oral stories have recorded a developmental pattern of control over narrative structure. The stories evolved from loose collections of ideas of the youngest children into the organized, focussed narratives of older children (Applebee, 1978; Botvin and Sutton-Smith, 1977). Descriptions of the structural patterns of oral stories are not unlike descriptions of narratives encoded in schema theory by story grammars.
A few studies have examined narrative schema development in writing. Two previous studies have examined the narrative schema development of written narratives and its relationship to reading ability (Hansche and Gordon, 1983; Shanahan, 1984). These studies utilized story grammars to measure the structural characteristics as evidence of story schema in the original stories of elementary school subjects. Both of these studies found a significant relationship between reading ability and the number of structural categories used in the stories. The correlations were low however, and the results were not conclusive.

The Hansche and Gordon (1983) study and the Shanahan (1984) study generated original narratives with either student choice of topic or a single-picture stimulus. The use of broadly defined topics generated a variety of narrative compositions, some of which were not stories in the traditional sense. Story grammar analyses of these various compositions were necessarily global in nature and of questionable usefulness. Analysis could only account for the presence or absence of story categories. No judgement could be made about the quality of schema employed in the narratives.

Some solutions to the problems of global story grammar analyses were offered by an exploratory study of the written narratives of a small group of disabled readers (McConaughy, 1985b). The task of the study was to explore the usefulness of a hierarchical schema quality scale. The study analyzed narratives which were generated by a three-picture stimulus that contained a
narrative structure. The pictures presented three space scenes in which a family is forced to leave a planet because of the increasing heat of the sun. The inherent structure suggested by the stimulus enabled McConaughy to describe a specific set of structural expectations for a well-formed narrative. Based on her previous research on story schema development, McConaughy devised a rating scale to describe schema quality. Results of the analyses indicated that the story grammar and the rating scale for schema quality described global organizational problems in the subjects' written narratives.

The present investigation will follow McConaughy's procedures. McConaughy's exploratory study offers a useful method of analysis for describing the quality of narrative schema manifested in written narratives. The use of a restricted topic enables the researcher to attempt a more sensitive, less generic analysis of the structural properties of written narratives. McConaughy's more descriptive version of a story grammar, incorporating schema quality ratings, is based on previous findings about differential development of narrative schema (McConaughy et al, 1983). This analysis would appear to enable access to information about the development of schema quality in written narratives of readers of different abilities. The present study will extend McConaughy's previous study by using adolescent subjects who are regular school students with a range of reading abilities.

In summary, theories about the holistic nature of
cognitive/linguistic processing suggest that a narrative schema would be important for production of written narratives as well as oral stories. Previous research and theory also have established narrative schema as essential to reading comprehension. In theory it is possible that narrative schema development is an important shared component in both reading and writing. The intention of the present investigation is to explore the hypothesis that narrative schema development in written narratives is related to reading comprehension ability.

To recapitulate, the focus of this study is on one aspect of the reading/writing relationship—narrative schema development in writing and its relationship to reading ability. The concept of narrative schema as a possible reading/writing connection is grounded in theories about linguistic processing in which the language processes are viewed as interactive and reciprocal in development. This investigation will measure schema quality in written narratives through the use of a specific story grammar which has been designed to access and describe the narrative schema of original stories.

Purpose of the Study

The major purpose of this study was to investigate the relationship between reading comprehension ability and the quality of story schema demonstrated in adolescent written
narratives. A secondary purpose was to identify and quantify the types of story structures used by adolescents in their narrative compositions in order to determine whether there are differences in the number and type of different story structures and in the number of propositions. Specifically, the study explored written narratives in order to describe structural and qualitative differences in story schema, and investigate the relationship between the presence of narrative structures and reading ability.

Questions

The study attempted to answer the following research questions:

1. Will there be a relationship between reading ability scores and the frequency of different story structure categories in adolescent written narratives?

2. Will there be a relationship between reading ability scores and the number of propositions in adolescent written narratives?

3. Will there be a relationship between reading ability scores and a rating of story schema quality in adolescent written narratives?
Null Hypotheses

For the purposes of statistical analyses, the research questions were re-formulated as the following null hypotheses:

H1 There will be no statistically significant relationship between reading ability scores and the frequency of different story structure categories in adolescent written narratives.

H2 There will be no statistically significant relationship between reading ability scores and the number of propositions in adolescent written narratives.

H3 There will be no statistically significant relationship between reading ability scores and a rating of story schema quality in adolescent written narratives.

Definition of Terms

Story Structure Categories

Story structure categories are the parts of a story grammar that denote the underlying structural elements of a simple story. The eleven story elements included in this analysis were: setting, initiating event, internal response, goal, attempt,
outcome, description, disposition, resolution, reaction, and moral. (See Appendix B for definitions)

**Episode**

"An episode is comprised of a stated or implied internal response...of a character, one or more attempts or actions, and the specific outcome(s) of the attempts." (McConaughy, 1985b)

**Story Proposition**

A story proposition consists of a unit of prose which expresses an idea, emotion, or action. It may be as short as a word or phrase or as long as a clause or sentence.

**Story Schema**

Story schema is a recognized conceptual mechanism which, in theory, encodes information in the individual's mind about the essential elements of a story and guides the recall, comprehension and production of stories. It is assumed that through repeated exposure to stories, story concepts are encoded as a schema whereby individuals formulate a set of expectations about the typical structures of traditional stories.
Story Grammar

A story grammar represents a labelling system for the structural components of a story.

Assumption

It was assumed that story schema, essentially a mental construct, is evident in the structure of written narratives and is measurable by written story structure analysis.

Limitations

Test Conditions

Although care was taken to ensure that test conditions for each class were as similar as possible, test conditions for each class group may have been slightly variable because students were in intact classes and were tested during their regular English classes. Substantial effort was made to ensure that none of the classes was tested at less than optimal times (ie. during the period before lunch or last period Friday afternoon).

In order for identical test conditions to occur it would have been necessary for all the students to write their tests
together in a large hall. It was decided that the benefits of standardizing the test venue may have been offset by the increased anxiety produced in large group assessment situations.

**Story Stimulus**

Only one story stimulus was used to generate narrative samples. This is a limitation of this study as it increases the probability that a portion of the results was affected by student affinity or disaffection for the topic of space. A further limitation of the use of one story stimulus is the possibility that the writing sample collected on the test day may not be truly representative of a student's writing ability.

**Intelligence**

Another limitation of the study is that the Intelligence Quotients of the subjects were not available and could not be controlled for in this investigation. It has been the policy of the school board not to test children for IQ unless there is some concern. Intelligence could be considered as a variable in a reading/writing investigation because it has been shown to correlate with reading ability. It should be noted however that although IQ test scores generally correlate with reading test scores and IQ tests are helpful in predicting reading
achievement, the constructs are not identical. Golinkoff (1976), in her review of the literature on the reading and IQ relationship concluded that there was insufficient evidence to conclude that reading and intelligence tests measure the same skills.

Intelligence as a factor is probably more important to consider in experimental research where the causes of interactions are discussed. The present study is correlational and intends only to investigate the relationship between reading ability and narrative schema development.

Organization of the Thesis

The thesis is organized into five chapters. Chapter One presents the problem, the theoretical context, and the rationale for the study, as well as the questions and research hypotheses. Chapter Two reviews the relevant literature. Chapter Three describes the design and methodology of the study including the procedures for data collection and analysis. Chapter Four presents the results of the data analysis. Chapter Five includes a discussion of the major findings of the study and states conclusions, limitations and implications for further research.
CHAPTER TWO

Review of the Literature

Introduction

The purpose of this review of literature is to provide a survey of relevant theory and research for both the general and specific contexts of the present investigation. Accordingly, the review is organized into two major sections.

The first section of the review establishes the general context of the study. It provides a survey of previous empirical research on the relationship between reading and writing. It then provides a description of more recent theory and research which supports reading/writing connections within a holistic view of language relationships.

The second section of the review provides background for the specific reading/writing connection to be investigated by this study. This section begins with a brief examination of theory and research on the development of story knowledge in children and an overview of story schema theory. The section concludes with a review of relevant research on reading comprehension and story grammars, and examines in more detail those studies which have previously investigated the relationship between story schema development in written narratives and reading ability.
The Reading/Writing Relationship: Research

Introduction

Research and theoretical descriptions of the reading/writing relationship are fundamentally different. The theoretical literature has described developmental or functional similarities of reading and writing processes and has inferred general connections based on these similarities. Research studies, on the other hand, have analyzed specific reading and writing abilities in order to define the relationship explicitly. These studies have been correlational as well as experimental in design. Correlational studies have investigated the existence and nature of possible relationships, whereas experimental studies have explored whether instruction in one mode affects performance in the other.

In the following review, research studies will be broadly categorized according to whether they attempted to answer one of the following important questions about the reading/writing relationship:

1. Are reading abilities and writing abilities related?
2. How are reading and writing related?
3. Does writing or writing instruction influence reading ability?
4. Does reading or reading instruction influence writing ability?
Are Reading Abilities Related to Writing Abilities?

There has been surprisingly little research which conclusively supports the assumption that reading and writing are closely related processes. Global correlational studies have described low positive relationships between general measures of reading and writing. Correlations were not high enough to allow statements about the predictive value of reading ability for writing ability or writing ability for reading ability.

Research explorations into the reading/writing relationship have appeared sporadically over the last forty years. The earliest study found was an experiment on the effect of reading training on writing achievement in college composition classes. Matthew, Larsen and Butler's (1945) experiment is cited in recent literature on the reading/writing relationship because it found a significant correlation between reading and writing ability. During a preliminary analysis, reading scores of 160 freshmen were correlated with scores in composition classes. Students who received lower grades in writing were also found to have lower reading comprehension scores. The authors concluded that "these figures certainly hint that retardation in reading ability is an important contributing cause of poor grades in Rhetoric I" (p.500). However, the subsequent experiment of training students in reading did not bear out an original hypothesis that reading training would improve writing composition.

In 1946, Piexotto correlated the reading and writing
entrance-test scores of 263 first year female college students and, thirty years later, Grobe and Grobe (1977) correlated the reading and writing scores of freshmen university students. It was predicted that reading and writing were systematically related abilities so that knowledge of one would be a valid predictor of the other. Both studies found positive correlations between the results of reading achievement and essay entrance exams, but they came to very different conclusions. Piexotto's (1946) low correlation (.21) led to a conclusion that writing skill was largely independent from reading skill as measured in that study. The Grobe and Grobe (1977) results of a multiple regression analysis yielded a coefficient of .50 and it was concluded that the assumption of a systematic relationship between reading and writing ability was supported. The latter research found a stronger relationship between poor reading and poor writing than they did for good writing and good reading. This suggests the presence of school-related, linguistic, or cognitive factors not considered in studies which correlate global measures of reading and writing.

Similar correlational values were discovered by Woodfin (1968) in a study of over 500 grade three students although conclusions were again different from the Grobe (1977) study. Woodfin included a number of other factors (sex, intelligence, socioeconomic status, language ability) in a multivariate analysis of reading and writing abilities. Writing samples were analyzed according to measures of effectiveness of expression,
organization of ideas, counts of words per composition and words written per minute. A total of seven compositions for each child were analyzed, yielding an extremely large number of writing samples. Reading ability was measured by a standardized reading test.

Consistently, the largest correlation with writing ability was found to be reading achievement (mean .49, p<.01), followed by language skills, as measured by the language section of a standardized test (mean .47), I.Q. (mean .34), and socioeconomic status (mean .22). These correlations were all judged to be too low to describe valid predictive relationships between these factors and writing ability as measured by this study. Woodfin concluded that "teachers will do well not to base their expectancies for competency in written expression for third grade children too highly on any of the factors examined in this study" (P.1239).

Woodfin's 1968 findings for socioeconomic status contradicted the results of a study by Walter Loban (1963, 1976). Loban conducted a thirteen-year longitudinal study of language development (1952-1965) and found significant differences in oral language proficiency, reading, and writing performance for low and high socio-economic groups. This study is often cited in the literature because of its scope and extensive descriptive analysis of oral language growth. It is included in this review because it also examined the interrelations between the language arts including reading and writing ability.
Loban's 211 subjects were selected to be representative of the population by a stratified sampling procedure for four variables: sex, ethnic background, socioeconomic status, and intelligence. For the purposes of data analysis, the subjects were divided into three subgroups of thirty-five each. Two of the groups were made up of students who received consistently high or low teacher ratings of language proficiency over the study's thirteen years. The third group was randomly selected from the remaining subjects. The teachers were asked to rate each student on five point scales for eight criteria: skill in communication; organization; purpose and point; wealth of ideas; fluency; vocabulary; quality of listening; quality of writing; and reading.

A comparison of teacher-rated "low" and "high" groups revealed that those children who were rated "high" by the teachers were also intelligent (median I.Q. of 116); white (77%); from 'white-collar' families (71%); and of either sex (51% female). The students in the "low" group had a median I.Q. of 88; were 69% non-white; were from 'blue-collar' families (86%); and were also of either sex (49% female). Loban interpreted low S.E.S. to be the significant factor in poor language performance—"Minority subjects who came from securely affluent home backgrounds did not show up in the low proficiency group. The problem is poverty, not ethnic affiliation." (p.23)

Loban compared standardized reading scores and writing ability assessments of teacher-rated groups, and concluded that
students who were ranked highly on language development also performed well in reading and in writing. Student writing samples were rated on a ten-point scale and put into one of five categories. Approximately 79% of the compositions in the "high" group were put into the Superior or High-Average writing categories, whereas only 5% of "low" group compositions were similarly categorized.

Loban concluded that "the relation between reading and writing seems so striking as to be beyond question". (P.82) He noted that of those who wrote at the superior level, none had reading scores below age level and no writers at the lowest writing levels had reading scores above age level.

Further analysis of the data yields some contradicting information: 10% of subjects in grade four, 19% in grade six, and 17% in grade eight, were judged good writers but were poor readers. Similarly, some better readers scored poorly on the writing assessment: 53% of subjects in grade four, 27% in grade six, and 23% in grade eight scored above age level on the reading test, but were judged to be below-average writers.

It seems evident from examination of Loban's data that this seminal study of oral language development in schoolchildren does not provide conclusive support for the assumption that reading abilities and writing abilities are directly related. The results of this study seem to suggest that reading and writing may be related indirectly because of interrelationships between intelligence, oral language proficiency, and socio-economic
status. They also clearly demonstrate the difficulty of making sweeping statements about the reading/writing relationship based on global correlational data. It seems evident that the reading/writing relationship is complex and multi-faceted. Although global correlations may indicate the presence of connections, they are not focused sufficiently to be informative.

Finally, two studies correlated school performance with a variety of factors related to reading experience. Donelson (1967) conducted a large correlational study of 1821 grade ten students. It was reported that effective writers owned more books, had more magazines in the home, had fathers who read, and were of higher socio-economic status. Although correlations were low, it was concluded that reading was an influence for students who were good writers.

Woodward and Phillips (1967) also concluded that poor writers had fewer reading experiences. Nine hundred nineteen freshmen university students were labelled good or poor writers according to their English marks and given a questionnaire about their reading habits. Results indicated that poor writers reported reading less and having fewer reading materials at home.

Although these studies provide some evidence that reading experience may be a factor in good writing, no evidence could be found about kinds of reading experience, amount of reading, or attitudes about reading and their relationship to writing performance. Given that writing performance was not evaluated
specifically, it seems spurious to assume that English grades represent writing ability. A later study of secondary English classes in the United States found that students wrote in class as little as ten minutes a week (Applebee et al, 1980). However, these large studies do provide some evidence that students who were successful in English classes had more exposure to reading materials in the home than those who did not.

Home factors were found to be important in another correlational study (Kroll, 1983). As part of the Bristol Study (Wells, 1985), a longitudinal study of language and literacy development, Kroll analyzed data to discover which of four family and school-related factors would predict writing attainment at age nine. Four pieces of writing from eighteen nine year-olds were analyzed and results compiled into a "Composite Index of Quality" which was correlated with the home and school factors collected in the larger study. Results indicated that the highest predictor of writing success was 'parent interest in literacy' (.74), followed by 'preschool knowledge of literacy' (.64) and 'class of family background' (.59). The final significant predictor of writing success at age 9 was 'reading attainment at age seven' (.54). The study also found 'preschool knowledge of literacy' to be the highest correlate with reading attainment at age seven.

A major conclusion of the Bristol study was that knowledge of literacy was developed in the home through parent/child interaction during story-reading (Wells, 1985). It was concluded
that knowledge of stories and story structure was important for the development of reading ability and that this knowledge was best developed early in the child's home.

In order to examine further the reading/writing relationship, Kroll correlated reading scores with three more specific writing measures. Low significant correlations were found for measures of syntactic complexity (.06); mean number of clauses per t-unit (.26); and vocabulary diversity (.33). These results should be viewed with caution in terms of reading/writing research because of the small sample size and the fact that there was a two year gap between collection of reading and writing scores.

To conclude, decisive evidence of a relationship between reading and writing abilities cannot be found in studies which have correlated general reading and writing measures. Although the studies of Matthew et al (1945), Piexotto (1946), Woodfin (1968), Grobe (1977), and Kroll (1983) all yielded positive correlations, these were not large enough to have predictive validity. Results in the Loban study were confounded by other factors (ie. intelligence, and socio-economic status).

From an examination of this research, it becomes evident that the relationship between reading and writing processes is highly complex and defies simple analysis. Although global correlational studies do not provide a resolute picture of the reading/writing connection, they do provide some evidence of an affiliation between reading and writing abilities and
experiences. It seems that more sensitive and focused analysis is necessary in order to tease out specific relationships between these complex processes.

How Are Reading and Writing Related?

A few descriptive studies have examined the relationship between reading and writing more closely in an attempt to reveal the nature of that relationship. These studies have compared reading ability with the presence of specific structures in writing.

In a 1969 study, Samuel Zeman attempted to describe the relationship between reading comprehension and the presence and frequency of certain sentence types and patterns in written compositions. One hundred ninety grade two and two hundred twenty grade three students were divided into above-average, average, and below-average reading ability groups according to a standardized test. The writing task was to compose an ending to an unfinished story. These were analyzed for proportional frequency of four sentence types and ten structural sentence patterns.

Results showed no differences in proportional frequency of sentence patterns for the three reading groups. The noun/verb/noun pattern was most frequently used by all groups. It was concluded that analysis of ten basic sentence patterns could not differentiate among grade two and three students in terms of reading comprehension, sex, or grade level.
Analysis of variance showed that reading was a main effect for two sentence types. Results indicated that above-average readers used more compound sentences and below-average readers used more simple sentences. It was concluded that the use of sentence types in compositions is related to reading ability.

In another study, student writing was examined to see which syntactic structures could predict reading achievement (Evanechko, Ollila, and Armstrong, 1974). The written narratives of 118 grade six students were analyzed for thirteen syntactic writing indices to discover which ones would be predictive of reading achievement. Of the thirteen, four were found to contribute significantly as predictors of reading achievement. These were in order of significance: the number of communication units; structures which were designated as 'two-count' (passives, dependent clauses, comparatives, participles, paired conjunctions and other similar measures of complexity); sentence patterns (subject/verb/indirect object; subject/verb/complement); and the number of words per communication unit.

Evanechko et al concluded that fluency and control of syntactic complexity were "the key language competencies underlying reading achievement" (p. 325). They stated that the number of communication units, the most significant writing index, represented the number of ideas expressed and was essentially a measure of fluency and that 'two-count' structures, the second significant index, were indicators of flexibility, complexity and sophistication of expression in language. The
relationship between writing factors and reading achievement was interpreted to be an indirect one based on general language competence. It was concluded that reading and writing used "certain language skills in common" (p.323).

Hofmann and Kerek (1983) also examined syntactic maturity as a measure of writing performance. These researchers investigated reading comprehension as a predictor of syntactic maturity or words per clause, and writing effectiveness. Writing samples were collected from 290 undergraduate students who also were administered a reading comprehension test. The writing samples were measured for syntactic maturity, usage, ideas, organization, coherence, sentence structure, voice, and quality of composition. These measures were correlated with reading comprehension and vocabulary test results.

No significant relationships were found between any of the writing measures and reading ability. It was concluded that there were no consistent multivariate relationships between reading and writing as defined by the measures used the study.

The results of the Hofmann and Kerek (1983) study were quite consistent with the Evanechko et al's (1974) findings for syntactic maturity. The latter group found the number of words per communication unit to be the least significant predictor of reading performance. The lack of any positive findings in the Hofmann and Kerek study is consistent with other studies which used similar measures of writing performance (Woodfin, 1968; Zeman, 1969).
A recent study analyzed relationships between reading and writing while controlling for socio-economic status (Chall and Jacobs, 1984). Thirty students judged to be low in socio-economic status were studied in grades two, four and six, and a year later in grades three, five, and seven. Unlike the Loban study, low S.E.S. students were not compared to other S.E.S. groups. The purpose of this study was to analyze the reading and writing development of low S.E.S. students to discover trends, and to see if these trends were the same for above and below average readers within the low S.E.S. group.

An individual reading measure was designed to consist of six sub-tests: word recognition, phonics, oral reading, word meaning, silent comprehension, and spelling. Ten minutes of narrative writing in response to a picture stimulus was collected. Writing samples were evaluated on twelve measures including six judgmental and six objective measures. These measures fell into one of four categories: overall measures; syntactic-organizational measures; content measures; and precision measures.

The results of the Chall and Jacobs study support Woodfin's (1968) earlier findings for grade three. Little difference between the writing of above and below average readers was observed for grade three. At grades five and seven however, above-average readers were generally rated "better" and more consistent on all types of writing measures. Developmental trends were observed for both groups of readers with regard to content
ratings (cohesion, coherence, complexity of situational development, interest and humour). Both reading groups were found to have progressively higher content ratings in successive grades and equally strong increases were found at grade five as compared with grade three and in grade seven as compared with grade five. In other words, although better readers were better writers, the writing content of both good and poor readers was superior to their younger cohorts. The authors concluded that the below-average readers in their samples tended to have "better ideas than ways of expressing them successfully in their writing" (p. 98). The findings of this study appear to support those theorists who have described writing ability as a developmental phenomena.

An important finding of the Chall and Jacobs study was that the strongest difference between reading groups was observed on ratings of writing 'form'. Form ratings were based on mechanics, sentence structure, and grammar. Ratings for below-average readers were reported to be consistently low and below the above-average group. It could be concluded that reading ability contributes to the development of the mechanics or form of writing. Potentially confounding factors such as differential reading experiences in the home and school may have been eliminated by controlling for socio-economic status. However, it is possible that proficiency in writing mechanics may be more of an indication of the successful learner in school or other factors such as adequate visual perception or fine motor
coordination. Perhaps better readers received more or different instruction and experiences with writing than did poorer readers. Instructional factors should be considered in further research design.

Although the sample in the Chall and Jacobs study was small and results cannot support definite conclusions about specific reading and writing relationships, it is important nevertheless for a number of reasons. It is useful in that it reports relationships, or at least trends, between writing and reading ability, independent of S.E.S. factors. The findings also raise pertinent questions about commonly-held assumptions regarding deficient writers. Rather than dwelling on the deficiencies of poor as compared to good groups, Chall and Jacobs were able to discover common characteristics of good and poor readers as developing writers. From this perspective, one may speculate that experience in reading may influence any reader's notion of story and the content of his written work. Concepts about story content may be more subliminally developed as compared to the more obvious nature of the mechanics of surface features. Finally, this study is important because it clearly showed that the analysis of specific aspects of writing performance is far more informative than investigations of broad, inclusive definitions of writing ability.

In conclusion, although one may speculate about the direct relationship of reading on writing from these studies, further research is needed. Nevertheless, one can infer that through
selection and analysis of specific aspects of the complex process called writing, one may be able to begin to isolate the contribution of reading to the development of writing and illuminate the nature of the reading/writing relationship.

The results of these studies tend to support theories about the developmental nature of writing in that older children showed more advanced development of certain aspects of writing. There is also some support for the theory that syntactic complexity in writing is associated with reading ability. Without further research however it remains difficult to draw definite conclusions about the relationship between reading and writing.

Does Writing or Writing Instruction Influence Reading Performance?

The question of writing influence on reading performance has not been examined extensively. Generally the studies provided students with writing strategies or exercises and looked for subsequent improvements in reading comprehension. In one study, 436 grade four students in five schools were designated high, middle, or low-ability readers according to a standardized reading test (Smith, Jensen, Dillingofski, 1971). The students were randomly assigned to one of three treatment groups. Two of the groups were asked to do some writing after they read and the third served as a control. Treatment One students read a short selection and were asked to extend the selection (designated as a creative writing task). Treatment Two students read a short
selection and then either summarized the story or described the main character or action in the story (designated as a non-creative writing task). After writing, the groups were given a comprehension test on the selection. The control group read the selection and took the comprehension test but did not write anything after reading.

It was hypothesized that written products would be of higher quality with the 'creative' writing experience and that reading comprehension, factual recall and main idea identification, would be enhanced by the 'non-creative' writing experience. A second hypothesis was that reading comprehension scores would be higher for groups receiving either of the writing experiences than for the group receiving no reading-related writing experience.

Analysis of variance results did not find significant effects at the .05 level for the comprehension tests among the treatment groups at any ability level. The authors concluded that neither of their writing tasks combined with a reading experience appeared to have any advantage over a reading experience with no related writing task.

Another study investigated the effects of synthetic and analytic approaches to writing instruction on growth in reading comprehension (Straw and Streiner, 1982). One hundred and twenty-four grade four students in six intact classes, were instructed by one of three methods of grammatical instruction: sentence-combining (designated synthetic), sentence-reduction (analytic) or element identification (analytic). Two classes were
randomly assigned to each treatment. Two instructors taught one class from each of the three groups. The element-identification treatment consisted of typical grammar lessons from the classroom language text and was designated as the control. The treatments were for 30 minutes a day for 25 consecutive school days.

The premise of the study was that instruction that affects growth in the "underlying syntactic knowledge of students, should be observable in performances in other language processing modes" (p. 341). In other words it was hypothesized that sentence-combining instruction would affect reading comprehension. Previous results were discussed which had indicated that students instructed in sentence-combining techniques developed greater syntactic fluency in their writing. No previous studies had convincingly established the effects of sentence-combining on reading comprehension.

Students were given pre and post-test forms of the Nelson Reading Skills Test as well as an author-designed cloze post test as reading measures. Pre and post-test forms of the Syntactic Maturity Test were also administered. A three-way analysis of covariance was employed. The independent variables were treatment, instructor, and reading ability.

A significant treatment effect (P < .01) was reported for the cloze reading test but not for the standardized reading test. The sentence-combining treatment was higher than the sentence-reduction treatment, and both were higher than the control. However, a significant instructor-by-treatment interaction was
found for the cloze test and the spectre of instructor bias made the results doubtful. The results of this study did not provide sufficient evidence to support the hypothesis that the practice of sentence-combining in writing has an influence on reading comprehension.

One of the problems of studies like those above is that it seems to be difficult to establish any significant results in treatment experiments that are so short-lived. Some research has examined the effects of writing practice on reading over a longer period of time using case-study research.

Two recent case studies have investigated the writing-reading connection by examining the influence of regular writing practice on the reading comprehension of remedial readers. One case study described the improvement of a twelve year old boy with reading difficulties (Smith, 1982). Although previous remedial reading instruction had not been successful, the author documented an increase in the boy's reading comprehension after a program of instruction that included daily writing.

Daily writing also improved the reading of grade one students in a learning assistance centre (Dobson, 1985). The teacher-researcher reported on a case study of eight students who were behind in their reading skills. The students were involved in a writing-process programme. Most of their reading was done as they read and revised their work. Dobson observed the children's increased sense of control over language. She reported that their confidence grew as their competence increased during daily
writing sessions in the Learning Assistance Centre. The children became involved in the regular reading lessons in their classrooms and experienced success for the first time.

Both of these case studies observed an increase in the confidence of the students as they gained a sense of control over written language. Similar findings were reported from an experiment with 70 freshmen in two college remedial reading classes (Collins, 1985). Remedial reading was taught to both classes but one class also wrote freely for ten minutes during each session. It was reported that the writing group had increased in self-esteem, confidence and improved attitude towards reading and writing. A significant increase in the group's reading comprehension was also reported. However, pertinent data was not available and no firm conclusions could be made about the influence of writing practice on reading comprehension.

To summarize, there is not enough research in the literature on which to base any firm conclusions about the effect of writing or writing instruction on reading performance. It seems that writing instruction may not affect reading comprehension but free writing practice in the classroom may help less able readers to gain confidence in their ability to deal with written language, including reading.
Does Reading or Reading Instruction Influence Writing Performance?

The most promising area of research into reading/writing relationships has been the influence of reading and reading instruction on writing performance. Again there has been rather sporadic interest over the last forty years and researchers have approached the topic with varied emphases. Even in this most promising area of investigation, the conclusions remain somewhat equivocal. Experimental studies which used reading instruction as a treatment were the least successful whereas those studies which examined reading input as an influence on writing yielded interesting results.

After the investigation by Matthew, Larsen and Butler (1945) into the effect of reading instruction on writing performance in college composition classes, no other experimental research on the topic appeared for almost twenty years. One study discovered inadvertently that reading had a positive effect on writing performance (Heys, 1962). In fact Heys' real purpose was to examine the effects of regular writing practice on writing performance with two classes each of grades nine to twelve. One class of each pair was given weekly writing assignments while the other class was excused from writing for the year but was given equivalent time to read in class. Subjective evaluation of writing performance at the end of the year favoured the reading group over the classes which had extra writing practice. Heys concluded that "for many students reading is a positive influence
on writing ability", and this influence "appears to be a separate factor, not related to the teacher's personality and enthusiasm" (p.322). He encouraged replication of the study with much larger samples of students. A review of the literature, however, reveals that no one else was willing to replicate the study by removing writing from their curriculum for a year.

A recent investigation examined the effects of reading instruction on writing performance (Taylor and Beach, 1984). These authors hypothesized that "reading instruction would indirectly develop students' competence in using text structure when writing expository text and thus affect the quality of their writing." (p.137) The subjects were 114 grade seven students who were in one of three combined Social Studies/English classes. The classes receiving the experimental and conventional instruction were taught by the same teacher. The third class was designated as the control group and taught by a different teacher. All the classes were tested on the California Achievement Test and described as being of similar reading ability.

Students in the experimental group were taught to summarize social studies textbook material according to the organization of main and subordinate ideas in the text. Conventional instruction consisted of answering and discussing questions after reading. The control group received no reading instruction in social studies. The experiment lasted seven weeks. All groups were pre and post-tested in reading and writing. Reading measures included two written recall and short answer tests in response to
expository essays. The writing task consisted of two "opinion/example" essays. These were rated for overall quality. Means were calculated for the three groups on the pre and post-test reading measures, a standardized reading measure and the pre and post-test writing samples.

Analysis revealed that on the writing post-tests, the experimental group had significantly higher ratings than the control group but were not higher than the conventional group. There had been no difference between the groups on the pre-test ratings. The experimental group had significantly higher scores than the other two groups on recall of the first passage. On the second passage, they were higher than the control group but they were not significantly higher than the conventional group.

The authors concluded from their data analysis that "reading instruction focussing on text structure had indirect effects on the students' writing in addition to direct effects on their recall of unfamiliar reading material" p.143. They interpreted this further to state that awareness of text structure may have improved the structure of the students' expository writing. This interpretation cannot be corroborated from the data because the writing measure was only described as being for 'overall quality'. A more revealing measure would have analyzed the essays for the presence of a hierarchical structure with superordinate and subordinate propositions.

Another limitation of this study was the use of one teacher for two of the groups and another for the control group. The
authors pointed out that the teacher effect was not a factor because they said that the teacher did not have a vested interest in either treatment. But although teacher effect may not have been a factor in differences between the experimental and conventional instruction groups, it certainly could be considered a factor where both of those groups were different from the control group, taught by another teacher. The problems of this study need to be considered before accepting its evidence of reading instruction influence on writing performance.

Two studies attempted to examine reading content as an influence on writing performance. One study examined the relationship between reading comprehension and the production of syntactic structures (Evans, 1979). Fifty students in grades eight, twelve and senior year in university were given nine prose passages to read and were required to respond to cloze reading tests constructed on the same passages. There were three passages each of narrative, expository, and descriptive prose. Each passage was rewritten into either simple, moderate or difficult syntactic structures and each student read one of each level of difficulty in each of the prose categories. Students were asked to re-write a simplified paragraph in a "better way by combining, rearranging, and deleting sentence parts"(p.130). The rewrites were analyzed for syntactic complexity according to t-unit length, mean number of noun clauses and phrases per sentence. It was predicted that there would be a significant relationship between the writing and reading of syntactic
structures for all the grade levels.

The results of the analysis of variance indicated an overall significant inverse relationship between the three criteria for written syntax because as the cloze means increased, the indices of writing decreased. The cloze means declined across the grades whereas the writing indices increased in the older students.

This study was designed to show that ability to produce certain kinds of syntactic structures in writing is related to the ability to comprehend written language having those same structures. Unfortunately, by giving the students the passages to read before they wrote cloze tests based on the same passages, the task became one of short-term memory rather than comprehension. It is perhaps not surprising that the grade eight students out-performed the university seniors on the cloze task. They may have been more familiar with the 'fill-in-the-blank' format from recent elementary school experience. The author also speculated that the grade eight students may have viewed the task more seriously.

Cloze passages may be perfectly valid on their own for measuring comprehension of syntactic structures and so it is puzzling why Evans chose to have the students read the passages first. Comparing students of different grade levels also confounded the results with age and experience. An investigation which used more than one writing sample and which compared the results of syntactically controlled cloze passages within grade levels might have more enlightening results.
The other study that examined the relationship between reading input and writing performance examined classroom reading materials as an influence on children's writing (Eckhoff, 1984). Eckhoff proposed that children may learn structures from their reading and use them in their writing. She compared the writing of two grade two classes who used different basal reading series. Basal A was described as having a somewhat literary style and Basal B as having a simplified style. Stories were randomly selected from each basal and analyzed for sentence length, t-units, and words per t-unit. Basal A was found to have more complex structures than Basal B. Writing samples were collected and analyzed for style, format, and linguistic structures.

Eckhoff found that Basal A children used more elaborate structures with complex verbs, subordinate clauses, and infinitive and participle phrases. However, when above average Basal A and B children were compared, no statistically significant difference was observed for the use of subordinate structures.

Eckhoff reported similarities of format and stylistic features of the Basal B series in the writing of those children. She concluded that the Basal stories had a strong impact on the children's writing as they seemed to serve as models for the children.

It would seem that analysis of linguistic structures as a basis for comparison between reading input and writing output is difficult because of so many potentially confounding variables.
A limitation of the Eckoff study was that differences in teaching methods, oral linguistic abilities, and outside reading experiences may have influenced the writing performance of subjects.

Finally, three studies examined the behaviour of writers and found reading to be an influential factor. These subjective observations seem to affirm hypotheses about the influence of reading in the development of writing ability. In one study examining the reading and writing behaviours of eight students selected from grades four and seven (Birnaum, 1982), it was found that the better writers were good readers; they formed plans and frequently paused to re-read as they wrote. In contrast, it was reported that the poor writers seldom re-read and seemed to have less of a sense of control and purpose in their writing.

In a case study of an eight year old, the relationship between reading and writing was described as a 'reciprocal agreement' (Boutwell, 1983). Boutwell described reading as a strategy for writing. The child, a proficient reader and writer, was observed to re-read frequently as she wrote and to revise with an awareness of her experience as a reader.

Observations from a study of fifteen grade twelve students who were good writers (Stallard, 1974), confirmed that frequent re-reading was part of the process for proficient writers. A good writer re-read not just in order to revise but also in order to reflect on what he had written, "to experience it himself" as a reader. (p. 218)
In summary, the research on the influence of reading instruction on writing performance provides little insight into the relationship. Studies which tried to establish reading instruction as an influence on writing were not of sufficient duration to verify any hypotheses about the reading/writing relationship. The time factor combined with problems of design have meant that this body of research has not been overly enlightening in terms of reading/writing connections. The more promising research of Heys (1962), Stallard (1974), Birnaum (1982), Boutwell (1983), Eckhoff (1984), has seemed to strengthen theories about reading's influence on writing performance and development. However, this research only provides a sense of the role of reading in writing performance. These studies, along with those of Evanechko et al (1974) and Chall and Jacobs (1984), have furnished indications rather than firm conclusions. They indicate that reading practice and experience may influence the development of syntactic structures, mechanics and form in writing. They seem to confirm other theories about the developmental character of writing. They have not provided definitive evidence about the nature of the reading/writing relationship.

Conclusion

Few definite statements can be made about the reading/writing relationship based on a survey of past research. Research interest in reading/writing connections has occurred
only sporadically over the years. The work that has been done has been isolated, with little obvious connection to previous work. Researchers from the fields of linguistics or education have not explored or extended each other's investigations, but have pursued rather idiosyncratic paths of inquiry.

The research produced by these independent and variant sources has had problems with design and methodology. Small samples, insensitive measures, and confounding variables have interfered with results. Correlational studies have been too global to provide much insight. The ensuing evidence from all these studies is not easily synthesized into a clear picture of the reading/writing relationship. While there is evidence in the research that the two processes are related, the nature of that relationship remains obscure.

The Reading/Writing Relationship: Theory

Introduction

The present investigation attempts to examine one aspect of the relationship between reading and writing. The theoretical framework of the study links theories about the reciprocal interaction and development of reading and writing with theories which assume that the origin of story elements in children's narratives and the development of story schema are influenced by experience with story-reading. This section of the review describes theories of reading and writing development as interactive within a holistic perspective. It also discusses
theories about the origins and development of story concepts and narrative abilities as one facet of holistic language development.

The Holistic Development of Language Ability

"... we must come to understand that what the child knows about one expression of language can support growth and development in another." (Harste, Burke, and Woodward (1982), p.129.)

Describing the nature of the relationship between language processes has been a reoccurring interest within the socio-psycholinguistic theoretical perspective. Explorations into similarities in communicative function, and patterns of development of competency in each of the four processes (reading, writing, speaking, listening), have fueled assumptions about the interrelation of these components of language. From this recognition of similarities between language processes, a holistic view of language development emerges to form the foundation of theories about reading/writing connections. It is from this theoretical perspective that this study was conceived.

A holistic view of language emphasizes analogous properties and interaction between language processes. In Atwell's (1983) holistic view for example, language is the relational base for speaking, listening, reading and writing and these different language expressions relate to the contextual setting and the pragmatic choices of the user. She states that all expressions of language call upon the same base, and that movement between forms
is natural as the user chooses the form appropriate to the context and pragmatics of the situation. In Atwell's language schema, reading, writing, speaking and listening are 'representational formats' of a whole-language base.

Within a holistic perspective, the development of language processing abilities is viewed as interrelated. Many theories about interrelated language development are rooted in parallel observations about children's oral language acquisition. The premise of these theories is that children seem to have a natural ability to learn language in all its forms and that children do this by observing or listening, and experimenting in different contexts. This assumption of interactive language growth appears to underlie recent literacy research which has stressed developmental similarities between the four language processes.

A growing number of literacy studies support the portrait of the child as portrayed by research into oral language acquisition (Johnson, 1976). Recent research into emergent literacy has corroborated a profile of the child as an active learner who uses redundancies, hypothesizes, generates rules, and tests rules as she develops language ability. Harste, Burke and Woodward (1982), for example, found evidence in children's early writing that written language is learned naturally by children in literate societies. These children, are actively involved with print in their environment, and their perceptions are "organized", "systematic" and "verifiable" in that they expect print to be meaningful and have semantic intent. These researchers have
postulated that written language development is a sociopsycholinguistic process which parallels oral language development.

From their observations of emergent literacy and early writing in young children, Harste, Burke and Woodward have constructed an important theory about the relationships between language processes including reading and writing. They coined the term "Linguistic Data Pool" in order to describe the cognitive interaction which they theorize takes place during linguistic processing. This term describes the interaction during which what is learned via one expression of language becomes available data for expression in another language form. Harste, Burke and Woodward state that children seem to have a natural strategy of "fine tuning language with language" and that this use of experiences with other linguistic sources demonstrates the interrelatedness of the development of the language processes.

Similar assertions were made by Bissex (1984), Goodman (1983), Chomsky (1979), and Clay (1983) who observed that children demonstrate cognitive flexibility in their willingness to use what they know from other linguistic sources in their hypotheses-testing to discover the pragmatics, semantics and syntax of written language. In other words, according to these researchers, children in literate environments are actively pursuing knowledge about written language through 'reading' environmental print and are able to use this knowledge in their early explorations with writing. These theorists, along with
Harste, Burke, and Woodward, have in common their emphasis on similarities and analogous properties in the development of language processes including reading and writing, and their assumption of interrelations between these processes.

Other researchers have observed reciprocity during reading and writing as older children develop as writers. Lucy Calkins (1983) commented that children who are proficient writers use their knowledge about reading as they compose. In other words, according to Calkins, they capitalize on connections between reading and writing as they develop proficiency. Janet Emig in her 1971 study on student writers in grade twelve, described writing as a recursive process where revision involves the writer monitoring his work in the role of 'audience', in other words, in the role of reader. Emig's early (1969) theories about writing, published in an article on the development of rhetoric (1983), are substantiated by later research which has confirmed the evolution of writing as a natural, developmental phenomena in which the writer calls on his resources developed through reading (Harste et al, 1984).

These and other theories about the holistic nature of language processing have had recent impact on education. They have gradually influenced educators' perceptions of reading and writing. There has been a marked shift away from the commonly held view of reading as reception and writing as production. Traditional views perceive reading and writing as discrete entities and natural opposites or mirror-images of one another.
whose skills need to be taught sequentially and independently. Until recently, school curricula seem to have operated on a kind of sequential theory in which oral language influences reading development and reading is in turn a foundation for writing (Tierney, 1985; Tway, 1986).

Current theorists have described the relationships between the language processes as interactive rather than linear-sequential. For example, Donald Graves (1982), pioneer researcher of the writing process, exploded conventional wisdom which held reading as a precursor for writing development when he observed that the opposite was also true in that children learned more about reading through their writing. He also noted that children who write for others achieve more easily the objectivity necessary for reading the work of others. The premise of these theories about reading and writing development is that reading and writing are similar and that they interact in a mutually supportive way so that the learner is able to enhance the development of reading ability through writing and vice versa.

Corresponding theories about the function of language processes also have emphasized the presence of similarities. Theorists have recently recognized the existence of analogous properties and have postulated specific related components within these language processes. Tierney and Pearson (1983) for example, state that reading and writing are similar processes because they both involve 'acts of composing'. They argue that readers 'compose meaning' for themselves as they read. To support their
argument, they describe the composing process and point out similarities between the act of composition for readers as well as writers. These characteristics of composing are: planning, drafting, aligning, revising, and monitoring. Pearson and Tierney state that readers and writers negotiate meaning and that they are each tacitly aware of the other as they attempt separately to align their perceptions to get at or to convey meaning, the primary function of each process.

Wittrock (1983) also describes similarities between the function of language processes. He argues against a view that implies that reading is essentially a 'reproductive skill' and writing is conversely a 'constructive' or 'generative' skill. In Wittrock's model of generative comprehension, reading shares important cognitive processes with writing. He states that 'good' reading involves "generative cognitive processes" as does effective writing because readers "generate" meaning as they read. According to Wittrock, readers generate meaning by relating parts of the text to one another and to their prior knowledge about text structure.

Other theorists agree with Wittrock about the importance of prior knowledge, particularly knowledge of text and story. Squire (1983) states that prior knowledge including story knowledge is an essential element in both composing and comprehending. In Squire's view, formation of prior knowledge is critical in that it fuels the development of both composing and comprehending. He views three aspects of prior knowledge as important: general
background knowledge and experience; knowledge of strategies for relating new information to prior information; and knowledge about schema and rhetorical structures.

Adams and Bruce (1982) state that language "is a means for directing others to construct similar thoughts from their own prior knowledge" (p.3). They claim that text comprehension results when there is a match between the author's assumption of the readers' prior knowledge and the actual knowledge that the reader possesses, and the reader's assumption of the author's intent. According to Adams and Bruce, background knowledge has 'conceptual', 'social' and 'story' components which are enhanced as the individual uses prior knowledge to create new knowledge in the act of comprehension. This constructivist view of reading encompasses a perception of reading and writing as analogous in function.

Adams and Bruce, Squire (1983), and Wittrock (1983) have recognized prior story knowledge as an important facet of reading/writing functioning. They do not however theorize about how story knowledge develops and what role it plays in the development of reading and writing.

In summary, investigators have emphasized cognitive and linguistic similarities between development and function of language processes and have generated theories about the holistic nature of language processing. These theories have provided the conceptual framework for exploring and understanding reading/writing connections.
The Development of Story Knowledge and Reading

"...people not only learn to read by reading and write by writing but they also learn to read by writing and write by reading." (Goodman and Goodman (1983), p. 592.)

The premise of holistic perspectives on language development is that the development and function of one language process impacts on the development and function of another language process. In this view, reading development influences writing development and vice versa. Within this conceptual framework, it is the theory of a specific relationship between story development in writing and reading ability that is to be examined by the next section of the review.

Research into the origins of story knowledge has contributed to understanding of reading/writing connections. A number of theories have emerged to describe the evolution of the concept of story and storying ability in children and the connection to reading. To continue the analogy with oral language development where children are depicted as active learners, generating and testing rules about language structure and function, theorists have assumed that developing readers generate and test rules about stories and storying unconsciously as they read or are read to by adults (King and Rentel, 1983). In theory, just as a child internalises patterns and rules of oral language and uses that pattern to create each of his utterances, the child internalises a schema for stories which guides his production of stories.

Vygotsky (1962) believed that language development is not taught but rather learned through exposure and experience. He
stated that language is mastered consciously only after it is used and practiced unconsciously, although he stated that the process of conscious mastery could be accelerated by collaboration with adults. More recently, theorists have postulated that mobilization of story knowledge is also, at least initially, an unconscious cognitive process developed through experience with stories.

Much of the early research into the development of narrative ability in oral and written language explored connections with general cognitive or linguistic development. For example, a study of children's writing development by Wilkinson, Barnsley, Hanna, and Swan (1980, 1983) was predicated on the theory that there are linguistic correlates to stages of cognitive development. They reported on an extensive longitudinal study of the writing development of children at ages 7, 10, and 13 which hypothesized a relationship between cognitive maturation and growth in writing. Wilkinson et al observed increases in the complexity of compositions as the children aged. Their results seem to corroborate later theories about the developmental nature of writing.

Brian Sutton-Smith along with G. Botvin (1977) also probed the developmental nature of storying although they examined oral stories rather than written narratives. They examined stories of children, ages three to twelve, and found that the structural complexity of the stories increased with age. They discovered a hierarchical developmental sequence of storying ability in which
complexity and focus of oral narratives were the key elements. The authors theorized that the development of narrative structures is analogous to the acquisition of other linguistic structures. They surmised that there is evidence that children attempt to imitate available models in their storying although they did not investigate the reading/writing connection.

Arthur Applebee's (1978) research on children's stories led him to conclude that children internalize a concept of story through exposure to stories as they read, or are read to by adults. He also concluded that this concept of story is developmental. Applebee analyzed children's oral stories for formal story characteristics and found that even the stories of two and one-half year-olds had evidence of story form. He described their expectations about story characters, use of narrative linguistic structures, and formal story openings and closings. He discovered an increased incidence of formal story characteristics in the stories of older children and concluded from his analyses that what he called a 'concept of story' was developmental in nature.

Applebee described six developmental stages of complexity in the children's stories. These categories are similar to Botvin and Sutton-Smith's (1977) categories in that they also describe increasing levels of structural complexity and focus in narratives. The important characteristic of development in Applebee's hierarchy is the children's ability to centre a narrative. For example, the most primitive stories, told by the
youngest children, were characterized as "heaps" of unrelated events or descriptions. The stories increased in complexity and focus in older children - progressing from "heaps", "sequences", "unfocussed" and "focussed chains", to the highest stage of centered narrative.

Although Applebee theorized that development of a concept of story was related to exposure to stories through reading, his research did not explicitly explore the relationship of the structural complexity of stories to reading ability, quality and quantity of exposure to stories or any other aspect of reading experience.

Theorists have continued to explore ideas about the mobilization of story knowledge as an unconscious cognitive process which is developed through experience with stories. Marie Clay (1983) for example, stated that "experience with written dialect" (p.269) through hearing stories, acquaints children with the forms of language used, character types, and the ways in which stories are written. She defined this developing schema for stories as a plan which guides and controls the serial ordering of ideas in writing. Clay's assumption that reading input influences the development of story schema, lead her to advocate exposure to literature in the home and classroom.

James Britton (1983) noted a developing sense of story in his own grandchild which he assumed came from her exposure to stories. He described the child's anticipation of events in stories as she was being read to and her incorporation of
incidents from particular stories in her own imaginative play. Britton theorized about a reciprocal arrangement, between the child's story world and the real world, which contributed to a growing perception of narrative form. In other words, in Britton's view, a child begins to form a series of expectations about story structure from an early age. Encounters with written narratives are an integral part of this formation in that it is through exposure to story books by listening and reading that the child begins to internalize story form and the structure of written language, according to Britton.

The sharing of stories was found to be the most important factor in homes of pre-school children who experienced later success in school in the Bristol Study conducted by Gordon Wells (1985). The results of this fifteen-year longitudinal study of child language development were conclusive in regards to the influence of reading and writing activities in the literate family environment. Wells theorized that the influence of story-reading went beyond learning to read and had impact on the cognitive development of the child. He argued that a sense of story evolves naturally as children encounter the narratives of everyday interaction, including conversations, personal stories, and dramatic play. This inner sense of story, states Wells, is shaped as children attempt to integrate information and make sense of the world around them. Through listening to stories children extend their experience and "begin to assimilate the more powerful and more abstract mode of representing experience
that is made available by written language (p. 7). Stories are the link between reading and writing and the key to making meaning, in Wells' view.

In summary, researchers who have examined storying ability in children have surmised that this ability is developmental in nature and that its evolution may be assisted by exposure to stories during story-reading experiences. Botvin and Sutton-Smith (1977), Applebee (1978), Britton (1983) and Wells (1985) all found evidence of story elements in the children's stories. Their theories about the influence of story-reading experiences on the development of storying ability seem to interface well with previously mentioned theories about the holistic, interactive nature of linguistic processing where linguistic input from one source influences the development of another language performance.

Narrative Schema Development: Related Research

Introduction

The intention of this section of the review is to provide background theory and research which is particularly relevant to the present investigation. A description of story schema theory and story grammars will be presented along with a review of research which has examined story schema and reading ability. Those few studies which have previously investigated the development of story structure in original written narratives and
its relationship to reading ability will be examined in more detail.

The Development of Narrative Schema

A narrative or story schema is defined as the conceptual mechanism or framework for story knowledge that guides an individual's comprehension and retrieval of stories. Theories about a schema for stories have been explored by the fields of psychology, artificial intelligence, and more recently, education.

Bartlett (1932) originated the concept of schema to define the mental processes used during encoding and retrieval of story events. He argued that recall is not an exact reproduction of input but a synthesis of information constructed during encoding. He concluded that memory for stories is constructive and the product of interaction between incoming information and existing mental constructs or schema.

Story schema theorists in the 1970's examined Bartlett's notion of schema and related it to narrative structure of simple stories. Early research examined the evolution of narrative structures in memory through analyzing oral recall of stories which were read or listened to by adult subjects.

The fundamental premise to all schema theory research is that individuals tell or retell a story by utilizing an ideal internalized schema for stories. This premise is analogous to theories about the development of story concepts as described by

The consistent results of experiments involving story recall lead theorists to conclude that the concept of story schema has psychological validity and that story schema descriptions are valid representations of the psychological or conceptual mechanisms which guide comprehension and retrieval of simple stories in memory (Black and Bower, 1980; Johnson and Mandler, 1980; Lichtenstein and Brewer, 1980; Rand, 1984).

Briefly, story schema researchers have reached the following important conclusions about story schema and recall:

- memory for stories is organized according to an idealized story schema (Bartlett, 1932; Mandler and Johnson, 1977; Rumelhart, 1977).

- the more a story conforms to an ideal structure or schema, the better the recall (Mandler and Johnson, 1977).

- basic structural elements are expected and are recalled more easily: setting, initiating event, consequences, goals (Bower, 1976; Rumelhart, 1977; Thorndyke, 1977; Kintsch and Van Dijk, 1978; Stein and Glenn, 1979; Lichtenstein and Brewer, 1980; Glenn, 1980; Nezworski, Stein and Trabasso, 1982; Gold, 1983).

- a schema for stories develops with age (Mandler, 1978;
Stein and Glenn, 1979; McClure, Mason, Barnitz, 1979; Poulson, Kintsch, Kintsch, and Premack, 1979).

-stories that are non-conforming are encoded in memory and recalled from memory according to an idealized story schema (Mandler and Johnson, 1977).

-stories that are presented in scrambled order are less well recalled than those presented in expected order (Thorndyke, 1977; Kintsch and Van Dijk, 1978; Hoover, 1982).

Narrative Schema and Comprehension

The concept of narrative schema as a structure in memory which facilitates encoding and retrieval of stories has been broadened to include story comprehension. Researchers state that readers appear to mobilize schema during comprehension. Research has discovered that reading material that follows expected story form is comprehended or predicted more easily (Stein and Glenn, 1979; Bruce, 1980; Whaley, 1981; McConaughy, 1982; McGee, 1982; Stein and Trabasso, 1982; Fitzgerald, 1984). Assertions that a schema for stories guides comprehension appear to support theories about prior story knowledge and its essential role in reading comprehension (Adams and Bruce, 1982; Squire, 1983; Wittrock, 1983). In theory, prose comprehension requires prior knowledge of story structure as well as prior knowledge of human action and behaviours (Glenn, 1980).

Researchers examined the comprehension of stories and postulated that a schema for stories develops through exposure to
stories (Whaley, 1981). A number of studies discovered a relationship between age and expectations for story structures in narratives. Adults were found to have more well-developed story schemas than were children, and older children were found to be more adept at recognizing and reproducing story structure than were younger children (Brown, 1977; Poulson, Kintsch, Kintsch and Premack, 1979; McGee, 1982; McConaughy, Fitzhenry-Coor and Howell, 1983). These results support theory that story schema is developmental and may result from incidental learning through repeated exposures to narrative structures including both oral and written stories.

Researchers observed differences between age groups and use of story schema during recall and comprehension (Mandler and Johnson, 1977; Stein and Glenn, 1979). Differences were explained as immature manifestations of an idealized narrative schema. Children demonstrated the same general profile of structures in their schema but the pattern of emphasis differed from adults (Stein, 1982).

McConaughy, Fitzhenry-Coor, and Howell (1983) expanded upon research which described developmental differences in schema. The authors proposed a novel interpretation of variation in story schema. They suggested that adults and children employ qualitatively different types of story schemata during comprehension.

McConaughy et al described two levels of schema quality designated as 'causal inference schema' and 'social inference
Causal inference schema is defined as representing a less mature level of comprehension which emphasizes physical causality in stories. Categories of information that are most important at this level are descriptions of events, actions and outcomes. This schema organization seems to correspond with Applebee's 'unfocussed chain'(1978). In other words, it describes a narrative that consists of a series of events temporally connected to each other but without a common focus.

Social inference schema is defined as representing a more mature level of comprehension. At this level, individuals are said to focus on character motivation. In other words, social inference schema incorporates expectations for psychological causality into interpretations of story information. Categories of information that are most important at this level include the major goal of the character, her internal responses or sub-goals, as well as outcomes and resolution of the goal. This schema description seems to correspond to Applebee's 'focussed narrative'(1978). The events in this schema are connected through the central focus of the main goal statement. The emphasis on the goal as the central element of a story also concurs with research which has recognized the importance of goals and plans in recall and comprehension schemata (Lichtenstein and Brewer, 1980; Fitzgerald and Spiegel, 1983).

McConaughy et al hypothesized that younger children and less mature readers would demonstrate a causal inference schema whereas adults and more mature readers would demonstrate social
inference schema. Story summaries were collected from grade five and college students and compared according to structural categories. The main hypothesis was confirmed by results which showed that adult summaries emphasized character motivation while children de-emphasized motivation and placed more emphasis on actions and events in the stories. The authors interpreted their findings as support for the distinction between schema for adults and children.

Research also has examined the relationship between reading ability and narrative schema development. Given that theoretically a schema for stories develops at least partly through exposure to stories through reading, a small number of studies investigated the relationships between reading ability and the ability to comprehend, recall, or reorder structural aspects of traditional narratives (McClure et al, 1979; Fitzgerald Whaley, 1981; Hoover, 1982; Fitzgerald, 1984; McConaughy, 1985a). Overall, findings from this research tend to indicate that better readers may have a more well-developed schema for stories than poorer readers. However, the studies were not unanimous in their conclusions and further research is needed before definitive statements can be made. These studies did not attempt to access mobilization of schema during original production of stories but relied on recall, summary and reordering tasks.

In summary, research has concluded that individuals possess a schema for stories which guides memory and facilitates
comprehension. Researchers agree that an individual's internalized representation of a story aids listening and reading comprehension, allows predictions about meaning, and enables retelling or creation of stories.

This theory concurs with that of researchers who have examined the evolution of story concepts in young children (Applebee, 1978). Story schema research seems to confirm theories that knowledge about stories develops through experience with events in the world and through exposure to narrative structures in stories (Wells, 1985).

There also appears to be agreement between concepts of what characterizes a more mature structural organization. Assertions of story schema theorists that a well-formed story is focused around a goal and that goals and statements that are related to goals are salient in recall, (Rumelhart, 1977; Lichtenstein and Brewer, 1980; and McConaughy et al, 1983), seem to concur with findings of Applebee (1978) and Sutton-Smith (1981) that the most mature level of story structure is a focused or centered narrative. Similar observations about story concept development and story schema theory sanction fundamental theories about how an individual processes and produces stories. Further research corroboration is needed.

**Story Grammars**

Story schema research has provided a viable tool in story grammars for assessing structural schema in narratives. Story
Story grammars are employed in recall and comprehension research to encode the macrostructure of an idealized story schema. A brief explanation of story grammars is provided here as a preface to that research which has previously used story grammars to investigate the relationship between reading ability and story schema development in comprehension and production of stories.

Superficially similar to sentence grammars, story grammars consist of a set of grammatical categories and rewrite rules which describe relations between the categories. A typical story grammar is as follows:

```
Story----> setting + theme + plot + resolution
Setting----> characters + location + time
Theme----> event + goal
Plot----> episode
Episode----> subgoal + attempt + outcome
Attempt----> event + episode
```

(Thorndyke, 1977)

Story grammars which define a well-formed simple story were devised for purposes of recall and comprehension research (Rumelhart, 1977; Thorndyke, 1977; Mandler and Johnson, 1977; Stein and Glenn; 1979). The concept that simple stories have structural regularities was based on Propp's important research on folk stories (1968). Propp observed reoccurrence of certain forms and organizational tendencies in stories and concluded that
structural attributes of simple narratives were stable. Simple stories were consistently constructed around a central goal of a main character or group of characters. Typically, something happens initially so that the protagonist(s) establishes a goal and the story directly or indirectly describes related attempts to accomplish the goal and resolve the central problem. Story grammar analysis provides a framework for describing structural patterns in simple narratives. Each story grammar includes these recognized attributes of a simple, well-formed narrative although there are differences in descriptions of relations between categories.

It should be noted that story grammars have been criticized because they can distort or ignore semantic content in certain applications; nevertheless, it is accepted that they do describe the fundamental elements necessary to story structure and are acceptable as descriptions of a schema for simple stories (Black and Bower, 1980; Mandler, 1982; Thorndyke and Yekovich, 1980).

Narrative Schema Development and Reading Ability

McClure, Mason and Barnitz (1979) investigated the relationship between story structure and the ability to sequence stories. Three classes each of grades three, six and nine were given three versions of scrambled stories including one version which contained structural categories predicted by a story grammar. Reading ability was assessed by the comprehension section of the Gates MacGinitie reading test. The task was to
reorder the stories.

Of the three stories, the story grammar versions were ordered most easily for all groups. Developmental effects were found for the tasks as correctness was observed to increase with age. Subjects were observed to use their knowledge of a story's deep structure to reorder sentences. It was concluded that individuals were able to ignore surface characteristics of a story text and attend to the propositional content and underlying structure. An exception to this was a few of the youngest subjects who reordered stories using cohesive lexical ties to join sentences in logical pairs, ignoring the structural sense of the story. Significant correlations between reading ability and ability to order stories, were found at all three grade levels. The combined correlation for reading ability and story ordering was .72.

A major assertion of the study by McClure et al (1979) was that specific types of event sequences are expected to occur in stories and that if these do not occur, then reorderings will conform to the expected norm. Their findings confirmed memory research in which stories presented in scrambled form were reordered in memory to conform to that structure predicted by a story grammar (Mandler and Johnson, 1977; Stein and Glenn, 1979).

Expectations for story structure were assessed more directly in a later study by Fitzgerald Whaley (1981). One hundred fifty-three good and average readers in grades three, six and eleven, were asked to predict endings after reading unfinished stories.
The stories were differentially organized according to structural emphasis. In a second task, designated 'macro-cloze', subjects were asked to fill in missing text in stories. Deletions were from structural categories based on a story grammar. Oral protocols were transcribed and scored according to story grammar categories. It was hypothesized that readers would expect structures defined by story grammar categories.

Data analysis confirmed the hypothesis that readers expect structures described by a story grammar although grade three subjects gave responses that matched the grammar less frequently than did the older subjects. Increased experience with stories or with social situations that are incorporated in stories, was given as a possible explanation for age-related differences. There were no differences in the structural pattern of expectations for grades six and eleven, leading the researcher to conclude that readers of average and above ability employ the same schema during comprehension.

Fitzgerald continued research on expectations for story structures with a second study (1984). This investigation examined the relationship between reading ability and the ability to anticipate narrative text structures during reading. Essentially the same tasks were employed as in the previous study except that in this study the subjects differed in reading ability.

Ninety-six grade four and seventy grade six subjects read two stories and were asked to orally supply the missing
information. The structural categories of the oral protocols were assessed according to a story grammar. Results demonstrated a significant relationship between reading ability and story expectations. Although the pattern of categories was the same for both grade groups, the tendency was for better readers in both grades to expect structural categories more often than poorer readers. Fitzgerald suggested that better readers tended to be more sensitive to narrative structure than poorer readers.

In a study of younger children, Hoover (1982) also concluded that better readers were sensitive to text structure. The study examined 112 subjects in kindergarten and grade one. The ability to distinguish normal from incoherent stories by listening was predictive of subsequent reading achievement for subjects in this study and it was suggested that story schema development was a significant influence on the ability to monitor narratives for incoherence.

The studies by McClure et al (1979), Hoover (1982), and Fitzgerald (1984) found relationships between reading ability and mobilization of story schema during comprehension. It would seem from this research that there is a relationship between reading ability and expectations for structural sense and coherence in a story. Readers seem to expect certain structures in a story and employ their schema for stories in order to comprehend during reading or listening.

A later study examined the oral and written recall protocols of good and poor readers (McConaughy, 1985a). Twenty-one good and
twenty-one poor grade six readers read or listened to four stories and summarized them orally or in writing. Recall summaries were parsed into propositions and presented for blind scoring. Raters categorized each proposition according to a story grammar. The protocols were analyzed for proportion of statements related to original story propositions; proportion of statements in eight story grammar categories; and the hierarchy of events and propositions in the summaries. It was hypothesized that good readers would show a higher level of schema quality, similar to adult organization, under both modality conditions. Poorer readers were expected to employ higher level schema organization during listening and oral recall but their schema quality was hypothesized to become less complex during reading and written recall tasks.

Analysis of variance revealed that good readers on average produced longer summaries and recalled more story propositions than poor readers. Both groups produced longer oral summaries than written. There were no significant differences between the modalities of presentation, listening and reading, for either group. No significant differences were found for the presence of syntactic categories or evidence of appropriate hierarchy of propositions defining schema quality. Although poor readers recalled slightly fewer propositions in each category, the pattern of category recall was the same for both groups and similar to recall profiles in previous research.

During recall of explicit text structures, both reading
groups displayed the expected story categories that reflected the more complex level of schema quality and matched the hierarchical levels of ideal structure generated by the story grammar. It was found however that both groups were less able to deal with texts that contained implied structures such as implicit sub-goals or internal responses. McConaughy suggested that subjects at the grade six level may not yet have developed sufficient stability in their schema development to be able to employ complex schema when higher level categories were less obvious in text. McConaughy concluded that poor readers were not deficient in their basic schema organization when compared to good readers on recall tasks. Implications of using a simple narrative stimuli were discussed. It was implied that poor readers may be capable of higher level comprehension when the reading material is presented in a familiar form with a predictable structure. McConaughy cautioned that the result of using more complex stimuli could be quite different. In summary, research into the relationship between reading and narrative schema has had differential results. While it appears from research that good readers may employ a schema in their expectations of a well-ordered story which conforms to certain story schemata, it cannot be stated that poor readers conversely lack a schema for stories. Fitzgerald’s (1984) finding that the pattern of expectations was the same for good and poor readers, and McConaughy’s finding of no difference in schema employed in recall, tempers any generalization about schema
differences and reading ability. However, although both groups of readers may possess and employ a schema for stories, differences may lie in the degree to which a poorer reader is able to mobilize schema in situations other than recall and completion tasks.

One way of investigating the employment of schema would be analysis of original story productions either written or oral. Oral storying ability has been explored by other research. Both Botvin and Sutton-Smith (1977) and Applebee (1978) described age-related differences in the development of structural complexity of narratives. However, the relationship between structural complexity in oral stories and reading ability remains a subject for future research.

Reading Ability and Story Schema Development in Written Narratives

Three studies were found which had recently examined written narratives and looked for a relationship with reading ability. Hansche and Gordon (1983) analyzed the original written narratives of good and poor readers according to a story grammar. Sixteen good and poor readers in grades one, four, eight, and ten were told to write a story on a topic of their choice. The stories were scored for the presence of six story categories: Setting, Initiating Event, Response, Attempt, Consequence and Reaction. It was hypothesized that grade one stories would
contain fewer elements than those of grade four and that the grade eight and ten stories would contain all six story elements.

Differences between the stories for good and poor readers were found only at the grade one and ten levels. It was concluded that the extent of differences between story schema development in the writing of good and poor readers could not be determined by this instrument alone.

The results of the Hansche and Gordon study were confounded by the fact that students could choose their own topic. Although this issue was not addressed by the researchers, it would seem that some students did not write narratives when told to write a story. It was reported that the stories of the grade four and eight students were fairy tales and ghost stories whereas some grade ten students wrote non-fiction accounts of personal experiences. Given that story grammars were designed to describe narrative structures, and that not all students wrote a narrative, it is not surprising that the researchers concluded that their instrument was not effective at all grade levels.

Timothy Shanahan (1984) conducted an exploratory multivariate analysis that examined the reading-writing relationship from a number of aspects. Multiple reading and writing measures were administered to 256 grade two and 251 grade five subjects. Reading was measured by a number of standardized tests and two original writing samples were collected from each subject. Writing analyses consisted of mean t-unit length, vocabulary diversity, and story grammar analysis including: number of story
grammar categories, number of episodes, and number of information units. A spelling test was also administered.

Results indicated that reading and writing were significantly related at both grade levels. However, neither reading nor writing were sufficient to account for more than 43% of the variance. Shanahan observed that as students became more proficient, the nature of the relationship between reading and writing also changed. For beginning readers, phonics and spelling were the most important variables, whereas for proficient readers vocabulary and story structure became most important in the reading/writing relationship.

Low significant correlations were computed for reading comprehension and story grammar analyses at both grade levels. The correlations reported for number of propositions and reading comprehension were .33 for grade two and .22 for grade five. For the number of different structural categories with reading comprehension, the correlations were .34 for grade two and .27 for grade five (p.470). Correlations of .20 for grade two and .21 for grade five were reported for number of episodes with reading ability.

Shanahan divided both grade groups into two reading ability groups designated 'beginning' and 'proficient' readers. For beginning readers, the three story grammar variables were found to contribute equally whereas for proficient readers, the number of different categories was found to be slightly more important than the other two variables. Shanahan suggested that as readers
mature, the variety of information becomes more important to the reading/writing relationship than the quantity of information.

The correlations for all the story grammar analyses were among the lowest in the multivariate reading/writing analysis. It was not known if Shanahan encountered a problem similar to that of the Hansche and Gordon study of trying to measure non-stories with narrative schema analysis. The picture stimuli used by Shanahan were not inherently narrative in nature and so it is possible that children may have written mere descriptions of the scene. In this case, analyses may have been affected in that descriptive compositions may not manifest many of the structural categories which a story grammar describes for a true narrative (Mandler, 1980).

The final study which examined evidence of narrative schema in written narratives, was a small exploratory study (McConaughy, 1985b). The study utilized a story stimulus with an inherent narrative structure in a three-picture sequence. The stimulus was derived from the Test of Written Language, a standardized writing measure. Story protocols from a small group of disabled readers aged 9 to 11 were analyzed according to a story grammar and scored on a nine-point rating scale for schema quality. As in all research involving story grammar analysis, the narratives were first parsed into story propositions and assigned to structural categories of the grammar. The grammar used in this study was adapted by McConaughy from those of Rumelhart (1977) and Thorndyke (1977). Each parsed narrative was then assessed.
according to a set of criteria for quality of story schema measured by a score on the Schema Quality Rating Scale (McConaughy, 1985b).

The Schema Quality Rating Scale was devised by McConaughy, a researcher in the Department of Psychiatry at the University of Vermont. It evolved from theories of a developmental story schema for story comprehension (McConaughy et al, 1983) and from previous story schema research. From findings that certain structures assumed more importance in memory, the concept of a hierarchical arrangement of structural categories in story schema was formed and subsequently corroborated by comprehension research (Whaley, 1981). Research findings about story structure established the presence of initiating events, resolutions, episodes, and goals as most important of story structure categories (Rumelhart, 1977). Number of episodes was found to be related to structural development (Mandler and Johnson, 1977). The intention of the Schema Quality Rating Scale was to interpret these previous findings about story structure and characterize the quality of a story structure, an interpretive aspect of schema not depicted by the structural categories alone.

McConaughy also incorporated research findings which had concluded that children and adults demonstrated differential schema quality (Stein and Glenn, 1979; McConaughy et al; 1983). The main distinctions between designations of schema quality were the emphasis of goal statements and internal responses. Briefly, stories which contained goal statements and internal responses of
characters were said to incorporate psychological causality and character motivation, and therefore, according to McConaughy, demonstrated a more mature level of schema - Social Inference Schema.

Causal Inference Schema was described as less mature because of emphasis on physical causality and temporal description of actions. Those stories which were characterized as a string of causally related actions and descriptions without a central focusing goal were described as less mature in schema quality.

McConaughy found that analysis of schema quality highlighted organizational problems not described by conventional analyses. This was a small exploratory study which proposed a promising analysis of structural aspects of written narratives.

To conclude, evidence from the three studies which examined story structure in original narratives is not decisive and further research is needed. Low positive relationships were observed for the presence and number of structures in the stories of readers of differing ability levels but these were not strong enough to be predictive of reading ability. Analysis of story structure in written narratives was not conclusive. Lack of controlled writing stimulus meant production of compositions inappropriate for assessment by a grammar of defined narrative structures. This factor may have interfered with the results.
Conclusion

Few conclusive statements can be made about the reading/writing relationship based on a survey of the research and theoretical literature to date. A holistic perspective of interrelated language development considers reading and writing as mutually interactive in function and development. Theories about the origins of story concepts and schema have assumed connections between related language processes. Yet, many theoretical assumptions remain untested by subsequent research. Research has been relatively isolated, with little connection to previous work. Researchers from the fields of linguistics, psychology and education do not seem to have explored or extended each other's investigations, but have often pursued rather idiosyncratic paths of inquiry.

The evidence produced from these independent and variant sources is not easily synthesized to form a clear picture of the nature of the reading/writing relationship. While there is evidence in the literature that the two processes are related, the nature of that relationship remains unclear. The relationship appears to be multi-faceted and complex. Research which has investigated relationships between specific facets of the two processes has produced the most promising results, but further analysis is needed. If research on the reading/writing relationship is to inform practice, it needs to provide information on how these processes are related, so that classroom teachers may best capitalize on the connections.
CHAPTER THREE

Methodology

Research Design

A correlational study was conducted in which reading comprehension scores were correlated with ratings of schema quality, for written narratives.

Subjects

Subjects were grade eight students in a secondary school in Vancouver, British Columbia. The school is located on the east side of the city in a neighbourhood that tends toward lower-middle or working class socio-economic status and is of mixed ethnic and racial background.

The students represented the entire grade eight population of the school with the exception of those grade eight students in a learning skills class and in a class in which English was taught as a second language. The subjects were in five English classes taught by two different teachers. Three of the classes were taught by one teacher and two by the other. The students were selected randomly for placement in classes by the administrative computer which generated student timetables.

The original group of subjects consisted of one hundred
twenty-six students who were given a standardized reading test. Attrition due to illness meant that one hundred fifteen students participated in the writing portion of the study. Two students who were repeating grade eight were dropped from the study leaving the final sample of one hundred thirteen subjects. The median age of the group was 13 years 4 months. There were fifty-five girls and fifty-eight boys.

Data Collection

The students were given the Gates-MacGinitie Reading Test (1980) as part of the regular fall assessment programme of the school. Sub-tests were administered over two English periods during two weeks in early October.

About two weeks later, after the administration of the reading tests was completed, the written narratives were collected during another English class. Students were given a story stimulus and told to write the best story they could using all three pictures. Time allowed for writing was forty-five minutes.

Each class was given identical instructions and allotment of time and the researcher administered all the tests. The researcher was a familiar figure to the students as a teacher in the school, although none of the students were in the researcher's own class.

Each student was identified by a number which encoded her class and placement on alphabetized class lists. These number
codes were used to ensure subject anonymity when reading tests and writing samples were being scored and also for purposes of entering the data for computerized data analysis. Data from the reading assessment was not available during the scoring of the writing samples and vice versa so that blind scoring was employed.

**Measurement**

**Reading Ability**

Reading ability was assessed by the comprehension section of the *Gates-MacGinitie Reading Test* (1980), Level E, Form 1. This test is a widely-used standardized reading survey test which measures a general level of reading comprehension ability. The test consists of a vocabulary test and a comprehension test. Both of these sub-tests were administered to the students but only the results of the comprehension test were used in the data analysis.

The selection of the comprehension section is considered justified because this test measures the ability of the reader to decode and comprehend connected discourse at both literal and inferential levels (Mitchell, 1985). It is this ability which is most relevant to story reading and the purpose of this study.

The *Gates-MacGinitie Test* was standardized according to norms developed from the results of testing 46,000 Canadian students. A stratified sampling procedure was used to ensure proportionate representation. Reliability coefficients of .87
are reported for the sub-tests (Kuder-Richardson formula) (MacGinitie et al, 1980).

**Scoring Procedure for Reading Tests**

The reading tests were hand-scored and tabulated twice; once by the learning assistance teacher in the school, and once by the researcher. The raw scores for the comprehension portion of the test were computed and stanines and grade equivalent scores were tabulated from the tables of norms in the test manual.

Form E, Level 1 of the *Gates-MacGinitie* test is designed for use at the beginning high school level (MacGinitie, 1980). Subjects were entering high school in grade eight for the first time and there was no possibility that any of the students had written the test previously.

**Narrative Stimulus**

The picture stimulus of the *Test of Written Language* or *TOWL* (Hammill and Larsen, 1985) was used to generate the narrative samples (Appendix A). The *TOWL* picture stimulus was designed by the authors to elicit story samples from students. The *TOWL* has been widely used in a test of written language for the past ten years and is one of the few normed and standardized measures which uses a story sample for analysis (Mitchell, 1985). Only the picture stimulus from the *TOWL* was used as the other sub-tests were not relevant to the purposes of this study.

The *TOWL* stimulus was used because it contains an inherent
structure which strongly suggests a story. This enabled the development of a set of specific structural expectations. The intention was to eliminate the problem of story protocols which elicited composition which were more descriptive or anecdotal than narrative. Previous analysis by the researcher of another set of TOWL samples indicated that the picture stimulus prompted students to write narratives.

The stimulus consists of three adjacent pen-and-ink pictures presenting a space story. In the first picture, conditions on one planet are deteriorating, leading to an exodus of space vehicles in the second picture, and subsequent settlement on a new planet in the final picture.

None of the participants in the study had previous experience with the TOWL writing stimulus. The TOWL is time-consuming to score and therefore most often used in specialized one-on-one situations characteristic of learning assistance and skills development centres in elementary and secondary schools. Therefore, it was highly unlikely that any of the students had an opportunity to view the stimulus beforehand.

Analysis of Written Narratives

Organizational structure of the narratives was first assessed for the presence of thirteen possible story structure categories. These categories were adapted by McConaughy (1985b) from those in story grammars previously devised by Rummelhart (1975) and Thorndyke (1977). The categories were: setting,
initiating event, internal response, description, goal, attempt, outcome, reaction, resolution, moral, disposition, commentaries, and unclassified. (see Appendix B for definitions)

After the structural categories of the narratives were recorded, a further analysis was performed in order to assign each narrative a rating for quality of story schema.

**Scoring Procedure for the Written Narratives**

The stories were parsed into story propositions for blind scoring. The criterion for a proposition is defined as a unit of prose which expresses an idea, emotion or action. Analyses were recorded for each story on a separate score sheet which was encoded with the student's identification number. Nothing was eliminated from the stories and no attempts were made to change anything about the stories during the parsing process except spelling mistakes. A rationale for correcting spelling errors was described by McConaughy (1985a) as preventing possible bias against writers with poor written language skill. As the purpose of the study was to analyze story structure, it was decided to reduce interference from any other cues that could subconsciously interfere with the rating process. Parsing the stories ensured that each story took on the same appearance thereby reducing the tendency to infer writing or reading abilities based on evidence from appearance, mechanics, spelling or handwriting.

The parsing task proved to be relatively straightforward. Each story was rewritten by the researcher as a list of numbered
propositions. After the narratives were parsed into propositions, the following analyses were performed: (see Appendix D)

**Presence and number of story structure categories.**

Each proposition in each story was analyzed and assigned by the researcher to a story structure category. Parsed stories were each read twice with the analysis taking place during the second reading. A frequency count of propositions was tabulated for each structural category. A profile of structural categories was developed for the final analysis of schema quality.

The number of different story structure categories was counted for each narrative. Previous research found a positive relationship between reading ability and the number of different structural categories present in original narratives (Hansche and Gordon, 1983; Shanahan, 1984). The count of structural categories was used as a measure of structural variety in those studies. It was felt that the measure could be useful in the present study because it provides a recognized analysis of structure that is separate from the analysis of schema quality. Eleven of the thirteen structural categories were used for this analysis. The categories of commentary and unclassified were eliminated because they are not part of the story grammar.

**Number of episodes.**

The profile of story structure categories in each narrative was analyzed for the presence of complete episodes. An episode consists of a goal, internal response or sub-goal of a character or characters; an attempt or series of attempts to act on that
goal or response; and an outcome or resolution leading directly from those attempts. The number of episodes was recorded as an index of complexity. This follows research of schema theorists who described episodes as aspects of plot development (Thorndyke, 1977) and described the number of episodes as indications of structural complexity. The number of episodes was included with the structural analysis in the assessment of schema quality. Number of episodes has been used in previous research as a discrete measure of story structure (Shanahan, 1984). However, a separate analysis of number of episodes would have been tautological in the present study because the measure was included in rating the schema quality of the narratives.

**Number of propositions.**

Total number of propositions in each story was recorded as a measure of narrative length. The number of propositional statements has been a significant correlate in previous story schema research which showed relationships between length of summaries and reading ability (McConaughy, 1985a). The number of propositions could be an important factor should a relationship between schema quality and narrative length appear salient. It seemed important to establish that measures of schema quality were not dependent on the length of the composition.

**Story schema quality.**

Following the procedures of McConaughy's studies, profiles of structural categories for each parsed narrative were assessed according to a set of criteria for quality of story schema
contained in the **Schema Quality Rating Scale** (McConaughy, 1985b; see Appendix C). The **Schema Quality Rating Scale** was devised by McConaughy, a researcher in the Department of Psychiatry at the University of Vermont, based on her theories of a developmental story schema for story comprehension (1983).

After propositions of the parsed stories were assigned to structural categories, the number of episodes was counted, and a structural profile was described. The structural profile of each narrative was assigned a rating for schema quality from 0 to 9 according to the levels of the scale.

The McConaughy scale is hierarchical: a rating of 0 indicates no schema, and a rating of 9 indicates a complex, mature schema. A narrative which received a rating 0 for 'no schema' was judged as missing most of the important structural categories, whereas a narrative which received a 9 had two or more goals, an initiating event, resolution, and one or more complete episodes for each goal or group of characters. A full description of each level of the scale appears in Appendix C.

**Pilot Studies**

Prior to conducting the main study, the researcher conducted two pilot studies using the **TOWL** stimulus and the McConaughy **Schema Quality Rating Scale**. These were undertaken in order to establish the usefulness of the measures. The first study
consisted of one grade eight class of 21 students who had been judged by their previous year's teacher as having poor skills in language arts. The Test of Written Language was administered and scored as part of an assessment of the students' reading and writing abilities. In a trial run for the present investigation, five stories were chosen randomly from the sample of tests, and parsed and rated according to McConaughy's procedures. From this preliminary analysis, it was found that Schema analysis yielded information about organization not generated by the rest of the TOWL sub-tests.

A second pilot study was conducted using adult subjects. The 17 subjects were in a third year undergraduate university class in developmental reading. This analysis was undertaken to see if McConaughy's (1983) contention that adults employ the more advanced Social Inference Schema would hold for adult written narrative production. The secondary purpose of this small study was to test further the utility of the measure. It was found that all of the adult narratives demonstrated the Social Inference Schema (Appendix E). It was concluded by the researcher that the analyses constituted a valid and useful measure of schema quality in written narratives.
Interrater Reliability

A second rater was trained to parse stories, to use story structure categories, and to analyze stories for schema quality according to the McConaughy Schema Quality Rating Scale. Training sessions utilized a second set of TOWL stories collected previously in a small pilot study conducted by the researcher. The second rater analyzed a random 25% of the total sample and recorded scores on separate score sheets. The percentage of agreement yielded an overall interrater reliability of .91 (Borg and Gall, 1979). Those differences in scores were discussed and agreement was reached on a final score for schema quality of each narrative.

Data Presentation

After the original 113 narratives were scored, 10 of them were eliminated from the data analysis because they were not completed within the testing period. These stories tended to be long and quite complex in structure, but because they were unfinished they lacked a Resolution statement. The absence of this important category would have meant a much lower rating than they would otherwise have received. It was felt that an unfinished story should not be judged by the same criteria as a finished story and so these subjects were eliminated from the
final analysis.

One more story was deleted from the analysis because the subject chose to ignore the picture stimulus and wrote about a family who took a picnic by boat to a tropical island.

The final number of story protocols was 102. Pearson product-moment correlations were computed using reading ability raw scores on the Gates-MacGinitie comprehension test with schema quality ratings, number of propositions, and number of categories derived from the narrative analysis.
CHAPTER FOUR

Results

Introduction

Results are organized for presentation into three sections. The first section presents the findings from the preliminary analyses including compilation of normative data for results of the measures and separate analyses of gender factors.

The second section presents those findings pertaining to the three hypotheses which formed the basis for this investigation.

The final section presents further findings relevant to the relationship between reading ability and story schema quality in original written narratives. It includes a descriptive analysis of the frequency of use of story structure categories in the narratives and a crosstabulation of schema ratings with three reading ability groups.

Preliminary Analyses

Means and Standard Deviations of Variables

Means and standard deviations were calculated for reading raw scores, schema quality ratings, number of categories and number of propositions (Table 1).
Table 1
Means and Standard Deviations for All Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Ability Raw Scores</td>
<td>28.28</td>
<td>6.77</td>
</tr>
<tr>
<td>Schema Quality Ratings</td>
<td>4.97</td>
<td>2.83</td>
</tr>
<tr>
<td>Number of Propositions</td>
<td>28.36</td>
<td>12.71</td>
</tr>
<tr>
<td>Number of Categories</td>
<td>7.53</td>
<td>1.36</td>
</tr>
</tbody>
</table>

Reading Ability

The reading raw score mean of 28.28 was converted to a mean grade equivalent of 8.0 for the group according to the norming table contained in the Gates-MacGinitie test manual. This mean conforms to the expected mean score for a group of beginning grade eight students on the Gates-MacGinitie Reading Test (1980, p. 41).

Raw scores were also converted to stanines according to the standardization tables in the Gates MacGinitie manual. In order to profile the abilities of the group, those who received stanines in the 4-6 range were classified as average readers and those who scored below stanine 4 or above 6 were classified as below and above-average readers respectively. The reading score distribution of the 102 subjects is depicted in Table 2.
Table 2
Profile of Subjects According to Reading Ability

<table>
<thead>
<tr>
<th>Reading Ability</th>
<th>Above-Average</th>
<th>Average</th>
<th>Below-Average</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Subjects</td>
<td>23</td>
<td>58</td>
<td>21</td>
<td>102</td>
</tr>
<tr>
<td>Percentage</td>
<td>22.5%</td>
<td>57%</td>
<td>20.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Gender Differences

In order to discover any gender differences for the variables, a number of separate analyses were performed for males and females. There were 50 female and 52 male subjects.

Separate means and standard deviations were calculated for males and females for reading raw scores, schema quality ratings, number of propositions and number of story structure categories. The means were similar for males and females for number of categories, reading ability, and schema quality ratings. Pooled variance estimates indicated that males and females only differed significantly for number of propositions (Table 3).
Table 3
Pooled Variance Estimates for Males and Females for All Variables
(Females: \( n=50 \). Males: \( n=52 \))

<table>
<thead>
<tr>
<th>Variable</th>
<th>Females</th>
<th>Males</th>
<th>Pooled Variance Estimate</th>
<th>Standard Deviation</th>
<th>T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Ability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>28.64</td>
<td>27.92</td>
<td></td>
<td>7.32</td>
<td>6.26</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Schema Quality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>5.04</td>
<td>4.90</td>
<td></td>
<td>2.95</td>
<td>2.78</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of Categories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>7.70</td>
<td>7.37</td>
<td></td>
<td>1.45</td>
<td>1.25</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of Propositions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>32.74</td>
<td>24.15</td>
<td></td>
<td>15.45</td>
<td>7.32</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.001
Point biserial correlations were calculated for gender and reading ability, schema quality, number of propositions, and number of categories. Negative coefficients were found for all the variables although the only significant correlation was for gender and number of propositions. There was no statistically significant interaction between gender and any of the other variables in the study (Table 4).

**Table 4**

**Point Biserial Correlations for Gender and All Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Ability</td>
<td>-.05</td>
</tr>
<tr>
<td>Schema Quality</td>
<td>-.02</td>
</tr>
<tr>
<td>Number of Propositions</td>
<td>-.34 *</td>
</tr>
<tr>
<td>Number of Categories</td>
<td>-.12</td>
</tr>
</tbody>
</table>

*p<.0001

In order to compare the relationship between reading ability and number of propositions for males and females separately, a test of independent correlations was computed (Table 5).
Table 5

Independent Coefficients for Reading Ability and Number of Propositions for Males and Females

<table>
<thead>
<tr>
<th>Gender</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>.02 *</td>
</tr>
<tr>
<td>Females</td>
<td>.47 **</td>
</tr>
</tbody>
</table>

*p<.435  **p<.0001

To compare the magnitude of the correlations between reading ability and number of propositions, a one-tailed test of significance was performed at the .05 level. The appropriate value, (z=2.359) was significantly greater than the critical tabled value (z=1.645). It was concluded that the relationship between reading scores and number of propositions is significantly different for females than it is for males in this sample. For female students in this sample, reading is related to number of propositions. For males there is no statistically significant relationship.
Main Analysis

Introduction

Three hypotheses were examined:

H1: There will be no statistically significant relationship between reading ability scores and the frequency of different story structure categories in adolescent written narratives.

H2: There will be no statistically significant relationship between reading ability scores and the number of propositions in adolescent written narratives.

H3: There will be no statistically significant relationship between reading ability scores and a rating of story schema quality in adolescent written narratives.

In order to test the hypotheses, Pearson product-moment correlations were conducted for reading comprehension raw scores on the Gates MacGinitie with schema quality scores, number of story propositions, and number of story categories (Table 6). There were moderate to low significant positive correlations between reading ability and the three writing variables.
### Table 6

**Pearson Correlations Between Reading Ability Scores and Writing Variables**

<table>
<thead>
<tr>
<th>Writing Variable</th>
<th>Correlations with Reading Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schema Quality</td>
<td>.45 **</td>
</tr>
<tr>
<td>Number of Propositions</td>
<td>.32 **</td>
</tr>
<tr>
<td>Number of Categories</td>
<td>.24 *</td>
</tr>
</tbody>
</table>

*p<.01  **p<.001

**Reading Ability and Number of Story Structure Categories**

Hypothesis one addressed the relationship between reading ability scores and number of story structure categories in adolescent written narratives. A significant correlation was observed and the null hypothesis was rejected.

**Reading Ability and Number of Propositions**

Hypothesis two addressed the relationship between reading ability scores and the number of propositions in adolescent narratives. A significant correlation was found and the null hypothesis was rejected.
Reading Ability and Schema Quality Ratings

Hypothesis three addressed the relationship between reading ability scores and a rating of story schema quality in adolescent written narratives. A significant correlation was found and the null hypothesis was rejected.

Further Analyses

Number of Structural Categories in Narratives

A further analysis of the number of categories revealed that the majority of the propositions in the narratives collected in this study could be assigned to one of the structural categories defined by the story grammar. Out of the 102 narratives that were parsed, only 3 propositions were assigned to the unclassified category and 25 were classified as being Commentary. However, the majority (17) of the Commentary statements were accounted for by two stories which contained a number of personal comments not directly related to the narrative. Out of over 3000 propositions, only 28 could not be accounted for by the grammar.

The total number of categories used in each narrative ranged from a low of 5 to a high of 10 out of a possible 11. A frequency count presents the pattern of use for categories in all the narratives. Table 7 shows the percentage of narratives containing each structural category.
Table 7

Use of Different Structural Categories in Total Narrative Sample

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Narratives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attempt</td>
<td>100</td>
</tr>
<tr>
<td>2. Description</td>
<td>99</td>
</tr>
<tr>
<td>3. Initiating Event</td>
<td>95</td>
</tr>
<tr>
<td>4. Outcome</td>
<td>96</td>
</tr>
<tr>
<td>5. Internal Response</td>
<td>85</td>
</tr>
<tr>
<td>6. Resolution</td>
<td>79</td>
</tr>
<tr>
<td>7. Goal</td>
<td>74</td>
</tr>
<tr>
<td>8. Setting</td>
<td>72</td>
</tr>
<tr>
<td>9. Reaction</td>
<td>33</td>
</tr>
<tr>
<td>10. Disposition</td>
<td>16</td>
</tr>
<tr>
<td>11. Moral</td>
<td>1</td>
</tr>
</tbody>
</table>

Schema Quality Ratings of Narratives

A Social Inference Schema was characterized as a narrative focused around the psychological motivation of the central character(s). A rating of 5 to 9 was classified as Social Inference.

Causal Inference Schema included those narratives which lacked a clear character motivation but contained a series of causally or temporally related actions and events which were resolved in the end of the story. The salient feature of these narratives was the absence of a goal statement. A schema rating of 2 to 4 was classified as Causal Inference.

A Simple Description schema contained descriptions of events and actions. These narratives may have included a goal statement.
but lacked one or more of the other important structural categories. A schema rating of 1 was classified as Simple Description. Narratives classified as No Schema lacked most of the requisite elements of narrative structure.

Of the 102 narratives in this study, the majority (60%) were rated as demonstrating Social Inference Schema. Twenty-two percent of narratives were rated Simple Description Schema, followed by Causal Inference Schema (16%), and No Schema (3%). Table 8 illustrates the frequency of schema quality ratings from most to least complex for the total group of narratives.
Table 8

Frequency of Schema Quality Ratings

<table>
<thead>
<tr>
<th>Schema Quality Rating</th>
<th>Number of Narratives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Inference</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Schema</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Causal Inference</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Schema</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Simple Description</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>No Schema</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>102</td>
</tr>
</tbody>
</table>

Reading Ability and Schema Quality in Narratives

Using the profile of reading ability developed at the outset of the data analysis, it was possible to examine the relationship between reading ability and schema quality more closely. The chi-square test of association was used in order to establish whether
the observed differences in the schema quality ratings of the three reading groups was due to sampling error. A significant chi-square of 12.59 (df:6) was found, eliminating the possibility that the observed differences between the reading groups were due to chance. A crosstabulation of the distribution of the schema quality of narratives written by each reading ability group is illustrated by Table 9.

None of the narratives written by below-average readers were rated by as the most advanced Complex Social Inference Schema, 39% of the narratives by above-average readers, received this rating. Sixteen percent of the narratives by average readers also were rated as Complex Social Inference.

Eighty-seven percent of the narratives by above-average readers were classified as a level of Social Inference Schema. Sixty percent of the narratives by average readers and 29% of the narratives by below-average readers were classified as Social Inference Schema.

Of those narratives classified as being Causal Inference Schema, the majority were by either average or below-average readers. All of those narratives classified as having No Schema were by average or below-average readers.
Table 9

Crosstabulation of Reading Ability by Schema Quality

<table>
<thead>
<tr>
<th>Schema Quality</th>
<th>Reading Ability</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+ Average</td>
<td>Average</td>
<td>-Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Narratives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complex Social Inference II</td>
<td>4</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Complex Social Inference I</td>
<td>5</td>
<td>7</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Social Inference III</td>
<td>8</td>
<td>16</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Social Inference II</td>
<td>3</td>
<td>9</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Social Inference I</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sub-totals</td>
<td>20</td>
<td>35</td>
<td>6</td>
<td>(61)</td>
</tr>
<tr>
<td>Social Inference Schema III</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Causal Inference II</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Causal Inference I</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sub-totals</td>
<td>1</td>
<td>8</td>
<td>7</td>
<td>(16)</td>
</tr>
<tr>
<td>Simple Description Schema</td>
<td>2</td>
<td>14</td>
<td>6</td>
<td>(22)</td>
</tr>
<tr>
<td>No Schema</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>(3)</td>
</tr>
<tr>
<td>TOTALS</td>
<td>23</td>
<td>58</td>
<td>21</td>
<td>(102)</td>
</tr>
</tbody>
</table>
Discussion and Recommendations

Summary

The present study was designed to investigate the relationship between reading ability and story schema development in adolescent student narratives. The study examined original written narratives by parsing them into propositions and analyzing them for schema quality. This analysis involved assigning propositions to structural categories, determining the number of episodes present, and combining these assessments into a rating for schema quality according to a hierarchical scale.

The study sought answers to the questions of whether there would be a relationship between reading ability and certain properties of written narratives. Structural analysis involved assessing the number of propositions and frequency of story structure categories used in the narratives. Schema quality analysis involved describing the pattern of categories and episodes employed in the narratives and assigning a rating of schema quality to each narrative.

The previous chapter presented the results of the study. Correlational analyses revealed moderate correlations between reading ability and the three writing analyses and the null hypotheses were rejected. An interesting result was found for the
number of propositions in the narratives in that there was a
correlation with reading ability for females only. Descriptive
analyses were employed to discuss the relationships in more
detail. Further analyses included frequency profiles of
structural categories and schema ratings, and a crosstabulation
of reading ability by schema quality. The present chapter
interprets these findings and presents a discussion of their
implication for the reading/writing relationship. It concludes
with recommendations for further research.

Discussion of Results

Reading Ability and Number of Structural Categories

The low correlation found \( r = .24 \) between number of
categories and reading ability in this investigation is similar
to those found by Shanahan (1984) in his study of grade twos and
fives. The result suggests that the number of different
structural categories employed in written narratives is
relatively similar for adolescent students of varying reading
abilities. This finding concurs with recall and comprehension
research which suggested that category recall was similar for
good and poor readers (McConaughy, 1985a). It seems that students
at the grade eight level have sufficiently developed their
knowledge and expectations of narratives to utilize a variety of
structures in their own writing. Any differences seem to lie in
the pattern of emphasis of those structural categories which are more salient in the hierarchy.

A further analysis of the structural categories was undertaken to examine the pattern of structural properties of the narratives in the study. From most to least frequent, the profile of categories in the narratives was: Attempts, Descriptions, Initiating Events, Outcomes, Internal Responses, Resolutions, Goals, Settings, Reactions, Dispositions, Morals.

The pattern of frequency of structural categories found in narratives in this study differs from recall research which found that subjects recalled Settings most frequently and recalled Internal Responses least frequently (Stein and Glenn, 1979). However, the fact that 85% of the written narratives in the study contained Internal Responses is consistent with research which noted that older students and adults tended to emphasize motivational aspects of characters in recall summaries (McConaughy et al, 1983). The finding for written narratives in this investigation suggests that adolescents are sufficiently aware of the importance of intentionality in character development in stories to include an Internal Response.

The structural pattern of the narratives in this study resembles that of recall studies for three other categories. Initiating Events and Consequences (Outcome and Resolution) frequently appeared in the written narratives and were frequently recalled after listening and reading in previous research. Similarly, the frequency of Reactions in the written narratives
was consistent with recall and comprehension research. Reactions were consistently among those propositions least frequently recalled in memory research, and were present in only 33% of the written narratives in the present investigation.

Overall, the consistency of the results suggests that the story grammar was able to describe adequately those structures contained in the narrative samples collected in this investigation. The findings are consistent overall with comprehension and recall research suggesting that individuals employ similar structural schema during production of simple narratives as they do when assimilating narrative input. The profile of category use implies that if adolescent students understand that the task is to write a narrative in the traditional sense, then they are capable of producing a composition which matches those patterns of narrative structures described by a story grammar.

A question of paramount concern to this investigation was whether in fact a story grammar could be employed to analyze a written narrative. It was argued that the choice of stimulus is all-important to generating the type of simple narrative that can best be assessed by a story grammar. Preliminary results with another class of students along with an adult sample led the researcher to assume that in fact a story grammar could be used to assess written narratives. The results of this study confirm this assumption.

It appears that a story grammar is able to describe the
different structures in narrative compositions. This concurs with previous comprehension studies which found that students supplied structures expected by story grammars when completing stories (Fitzgerald, 1984). The findings from the present study differ from those of Hansche and Gordon (1983) and Kroll and Anson (1984) who concluded that story grammars were not sensitive enough to predict all structural categories in original written compositions. Perhaps the reason for this difference lies in the choice of writing stimulus.

It seems that when children are provided with an open-ended stimulus and told to write a story, their compositions can assume a wide variety of styles including descriptions, personal anecdotes etc., which can be called narratives in the broadest sense of the word. A story grammar is intended to define the structure of a well-formed, simple narrative and as such is probably not of much value in assessing the broad spectrum of children's compositions. However, it was assumed in this study, based on research, that individuals do have a schema for stories and that the written manifestation of this story schema can be encoded by a story grammar. The intention of the present investigation was to examine whether there was a relationship between reading ability and the ability to employ in writing those structural and semantic categories predicted from previous schema theory. Therefore, in order to eliminate the problem of assessing non-narratives with a structural system designed to measure traditional narratives, the subjects were presented with
a stimulus with an inherent narrative structure. The results suggest that when students understand that they are to write a simple narrative, then they are able to do just that and hence a story grammar is able to account for the structures employed.

Having stated that the grammar was able to account for the structures in the narratives, it is necessary to restate that the relationship found between the frequency of different story structure categories and reading ability scores of this sample was not particularly strong. While the low positive correlation does indicate a tendency for better readers to employ more of the structural categories in their narratives, it would seem that the use of different story structure categories in written narratives was fairly similar for readers of different abilities. It remains for analysis of the schema quality ratings to establish different patterns of emphasis for certain categories and the relationship of these patterns to reading ability.

Reading Ability and Number of Propositions in Narratives

A significant correlation \( r = .32 \) was found between the number of propositions and reading ability. The preliminary analyses of gender differences revealed pertinent information which focusses this result. A comparison of independent correlations for males and females led to the conclusion that the relationship between reading scores and number of propositions was significantly different for females than it was for males in this study. The larger coefficient observed for females would
seem to account for most of the observed relationship between the variables. The significant gender difference for this relationship modifies interpretation of the significance of the overall correlation between these two variables.

The difference in interaction between number of propositions and reading ability for girls and boys is somewhat puzzling in light of the preliminary analysis which also established that there was no difference in reading ability between the sexes. The lack of relationship for boys precludes any implication that number of propositions is related to reading ability for the whole group.

One can only speculate that a possible reason for the observed difference between males and females for number of propositions in narratives may lie in the mode of presentation for the narrative task in this study. Previous research using oral narratives rather than written found no difference between the comparable 'number of narrative units' produced by girls and boys (Botvin and Sutton-Smith, 1977). In that study, boys and girls told fantasy stories of similar length and propositional content. Perhaps when asked to tell a story, boys are more likely to produce a longer composition than when asked to write a story. It is also possible that girls who are less proficient readers tend to produce written stories with fewer propositions. No firm conclusions can be made from the results of this investigation.
The positive correlation between measures of reading comprehension and schema quality suggests a moderate relationship between these two variables \( r = 0.45 \). From a correlation of this magnitude, it is not possible to state with certainty that reading ability is able to predict the quality of schema rating. However, it does suggest that there is a tendency for schema quality ratings of narratives in this study to be related to reading comprehension scores. A positive relationship implies that better readers may employ a more advanced story schema in their written narratives.

Using the profile of reading ability groups developed at the outset of the data analysis, it was possible to examine the relationship between reading ability and story schema development more closely. The subjects were classified according to three reading ability levels and the narratives of each group were compared. A crosstabulation demonstrated that the majority of those readers designated as above-average in this study wrote narratives which were classified as representing levels of Social Inference Schema (see table 9).

To recapitulate, the Social Inference Schema designation was designed by McConaughy (1983) to describe more mature levels of schema approximating an idealized adult model. This designation acknowledges previous theory which postulated that in an idealized schema, the goal and internal response categories are the most important for recall. The Social Inference Schema also
incorporates results of recall research which substantiated an early assertion of Rumelhart's (1977) that those propositions related to the formulation or resolution of the goal are most important for comprehension (Nezworski, Stein and Trabasso, 1982). These propositions included Initiating Events, and Consequences. Narratives rated as Social Inference Schema incorporated these important structural categories and its episodes were focused around the goals and internal responses of a central character or group of characters.

The majority of above-average readers in this study manifested Social Inference Schema in their narratives. This fact seems to indicate that better readers have implicit knowledge of the importance of both structural and semantic aspects of narratives. It is also important to note that many of the average readers also displayed Social Inference Schema in their narratives. It would seem that proficient adolescent readers are able to employ expected narrative structures in their writing and include psychological causality to develop character motivation.

Very few narratives of above-average readers were rated as employing Causal Inference Schema. The designation of Causal Inference Schema included those narratives which were organized around physical causation. Typically, these included a string of propositions classified as Attempts, Descriptions, and Outcomes. The most salient feature of these narratives was that they lacked a central goal or focus to the action.

Previous research has shown that this less-mature level of
schema is manifested in recall and comprehension by children but not by adults (McConaughy et al., 1983). This finding was supported for written narratives by the pilot study which found that none of the small sample of adults employed the Causal Inference Schema. One third of the poorer readers in the present study displayed this schema in their narratives. This fact suggests a tendency for poorer readers to have less control and purpose in their writing.

The second most frequent classification of narratives was Simple Description. This classification is an interesting one because it employs many of the characteristics of the more well-developed Social Inference Schema. However, by definition, it would seem that these narratives were deficient in organization. Narratives rated as simple description may have had a central goal but lacked structures which related to the goal. They often were missing an Initiating Event and a clear resolution. Considering that three-fourths of the narratives contained at least one Goal statement, it seems clear that many students understand the importance of a central focussing element in a story. However, some students lack the ability to structure their written narratives more effectively around the Goal as demonstrated by the designation of Simple Description schema. This organizational deficit seemed to be related to reading ability in that most of the narratives rated as Simple Description were written by average or below-average readers.

The results of the analyses suggest that adolescent readers
of differing reading ability were able to focus a written narrative but some may lack the skills to organize their narrative overall. The results also indicate that better readers do seem to use more well-developed schema in written narrative production. Despite these indications, no firm conclusions can be made from the moderate overall correlation. The distribution of the reading ability groups needs to be considered. Of the 102 subjects in the study, approximately 25% were above or below-average in reading ability while 60% were of average ability. This large middle group probably had a moderating effect on the overall correlation. The small size of the above and below-average reading groups suggest caution in the interpretation and generalization of the findings.

In summary, the correlational data generated by this investigation indicated a relationship between reading ability and schema development in the written narratives of adolescents. Further analysis of the reading ability sub-groups clarified the relationship and provided additional evidence of tendencies for readers of differing ability to structure their narratives differently. The tendency of better readers to manifest a more adult-like schema in their stories was apparent from the descriptive analysis. Adolescent students of average ability also seemed to have the capability of employing those structures described as requisite for a well-developed simple narrative. Only the weakest readers were not able to organize their narratives according to expected structural patterns.
The story grammar, structural categories, and a rating scale for narrative analysis, enabled the researcher to analyze the relationship between reading ability and story schema development in written narratives. The results of the study indicate the presence of a relationship between these two aspects of the reading/writing connection. Further research is needed in order to explore the relationship more fully.

Implications: The Reading/Writing Relationship

The findings of this study have interesting implications for the theoretical assumptions about the reading/writing relationship. Evidence of a relationship between reading ability and schema development in narratives leads one to speculate about the nature of the relationship between reading and writing.

The present study was undertaken within a theoretical framework of holistic language processing which assumes that input from one language process influences output of another language process. The rationale also included reference to theories about the origin of knowledge of story concepts and narrative structure including the notion that story knowledge is developed through exposure to stories through reading and listening. It was discussed that a logical corollary of this theory could be that reading narratives influences the development of writing narratives and that, possibly, better readers would have a more developed sense of story and be able to manifest that knowledge in their written narratives.
Reasons for the observed tendency of reading ability to be related to narrative schema development remain in the realm of speculation. However, theories about narrative schema and cognition do provide some food for thought. It would seem from theory, that children develop a sense of narrative from the world around them and that this narrative sense is developed and enhanced through exposure to literature. The exact dynamics of the interaction cannot be described, but it is possible that the fundamental connection between reading and writing development may be the inherent narrative abilities that the child brings to the task of literacy. Activation and control of this innate organizational structure could be the key to the interactive development of proficiency in reading and writing.

Narrative has been called a 'primary act of mind' (Hardy, 1977). It has been described by others as an essential component to our cognitive make-up (Rosen, 1984). It has also been argued that we make sense of the world around us by creating a mental representation of experience which resembles a sort of 'mind story' (Wells, 1986). From this global point of view, narrative seems to permeate our very existence. It seems essential to our understanding of the world that we are able to understand another's motivation or to describe our own goals. It is logical therefore that a child comes to the task of reading and writing with a set of expectations about narrative structure that are in place through interaction with the world around her (Wells, 1986).
Certainly a well-developed sense of narrative structure would assist immeasurably in school-based tasks from responding to history lessons, to writing stories, or even understanding social situations in one's peer group. As was discussed earlier, the most important feature of a well-developed story was a central focussing element. In story grammar analysis, that element was a protagonist's goal. In reading comprehension exercises, that element becomes the main idea. The main idea can be seen as the goal of the writer that the reader must identify. In order to find the central point in a passage of prose or non-fiction or to write a coherent paragraph that sticks to a topic, students need control over structural aspects of narrative. Theorists have described this control as a result of the ability of the individual to articulate an awareness of their own thinking (Donaldson, 1978).

Psychologist Margaret Donaldson (1978) argues that what is essential to school success is the development of what she calls 'disembedded thinking'- the ability to remove oneself from the immediate context, to analyze, to generalize, and to consciously apply generalizations to new situations. To follow her logic, it can be seen that what may be necessary for school-based success in reading and writing is for children to become conscious of their inherent understanding of narrative structure in the world around and in the stories they read and write; to generalize, and to apply this understanding to reading and writing in new situations. If in fact a schema for narrative structure is
inherent to the cognitive fabric of an individual, then an important role of education should be to develop an awareness of narrative structure - to provide opportunities for students to extrapolate from their immediate personal context, in order to understand the power of their own understanding.

In the context of the reading/writing relationship, it can be seen that a meta-textual awareness of the structure of narrative may be an important key to reading and writing development. Perhaps those students who have been able to develop that awareness are those that will be most successful at reading and writing tasks. The results of the present investigation suggest that this may be the case in that the majority of the small group of above-average readers demonstrated control over narrative structure by employing appropriate structures in their writing.

In the present study, the narratives with the weakest structure were not written by above-average readers. The below-average readers produced the narratives with poorer schema quality ratings - those narratives which often lacked a centre or were weak in narrative structure. A number of other studies have observed that weaker writers did not seem to plan or be aware of the global organizational features of their written work (Golinkoff, 1976; Pianko, 1979; Atwell, 1982). Rather, they revised again and again at the surface level, concentrating on the mechanics, spelling and handwriting of their piece. Brown (1980) observed that poor writers had difficulty making use of
language in the role of the spectator. In other words, they were not able to disembed from the surface-structure concerns and attend to the deep structure of their narrative.

It is rather easy to speculate as to who is responsible for the perseveration of poor writers with regard to the mechanics of writing. A study of children's concepts about writing in school showed that children perceive writing as a form-oriented process, with emphasis on correct handwriting, spelling, punctuation, grammar (Black and Martin, 1982). Schools have traditionally emphasized the importance of correctness, but research has found that this has also been reinforced in the students' homes. Graves (1984) observed that parents felt that it was the teacher's responsibility to proofread children's written work. It is certain that these practices and expectations exist today. Yet, a respected group of researchers have recommended for a number of years that if children are given the opportunity to write, the conventions will come along naturally (Graves, 1975, 1982; Bissex, 1980; and Harste, Burke, and Woodward, 1982).

It can be argued however, that mere experience is not enough. Feuerstein (1980), an Israeli psychologist calls upon teachers to provide students with 'mediated learning' experiences. Perhaps the mediation that is needed in order for students to make the connections between reading and writing is to make conscious the structural and semantic aspects of narrative. To follow a model proposed by Applebee and Langer for instructional scaffolding (1983, 1986), structures in reading and
writing would be made conscious for the learner through teacher questioning and modelling. It would seem that a logical place to begin the scaffold would be with the child's inherent schema for narrative. The ideal models would certainly lie in children's literature (Bettelheim, 1975, 1982). The key ingredient in the process would be the carefully constructed mediation between the literacy experience and the learner. Learning experiences would be designed by the teacher to build that meta-awareness, that disembedded thinking that allows the child to realize and extend from her own experience with narrative. Through this process of increasing awareness and the resulting control, children may be able to capitalize on an important component for both reading and writing -narrative schema.

Suggestions for Further Research

Given results indicating a moderate relationship between the measures of story schema development and reading ability, and considering the limitations of this study, it would seem that a clarification of the relationship could be possible with some changes to the research design.

In order to explore the relationship further, more than one writing sample could be analyzed to establish the veracity of the findings of the present study. It would be necessary to develop at least one other picture stimulus with an inherent narrative structure. With more than one stimulus it would be
possible to limit the potentially stifling effects of a student's dislike of the topic.

A future investigation also could use a larger sample of students in order to define more balanced sub-groups of readers and produce a more comparative analysis. If differences between reading ability groups are to be confirmed, it will be necessary to analyze larger reading ability groups of equal numbers. While the present findings do suggest a tendency for reading ability to be related to narrative schema development, the moderate correlation does not allow clear prediction of schema quality in written narratives from reading ability levels or vice versa. Larger groups of good and poor readers would be needed in order to generate more conclusive data.

In order to sharpen an analysis of the role of narrative schema development in reading and writing it would be useful to employ a reading test which measures narrative reading ability. A test of narrative comprehension ability would focus analysis on the relationship between the ability to utilize narrative schema in comprehension and production of narratives. Inclusion of oral as well as written narrative production would also provide insight into the role of narrative schema development in reading and writing. It would be interesting to examine whether children tell stories orally the same way they write them and what the relationship is between their oral and written story-production and their narrative reading ability. Similar methods to the present investigation could be used to establish the nature and
quality of the story schema employed by readers of differing abilities during both oral and written composition. The results of such a study would extend the present findings and contribute to a greater understanding of the reading/writing relationship.
REFERENCES


Instructions: Look at the three pictures above and make up a good story to go with them. Take about five minutes to think about your story. Be sure to write a complete story using all three pictures. It is best to plan a whole story before you begin to write.
**APPENDIX B**

**Definitions of Story Structure Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempt (A)</td>
<td>An action engaged in by an animate being or character directed toward satisfying a sub-goal, creating a new subgoal, or emerging from a thought or feeling.</td>
</tr>
<tr>
<td>Commentaries (C)</td>
<td>Comments by the author which are not a part of the story itself, such as an introduction to the audience or comments on the episodes or resolution of the story.</td>
</tr>
<tr>
<td>Description (DES)</td>
<td>An account of physical, temporal or environmental states or events which are not actions of the characters or outcomes of their actions.</td>
</tr>
<tr>
<td>Disposition (DISP)</td>
<td>An account of a personality or character trait of a character which explains the general motivation for his attempts or actions.</td>
</tr>
<tr>
<td>Goal (G)</td>
<td>A major or overriding desire or problem of the main character which arises from the initiating event of the story and eventually leads to, or is related to, the final resolution. The goal may be expressed in terms of a desire, a decision to take action, or a general statement about &quot;trying&quot; or &quot;attempting&quot; to achieve a goal.</td>
</tr>
<tr>
<td>Initiating Event (IE)</td>
<td>An event, state or action which leads a main character to formulate his major goal.</td>
</tr>
<tr>
<td>Internal Response (IR)</td>
<td>A mental response of a character to an external event which can be either a subgoal, a thought, or a feeling, which leads to subsequent attempts or actions of the character.</td>
</tr>
<tr>
<td>Moral (M)</td>
<td>A lesson or principle of right behavior which can be derived from the plot and resolution of a story.</td>
</tr>
<tr>
<td>Outcome (O)</td>
<td>An event or state produced by a prior attempt or action of a character.</td>
</tr>
</tbody>
</table>
APPENDIX B Continued

Definitions of Story Structure Categories - 2

Reaction (REA) A thought or feeling of a character in response to an outcome or the final resolution of the plot, which does not directly lead to a new attempt or action.

Resolution (RES) The final outcome or consequence of the story which is a successful or unsuccessful attainment of the major goal of the main character or characters. (A statement "They lived happily ever after" is not sufficient unless it is an obvious consequence related to the major goal.)

Setting (S) The introduction of the characters, conditions of the characters, and the time and location of the story. (A statement "Once upon a time" is not sufficient alone, but may be part of a setting statement.)

Unclassified (N) Story statements which are not scoreable in any of the above categories.

Adapted from Rumelhart (1975) and Thorndyke (1977)
Note: Dialog between characters is scored as one of the above categories.
# APPENDIX C
## Schema Rating Scale

<table>
<thead>
<tr>
<th>Score</th>
<th>Schema Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9</strong></td>
<td>Complex Social Inference Schema II</td>
</tr>
<tr>
<td></td>
<td>Two or more major Goals are stated.</td>
</tr>
<tr>
<td></td>
<td>Separate goals are stated for two sets of characters (earthlings, spacelings or added characters).</td>
</tr>
<tr>
<td></td>
<td>Initiating Event and Resolution are present.</td>
</tr>
<tr>
<td></td>
<td>One or more complete episodes* are connected to goals for separate sets of characters.</td>
</tr>
<tr>
<td></td>
<td>There is interaction or conflict between characters.</td>
</tr>
<tr>
<td></td>
<td>All three pictures are included.</td>
</tr>
<tr>
<td><strong>8</strong></td>
<td>Complex Social Inference Schema I</td>
</tr>
<tr>
<td></td>
<td>One major Goal is stated.</td>
</tr>
<tr>
<td></td>
<td>Initiating Event and Resolution are present.</td>
</tr>
<tr>
<td></td>
<td>The emphasis is primarily on one set of characters (earthlings or spacelings).</td>
</tr>
<tr>
<td></td>
<td>Two or more complete episodes* are related to one set of characters.</td>
</tr>
<tr>
<td></td>
<td>A second set of character(s) is introduced without development of separate Goals and/or episodes related to them.</td>
</tr>
<tr>
<td></td>
<td>All three pictures are included.</td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>Social Inference Schema III</td>
</tr>
<tr>
<td></td>
<td>One major Goal is stated.</td>
</tr>
<tr>
<td></td>
<td>Initiating Event and Resolution are present.</td>
</tr>
<tr>
<td></td>
<td>The emphasis is on one set of characters (earthlings or spacelings).</td>
</tr>
<tr>
<td></td>
<td>Two or more complete episodes are related to one set of characters.</td>
</tr>
<tr>
<td></td>
<td>All three pictures are included.</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td>Social Inference Schema II</td>
</tr>
<tr>
<td></td>
<td>One major Goal is stated.</td>
</tr>
<tr>
<td></td>
<td>Initiating Event and Resolution are present.</td>
</tr>
<tr>
<td></td>
<td>There is one complete episode for one set of characters.</td>
</tr>
<tr>
<td></td>
<td>All three pictures are included.</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Social Inference Schema I</td>
</tr>
<tr>
<td></td>
<td>One major Goal is stated.</td>
</tr>
<tr>
<td></td>
<td>Initiating Event and Resolution are present.</td>
</tr>
<tr>
<td></td>
<td>There are no complete episodes* or one picture is left out.</td>
</tr>
<tr>
<td>Score</td>
<td>Schema Quality</td>
</tr>
<tr>
<td>-------</td>
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| 4     | **Causal Inference Schema III**  
No major Goal is stated.  
Initiating Event and Resolution are present.  
There are two or more complete episodes* for one or more sets of characters.  
The emphasis is primarily on actions, outcomes and descriptions.  
All three pictures are included. |
| 3     | **Causal Inference Schema III**  
No major Goal is stated.  
Initiating Event and Resolution are present.  
There is one complete episode* for one set of characters.  
The emphasis is primarily on actions, outcomes and descriptions.  
All three pictures are included. |
| 2     | **Causal Inference Schema I**  
No major Goal is stated.  
Initiating Event and Resolution are present.  
There is one complete episode* for one set of characters.  
The emphasis is primarily on actions, outcomes and descriptions.  
One picture is left out. |
| 1     | **Simple Description Schema**  
The major Goal may or may not be missing.  
Either the Initiating Event or Resolution or both are missing.  
The major emphasis is on actions, outcomes and descriptions.  
There are some causal or temporal connections between attempts and outcomes.  
All three pictures are included. |
| 0     | **No Schema**  
The major Goal may or may not be missing.  
Either the Initiating Event or Resolution or both are missing.  
The pictures are described separately with little or no causal connections.  
The sequence of events is confusing, fragmented or reversed in order.  
One or more pictures may be excluded. |

* An episode is comprised of a stated or implied internal response (subgoal, thought or feeling) of a character, one or more attempts or actions, and the specific outcome(s) of the attempts.
APPENDIX D

Sample Story

1 The year is 2105 and
2 the earth is about to be disintegrated
3 by a solar flare from the sun
4 There was only one person ready for this catastrophe S
5 Noah, a farmer working at the Vancouver Game Farm S
6 One day, while sharing some red goo with a man-eating
7 aardvark
8 there was an explosion IE
9 the farm shook DES
10 the ground cracked open, and
11 people were running everywhere REA
12 "Get everybody off the farm," yelled Noah IR
13 Immediately, 7 space crafts came out of the ground A
14 Everybody helped put the animals in the ship A
15 Another quake rang out DES
16 "We've got to get off this planet," Noah mumbled to
17 himself GOAL
18 As he entered a ship he found A
19 how crowded it was, full of animals and people DES
20 The ship blasted off O
21 As they went higher they saw A
22 Grouse Mountain falling apart DES
23 A few minutes later the pilot announced A
24 that they were destined to a planet A
25 inhabited with Venusians DES
26 With a horrendous bang DES
27 Earth was no more DES
28 The solar flare ripped through Earth DES
29 As the people landed A
30 they were greeted by many Venusians A
31 who welcomed them to Venus REA
32 and hoped they could unite to one family IR
33 From that day a handful of Earthlings and animals A
34 began a new life RES

NUMBER OF CATEGORIES - 9
NUMBER OF PROPOSITIONS - 31
NUMBER OF EPISODES - 2
SCHEMA QUALITY RATING - 8
### APPENDIX E

**Preliminary Analysis of Adult Story Protocols**

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NOTE: The sample was comprised of a small class of students in an undergraduate course on Developmental Reading at the University of British Columbia.