THE EFFECTS OF COGNITIVE STYLES ON SUMMARIZATION OF

EXPOSITORY TEXT

DISSERTATION

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By

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The study investigated the relationship among three cognitive styles and summarization abilities. Both summarization products and processes were examined. Summarizing products were scored and a canonical correlation analysis was performed to determine their relationship with three cognitive styles. Summarizing processes were examined by videotaping students as they provided think aloud protocols. Their processes were recorded on composing style sheets and analyzed qualitatively.

Subjects were sixth-grade students in self-contained classes in a suburban school district. Summarizing products were collected over a two week period in the fall. Summarizing processes were collected over an eight week period in the spring of the same school year.

The results of the summarizing products analysis suggest that cognitive styles are related to summarization abilities. Two canonical correlations among the two variable sets were statistically significant at the .05 level of significance (.33 and .29). The results further suggest that students who are field independent, reflective,
and flexible in their attentional style may be more adept at organizing their ideas and using written mechanics while summarizing. Students who are impulsive and constricted in attentional style may exhibit strength in expressing their ideas while summarizing.

Results of the summarizing processes analysis suggest that students of one cognitive style combination may exhibit different behaviors while summarizing than those of other cognitive style combinations. Students who are field independent, reflective, and flexible in their attentional style seem to display more mature, interactive behaviors while summarizing than their peers of other cognitive style combinations.
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CHAPTER I

INTRODUCTION

Background of the Study

The ability to identify and retain main ideas from text is among the most important skills students must develop in order to be successful in school. Indeed, skill at comprehending important information in prose discriminates good readers from poor readers (Eamon, 1978-79; Smiley, Oakley, Worthen, Campione, & Brown, 1977; Winograd, 1984) and requires unique and rather refined metacognitive skills (Bean & Steenwyk, 1984; van Dijk & Kintsch, 1983).

The ability to construct a written summary of expository text is a related, equally complex, yet quite different, metacognitive process. As is the case with main idea comprehension, academic success is likewise highly dependent upon students' abilities to master the summarization process.

Some developmental factors have been identified as important determinants of summarization skill. Much is still unknown, however, about the differences between students who produce good written summaries and those who do not. Much recent research has indicated that summarization is amenable to instruction; many students who experienced
difficulty with main idea comprehension and subsequent summarizing tasks became, with instruction, more adept at both (Day, 1980; Taylor, 1983; Baumann, 1984).

There are several plausible explanations for the diversity among students in their abilities to discern main ideas from the texts they read and construct them into well-formed summaries. One explanation that seems particularly reasonable is individual differences among students in their cognitive styles.

Kogan (1971) describes cognitive styles as "individual variation in modes of perceiving, remembering, and thinking, or as distinctive ways of apprehending, storing, transforming, and utilizing information" (p. 244). He adds that although abilities also involve the foregoing properties, a difference in emphasis should be noted: "Abilities concern level of skill--the more and less of performance--whereas cognitive styles give greater weight to the manner and form of cognition" (p. 244).

Messick (1976) has identified nineteen cognitive styles, three of which are considered in this study. The three are: field independence-field dependence, conceptual tempo, and attentional style. They are particularly fitting for this type of study because "1) research or logic indicates their relevance to reading (and writing), 2) research indicates their relevance to children, and 3) there are tests for these styles which could be used to validate
the investigator's instruments" (Pitts, 1982, p. 2).

The effects of cognitive styles on reading comprehension have received some, though not extensive, attention from researchers. Moreover, negligible direct attention has been devoted to the study of these effects on written production. There is an evident need for increased knowledge and understanding of the relationships among cognitive styles and the language functions of reading and writing, particularly those aspects of literacy related to the most important features, the main ideas, of text.

Statement of the Problem

The problem of this study was twofold:
1. To ascertain if a relationship exists between cognitive styles and the product variables of expository text summarization.
2. To identify writing behaviors displayed by students of particular cognitive styles as they engage in expository text summarization.

Purposes of the Study

The specific purposes of the study were:
1. To determine if cognitive styles influence the summarization abilities of sixth grade students as measured by an assessment of written product variables such as summarizing efficiency and analytic quality of summaries.
2. To identify the writing behaviors of sixth grade
students of particular cognitive styles as they summarize expository text. Their writing processes were collected as "compose aloud" protocols (Perl, 1979) and will include such behaviors as planning, rereading or rescanning stimulus texts, and revising composed texts.

Research Questions

1. Is there a significant relationship between cognitive styles and the summarization abilities of sixth grade students as measured by an assessment of their summarizing efficiency?

2. Is there a significant relationship between cognitive styles and the summarization abilities of sixth grade students as measured by an assessment of their organization of ideas?

3. Is there a significant relationship between cognitive styles and the summarization abilities of sixth grade students as measured by an assessment of their expression of ideas?

4. Is there a significant relationship between cognitive styles and the summarization abilities of sixth grade students as measured by an assessment of their usage and grammar?

5. Is there a significant relationship between cognitive styles and the summarization abilities of sixth grade students as measured by an assessment of their written mechanics?
6. What writing behaviors are displayed by students of particular cognitive styles when their writing processes are observed?

Definitions of Terms

1. **Attentional style** is a dimension of individual differences dependent upon subjects' susceptibility to distraction and cognitive interference in tasks containing conflicting cues, also called constricted versus flexible control.

2. **Cognitive style** is "a preferred or habitual mode of problem-solving, perceiving, thinking, and remembering; involves distinctive ways of storing, transforming, and utilizing information" (Pitts, 1982, p. 26).

3. **Conceptual tempo** is also called the reflection-impulsiveness dimension; involves a subject's "willingness to pause and reflect on the accuracy of his hypotheses and solutions" (Kogan, 1971, p. 266).

4. **Expository text** is "non-narrative prose, as opposed to narrative ('story') prose; expository text presents or explains information or ideas, as in social studies or science textbooks or in news or informational articles" (Hickerson, 1985, p. 11). Subcategories include: (a) stimulus texts which are those from which writers select information for use in their own textual productions and (b) summarized text which is the writer's condensation of the stimulus text.
5. **Field dependence** is a global, in contrast to an analytic, way of perceiving, characterized by a tendency to view a whole rather than its separate parts.

6. **Field independence** is an analytic, in contrast to a global, way of perceiving; characterized by a "tendency to experience items as discrete from their backgrounds and reflects ability to overcome the influence of an embedding context" (Kogan, 1971, p. 246).

7. **Impulsiveness** is "that aspect of conceptual tempo characterized by fast, inaccurate responding" (Pitts, 1982, p. 27).

8. **Reflection** is "that aspect of conceptual tempo characterized by long response latency and few errors" (Pitts, 1982, p. 27).

**Significance of the Study**

The ability to identify main ideas in expository text and construct them into a cogent summary is an important academic, as well as practical, skill. Indeed, Taylor (1983) affirms that "throughout life, people are called upon to summarize" (p. 524). Many students, however, fail to master summarization skills during the time they are most needful of them--their years in the intermediate and secondary grades (Armbruster, Echols, & Brown, 1983; Day, 1980; Taylor, 1983).

Individual differences in cognitive style may affect many students' school performance, including their
performance in tasks requiring strong summarization skills. Kogan (1971) contends that "obvious demographic differences" among students such as sex, race, ethnic background, and social class, have long been taken into account when examining students' school performance. Cognitive style, on the other hand, has received little attention. "Unlike ability, personality, and value constructs, all of which have been intimately involved in educational practice for several decades, the concepts of cognitive styles have penetrated the educational scene to only a minor extent" (Kogan, 1971, p. 243).

Investigations into the relationship between cognitive style and specific educational constructs may provide needed knowledge and insight into a scarcely-explored area. This knowledge and insight may allow educators to develop and implement instruction better suited to students' individual needs.

This study is significant in that it:

1. Determines if individual differences in cognitive style are related to students' performance on written summary products.

2. Determines if individual differences in cognitive style are related to students' summarization processes.

3. Provides the rationale for specific diagnostic, curricula, or teaching methodology modifications for reading and writing instruction based on students' cognitive styles.
Limitations

A limitation of this study is that it was conducted in a suburban school district among sixth grade students in self-contained classes. Broad generalizations to students in dissimilar contexts is inappropriate.

The study is further limited by the possible effect of an outside observer on students' composing behaviors. Ecological validity may therefore be distorted.
Chapter Bibliography


Smiley, S. S., Oakley, D. D., Worthen, D., Campione, J. C.,


CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter is divided into two main sections. The first section is a synthesis of the literature about and a discussion of cognitive styles. Since this study is concerned with three specific cognitive styles, three subsections appear in the general cognitive styles section. The second section is a presentation of the literature involving summarization and a discussion of it.

Cognitive Style

Educators have long made it their aim to maximize each individual's learning, thus researchers seek sources of differences among individuals. One proposed reflection of individual differences is cognitive style.

Since the inception of cognitive style theory in the early part of this century, many have investigated the nature of cognitive style. It has been associated with ego structure (Klein, 1954) and theories of cognitive development (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962; Kagan, Rosman, Day, Albert, & Phillips, 1962) and is variously referred to as cognitive structure, cognitive control, and personal style. Schwen, Bedner, and Hodson (1979), after a thorough perusal of cognitive style
literature, found consensus on some aspects of its nature:

1. It characterizes the habitual manner in which individuals process information including perception, storage, transformation and utilization of information from the environment.

2. It is related to the process of cognition rather than cognitive content or level of skill. In this sense, it is often described as bipolar or value free.

3. It is a spontaneous, unconscious individual mode of operation which crosses personality, affect, and cognitive aptitude which maintains relative stability across time and task.

Although Messick (1976) identifies nineteen separate cognitive styles, only two have received much attention from researchers: field independence-field dependence and conceptual tempo. Both of these styles seem well-suited to a study of the type presented here because of their logical relationship to reading and writing. For this reason, each of the foregoing styles is discussed in this review, as is a third, attentional style.

**Field Independence-Dependence**

Witkin first proposed the theory of field independence/field dependence in 1950, and since that time hundreds of published studies based on it have appeared. The term field independence refers to a tendency to view the
world analytically rather than globally based upon an individual's ability to perceive a figure as discrete from its surrounding ground. In addition, the field independent person is characterized as having a more impersonal orientation than his/her field dependent counterpart who has a tendency to view the world more globally, thus being more adept at seeing the whole, rather than its discrete parts. Field dependents are often characterized as people with greater interpersonal skills than their field independent peers and have higher levels of social orientation (Witkin et al., 1954; Witkin, Lewis, Hertzman, Machover, & Meissuer, 1962).

Though Witkin designed three tests to measure the degree of field independence-dependence in individuals, only the Embedded Figures Test (EFT) is frequently used because of its ease of administration. In the EFT the subject is shown a simple figure, which is then removed and replaced by a complex design of which the simple figure is a part. The subject is timed on how long it takes to disembed the figure, and the time is an index of field independence.

Some researchers argue that Witkin's tests measure merely spatial visualization or the ability to spatially decontextualize (Kaufman, 1981; Sherman, 1967; Zigler, 1963). Indeed, Witkin's primary interest was in perceptual processes when he discovered the dimension of field independence-field dependence. Subsequent research by many
in addition to Witkin, however, indicates that field independence-dependence is the perceptual manifestation of several attributes including those of intellect, personality, and behavior.

Intelligence, for example, has been significantly correlated with scores on Witkin's measures. Witkin, et al. (1962) discovered significant correlations between field independence and totalIQ's derived from both the Stanford-Binet and the WISC. Goodenough and Karp (1962) as well as Cohen (1959), while searching for more particularized results, found that field independence correlates positively only with three subtests of the WISC--Picture Completion, Block Design, and Object Assembly, a configuration they refer to as "analytical field approach". The researchers concluded that Witkin's tests shed no light upon the verbal abilities of those who took them. Contradictory research exists, however, on this point. Crandall and Sinkeldam (1964) found statistically significant correlations between verbal measures and field independence-dependence, as did Wachtel (1967).

In research of particular interest to educators, field independence-dependence has been linked to other educationally pertinent constructs. Witkin and others found correlations among global or analytic style and choice of college major with field dependents preferring areas of interpersonal reaction such as the social sciences,
counseling, teaching, personnel work, or selling, while field independents chose analytically-based studies in the sciences, math, and engineering (Chung, 1966, Clar, 1971, DeRussy & Futch, 1971; Glatt, 1969; Krienke, 1969; Pierson, 1965; Witkin, 1972; Zytowski, Mills, & Paepe, 1969). Furthermore, high achievement has been correlated with field independence-dependence when students of these cognitive styles were placed in courses that had been identified as especially appropriate on the basis of the earlier correlational findings.

In teaching/learning situations, other differences in field independence and dependence arise. Field independent students have a preference for the lecture method while dependents prefer the "discovery" method of teaching (Kaufman, 1981). In an area of special educational concern, field dependence has been linked to learning disabilities, especially in reading (Keough & Donlon, 1972; Robbins, 1962; Severson, 1962; Stuart, 1967). Finally, Boyd (1980), in studying the writing of college freshmen, found a relationship between field independence and composition. She found that field dependent students had significantly lower course grades in their composition classes. Field dependents had particular difficulty scoring commensurately with their field independent counterparts when the writing task was expository.

Of the two ends of the continuum, field independence
lends itself more to success in school. Some researchers have, therefore, sought to train students to be more field independent (Elliott & McMichael, 1963; Wolf, 1965; Jacobson, 1966, 1968; Blade & Watson, 1955; Brinkmann, 1966). The results of these studies are mixed, but Kogan points out that training efforts are more likely to be successful if they are prolonged and intensive. In fact, Laosa (1980) discovered that, among young children, long-term teaching strategies influence which cognitive style a child will develop. Her five-year-old subjects developed field independence or dependence according to the styles of their most frequent teachers and companions, their mothers. In other research designed to improve academic skills among field dependents, researchers taught them learning strategies. Canelos and Taylor (1981) improved field dependents' listening and reading comprehension by teaching them imagery and hierarchical retrieval memory techniques. Provost (1981), on the other hand, met with no success in teaching field dependents active learning techniques. Is field dependence then, amenable to instruction? The mixed results of studies on that topic leave the question unanswered.

Conceptual Tempo

Jerome Kagan is most prominent among those who have researched conceptual tempo. Kagan and his colleagues (Kagan, et al., 1964) developed the Matching Familiar
Figures Test (MFFT) to assess individual differences in reflection and impulsiveness. In the MFFT, subjects are presented with a figure and a series of facsimile figures, most of which differ slightly, but one of which is identical to the first. Subjects are asked to match the two identical figures. Those who answer with little reflection often err, and those who reflect longer before answering usually produce more correct responses. In a given sample, a subject is "reflective" if his response time is above the median while his error rate is below the median. An "impulsive" subject is one whose response time is below the median and his error rate above it. About two-thirds of Kagan's subjects fall into the reflective or impulsive categories. The final third is divided into those who are either "fast-accurate" or "slow-inaccurate" (Kagan, Rosman, Day, Albert, & Phillips, 1964; Kagan, 1966). Unfortunately, there is a dearth of research on those who do not fall neatly into Kagan's categories of reflective or impulsive (Messer, 1976).

Kogan (1971) asserts that children's tendencies toward reflection or impulsiveness will have a stronger impact on their educational achievement than any other single factor. Kagan and his associates have produced a large number of studies demonstrating relationships among the reflection-impulsiveness dimension and other educationally pertinent characteristics. In the area of intellective reasoning, for
example, the relationship between reflection-impulsiveness and inductive reasoning was examined (Kagan, Pearson, & Welch, 1966a). Kagan, et al., discovered that impulsive children responded more quickly and made significantly more errors than reflective children on inductive reasoning tasks. Kogan (1971) further extrapolates that since inductive reasoning tasks, along with other subtests containing response uncertainty, comprise a large portion of IQ measures, one must surely expect the impulsive child's performance on tests of IQ to be impaired.

Kogan's assertion is probably correct. A body of research indicates that impulsives are less successful in school than reflectives (Finch, Pezzuti, Montgomery, & Kemp, 1974; Kagan, 1965b; Lesiak, 1971; Margolis & Brannigan, 1978). Furthermore, studies done by the Kagan group and reported in two publications (Kagan, 1966; Kagan, et al., 1964) indicate relationships among the reflection-impulsiveness dimension and other educationally pertinent characteristics. In problem solving tasks, reflective individuals tend to scan for details and scan systematically, while impulsives perform the same task globally and erratically. In the area of speech, reflective subjects display more mature levels of speech, although impulsives have a tendency to verbalize more. Reflectives tend to have longer attention spans while impulsives are easily distracted. Researchers of conceptual tempo further
report a high incidence among impulsive subjects of "severe learning disabilities, emotional disturbance, first grade failure, reading difficulties, and hyperactivity" (Kaufman, 1981, p. 45).

Attempts to modify reflection-impulsiveness have met with mixed results. In studies that focus on response times, researchers have succeeded in increasing children's response latencies, but saw no corresponding decrease in error rates (Kagan, Pearson, & Welch, 1966; Debus, 1970). In contrast, training that focuses on accuracy can decrease error rate and response speed (Nelson, 1968).

Some research indicates that the constructs of field independence-dependence and conceptual tempo have developmental properties. Children tend to move toward the field independent and reflective ends of the continuum as they grow older, yet retain their basic tendencies in both areas when compared to their peers.

**Attentional Style**

Although Denney (1974) later renamed the dimension "attentional style", Klein (1954) was the first to use the terms "constricted versus flexible control" to describe subjects' susceptibility to distraction and cognitive interference in tasks containing conflicting cues. Using the Stroop (1935) Color-Word Interference Test, Klein identified two groups of subjects. On one extreme was a group which had difficulty blocking out extraneous stimuli
(the high-interference group), on the other was a group which was not bothered by irrelevant cues (the low-interference group). Klein postulated that those in the high-interference group tightly controlled their judgments and were intolerant of ambiguity. They were described as having constricted control. The low-interference subjects were described as having flexible control because of their tolerance for ambiguity.

Santostefano and Paley (1964) developed the Fruit Distraction Test to serve as a child's version of the Stroop measure. On one card are appropriately colored fruits and on another card are fruits in appropriate colors with colorless distracting stimuli surrounding them. The child must name the fruits on the cards. Both the speed of naming the fruits and errors in naming them are considered in scoring. Santostefano and Paley (1964) found younger children less able to avoid distracting stimuli than older ones. The investigators used subjects ranging in age from six to twelve years and found a definite interaction between naming speed and age.

Although attentional style has not been associated with IQ, it has been linked to obsessive behavior. Wachtel (1967) reports that obsessives often scan broadly but fail to notice links which are necessary for problem solving; they display constrictive control.

Some research also connects attentional style to
reading success. Santostefano, Rutledge, and Randall (1965) investigated three cognitive styles. Of the three, only attentional style distinguished good from poor readers. Denney (1974) obtained similar results in investigating two additional cognitive styles and attentional style. Finally, Cotugno (1981) found that the ability to focus on relevant information at the expense of irrelevant information distinguished able from disabled readers of elementary school age.

The dimension of attentional style, then, may have important implications for classroom instruction in reading related areas. As Pitts (1982) states:

The person who concentrates on relevant information and is not distracted by extraneous information probably scans more efficiently and accesses appropriate schemata more readily than does the person whose attention 'wanders'. The person with constricted control probably searches too many irrelevant schemata or searches haphazardly. (p. 41)

Summarization

The ability to produce a summarized text involves a number of interrelated skills and processes. Primarily, however, the quality of a written summary is dependent upon the writer's adroitness in separating important from trivial information (Brown & Day, 1983). Kintsch and van Dijk (1978) have developed a theory of text comprehension and
production which incorporates summarization. They describe
the mental operations that they believe undergird the
processes of comprehension and production of text. The
concept of macrostructure formation is the foundation of
their theory. They aver that, during comprehension, readers
abstract the macrostructure, or gist comprehension, from a
text's microstructure by using a set of comprehension
macrorules. These rules allow the reader to reduce and
organize the microstructure, or detailed "propositions", of
text; they permit the text to be viewed as a gestalt.
Kintsch and van Dijk's macrorules are three:

1. Deletion. Each proposition that is neither a
direct nor an indirect interpretation condition of a
subsequent proposition may be deleted.
2. Generalization. Each sequence of propositions may
be substituted by the general proposition denoting an
immediate superset.
3. Construction. Each sequence of propositions may be
substituted by a proposition denoting a global fact of
which the facts denoted by the microstructure
propositions are normal conditions, components, or
consequences. (p. 364)

In short, Kintsch and van Dijk theorize that adept language
users delete trivial or redundant information, substitute
superordinate terms for lists of subordinate terms when
appropriate, and select or construct main idea statements
for their texts.

van Dijk (1979) supplements his earlier work with Kintsch by distinguishing between *textually* important and *contextually* important information. Textually important information is that which is considered important by its author. The skilled, considerate writer conveys this importance to the reader. Conversely, contextually important information is considered important by the reader for personal reasons. These reasons may include reader interests, background experiences, or unique or specific purposes for reading.

van Dijk's hypothesis is significant because, along with Kintsch, he asserts that textual macrorule formation is strongly based in the prior knowledge and experiences of those who use text. Readers' knowledge and experiences are as varied as the texts they read; thus judgments of importance about textual propositions are bound to vary (Winograd, 1984). Indeed, sensitivity to importance can vary so much that Campione and Armbruster (1985) state:

> When the task is a complex one, even highly selected readers/students are not adept at discovering the main points...we do not know very much about how people manage to locate main ideas in new areas--our theories of comprehension are sorely lacking in this regard. (p. 48)

In an attempt to overcome this lack, Garner (1982)
compared "high-efficient" and "low-efficient" summarizers on recognition and verbalization performance. She found that high-efficient summarizers also process and store information in memory more efficiently than their low-efficient counterparts. The high-efficient summarizers were better able to "integrate important pieces of information into semantic wholes and lose track of unimportant pieces of information" (p. 279). Garner contends that some students may be better comprehenders simply because of their ability to summarize well. Adept, or high-efficient, summarizers "streamline" the information they have read so successfully as they summarize, that the summary itself becomes the text which is stored and retrieved. Hence, given a main idea recall task, these summarizers will invariably outperform their low-efficient counterparts.

Outcomes of studies on the effects of summarization training on main idea comprehension seem to give credence to Garner's assertions. Bean and Steenwyk (1984) investigated the effects of direct instruction in summarization on sixth graders. On both a paragraph summary writing task and a standardized test of paragraph comprehension, the treatment groups significantly outperformed the control group. Hare and Borchardt (1984) obtained similar results in a study with low income, minority high school students. These students, too, received direct instruction in summarization. Treatment groups were significantly better than their
control group peers in use of summarization rules and summarization products. In addition, these differences were maintained two weeks after instruction ended. Taylor (1983) states that college freshmen "showed large gains" in their ability to summarize after extensive practice. The students in Taylor's study also became more skilled at recognizing main ideas in a multiple choice task. Perhaps more important, they became better able "to form a Gestalt" of the texts they read and summarized.

Baumann (1984) taught sixth graders to identify both explicitly and implicitly stated main ideas. Baumann compared these students to a group which received massed basal reader lessons in main idea identification and a control group. He found "a powerful treatment effect favoring the Strategy group over both the Basal and Control groups" (p. 93). The results of other studies (Taylor & Beach, 1984; McNeil & Donant, 1982; Sjostrom & Hare, 1984) also attest to positive effects that summarization training can have on general reading comprehension.

Rybczynski (1987) obtained quite different results. Her sixth grade subjects were placed in three groups: two experimental groups received training in summarization to be done either individually or cooperatively and a third group was instructed merely to answer questions about the texts they read. All groups read and responded to the same texts. There were no significant differences between the
experimental groups and the control group. Rybczynski was forced to conclude that summarization used as a strategy for improving learning from textbooks may be ineffective. Rybczynski's results are interesting in light of the abundance of research demonstrating that summarization is a valuable and necessary tool in understanding of text.

A few researchers have investigated the effect of summarization instruction on special groups of students. Rinehart, Stahl, and Erickson (1985) studied the effects of summarization training on reflective and impulsive sixth graders. The investigators found that the major effect of the treatment was an increase in the quality of notes taken by the treatment group. The training the sixth graders received also led to their improved recall of major information from the texts they read. Finally, the treatment seemed to make students more reflective during a test which measured the amount of time they spent studying for an assessment and the quality of notes they took while preparing for it, thus "making them better studiers" (p. 19). Kurtz and Borkowski (1987) obtained similar findings when they studied reflective and impulsive fourth, fifth, and sixth graders.

In a related study, Williams (1984) taught middle school, learning disabled students to comprehend main ideas in short expository paragraphs. Again, the students receiving treatment performed significantly better than
control group students on a summary writing posttest task.

Some experts (Pincus, Geller, & Stover, 1986) claim that a stark difference exists between the skills and knowledge necessary to summarize narrative prose and those needed for expository prose summarization. They describe narrative text as "a temporally and causally linked chain of events" whereas expository prose may have subject matter, rather than characters as the focus of discourse, "and links in material are often logical rather than chronological" (p. 152). Baumann (1983) contends that "children are not highly skilled at comprehending main ideas after reading expository prose" (p. 329). He further contends that children are skilled at comprehending central story elements, or main ideas, when reading narrative texts.

Baumann's explanation for this discrepancy in understanding is that children have different levels of familiarity with the two types of text. Children have much exposure to narrative, or "story," text throughout their preschool and primary grade years, thus they develop strong story grammars (knowledge of story structure). Conversely, they get little exposure to expository texts before entering the upper elementary grades; therefore they have sparse knowledge about how such text is organized and have difficulty abstracting its main ideas. To rectify this lack of knowledge, Baumann recommends that children be given many opportunities to develop a schema for expository prose.
before they reach the upper elementary grades. He suggests that teachers spend more time reading nonfictional prose aloud to their young students and that publishers of basal readers include more informational selections in their books.

Other researchers (Sjostrom & Hare, 1984; Hare & Borchardt, 1984) add to Baumann's contentions. They state that, when reading expository prose students often lack sufficient background knowledge to determine what is important from the text. The students may, therefore, be attracted to novel or startling ideas rather than to the main ideas presented in the text. Indeed, in separate studies, Winograd (1984) and Brown and Day (1983) found that unskilled readers were drawn toward text elements which contained either strong visual detail or items of personal interest. Hare and Borchardt recommend alleviating this dilemma by using previewing techniques to bring to the surface students' existing knowledge, making students aware of structural cues such as topic sentences and subheadings and their purposes, and devising analogies and metaphors that may aid students in bridging the new and the known.

A significant trend cited by many who research summarization is that developmental factors play a key role in summarization ability. Although some studies (Taylor, K., 1983; Taylor, B., 1980) indicate that many adults experience difficulty with summarization, much research
implies that even very young children have the basic skills necessary to delete trivial and redundant information from text. Most students, however, do not develop use of the more complex transformational rules of condensation until their high school years.

Brown and Day (1983) studied the abilities of fifth graders, seventh graders, older high school students, junior college students, more advanced college students, and college rhetoric teachers to apply Kintsch and van Dijk's (1978) comprehension macrorules while composing summaries. The rules, in order of complexity, include: deletion of trivial and/or redundant information, substitution of a superordinate term or event for a list of items or actions, selection of a topic sentence if one is available, and invention of original topic sentences when appropriate. The researchers found a clear developmental pattern among their subjects. The older, more experienced subjects applied the rules more efficiently, had a marked tendency to rearrange and combine topically related material across paragraphs, and tended to use inferential reasoning. Thus, the developmental pattern found by the investigators is that deletion rules emerge first, followed by superordination and then selection. The final, most complex rule of invention is commonly "late developing." Although much research indicates that children, even very young children, may recall important textual features with apparent ease.
(Christie & Schumacher, 1975; Brown & Smiley, 1977; Meyer, 1977; Danner, 1976), they may have difficulty expressing those features in a written summary. Brown, Day, and Jones (1983) report that older elementary grade children are able to attempt summaries of lengthy texts, but they are consistently outperformed by high school and college students "in their propensity to plan ahead by making rough drafts, in their sensitivity to fine gradations of importance, and in their ability to condense more idea units into the same number of words" (p. 968). The younger students in their study were as adept as the older ones at recalling main ideas from text, but their summaries of it were not as skillfully wrought. The researchers conclude that summarization skill continues, for most students, to be refined throughout the school years. They state: "The ability to work recursively on information to render is as succinctly as possible requires judgment and effort, knowledge, and strategies" (p. 977).
Chapter Bibliography


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Lesiak, J. (1971). The relationship of the reflection-impulsivity dimension and the reading ability of elementary school children at two grade levels. Dissertation Abstracts International, 32, 244A. (University Microfilms No. 71-81, 044)


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in academic performance and in teacher-student relations. Paper presented at a symposium on cognitive styles, creativity, and higher education sponsored by the Graduate Record Examination Board, Montreal, Canada.


CHAPTER III

METHODOLOGY

Population for the Study

Subjects for this study were drawn from the public school population of a suburban school district in north central Texas. The total population of the district is approximately 96,000; the total school population, for grades K-12, is approximately 16,000. The average family income, according to the most recent census, is $26,249.00 per year. There are two traditional and one alternative high schools within the district which serve grades nine through twelve. The four junior high schools house students in grades seven and eight. There are sixteen elementary schools provided for children in grades K-6. Seventy-four percent of the district's students are Anglo. Of the remaining twenty-six percent, approximately fourteen percent are Hispanic, eight percent are Asian, and five percent are Black. Less than one percent are American Indians. Fifty to sixty percent of the district's high school graduates continue their formal education.

Selection of the Sample

Sixth graders were selected as subjects. Students this age were used for three reasons. First, the subjects had to
fall within the age limits required for the Children's Cognitive Style Assessment, the instrument used to measure cognitive style. Second, there is more stability in cognitive style among children of this age (Kagan & Kogan, 1970). Third, sixth grade students have typically had many opportunities to read, become familiar with, and summarize expository texts, the types of texts used in the study.

Permission to conduct the study was obtained from the district's administrative personnel as well as from the subjects' teachers and parents. For the portion of the study that required extensive writing of videotaped samples, the subjects' permission was also obtained. In addition, the six students whose writing processes were examined were selected from among ten who consented to participate. The teachers of the ten were consulted and advised the researcher about the relative willingness to vocalize while writing of each student. Those students whose teachers identified them as most likely to vocalize while writing were selected for study.

The subjects were selected from two elementary campuses in the district. There were two criteria for selection of each subject. They were: 1) that the subject have a reading level, as measured by a standardized reading test used by the district, of sixth grade level or higher, and 2) that the subject and his or her parent(s) consent to the subject's participation in the study. The permission form
distributed to parents appears in Appendix A.

Instruments

To investigate the research questions of this study, four instruments/materials were used: 1) the *Children's Cognitive Style Assessment* as a measure of cognitive style; 2) ten passages of expository text to serve as stimuli for summarization; 3) a set of directions for subjects to follow as they composed silently; and 4) a set of directions for subjects to follow as they composed aloud.

Thompson and Pitts (1981) developed the *Children's Cognitive Style Assessment* as a means for teachers to quickly evaluate a student's cognitive style. The CCSA requires teachers to rate the extent to which children manifest each of twenty-three traits which the literature suggests are characteristic of the three cognitive styles investigated in this study. Thompson and Pitts examined the validity of their instrument by studying the relationship, through use of factor analysis, between the CCSA's results and children's scores on the instruments traditionally used to measure the pertinent cognitive styles. The researchers report that "factor adequacy coefficients for the instrument were remarkably high. Thus, the results generally indicate that the CCSA instrument is reasonably valid" (Thompson & Pitts, 1981, p. 93).

There are nine possible score combinations on the CCSA. The CCSA score combinations appear in Figure 1.
<table>
<thead>
<tr>
<th>field independence-field dependence</th>
<th>reflection-impulsiveness</th>
<th>flexible-constricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. high</td>
<td>high</td>
<td>high</td>
</tr>
<tr>
<td>2. high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>3. high</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>4. low</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>5. low</td>
<td>high</td>
<td>high</td>
</tr>
<tr>
<td>6. low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>7. low</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>8. high</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>9. Any combination of mid-range scores</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Cognitive style score combinations possible on the CCSA.

A high score on the field independence-field dependence dimension indicates a tendency toward field independence. When students score high on the reflection-impulsiveness dimension, they tend to be reflective. Those whose scores are high on the dimension of attentional style lean toward the constricted end of the continuum. The CCSA appears in Appendix B.

Ten passages of expository text were selected as stimulus texts for the summarizing tasks. Each was 300 to 500 words long. Each had a readability level of fourth or fifth grade, based upon calculations using the Fry readability formula. Every text was complete; it was not excerpted from a longer text. The texts were comprised of
articles from *National Geographic World*, a popular children's periodical. The stimulus texts appear in Appendix C.

Directions were composed for students to follow as they read and summarized. The directions included permission to actively "highlight" important text or delete trivial information and specific instructions about how to mark revisions. One set of six specific directions was used when large groups of students composed silently. A second set of seven directions was used with individual students who composed aloud. The additional instruction in the set of seven provided students with information about how to compose aloud. The summarizing directions appear in Appendix D.

**Data Collection Procedures**

Students in the study were divided into two categories. One group of 155 participated in two summarizing sessions designed to collect information about writing products. From that 155, a second group of six was selected to participate in eight summarizing sessions in order to collect data about writing processes.

**Writing Products Group**

Summaries were collected in two late morning or early afternoon sessions which occurred one week apart. All sessions occurred between mid October and early November. The writing was collected from students in six intact class
groups of approximately twenty-five students per group. Each session was one hour in length.

The researcher provided each subject with a folder containing the directions for the summarizing task, the text to be summarized, three sheets of lined paper, and one sheet of unlined paper. The researcher then read the directions aloud and asked the subjects to read along silently, invited and responded to questions, then asked the subjects to begin the summarizing task.

Writing Process Group

The six members of the writing process group were selected from among the 155 members of the writing products group. These six students were selected on the basis of their scores on the CCSA.

Of the first eight score combinations possible on the CCSA, only two appeared in the scores of the original 155 subjects. They were the combinations of high-low-high (field independent-flexible control-reflective) and low-high-low (field dependent-constricted control-impulsive). It was decided to further investigate subjects whose scores fell in the mid-range in each cognitive style category to explore possible differences in their writing processes from those of their peers. Six students, two from the high-low-high category, two from the mid range scores category, and two from the low-high-low category, were selected. Three of the students attended school on one of the district's
campuses selected for study, while the remaining three attended the other. Three of the students were girls, the other three were boys. One student was Black, the remaining students were Caucasian.

The writing process data were collected from mid March to mid May. Eight videotaped sessions, one per child per week, occurred over a period of eight weeks. The sessions took place after school and subjects were allowed as much time as they required to complete their summaries. During each session, the subjects were provided with an isolated, quiet place to work and a folder of the type provided to the writing products group. The contents of folders were identical to those the larger group used, except for an additional direction to the six summarizers to compose aloud by using think aloud protocols.

The collection of think aloud protocols involves asking subjects "to externalize their thinking processes as much as possible" (Perl, 1979, p. 318). Before beginning the first composing session, each subject received an explanation of the process and a brief demonstration. A script of the oral directions provided to the subjects before they began composing aloud appears in Appendix D. Before subsequent sessions, the subjects heard reminders to use the think aloud technique.

As the students composed, a videotape camera, located behind their shoulders and above their work areas, recorded
their voiced processes as well as their reading and writing in progress.

**Style Assessment Procedure**

Teachers of the 155 subjects involved in the study completed the *Children's Cognitive Style Assessment* for each child. Each subject was rated by the one teacher who had primary responsibility for that subject's instruction; there were six such teachers who provided ratings in the study. The teachers were given the instruments at the time their students provided their first writing sample. The instruments were retrieved at the end of the students' second composition session. Thus, teachers had one week to complete the instruments and completed them approximately six to eight weeks into the school year.

**Scoring Procedures**

**Writing Product Data**

A panel of three raters, reading/language arts specialists who were knowledgable about and practiced in procedures commonly used for writing evaluation, evaluated the completed summaries. Before evaluating the summaries, the raters met for a training session in which the scoring procedures were discussed and consensus was reached about the relative importance of the ideas in the stimulus texts involved as well as the primary traits necessary to reflect an adequately wrought summary. Finally, the raters randomly assessed students' samples to confirm consensus in act as
Two scoring methods were employed to assess the writing products. First, summarizing efficiency was assessed by using a technique developed by Garner (1982). In this evaluative technique, raters unanimously identify and discriminate, in each student's summary, among sentences which contain very important information that should appear in a summary, moderately important information, and unimportant information that should not appear in a summary. The summarizing efficiency demonstrated in each written product was calculated by dividing the number of main ideas presented by the total number of words used in the summary.

Analytic holistic rating was employed as a further measure of the quality of each summary. Developed by Diederich (1974), this method calls for raters to assign a score of high (point value=six), middle (point value=four), or low (point value=two) to each of eight evaluation categories for each composition. Four of Diederich's categories were selected for use in this study. They are: organization of ideas, expression of ideas, usage and grammar, and mechanics.

The interrater reliability coefficients, respectively, for summarizing efficiency and analytic holistic rating were .94 and .85. A fourth rater read samples with discrepant scores and resolved those discrepancies in scores before final scores were used in analysis.
**Writing Process Data**

Data from the videotaped writing sessions were categorized using a modified version of a coding system developed by Perl (1979). Perl's system divides writing process activity into three categories, talking, reading, and writing, but adds subcategories of specific process behaviors unique to each of the three original ones. In order to show the frequency and duration of behaviors, each was graphically depicted on a time line, or composing style sheet, divided into one minute intervals. The information gained from these composing style sheets is important because they explain not what students wrote, but rather how they wrote it. Samples of completed composing style sheets appear in Appendix E.

**The Children's Cognitive Assessment**

The CCSA was scored by dividing each agree-disagree continuum into fifteen equal parts. A score between one and fifteen was assigned to each item. Average scores between one and fifteen were then calculated for each of the three cognitive styles. Scores of one to three are high; thirteen to fifteen are low scores.

**Summary**

One hundred fifty-five sixth grade students were selected for study from two elementary campuses. Each student summarized two passages of expository text. The summaries were evaluated for summarizing efficiency,
organization of ideas, expression of ideas, usage and grammar, and mechanics. Each student's teacher completed a CCSA for that student.

From among the 155 subjects, six were selected for further study. These six were individually videotaped as they summarized. In addition, they were asked to produce think aloud protocols as they composed. Eight separate writing sessions were videotaped for each of the six students. The videotapes were viewed and the students' behaviors were coded and recorded on composing style sheets. The style sheets serve as a record of the cognitive activities the students engaged in as they composed.
Chapter Bibliography


CHAPTER IV

ANALYSIS OF DATA

This chapter is divided into two sections: 1) an analysis of the writing products data and 2) an analysis of the writing process data. The writing products data were statistically analyzed using canonical correlation and will appear first. Writing processes were analyzed by means of a qualitative approach.

Canonical Correlation Analysis

The study involved three predictor variables, the cognitive styles, and five criterion variables, the writing scores of summarizing efficiency, organization of ideas, expression of ideas, usage and grammar, and mechanics. Because the study involved the investigation of the relationship between two sets of variables, canonical correlation analysis was the appropriate statistical technique to use to investigate the first five research questions (Ferguson, 1981).

Descriptive statistics for each variable were calculated. These appear in Table 1. From the descriptive statistics, a Pearson product-moment correlation matrix of the eight variables was produced. Table 2 displays this information.
Table 1

Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cases</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection-Impulsiveness</td>
<td>155</td>
<td>9.8581</td>
<td>3.8821</td>
</tr>
<tr>
<td>Attentional Style</td>
<td>155</td>
<td>7.6258</td>
<td>3.7315</td>
</tr>
<tr>
<td>Field Independence-Field Dependence</td>
<td>155</td>
<td>9.5419</td>
<td>4.2061</td>
</tr>
<tr>
<td>Summarizing Efficiency</td>
<td>155</td>
<td>0.0504</td>
<td>0.0132</td>
</tr>
<tr>
<td>Organization</td>
<td>155</td>
<td>4.2968</td>
<td>1.1059</td>
</tr>
<tr>
<td>Expression</td>
<td>155</td>
<td>3.7032</td>
<td>1.3146</td>
</tr>
<tr>
<td>Usage</td>
<td>155</td>
<td>4.2645</td>
<td>1.3146</td>
</tr>
<tr>
<td>Mechanics</td>
<td>155</td>
<td>4.5548</td>
<td>1.2228</td>
</tr>
</tbody>
</table>

The canonical correlation analysis involved the extraction of canonical functions for the correlation matrix presented in Table 2. The number of canonical functions extracted is equal to the number of variables in the smallest set, which in this study is the cognitive style set, thus Table 3 presents the three canonical functions extracted from the Pearson product-moment correlation matrix. The table also presents canonical structure coefficients (Thompson, 1984) for each variable. These coefficients play a key role in canonical correlation analysis because they, according to Thompson, "are
particularly helpful in interpreting canonical results in
terms of each variable's contribution to the canonical
solution" (p. 24). When squared, these coefficients
represent the proportion of each variable's variance which
is shared with each function.
Table 2
Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>SE</th>
<th>ORG</th>
<th>EXP</th>
<th>USE</th>
<th>MEC</th>
<th>RI</th>
<th>ATT</th>
<th>FD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>--</td>
<td>.28**</td>
<td>.15*</td>
<td>.05</td>
<td>.03</td>
<td>.07</td>
<td>-.13</td>
<td>.16*</td>
</tr>
<tr>
<td>ORG</td>
<td>--</td>
<td>.17*</td>
<td>.36**</td>
<td>.41**</td>
<td>.25**</td>
<td>-.24**</td>
<td>.25**</td>
<td></td>
</tr>
<tr>
<td>EXP</td>
<td>--</td>
<td>-.13</td>
<td>-.02</td>
<td>-.09</td>
<td>.10</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USE</td>
<td>--</td>
<td>.70**</td>
<td>.07</td>
<td>-.10</td>
<td>.14*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEC</td>
<td>--</td>
<td>.22**</td>
<td>-.25**</td>
<td>.31**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RI</td>
<td>--</td>
<td>-.81**</td>
<td>.75**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATT</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.78**</td>
</tr>
<tr>
<td>FD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

Note. N = 155; SE = summarizing efficiency;
ORG = organization of ideas; EXP = expression of ideas;
USE = usage; MEC = mechanics; RI = reflection-
impulsiveness; ATT = attentional style; FD = field
independence-dependence.
* p < .05  ** p < .01
<table>
<thead>
<tr>
<th>Variable</th>
<th>Function 1</th>
<th></th>
<th>Function 2</th>
<th></th>
<th>Function 3</th>
<th></th>
<th>H2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>S</td>
<td>SSQ</td>
<td>F</td>
<td>S</td>
<td>SSQ</td>
<td>F</td>
</tr>
<tr>
<td>SE</td>
<td>.309</td>
<td>.402</td>
<td>.161</td>
<td>.284</td>
<td>.285</td>
<td>.081</td>
<td>-0.826</td>
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<tr>
<td>ORG</td>
<td>.415</td>
<td>.681</td>
<td>.463</td>
<td>-0.583</td>
<td>-.129</td>
<td>.017</td>
<td>0.597</td>
</tr>
<tr>
<td>EXP</td>
<td>-.182</td>
<td>-.016</td>
<td>.000</td>
<td>0.894</td>
<td>.788</td>
<td>.621</td>
<td>0.476</td>
</tr>
<tr>
<td>USE</td>
<td>-.535</td>
<td>.344</td>
<td>.188</td>
<td>0.396</td>
<td>.231</td>
<td>.053</td>
<td>-0.332</td>
</tr>
<tr>
<td>MEC</td>
<td>.981</td>
<td>.789</td>
<td>.622</td>
<td>.204</td>
<td>.237</td>
<td>.056</td>
<td>0.060</td>
</tr>
<tr>
<td>RI</td>
<td>.070</td>
<td>.838</td>
<td>.702</td>
<td>-1.009</td>
<td>-.423</td>
<td>.179</td>
<td>1.488</td>
</tr>
<tr>
<td>ATT</td>
<td>-.370</td>
<td>-.914</td>
<td>.835</td>
<td>.686</td>
<td>.315</td>
<td>.099</td>
<td>1.735</td>
</tr>
<tr>
<td>FD</td>
<td>.624</td>
<td>.966</td>
<td>.932</td>
<td>1.525</td>
<td>.234</td>
<td>.055</td>
<td>0.352</td>
</tr>
</tbody>
</table>

**Note.** N = 155; F = canonical function coefficients; S = canonical structure coefficients; SSQ = squared canonical structure coefficients; H2 = canonical communality coefficients.

SE = summarizing efficiency; ORG = organization of ideas; EXP = expression of ideas; USE = usage; MEC = mechanics; RI = reflection-impulsiveness; ATT = attentional style; FD = Field independence-dependence.
Thompson further suggests that the sum of the squared canonical structure coefficients, across all possible functions for a given set, comprises a canonical communality coefficient. A canonical communality coefficient represents the proportion of a variable's variance which can be reproduced from the canonical solution. One may consult these coefficients in order to perform a stepwise canonical analysis, a direct analogue of stepwise multiple regression analysis. According to Thompson, attention to communality coefficients minimizes probability of Type II errors and produces more parsimonious and thus more generalizable results.

The results of the first canonical analysis indicated that a criterion variable, usage, had the smallest canonical communality coefficient (0.118 + 0.053 + 0.030 = .201663). Usage was, therefore, deleted from the matrix at the first step and a second canonical analysis was performed. The results for the second analysis are presented in Table 4.

As an outcome of the second step, three new canonical coefficients were found for the seven by seven matrix for the three canonical functions (Rc1 = .36146, Rc2 = .29652, and Rc3 = .11613, p < .05 for functions one and two). The summarizing efficiency variable showed a disproportionately low canonical communality coefficient of 0.611667, so was selected for exclusion at the second step of the backward stepwise procedure.
Table 4
Canonical Solution for Second Step

| Variable | Function 1 | | Function 2 | | Function 3 | |
|----------|------------|-------------------------------|------------|-------------------------------|------------|
|          |            | F     | S     | SSQ  | F     | S     | SSQ  | F     | S     | SSQ  | H2    |
| SE       |            | -.386 | -.486 | .236 | .164 | .122 | .015 | -.852 | -.601 | .361 | 0.612 |
| ORG      |            | -.216 | -.652 | .425 | -.673 | -.386 | .149 | 0.680 | .464 | .215 | 0.789 |
| EXP      |            | -.104 | -.185 | .034 | .903 | .813 | .661 | .441  | .426 | .181 | 0.876 |
| MEC      |            | -.760 | -.859 | .738 | .224 | -.063 | .004 | -.129 | .115 | .013 | 0.755 |
| RI       |            | .273  | -.664 | .440 | -.913 | -.636 | .405 | 1.525 | .393 | .155 | 1.000 |
| ATT      |            | .193  | .784  | .615 | .846 | .584 | .341 | 1.693 | .209 | .044 | 1.000 |
| FD       |            | -1.042 | -.988 | .976 | 1.284 | -.059 | .003 | .319  | .142 | .020 | 1.000 |

Note. \( N = 155 \); F = canonical function coefficients; S = canonical structure coefficients; SSQ = squared canonical structure coefficients; H2 = canonical communality coefficients.

SE = summarizing efficiency; ORG = organization of ideas; EXP = expression of ideas; 
Use = usage; MEC = mechanics; RI = reflection-impulsiveness; ATT = attentional style; 
FD = field independence-dependence.
In the third and final step of the analysis, a six by six matrix of the remaining variables was analyzed. The three original predictor variables remained, as did the writing variables of organization of ideas, expression of ideas, and mechanics. The communality coefficients at the step were all equal to 1.00, therefore the analysis was stopped at this step. Table 5 presents the results of the final canonical analysis. Table 6 presents the canonical index coefficients for the variables. These coefficients represent the correlation between a variable and the canonical variate for the variables on the same canonical function (Thompson & Frankiewisz, 1979).

The canonical correlation associated with the first canonical function at the third, and last, step of analysis was .333992 (Chi square = 32.29, df = 9, p < .05); the canonical correlation associated with the second canonical function at the last step of the analysis was .29160 (Chi square = 13.81, df = 4, p < .05); and the canonical correlation associated with the third canonical function in the final step of the analysis was .05380 (Chi square = 0.44, df = 1, p > .05). Only the first and second canonical correlations were statistically significant.

Although the first two canonical correlations are significant, both should be viewed with circumspection. The squared canonical correlation associated with the first function is .12, with the second, .09. Combined, then, the
### Table 5

**Final Canonical Solution**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>S</td>
<td>SSQ</td>
</tr>
<tr>
<td>ORG</td>
<td>.460</td>
<td>.756</td>
<td>.572</td>
</tr>
<tr>
<td>EXP</td>
<td>.012</td>
<td>.075</td>
<td>.006</td>
</tr>
<tr>
<td>MEC</td>
<td>.718</td>
<td>.907</td>
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</tr>
<tr>
<td>RI</td>
<td>.060</td>
<td>.807</td>
<td>.652</td>
</tr>
<tr>
<td>ATT</td>
<td>-.172</td>
<td>-.853</td>
<td>.728</td>
</tr>
<tr>
<td>FD</td>
<td>.812</td>
<td>.991</td>
<td>.982</td>
</tr>
</tbody>
</table>

**Note.** N = 155; F = canonical function coefficients; S = canonical structure coefficients; SSQ = squared canonical structure coefficients; H2 = canonical communality coefficients.

SE = summarizing efficiency; ORG = organization of ideas; EXP = expression of ideas; Use = usage; MEC = mechanics; RI = reflection-impulsiveness; ATT = attentional style; FD = field independence-dependence.
Table 6

Index Coefficients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Function I</th>
<th>Function II</th>
<th>Function III</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORG</td>
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<td>-.066</td>
<td>.033</td>
</tr>
<tr>
<td>EXP</td>
<td>.025</td>
<td>.252</td>
<td>.027</td>
</tr>
<tr>
<td>MEC</td>
<td>.308</td>
<td>.038</td>
<td>-.022</td>
</tr>
<tr>
<td>RI</td>
<td>.274</td>
<td>-.138</td>
<td>.019</td>
</tr>
<tr>
<td>ATT</td>
<td>-.290</td>
<td>.131</td>
<td>.014</td>
</tr>
<tr>
<td>FD</td>
<td>.337</td>
<td>.038</td>
<td>.002</td>
</tr>
</tbody>
</table>

Note. ORG = organization of ideas; EXP = expression of ideas; MEC = mechanics; RI = reflection-impulsiveness; ATT = attentional style; FD = field independence-dependence.

two functions extract 21 per cent of the variance linearly shared by the predictor and criterion variable sets. Thus, the first and second canonical functions account for a moderate amount of variance in the two variable sets.

Table 5 shows that the first canonical function loads heavily on all three cognitive style variables. At .99, however, by far the highest loading is on the field independent-dependent variable. Intercorrelations among the three cognitive style measures are also present. Function
one results also express high loadings on the writing variables of organization (.76) and mechanics (.91). Like the cognitive style variables, organization and mechanics share a strong relationship with one another.

The results of function two present a surprisingly different picture. In this function, the heavier cognitive style loadings are on the dimensions of reflection-impulsiveness and attentional style. Among the writing variables, expression of ideas has a loading of .87, one that is much higher than the other two.

It appears, then, that cognitive styles and summarizing abilities share a relationship. The results of the canonical analysis indicate that tendency toward field independence, a flexible attentional style, and reflection may be predictive of high performance in organization of ideas and mechanics. Field independence appears to be an especially strong predictor of high scores in organization of ideas and mechanics. Conversely, a writer's written expression of ideas may be positively influenced by a proclivity toward impulsiveness and a constricted attentional style.

Writing Process Data Analysis

To investigate the sixth research question, six students of varying cognitive styles were videotaped during eight separate summarizing sessions. The students composed their summaries while using a "think aloud" procedure of
providing protocols. The videotapes were then viewed and coded using a modified version of a writing process coding system developed by Perl (1979).

The process of analysis of these data required the researcher to do three things. First, was to organize information which indicates the average length of each subject’s compositions both in terms of linguistic units and time. The data pertaining to composing time is further divided into subcategories which show how subjects allotted time for writing subprocesses such as reading and planning. The composition length data are presented in Table 7 and discussed below. Next, the researcher grouped into categories all behaviors exhibited by the six subjects as they composed their summaries. The final groupings yielded a total of twenty-five categories of writing behaviors which were organized into four broad headings: planning behaviors, reading behaviors, writing behaviors, and editing behaviors. The twenty-five behaviors are listed and described in a later section. Frequency and percentage of occurrence of each behavior also follow. This information is presented in Tables 8-11. Finally, information reflecting the most frequently occurring behaviors for each subject was calculated and recorded. This information appears in Table 12.

In the tables, the data are presented individually, by child, but children’s names appear adjacent to their fellows.
who possess the same cognitive styles. Moreover, the progression from the category of low-high-low to middle-middle-middle to high-low-high is uniform. The subjects and their three categories, then, are: (1) Tina and Brad—low-high-low (field dependent-constricted-impulsive); (2) Stephanie and Simon—middle-middle-middle (their scores fell on neither end of the continuum); and (3) John and Melissa—high-low-high (field independent-flexible-reflective).

**Composition Length**

Table 7 presents the information pertaining to composition length. Most of the subjects in the writing process group limited their summaries to one draft. Five of the six elected to produce one composition per session, although all five displayed some editorial behaviors while composing. Melissa, who produced an average of 1.75 drafts per session, created drafts that were longer than four of her peers'. Both Tina and Brad, the low-high-low group, produced shorter texts, as did Simon, in the middle group, and John, Melissa's partner in the high-low-high group. Only Stephanie, the second member of the middle group wrote longer summaries than Melissa.

All but one of the six subjects produced sentences of twelve to thirteen words. Brad's sentences, however, averaged 8.77 words.

One third of the group chose to begin the summarizing task without first reading the full stimulus text. Both
<table>
<thead>
<tr>
<th></th>
<th>Tina</th>
<th>Brad</th>
<th>Stephanie</th>
<th>Simon</th>
<th>John</th>
<th>Melissa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drafts</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.75</td>
</tr>
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<td>Sentences/draft</td>
<td>10.75</td>
<td>10.25</td>
<td>17.75</td>
<td>6.66</td>
<td>11.0</td>
<td>13.86</td>
</tr>
<tr>
<td>Words/sentence</td>
<td>12.12</td>
<td>8.77</td>
<td>12.49</td>
<td>11.94</td>
<td>12.06</td>
<td>12.70</td>
</tr>
<tr>
<td><strong>Time (in minutes)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading full text</td>
<td>0.00</td>
<td>0.00</td>
<td>1.23</td>
<td>.93</td>
<td>1.41</td>
<td>1.15</td>
</tr>
<tr>
<td>Planning</td>
<td>1.39</td>
<td>2.49</td>
<td>4.91</td>
<td>2.04</td>
<td>3.54</td>
<td>9.70</td>
</tr>
<tr>
<td>Writing</td>
<td>19.33</td>
<td>7.11</td>
<td>17.14</td>
<td>3.44</td>
<td>5.39</td>
<td>5.90</td>
</tr>
<tr>
<td>Total composing</td>
<td>20.72</td>
<td>9.60</td>
<td>23.28</td>
<td>6.41</td>
<td>10.34</td>
<td>16.75</td>
</tr>
<tr>
<td><strong>Time (percentage)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prewriting (reading</td>
<td>7</td>
<td>26</td>
<td>26</td>
<td>46</td>
<td>48</td>
<td>65</td>
</tr>
<tr>
<td>and planning)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>93</td>
<td>74</td>
<td>74</td>
<td>54</td>
<td>52</td>
<td>35</td>
</tr>
<tr>
<td>On-task</td>
<td>91</td>
<td>98</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
Tina and Brad, the low-high-low group, began planning before reading the complete stimulus passage. In fact, both members of the low-high-low group often began marking their stimulus texts after reading the first sentence. Moreover, their planning times were among the three shortest of the six. Melissa, who composed multiple drafts, planned for twice as long as her five peers, followed by Stephanie, whose planning time was twice that of Tina's, Brad's, and Simon's.

Tina and Stephanie spent more than two times as long with pens to paper than the four others. John and Melissa, the high-low-high pair, fell among the bottom three in terms of writing time with only Simon requiring less. In total composing time, Tina and Stephanie were again the longest, but Melissa's time followed theirs closely, mostly because of her lengthy planning. Melissa and John used the highest and second highest percentage, respectively, of prewriting time. John's percentage, however, was only two points greater than Simon's.

Of the six summarizers, four spent one hundred per cent of their composing time focused on the task. Only the low-high-low group displayed off-task behaviors. These behaviors included engaging passersby in conversation, singing while drumming hands and/or pencils on their desks, and playing with the videotape camera. Both Tina and Brad left their seats during writing sessions and stayed gone for
several seconds. The researcher was unable to ascertain what was done during this time as they were outside the camera’s range.

Categories of Composing Behaviors

The twenty-five composing behaviors were evidenced by all or some of the six subjects in their summarizing sessions. Some of the behaviors were borrowed from Perl (1979), while others appeared to be unique to the summarizing task and were added to Perl’s behaviors. A descriptive list of the behaviors follows, grouped into their broad headings of planning behaviors, reading behaviors, writing behaviors, and editing behaviors. Afterward, the frequency and percentage of occurrence of each category are presented. The most frequently occurring behaviors of each subject are presented and discussed as well.

Planning Behaviors

Planning behaviors, for the purposes of this study, are subdivided into two main categories: those that can be done orally and one which is typically manual in nature. The first of these, the oral category, is broken down into yet another group of behavior categories. They are: commenting, questioning, assessing, repeating, and interpreting. The manual category is made up of a single behavior, highlighting.

Before the categories listed above are further
described, it is necessary to clarify their role in the writing process. Each of the categories has been placed under a main heading of planning. Typically, planning is an act believed and expected to occur as a precursor to another. In fact, in writing, some planning does usually occur before a draft of connected text is begun. It is also true, however, that planning behaviors continue to occur throughout the process of text production.

Flower and Hayes (1981) developed a "cognitive process theory of writing" which helped put to rest the notion that writing is a linear process beginning at point A and progressing neatly, unwaveringly to point Z. Rather, these investigators assert that:

People do not march through these processes in a simple 1, 2, 3 order. Although writers may spend more time in planning at the beginning of a composing session, planning is not a unitary stage, but a distinctive thinking process which writers use over and over during composing. Furthermore, it is used at all levels, whether the writer is making a global plan for the whole text or a local representation of the meaning of the next sentence. (p. 375)

Thus, the process of writing is recursive since the various stages of the process, including planning, are not discrete, but occur again and again, often embedded within one another. In this study, then, the planning behaviors
displayed by the student summarizers may be seen throughout their composing style sheets, from beginning to end.

Following each category name below, a one- to four-letter abbreviation appears. These abbreviations were used to identify individual behaviors on the subjects' composing style sheets.

**Oral planning behaviors.**

1. Commenting [C]—This category includes sighing, single word interjections such as "Oh" and emotional responses to ideas in the stimulus text. Brad, for example, responded with "Oh yuck, that's nasty" when reading about the eating habits of wolves. When she read that robots may one day clean her room for her, Tina commented "That sounds easier."

2. Questioning [Q]—This category includes questions pertaining to text content or task procedure. Near the end of a long session Tina mused "I wonder how long I've been here." When Simon had difficulty remembering textual information he asked "How old was she?" When she completed her first full page of her first summary, Melissa enquired "Can we write on the back?"

3. Assessing [A]—This category involves judgments made about one's own writing, either positive or negative. While reviewing one of her rough drafts, Melissa remarked of her own writing "I don't know about this first sentence. That's important, but people don't really need to know about
this." Assessing may also include counting the number of words one has used in a summary.

4. Repeating [R]—Phrases or sentences, which are repeated, make up this category.

5. Interpreting [I]—Statements in this category reflect a subject's attempt to paraphrase, clarify, or synthesize ideas from the stimulus text. This may be done aloud or silently by altering the stimulus text. After reading the entire passage about robots John spoke this summative statement "So, robots are like computers that can walk around and talk." Assessing the importance of ideas from the stimulus text is also included in this category. Also while reading the passage concerning robots, Simon remarked "This isn't important because most people already know this about robots." (Although Simon's statement is egocentric and possibly inaccurate, it was still classified as interpreting because his intent was to assess the importance of an idea from the stimulus text.)

Manual planning behaviors.

6. Highlighting [H]—Marking texts in such a way that the reader may discriminate important ideas from unimportant ideas describes the behavior in this category. Some subjects indeed chose to highlight, with colorful markers, those ideas they considered most important. Others merely crossed out the ideas they thought should not be included in their summary.
Reading Behaviors

Reading related to the stimulus text.
7. Reading the directions [Rd]
8. Reading the entire stimulus text [Rs]
9. Reading selected portions of the stimulus text [Rp]
10. Reading selected portions of the stimulus text aloud [Rpa]

Reading related to one's own written product.
11. Reading one sentence or a few words [Ra]
12. Reading one sentence or a few words aloud [Raa]
13. Reading a number of sentences together [Rab]
14. Reading a number of sentences together aloud [Raba]
15. Reading the entire draft through [Rwi]
16. Reading the entire draft through aloud [Rwia]

Writing Behaviors

17. Writing silently [W]
18. Writing aloud [TW]—This behavior involves talking and writing at the same time. It is composing aloud in such a way that what one is saying is actually being written at the same time.

Editing Behaviors

19. Adding syntactic markers, words, phrases, or clauses [Eadd]
20. Deleting syntactic markers, words, phrases, or clauses [Edel]
21. Adding, deleting, or considering the use of
punctuation [Epunc]

22. Considering or changing spelling [Esp]

23. Changing the sentence structure through embedding, coordination, or subordination [Ess]

24. Indicating concern for appropriate vocabulary [Ewcl]

25. Silence [s]—This final category does not fit neatly under the four broad headings previously listed. It was, however, a behavior displayed by the subjects, therefore, it will not be discounted. Silence involves not merely the absence of sound, but also the absence of any of the already named summarizing behaviors.

Frequency and Percentage of Occurrence of Categories

Planning Behaviors

There are three planning behaviors in which all the subjects participated. All six summarizers spent time commenting, interpreting and highlighting. Proportionally, Tina spent more time commenting than the others. With 12 per cent of her total behaviors comprised of commenting, she spent twice as much of her time on this task as did Brad or Melissa. Simon spent more of his composing time interpreting than his peers, although his 15 per cent was followed closely by John's 14 per cent. Melissa was next, with 9 per cent of her total composing behaviors falling under interpreting. Simon did more highlighting than the other five subjects, spending 20 per cent of his total behaviors on this activity. Only Stephanie and Melissa
devoted less than 10 per cent of their total behaviors to highlighting.

Of the remaining planning behaviors, little time was used for questioning and assessing. None of the subjects spent more than 2 per cent of total behaviors on these two activities. In fact, John spent no time at all on either of them. Five of the six spent some time repeating ideas as they composed. Stephanie used 8 per cent of her total behaviors for repeating, Brad 6 per cent, and Tina 4 per cent. Simon, John, and Melissa each used less than 1 per cent, with Melissa doing no repeating.

The highest total percentage of planning time is Simon's. His 46.004 per cent is twice that of Stephanie's 20.025 and almost twice that of Melissa's 23.006 per cent and Brad's 24.004 per cent. It is important to note, however, that part of Melissa's planning for her final drafts was spent in writing rough drafts. Table 10 shows that Melissa used approximately 33 per cent of her total behaviors for writing. A part of that, however, 13.13 per cent, was used to write rough drafts. The additional percentage, that spent on rough draft writing, if added to her total for planning, boosts her planning total to 36.14 per cent, equal to John's. The planning behaviors are presented in Table 8.

Reading Behaviors

Among the ten reading behaviors displayed by the
Table 8  
Average Frequency and Percentage of Planning Behaviors

<table>
<thead>
<tr>
<th></th>
<th>Commenting</th>
<th>Questioning</th>
<th>Assessing</th>
<th>Repeating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
<td>10.63</td>
<td>12</td>
<td>1.13</td>
<td>1.000</td>
</tr>
<tr>
<td>Brad</td>
<td>4.13</td>
<td>6</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Stephanie</td>
<td>9.25</td>
<td>7</td>
<td>1.38</td>
<td>0.009</td>
</tr>
<tr>
<td>Simon</td>
<td>4.63</td>
<td>8</td>
<td>0.25</td>
<td>0.004</td>
</tr>
<tr>
<td>John</td>
<td>5.88</td>
<td>8</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Melissa</td>
<td>5.88</td>
<td>6</td>
<td>0.13</td>
<td>0.001</td>
</tr>
</tbody>
</table>

|            |             |             |           |           |
|            |             |             |           |           |


<table>
<thead>
<tr>
<th></th>
<th>Oral Planning (Cont.)</th>
<th>Manual Planning</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interpreting</td>
<td>Highlighting</td>
<td></td>
</tr>
<tr>
<td>Tina</td>
<td>4.64</td>
<td>9.13</td>
<td>29.66</td>
</tr>
<tr>
<td></td>
<td>5.000</td>
<td>10.00</td>
<td>32.009</td>
</tr>
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<td>8.38</td>
<td>17.02</td>
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<tr>
<td></td>
<td>0.003</td>
<td>12.00</td>
<td>24.004</td>
</tr>
<tr>
<td>Stephanie</td>
<td>1.25</td>
<td>6.38</td>
<td>30.39</td>
</tr>
<tr>
<td></td>
<td>0.008</td>
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<td>20.025</td>
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<tr>
<td>Simon</td>
<td>8.88</td>
<td>11.75</td>
<td>27.27</td>
</tr>
<tr>
<td></td>
<td>15.000</td>
<td>20.00</td>
<td>46.004</td>
</tr>
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<td>John</td>
<td>9.88</td>
<td>10.00</td>
<td>26.14</td>
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<td></td>
<td>14.000</td>
<td>14.00</td>
<td>36.005</td>
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<td>Melissa</td>
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<td>6.38</td>
<td>22.02</td>
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<tr>
<td></td>
<td>9.000</td>
<td>7.00</td>
<td>23.006</td>
</tr>
</tbody>
</table>
subjects, Table 9 shows that only three got participation from the full number of summarizers. The three behaviors are: (1) reading selected portions of the stimulus text (Rp), (2) reading selected portions of the stimulus text aloud (Rpa), and (3) reading one sentence or a few words of one's own written product (Ra). Brad and Simon share the largest percentage of total behaviors spent on Rp with 26 per cent each. Tina, Stephanie, and Melissa have percentages in the low twenties, while John's percentage is sixteen.

When Rpa percentages are considered along with Rp percentages, the picture on reading stimulus text changes. Although Brad's and Simon's percentages remain among the largest (31 per cent and 28 per cent, respectively), Stephanie's willingness to read aloud elevates her percentage of total behaviors to 30 per cent spent on reading the stimulus text and pushes it to among the first two. Stephanie and John appear to be the most willing to read texts aloud; the table shows that 9 per cent of their behavior totals were used for Rpa. This is consistent with their Ra behavior; they have the highest two percentages, although still small, on Ra of the three students who participated in this behavior. Melissa may be the most reticent of the subjects. Her combined Rpa and Ra percentages amount to less than one per cent.

If Melissa is the least willing to read aloud, she
Table 9

Average Frequency and Percentage of Reading Behaviors

<table>
<thead>
<tr>
<th>Reading Related to the Stimulus Text</th>
<th>Rd</th>
<th>Rs</th>
<th>Rp</th>
<th>Rpa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
<td>0.13</td>
<td>0.0010</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Brad</td>
<td>0.00</td>
<td>0.0000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Stephanie</td>
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<td>0.0009</td>
<td>0.00</td>
<td>0.004</td>
</tr>
<tr>
<td>Simon</td>
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<td>0.0000</td>
<td>1.00</td>
<td>2.000</td>
</tr>
<tr>
<td>John</td>
<td>0.13</td>
<td>0.0020</td>
<td>1.00</td>
<td>2.000</td>
</tr>
<tr>
<td>Melissa</td>
<td>0.00</td>
<td>0.0000</td>
<td>1.00</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note. Rd = reading the directions; Rs = reading the entire stimulus text; Rp = reading selected portions of the stimulus text; Rpa = Rp + aloud.
Table 9 (continued)

Average Frequency and Percentage of Reading Behaviors

Reading Related to One's Own Product

<table>
<thead>
<tr>
<th></th>
<th>Ra</th>
<th></th>
<th>Raa</th>
<th></th>
<th>Rab</th>
<th></th>
<th>Raba</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
<td>1.13</td>
<td>1.00</td>
<td>0.00</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Brad</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
<td>0.000</td>
<td>0.13</td>
<td>0.001</td>
<td>0.13</td>
<td>0.001</td>
</tr>
<tr>
<td>Stephanie</td>
<td>1.00</td>
<td>0.007</td>
<td>0.50</td>
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<td>0.00</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Simon</td>
<td>0.25</td>
<td>0.004</td>
<td>0.00</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>John</td>
<td>1.63</td>
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<td>0.13</td>
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<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Melissa</td>
<td>8.13</td>
<td>9.000</td>
<td>0.13</td>
<td>0.001</td>
<td>1.00</td>
<td>1.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Note. Ra = reading one sentence or a few words; Raa = Ra + aloud; Rab = reading a number sentences together; Raba = Rab + aloud.
Table 9 (continued)

Average Frequency and Percentage of Reading Behaviors

<table>
<thead>
<tr>
<th></th>
<th>Reading Related to One's Own Product (continued)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rwi</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
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<td>0.0000</td>
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<tr>
<td>Brad</td>
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<td>0.0000</td>
</tr>
<tr>
<td>Stephanie</td>
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</tr>
<tr>
<td>Simon</td>
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<td>0.0000</td>
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<tr>
<td>John</td>
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<td>0.0020</td>
</tr>
<tr>
<td>Melissa</td>
<td>0.00</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Note. Rwi = reading the entire draft through; Rwia = Rwi + aloud.
appears to be the most interested in reading her own written product. Melissa spent 9 per cent of her total composing behaviors on reading small portions of the text she had produced. John's percentage in the Ra category was next behind Melissa's, but at 3 per cent, his was one-third of hers. The other four subjects each used 1 per cent or less of their total composing behaviors for reading small portions of their own texts, either silently or aloud. None of the subjects devoted more than 1 per cent of their total behaviors to reading large portions of their own compositions.

All of the subjects spent much of their total summarizing behaviors on reading; their percentages ranged from 26 to 31 per cent. By far the greatest number was used for reading and rereading the stimulus text.

Writing Behaviors

All six subjects engaged in both writing silently and writing aloud. Most of the writers appear to favor writing silently to writing aloud; percentages in the first category typically exceeded those in the second by six to nineteen points. Stephanie stands out as clearly preferring talking while writing with the greatest percentage, 28, in that category and the lowest, 11, in the writing silently column. Although only Stephanie exhibited a preference for writing aloud, Brad showed the smallest tendency to favor one type of writing behavior over the other. His writing silently
Table 10

Frequency and Percentage of Writing Behaviors
(average per sample)

<table>
<thead>
<tr>
<th></th>
<th>Writing Silently</th>
<th></th>
<th>Writing Aloud</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
<td>21.63</td>
<td>24</td>
<td>4.88</td>
<td>5.000</td>
<td>26.51</td>
<td>29.000</td>
</tr>
<tr>
<td>Brad</td>
<td>15.88</td>
<td>22</td>
<td>11.63</td>
<td>16.000</td>
<td>27.51</td>
<td>38.000</td>
</tr>
<tr>
<td>Stephanie</td>
<td>15.75</td>
<td>11</td>
<td>39.13</td>
<td>28.000</td>
<td>54.88</td>
<td>39.000</td>
</tr>
<tr>
<td>Simon</td>
<td>10.50</td>
<td>18</td>
<td>1.63</td>
<td>3.000</td>
<td>12.13</td>
<td>21.000</td>
</tr>
<tr>
<td>John</td>
<td>15.25</td>
<td>22</td>
<td>1.63</td>
<td>3.000</td>
<td>16.88</td>
<td>25.000</td>
</tr>
<tr>
<td>Melissa</td>
<td>31.13</td>
<td>33</td>
<td>0.38</td>
<td>0.004</td>
<td>31.51</td>
<td>33.004</td>
</tr>
</tbody>
</table>

percentage (22) exceeded his writing aloud percentage (16) by only six.

Consistent with her reading percentages, Melissa appears to be the most reticent of the group during writing too. Her total writing percentage of 33.004 was among the highest three, but it was made up almost entirely of silent writing.

As with reading, the six subjects spent large amounts of their total composing behaviors on writing behaviors. Their averages ranged from 21 per cent to 39 per cent. For each of them, his or her total combined percentages for
reading and writing amounted to more than 50 per cent of the total composing behaviors. The frequency and percentage of occurrence of writing behaviors can be found in Table 10. 

**Editing Behaviors**

As Table 11 indicates, every subject engaged in some editing behaviors, but the two most popular behaviors appear to be: (1) deleting syntactic markers, words, phrases, or clauses (Edel) and (2) considering or changing spelling (Esp). Every subject participated in both behaviors, but Esp percentages range wider than Edel percentages. Stephanie appears more concerned with spelling than the other five subjects with 6 per cent of her total composing behaviors devoted to editing for correct spelling. Brad, Simon, and Melissa seem relatively unconcerned; each shows an Esp percentage around one.

John was the only subject of six who used every identified editing behavior. Tina, however, devoted more of her total composing behaviors to editing (9.01 per cent) than John (6.02 per cent). Indeed, more than any of her peers. Simon, with 1.012 per cent of total behaviors used for editing, had the smallest percentage. He, however, used only three of the possible categories.

Two of the subjects were alone in their use of a specific behavior. John and Melissa were the sole participants in changing sentence structure by embedding, coordination, or subordination (Ess). They and Tina were
Table 11
Average Frequency and Percentage of Editing Behaviors

<table>
<thead>
<tr>
<th></th>
<th>Eadd</th>
<th>Edel</th>
<th>Epunc</th>
<th>Esp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Tina</td>
<td>0.38</td>
<td>0.004</td>
<td>3.00</td>
<td>3.000</td>
</tr>
<tr>
<td>Brad</td>
<td>0.50</td>
<td>0.006</td>
<td>1.75</td>
<td>2.000</td>
</tr>
<tr>
<td>Stephanie</td>
<td>0.50</td>
<td>0.003</td>
<td>2.25</td>
<td>2.000</td>
</tr>
<tr>
<td>Simon</td>
<td>0.00</td>
<td>0.000</td>
<td>0.50</td>
<td>0.008</td>
</tr>
<tr>
<td>John</td>
<td>0.75</td>
<td>1.000</td>
<td>1.75</td>
<td>3.000</td>
</tr>
<tr>
<td>Melissa</td>
<td>0.00</td>
<td>0.000</td>
<td>3.50</td>
<td>4.000</td>
</tr>
</tbody>
</table>

Note. Eadd = adding syntactic markers, words, phrases or clauses; Edel = deleting syntactic markers, words, phrases, or clauses; Epunc = adding, deleting, or considering the use of punctuation; Esp = considering or changing spelling.
Table 11 (continued)
Average Frequency and Percentage of Editing Behaviors

<table>
<thead>
<tr>
<th></th>
<th>Ess</th>
<th></th>
<th></th>
<th>Ewc</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td></td>
<td>n</td>
<td>%</td>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Tina</td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>0.13</td>
<td>0.001</td>
<td></td>
<td>8.51</td>
</tr>
<tr>
<td>Brad</td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>3.13</td>
</tr>
<tr>
<td>Stephanie</td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>11.75</td>
</tr>
<tr>
<td>Simon</td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>0.00</td>
<td>0.000</td>
<td></td>
<td>1.50</td>
</tr>
<tr>
<td>John</td>
<td>0.50</td>
<td>0.007</td>
<td></td>
<td>0.50</td>
<td>0.007</td>
<td></td>
<td>5.63</td>
</tr>
<tr>
<td>Melissa</td>
<td>0.75</td>
<td>0.008</td>
<td></td>
<td>1.25</td>
<td>2.000</td>
<td></td>
<td>6.76</td>
</tr>
</tbody>
</table>

Note. Ess = changing the sentence structure through embedding, coordination, or subordination; Ewc = indicating concern for appropriate vocabulary.
the only three subjects who indicated concern for appropriate vocabulary (Ewc) while summarizing.

Periods of Silence

This category seems not to fit under the four broad headings identified, but the behavior was exhibited by the subjects nonetheless. Melissa's percentage of silent behaviors is largest at 4 per cent. In descending order the other subjects and percentages are: Tina, 2 per cent; John, 1 per cent; Simon, .004 per cent; and Brad, .003 per cent. Stephanie displayed no periods of silence.

Most Frequently Occurring Behaviors

The average number of the four most frequently occurring behaviors for each subject appears in Table 12. The number four was selected because in each child's case, these four behaviors made up the largest portion of total summarizing behaviors. By far the most often seen behaviors are reading and writing. These behaviors appear among the most frequent behaviors of every subject studied. They also share the distinction of having the largest percentage of occurrence among the total composing behaviors of each of the six subjects. In particular, the Rp category is apparent as is the category of writing silently. These two categories appear at the top of the behavior lists of four of the summarizers: Tina, Brad, John, and Melissa. Even in Stephanie's and Simon's lists Rp appears among the top two behaviors listed.
Table 12
Most Frequently Occurring Behaviors
(average per sample)

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tina</td>
<td></td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>23</td>
</tr>
<tr>
<td>writing silently</td>
<td>24</td>
</tr>
<tr>
<td>commenting</td>
<td>12</td>
</tr>
<tr>
<td>highlighting</td>
<td>10</td>
</tr>
<tr>
<td>Brad</td>
<td></td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>26</td>
</tr>
<tr>
<td>writing silently</td>
<td>22</td>
</tr>
<tr>
<td>writing aloud</td>
<td>16</td>
</tr>
<tr>
<td>highlighting</td>
<td>12</td>
</tr>
<tr>
<td>Stephanie</td>
<td></td>
</tr>
<tr>
<td>writing aloud</td>
<td>28</td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>21</td>
</tr>
<tr>
<td>writing silently</td>
<td>11</td>
</tr>
<tr>
<td>reading aloud</td>
<td>9</td>
</tr>
<tr>
<td>Simon</td>
<td></td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>26</td>
</tr>
<tr>
<td>highlighting</td>
<td>20</td>
</tr>
<tr>
<td>writing silently</td>
<td>18</td>
</tr>
<tr>
<td>interpreting</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 12 (Continued)

Most Frequently Occurring Behaviors
(average per sample)

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td></td>
</tr>
<tr>
<td>writing silently</td>
<td>22</td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>16</td>
</tr>
<tr>
<td>interpreting</td>
<td>14</td>
</tr>
<tr>
<td>highlighting</td>
<td>14</td>
</tr>
<tr>
<td>Melissa</td>
<td></td>
</tr>
<tr>
<td>writing silently</td>
<td>33</td>
</tr>
<tr>
<td>reading (Rp)</td>
<td>20</td>
</tr>
<tr>
<td>interpreting</td>
<td>9</td>
</tr>
<tr>
<td>highlighting</td>
<td>7</td>
</tr>
</tbody>
</table>

Stephanie shows a penchant for behaviors performed aloud. Fifty per cent of her most frequently occurring behaviors are those done aloud. Every one of her most frequently occurring behaviors is in a reading or writing category. The remainder of the subjects showed an inclination to highlight frequently. Stephanie alone shows the absence of highlighting in her pattern of behaviors.

Three subjects, Simon, John, and Melissa, display interpreting among their oft seen behaviors. In John's and Melissa's cases, interpreting appears third in prominence.
only behind the leaders, reading and writing. Indeed, John and Melissa share identical patterns of most occurring behaviors. In Simon's case, three other behaviors appear more often than interpreting, although the percentage of his total behaviors is greater than either John's or Melissa's.
Chapter Bibliography


CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The study was undertaken to investigate the influence of cognitive styles on children's summarizing products and processes. A sample of 155 subjects participated in the study. Their cognitive styles were assessed using the Children's Cognitive Style Assessment. Each of the subjects produced two written products; they wrote summaries of expository text. The summaries were assessed for summarizing efficiency, organization of ideas, expression of ideas, usage and grammar, and mechanics. The relationships among cognitive styles and the writing variables were examined through canonical correlation analysis.

From the original 155 subjects, six were selected for further study. These six children summarized an additional eight passages of expository text. They were videotaped while composing and producing think aloud protocols. Their writing process behaviors were coded, categorized, and examined for patterns. This chapter presents a discussion of the findings of this study and their implications for classroom practice. Recommendations for further research are also included.
Findings and Conclusions

The findings and conclusions are presented in two sections. First, the findings of the written products analysis are discussed. Following that, a discussion of the findings of the writing processes analysis is presented.

Writing Products

The finding of two statistically significant canonical correlations implies that cognitive styles are related to writing abilities. Carver (1978), however, affirms that citing statistical significance may be a specious means of declaring educational significance. Carver contends that statistical significance is rather easily achieved through use of a large sample. Educational significance, on the other hand, is more accurately reflected in effect sizes. In this study, the effect sizes are represented by the squared canonical correlations for the first two canonical functions, that is, .12 and .09. These combined values suggest that the two variable sets linearly share 21 percent of the variance when weighted by the two sets of canonical function coefficients presented in functions one and two of Table 5. This variance is considered to be modest; therefore the educational significance of the results may be considered moderate.

Table 5 also reflects particular findings. First, the results indicate that field independent, reflective,
flexibly controlled students outperform their counterparts on the summarizing subtasks of organization of ideas and written mechanics. The canonical structure and index coefficients for the field independence measure indicate that this variable is the strongest predictor of high scores on the two writing variables. Second, the Table 5 results suggest that a tendency for students to be impulsive, and constricted in their attentional style, is predictive of better performance in their expression of ideas than their peers who are reflective and flexibly controlled.

The results appear to present a paradox and pat explanations are elusive. It seems, however, understandable that high scores in organization of ideas and mechanics are highly related to field independence, reflection, and flexible control. For example, organizing ideas from a text, for a new text, requires the text processors to possess the reasoning skills necessary to sequence text logically, thus coherently. These reasoning skills seem logically connected to field independence, an analytic approach to task completion. Field independent students may be more adept at viewing, comprehending, and analyzing ideas separately, thus enabling them to figure out the relationships among the individual ideas. This may lead to a more skillful reassembling of textual ideas into a clear, well organized whole. Mechanical accuracy in writing requires the writer to notice and respond to details. It
seems that a strong analytic aptitude would positively affect a writer's ability to notice and respond to such details.

It is unsurprising, too, that reflection is related to written organization and mechanics. Reflective students delay decisions as they consider many alternatives. Such behavior seems likely to produce cogent texts as students carefully consider which ideas should appear next and how punctuation will affect the readability of their compositions. Similarly, students with flexible control are able to focus on immediately relevant information. This ability to remain undistracted by inappropriate information may allow flexibly controlled students to better discriminate between ordered and disordered text.

Pitts (1982) also found field independence, reflection, and flexible control related to strong abilities in language use. She found these three cognitive style preferences to be related to inferential reading comprehension. Since the ability to summarize involves such comprehension skills, it does not seem unusual that the study described here should obtain similar results.

The second finding, that expression of ideas is related to impulsiveness and constricted control, is intriguing. It appears contradictory that impulsiveness and constricted control, considered the less desirable ends of their respective continua, should be related to high scores on any
summarizing variable. It may be, however, that successful expression of ideas requires that students be somewhat impulsive and constricted in control. An impulsive approach, for example, may allow students more creative freedom than a more reflective one. While the reflective student is carefully considering the composing alternatives and discarding all but the most "acceptable", perhaps the impulsive student is eagerly scrawling the first thing that enters his or her head. Sometimes these inchoate ideas, those one seizes without careful censorship, are the most compellingly expressed, the most beautifully wrought. Likewise, students who are constricted in attentional style, since they may have more ideas available to them (relevant or not), may also have more opportunities to express themselves in a clever, poignant, or otherwise appealing way. In short, the very traits that prevent students from experiencing success in organization and mechanics may free them from the constraints of leaden language.

**Writing Processes**

Some behaviors are common to all six summarizers, regardless of cognitive styles. Reading and writing, for example, appear prominently among the behaviors of every subject. In fact, these two behaviors alone account for over 50 per cent of the total behaviors of the six subjects. Considering the task to which they were assigned, this result is rather expected. The summarization task is
reliant, by definition, on reading and writing. If the task is reduced to its fundamental parts, they are reading and writing. Since the subjects also spent a large percentage of their total behaviors on planning (approximately 20 to 46 per cent), they may not have spent disproportionate amounts of time on reading and writing.

"Accomplished readers react to ideas that occur to them as they encounter cues in text" (Vaughn & Estes, 1986, p. 136). To a certain extent, all of the subjects exhibited the characteristics of accomplished readers. While planning, each subject engaged in at least three behaviors: commenting, interpreting, and highlighting. Perhaps these three behaviors lend themselves more to successful summarization than the less frequently used questioning, assessing, and repeating. Other explanations are possible though. For example, most students spent such large amounts of time on interpreting and/or highlighting the stimulus text that they may have felt little need or inclination to assess their own products. They saw the actual writing as a process of copying their highlighted or otherwise altered stimulus texts. Also, although none of the six subjects did much oral assessment of his or her own written products, all of them spent some time silently reading their own products. Possibly, then, most of the subjects' assessment occurred as unvoiced behaviors. And since all the subjects engaged in some editing behavior, it is apparent that more assessment
of their own writing took place than was reflected by the assessing category listed under planning. As for questioning, it may also be the type of behavior that is likely to be voiced internally rather than externally. At any rate, all summarizers displayed some willingness to and knowledge about how to actively respond to expository text.

All of the subjects did some editing of their own written products. The only two editing behaviors done by every subject, however, were: (1) deleting syntactic markers, words, phrases or clauses (Edel) and (2) considering or changing spelling (Esp). It is understandable that Edel behaviors predominate among editing behaviors in a study of summarization; after all, eliminating unimportant text is the fundamental issue. Many of the Edel behaviors evidenced, however, are of a cosmetic sort, words crossed out because letters are ill-formed or illegible, rather than attempts by the authors to eliminate unnecessary content. These results seem to match Perl's (1979) findings among unskilled college writers. Perl found that, among her subjects, editing often occurred "prematurely" and was "primarily an exercise in error-hunting." She states:

The students are prematurely concerned with the 'look' of their writing; thus as soon as a few words are written on the paper, detection and correction of errors replaces writing and revising....
What they seem to lack as much as any rule is a conception of editing that includes flexibility, suspended judgment, the weighing of possibilities, and the reworking of ideas. (p. 333)

Perhaps the editing behaviors of the six participants in this study are primarily a function of their age and developmental level. It may be, therefore, that Edel and Esp predominate because the two behaviors were used as compensations or camouflage for a lack of more mature editing behaviors.

What behaviors do the data suggest cognitive styles may influence? Although none of the three cognitive style combination categories is clearly delineated by its subjects' behaviors, some patterns do emerge. In the field dependent, constricted control, impulsive group, the group composed of Tina and Brad, some behaviors are apparent that do not appear among the other subjects' behaviors. First, neither Tina nor Brad read a stimulus text from start to finish in one act. In fact, both often began composing a final draft (they wrote no rough drafts) after reading the first sentence of a stimulus text. This behavior, or lack of behavior, may indicate that students of the low-high-low cognitive style combination are at a disadvantage when reading texts, thus when summarizing. Rosenblatt (1978), after examining "active" readers, produces this composite:

He sometimes found it necessary to reinterpret
earlier parts of the text in the light of later parts. Actually, he had not fully read the first line until he had read the last, and interrelated them. There was a kind of shuttling back and forth as one or another synthesizing element—a context, a persona, a level of meaning—suggested itself to him. (p. 10)

This reinterpretation, this interrelating, was absent from the behaviors of Tina and Brad.

The finding above is corroborated by the finding that Tina and Brad, along with Stephanie, had lower percentages of interpreting behaviors than their peers. These students appeared to view the summarizing task as strictly one of read, highlight, copy. Perhaps their relative predisposition to impulsiveness caused them to omit the process of considering synthesized textual responses, an interpretive process. It is also possible that their inclination toward field dependence may have influenced their behavior. Certainly analysis, the cornerstone of field independent behavior, is a necessary component of interpretation. If students lack the ability to analyze, it may be that a deficit in interpretive behavior will be reflected in their summarizing.

Tina and Brad are the only two of the six subjects who spent any time off the summarizing task. A tendency toward constricted control, the relative inability to focus on
relevant information, may have influenced the low-high-low group's off-task behavior.

Stephanie and Simon, the students with CCSA scores in the mid range, displayed few behaviors, as a group, which distinguished them from the other two groups. They did not, unlike Tina and Brad, display off-task behaviors, but neither did Melissa or John, the high-low-high group. Simon and Stephanie had the lowest Ra (reading one's own written product) percentages of the six, but the differences between their percentages and Tina's and Brad's was less than one. It seems then that Stephanie's and Simon's behaviors, taken together, are relatively undistinguished. The middle group's results appear to resist clean categorization.

John and Melissa, the field independent, reflective, flexibly controlled group, characterized themselves in several ways. They shared identical patterns of most frequently occurring behaviors, and these patterns differed from those of any of the remaining four subjects. Planning behaviors accounted for much of John's and Melissa's most frequently occurring behaviors, and interpreting was prominent among the planning behaviors. Melissa and John had the two highest prewriting times of the six subjects. Melissa, in particular, far outdistanced the others. The high-low-high group was the only group to use the editing behavior of changing sentence structure through embedding, coordination, or subordination. This specific behavior
characterizes them as perhaps more interested in the content of their products, unlike their peers who seemed to be more concerned with form. Finally, Melissa and John spent more of their total behaviors on reading their own written products than the members of either of the other two groups. One other behavior distinguishes John and Melissa, but only from two of their peers: along with Stephanie and Simon they spent all of their summarization time on-task.

Overall, John and Melissa seem to display the most mature composing behaviors of the six. As is evidenced by their heavy emphasis on planning, interpreting, rereading of their own texts, and use of refined editing behavior, their concept of summarization seems to be a more recursive, transactional one than that of their peers. In other words, Tina, Brad, Stephanie, and Simon appear to view the summarization task as a read, select, write (and make corrections in letter formation and spelling as one writes) process. Their summarizing follows a relatively predictable linear pattern. Melissa's and John's approach to summarizing is more akin to a read, select, combine, write, read, select, write (and, yes, make mechanical corrections as one writes) process. John and Melissa seem to, more clearly than their peers, approximate and extend the reading act described by Rosenblatt (1978):

The usual phrasing makes it difficult to attempt
to do justice to the nature of the actual reading
event. The reader, we can say, interprets the text.
(The reader acts on the text.) Or we can say, the
text produces a response in the reader. (The text
acts on the reader.) Each of these phrasings,
because it implies a single line of action by one
separate element on another separate element,
distorts the actual reading process. The relation
between reader and text is not linear. It is a
situation, an event at a particular time and place
in which each element conditions the other. (p.16)

It seems likely that John's and Melissa's composing
styles may, in part, be attributed to their cognitive
styles. Their high scores in field independence on the CCSA
indicate a strong tendency to approach tasks analytically.
Their composing behaviors appear to reflect this tendency.
Both children, for example, spent more time analyzing all
the texts involved in producing their summaries. Their
inclination to reread and change what they had previously
read and written reflects an inclination to continually take
apart and rebuild, an analytic process.

John's and Melissa's tendency toward reflection also
appears to influence their composing behaviors. Their
tendency to postpone decisions until they have examined all
alternatives is seen in their high degree of prewriting and
reading of their own texts.
Implications

The results of the study indicate that students' cognitive styles are predictive of some summarizing abilities. It seems, then, that style measures might be effectively employed to identify children who are experiencing or are likely to experience difficulty with summary writing because of their cognitive styles.

Some students may benefit from instructional techniques designed to modify ineffective summarizing traits. Field dependent students, for example, might be taught to graphically organize textual ideas before writing summaries. This technique, in which ideas are arranged hierarchically, requires students to "take apart" the text in an analytical manner, before reconstructing it into a cogent whole. Providing field dependent students with instruction in the various organizational structures of expository text might also be helpful to them. Such instruction may provide a needed schema, or cognitive base, upon which their analytic behaviors could grow.

Impulsive students may benefit from encouragement to delay decision making. Rewarding students for reading complete stimulus texts, for instance, may help them connect ideas that would otherwise go unconnected. These students might also improve their written organization by orally supporting their reasons for following one textual idea with another. Finally, and rather simply, impulsive students
should be required to read their own texts before making decisions about those texts' completeness.

Students with constricted control may be given passages suited to their needs. Teachers may want to try starting summarization instruction for these students with text that carries a light concept load and few supporting details. Progress could then be made toward more concept laden text containing more details.

The results of this study show that some reflective, flexibly controlled students may experience difficulty in written expression of ideas. Possibly these students would be helped by relatively unstructured "brainstorming" activities. These activities, in which no idea is censored until all have been recorded, may aid some students in considering and using previously unconsidered impressions.

All six of the subjects from this study who participated in writing process analysis displayed an eagerness to use highlighting as a means of preparing to summarize. They also, however, often used it capriciously and ineffectively, and to the exclusion of more interactive text marking systems. Some students, therefore, may benefit from instruction in such active reading techniques as ARC (Anticipation, Realization, Contemplation), INSERT (Interactive Notation System for Effective Reading and Thinking), or SMART (Self-Monitoring Approach to Reading and Thinking). These techniques are described by Vaughn and
Recommendations for Further Research

The study presented here answered several questions relative to cognitive style and summarization abilities and behaviors. In doing so, however, it raised new questions or issues. The following research is recommended to address these questions and issues.

This study's focus is on the relationship of children's cognitive styles and their summarizing products and processes. Future research might include studies that investigate the relationships among cognitive styles and other types of writing. Do cognitive styles, for example, appear to affect referential writing that is performed without a stimulus text in the same manner as referential writing stimulated by text? What are the effects of cognitive style on narrative or evaluative modes of writing?

This study revealed a rather paradoxical relationship. Cognitive styles are related to the writing abilities of organization of ideas and mechanics in a different way than they are related to expression of ideas. Future research should focus on the traits necessary to produce good written organization, adequate use of mechanics, and appealing written expression. If these three components of writing are in conflict, further research may uncover ways of resolving the conflict as well as ways of remediating students who have difficulty with any of the three
components.

Experimental research designed to investigate instructional interventions is warranted. There is evidence that suggests that cognitive styles can be changed through instruction (Rinehart, Stahl, & Erickson, 1985; Kurtz & Borkowski, 1987). Further evidence, however, indicates that cognitive styles are not amenable to change (Case, 1975; Provost, 1981). Interventions such as those discussed in the previous section of this study may alter composition products, composition processes, cognitive styles, or any combination of the three.

Studies similar to this one, but using subjects of different ages or of special populations (learning disabled, reading impaired, gifted) may shed further light on how children's cognitive styles are related to reading and writing. Further research should attempt to discover more about children's processes while interacting with written language as well as attempting to extend knowledge about the products they create.
Chapter Bibliography


APPENDIX A

LETTER OF PERMISSION
Dear Parents,

I am collecting research data for my doctoral dissertation. My research involves an investigation of the writing products and processes of sixth grade children. The tasks required of the children involved are the same as those required of children in the course of a normal school day. Specifically, children participating in the study will be asked to read and summarize two articles from popular children's periodicals.

The ISD has approved my research. I have also obtained the consent of your child's principal and teacher to collect data in their school. All participants in the study will remain strictly anonymous. In addition, a report of my findings will be made available to the school district for the perusal of parents and district personnel.

If you have an objection to your child's participation in this project please sign the form below and return it to your child's teacher. Also, if you have any questions about the project please contact me at during the day or during the evening. Thank you for your help.

__________________________________________

may not participate in the
research being conducted by in the

__________________________________________

(parent's signature)
APPENDIX B

CHILDREN'S COGNITIVE STYLE ASSESSMENT
Children's Cognitive Styles Assessment

Student's Name: ___________________________ Teacher: ___________________________

Instructions: Draw a line through the continuum on each scale at the point which best indicates how you feel.

EXAMPLE

Ice cream tastes good.

DISAGREE __________________________________ AGREE

The person moderately agreed that ice cream tastes good.

THE STUDENT named above...

1. thinks through a question, then answers. (RI +)
   DISAGREE __________________________________ AGREE

2. works better in locations which are secluded. (AT +)
   DISAGREE __________________________________ AGREE

3. can readily find the most important part of a problem. (FD +)
   DISAGREE __________________________________ AGREE

4. is cautious about making inferences. (RI +)
   DISAGREE __________________________________ AGREE

5. can concentrate even when the room is noisy. (AT -)
   DISAGREE __________________________________ AGREE

6. works best alone. (AT +)
   DISAGREE __________________________________ AGREE

7. works methodically and correctly. (RI +)
   DISAGREE __________________________________ AGREE

8. tends to be analytical rather than emotional. (FD +)
   DISAGREE __________________________________ AGREE

9. has trouble understanding broad concepts. (FD -)
   DISAGREE __________________________________ AGREE

10. has trouble paying attention to the task at hand. (AT +)
    DISAGREE __________________________________ AGREE

11. can make generalizations easily. (FD +)
    DISAGREE __________________________________ AGREE
12. complains about not being able to work due to distractions. (AT +)
   DISAGREE _______________________________ AGREE

13. makes snap judgments which are incorrect. (RI -)
   DISAGREE __________________________________________ AGREE

14. is interested in how or why things work. (FD +)
   DISAGREE ___________________________________________ AGREE

15. interrupts the speaker before getting the whole idea. (RI -)
   DISAGREE ___________________________________________ AGREE

16. has trouble understanding conceptual categories such as mammals, adverbs, and culture. (FD -)
   DISAGREE ___________________________________________ AGREE

17. works fast and doesn't worry about mistakes. (RI -)
   DISAGREE ___________________________________________ AGREE

18. can easily locate important facts in a set of facts. (FD +)
   DISAGREE ___________________________________________ AGREE

19. is easily distracted. (AT +)
   DISAGREE ___________________________________________ AGREE

20. has trouble completing projects. (AT +)
   DISAGREE ___________________________________________ AGREE

21. likes to make quick and wild guesses. (RI -)
   DISAGREE ___________________________________________ AGREE

22. sometimes forgets what he/she wanted to do. (AT +)
   DISAGREE ___________________________________________ AGREE

23. enjoys solving puzzles which require reflective thought. (RI +)
   DISAGREE ___________________________________________ AGREE

NOTE: The parenthetical information was not on the instruments completed by the subjects.

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APPENDIX C

STIMULUS TEXTS
What a crowd! It looks like a tuxedo party as thousands of Adelie (uh-DAY-lee) penguins crowd a shore on the continent of Antarctica. They have gathered here to mate, to lay eggs, and to raise their young.

There are many different kinds of penguins, and all of them live in the Southern Hemisphere. Several kinds, including the Adelie, breed in Antarctica. Two features help them survive the harsh climate there: fat and feathers. Blubberlike fat and a layer of fluffy feathers called down protect the birds from the bitter cold. A layer of stiff feathers covers the down, overlapping like shingles on a roof. These feathers provide extra protection from snow and icy water.

Like other penguins, Adelies cannot fly. They do use their short wings, however, to "fly" through the water, swimming at speeds of up to 25 miles an hour. They need to be good swimmers, for they spend more than half the year at sea. They feed on small sea creatures called krill.

In October, just before spring comes to Antarctica, the birds go ashore to their rookeries, or nesting places. Hundreds of thousands of Adelies may gather in one rookery. Waving their heads from side to side and cackling, males and females greet each other and form pairs. The penguins dash about, collecting pebbles to build nests. Some steal stones from their neighbors—and soon quarrels break out.

Amid this noisy activity, females lay two eggs each. Then they go off to feed. Males stay behind and sit on the eggs to keep them warm. After about two weeks, the females return and relieve the males for two more weeks. The males then take another turn, warming the eggs until downy gray chicks hatch.

For the next three weeks, penguin parents continue taking turns at the nest. They keep the chicks warm and protect them from enemies. Then the chicks band together in small groups, guarded by adults. When almost two months old, the chicks—with newly grown feathers—are ready to plunge into the sea. They dive in and head north to winter feeding grounds. In time, they will return to the same shore to raise young of their own.
"As free as a bird," is a familiar phrase. On Gibraltar, people might use another expression and say, "As free as an ape." Gibraltar is a small peninsula on the southern coast of Spain. Some 40 Barbary apes live on the mountainous Rock of Gibraltar, at the tip of the peninsula. Some of the animals often come down from the rock to visit the city below.

About 30,000 people live in the city. No one interferes with the Barbary apes. They go where they please by day and sleep where they want at night. The reason they are permitted such freedom lies in an old legend. It concerns the possession of Gibraltar.

The peninsula is tiny and rocky. But its location at the Atlantic entrance to the Mediterranean Sea has made Gibraltar important. Once, an army or navy based on Gibraltar could control the Mediterranean. Nations fought over the peninsula for centuries.

Muslim conquerors occupied the peninsula in A.D. 711. They held it for hundreds of years. Then Spain seized Gibraltar. In 1704, Britain captured it from Spain. Today, Gibraltar is a British colony. According to legend, Britain will keep Gibraltar as long as the Barbary apes remain there.

British troops on Gibraltar have a tradition of taking good care of the animals. They give them food provided by the British government. They look after the animals' health. There is even a soldier with the title Sergeant in Charge of Rock Apes.

Actually, Barbary apes are misnamed. They aren't apes at all, but tailless ground-dwelling monkeys called macaques (muh-KACKS).

Barbary apes are the only wild monkeys in Europe. Many thousands of years ago, their ancestors roamed over much of Europe. Today, Barbary apes are a threatened species.

Like all macaques, Barbary apes are intelligent and curious. Their curiosity frequently leads them into mischief. They raid washlines and try to put on clothing. They examine visitors' cameras, hats, and jewelry—and sometimes run off with them. Overturned trash can? It's probably evidence of macaque mischief.

In general, the people of Gibraltar accept the monkeyshines with good humor. After all, no real damage is done. And there's no denying that the Barbary apes add a dash of spice to life on the Rock.
When you hear the word "shark," you probably picture a large gray fish with a long pointed snout and a mouth full of sharp teeth. There are sharks that look like that, but there are also blue, brown, and white sharks...striped sharks and spotted ones...sharks the length of a pencil and sharks about the length of a school bus...sharks with rounded bodies and sharks that are as flat as pancakes...sharks with teeth the size of a baby's fingernail and ones with teeth 2 inches long. In all, about 350 species of sharks swim the seas in all parts of the world. Half the species grow no more than 5 feet long.

Like other fish, sharks breath through gills. But unlike most fish, sharks have no bones. Soft, flexible tissue called cartilage makes up a shark's skeleton. The same material gives shape to your nose and ears.

Sharks bear young in a way unlike that of most bony fish. The bony fish lay eggs, thousands at a time. Most sharks give birth to live young, usually 6 to 12 at a time. Some sharks species, however, lay thick, leathery egg cases. The cases protect the young until they hatch.

The young sharks, called pups, look like miniature versions of their parents. The pups are able to hunt on their own right from the start. Most feed on fishes and other sea animals, such as snails, clams, squid, octopuses, crabs, lobsters, and sea urchins. Some larger sharks eat marine mammals, such as seals and sea lions. By preying on weak animals, sharks and other predators help keep the remaining populations healthy.

Sharks use their keen senses of smell and hearing to track down prey in the dim light of the sea. Some sharks can sense prey by smelling just a few drops of blood, and they can hear sounds more than the length of six football fields away. Certain sharks detect prey by electricity. Hundreds of pores called ampullae (am-FULL-uh) of Lorenzini dot the faces of these sharks. A jelly-like substance in the pores carries the electrical signals given off by other animals to special sense cells. By following the signals, the sharks can locate prey--even if its buried in sand.

As you might expect, the large sharks are powerful creatures. They can harm or even kill humans. What you may not know, however, is that very few sharks fall into this category. Experts estimate that only about 30 of the 350 species of sharks ever harm people.

Scientists are still discovering previously unknown shark species. In 1976, they found a kind of shark that has an enormous, cavelike mouth. The mouth gives off a glow that appears to lure shrimplike animals called krill inside. It's a sort of glow-in-the-dark dinner catcher.

Over the last 15 years, scientists have learned many new facts about sharks. The oceans are large, however.
knows what other sharks—and shark secrets—remain to be discovered?
Don't count on a robot for help with your chores this weekend. Before long, however, you may be able to ask a robot to clean your room. Expert opinions vary on just how far off this day may be, but there's no doubt that robots are moving into everyday life. Many have already arrived. They're in factories, in restaurants, in homes—and in toy stores.

Think of a robot as a computer that can perform physical tasks. The program, or set of instructions, in the computer tells the robot what to do. Some robots have devices, called sensors, that pick up information about their surroundings. Using the information, they can react to different situations. For example, if such a robot bumps into a wall, it can turn and go in the opposite direction.

Not all robots can move from place to place. Those that do usually roll along on motorized wheels. But the wheels run only across smooth, flat surfaces. They can't climb stairs or hike up rocky hills. That's why scientists are designing mechanical legs that will be able to carry robots anywhere. Some legs have joints. These limbs bend and take steps just as the legs of humans do. Other legs are jointless, but have springs. Designed somewhat like pogo sticks, the legs hop across the ground. Making robots more mobile is one of the big challenges facing robot builders.

Most scientists predict a great future for robots. The machines are already doing jobs that are boring, dangerous, or impossible for humans to perform. Robots work on factory assembly lines—and even inspect the work of other robots. They explore space and handle explosives. Some respond to human speech. One day—who knows—you may have a lively conversation with a robot.
What does flying mean to you? Flying can mean many different things. A kite or a balloon can fly. So can an airplane or a rocket. In just a few moments, you could name many more flying objects. Generally, flying just means moving through the air. In that sense, flying squirrels do fly. But biologists, scientists who study living things, say that only certain animals truly fly. These animals are birds, insects, and bats. What the biologists mean is that these are the only animals that can fly by flapping their wings.

Flying squirrels don't have wings, but they can fly through the air. How do they manage it? They glide. Flying squirrels have membranes—pieces of skinlike tissue—instead of wings. The membranes stretch between the squirrel's front and hind legs. As the squirrel jumps from a tree limb, it spreads its four legs wide. The membranes open like a parachute, allowing the squirrel to glide as far as 150 feet. It can glide from branch to branch or from a tree to the ground. The squirrel must climb back up, however, like any other squirrel.

When a flying squirrel glides, it moves through the air much the way a paper airplane does. Speed, light weight, and a flat shape help both stay in the air. You can change the direction a paper airplane flies by bending its wings. In the same way, a flying squirrel can change its direction by lowering one or more of its feet. This action creates a drag, or wind resistance. In this way, a flying squirrel can glide in long, slow spirals, or loops—and land gently.

People using sailplanes and hang gliders can move through the air in almost the same way that flying squirrels can. They start off high in the air and glide to earth. Sailplanes and hang gliders, however, may get a lift from thermals—warm currents of air that rise in spirals from earth.

In the animal kingdom, birds such as eagles, hawks, and vultures are masters at catching thermals. Thermals enable these birds to climb slowly for thousands of feet. Thermals also carry them across many miles. An eagle, for example, can glide for hundreds of miles by going from one thermal to another.

Riding currents of air, eagles and other birds can perform aerobatics—acrobatics in the air—to rival any human air show. Ravens do barrel rolls. Eagles fly upside down. Wood ibises make loops. Scientists have not discovered why birds do these tricks. One theory is that they do them for the same reason people do—for fun.

The true masters of aerobatic flight are insects. Dragonflies, for instance, can hang in the air, fluttering their wings. They can fly backward, forward, and up and down. They can, in flight, lift 15 times their own weight.
Aircraft engineers study birds to learn how to build better airplanes and helicopters. Now engineers are taking a closer look at how insects fly. They hope to find ways to build stronger aircraft that can turn, take off, and land more easily and quickly.
In a well-known fairy tale, the Big Bad Wolf tries to eat up Little Red Riding Hood. This story is one of many that have caused people to misunderstand and fear wolves. The truth is that healthy wolves do not attack people. Scientists say wolves tend to be intelligent and shy. They live in groups called packs, and cooperate to survive.

Wolves are the largest wild members of the dog family. Gray wolves live in parts of North America, Europe, and Asia—usually in packs with no more than eight members. A pack includes a head male and female, their young, and sometimes other adults. The head male usually decides when and what to hunt, and he settles fights. The head female leads the other females, the young, and sometimes the weaker males. The leaders and other pack members communicate by using facial expressions, body postures, and sounds. For example, by standing tall with its ears erect and tail held high, a leader says: "I'm boss." By crouching and lowering its ears and tail, a follower replies: "I know."

Usually only the head male and female mate and have pups. But all pack members help raise the young. The mother gives birth to about six pups in a den underground, in a rock crevice, or under a fallen tree. She feeds them milk from her body. As the pups grow older, all the adults help feed them by bringing up meat they have swallowed. The whole pack plays with pups and guards them against bears and other enemies.

Wolves will eat small mammals, lizards, and fruit, but they feed mainly on animals larger than themselves, such as deer and moose. Hunting large prey usually requires group efforts for success. However, even a group hunt may fail, and wolves may have to go days without eating.

Wolves once roamed most of North America. But as people settled the land the wolves occupied, many wolves were killed. Today, gray wolves still occupy much of Canada, but they are considered endangered in most of the United States. They can be found in Alaska, Minnesota, Michigan, Montana, and Wisconsin. Because wolves are shy, you probably won't see them if you visit these areas. But you may hear their howls echoing through the wilderness.
A roar echoes across the African plain. From far away comes an answering roar. Members of a pride of lions are keeping in touch—and warning other prides to stay away.

Lions inhabit parts of Africa south of the Sahara. Most lions belong to prides—groups of related adult females, cubs of various ages, and a few adult males. The males defend the pride. The females, better hunters, provide most of the food and care for the cubs.

A newborn cub is nearly helpless, so its mother keeps it hidden in a safe place. When the cub is about two months old and strong enough to keep up with the pride, the mother brings it into the group. Now it has cubs from other litters to play with and other lionesses to "mother" it.

Cubs play in many ways. They leap and tumble and paw at sticks. They climb trees and creep up on birds. Two or three cubs together may wrestle, swat, and rush one another. These kinds of games strengthen their muscles, develop their reflexes, and give them practice in the hunting skills they'll use as adults. They're learning to be part of a pride—and some of the cubs they play with in the pride may continue to be their companions for many years to come.

Like other cats, lions are most active in the early morning and evening hours. Having snoozed through much of the day, lions waken fully around dusk. They stretch and then they groom themselves and each other as they prepare for the night's activities: walking, hunting, feeding—and more resting.

Roaring is more common at night, too. Just after sunset, a pride may give a chorus of roars. A loud roar may be heard miles away. The lions also communicate among themselves with grunts, woofs, humming, meowing, and purring.

Soon after they reach 2 1/2 years of age, most young male lions leave the pride, often together. They wander for awhile. Then they may challenge other males. Sometimes they are able to take over a pride. Young females usually stay with their mother's pride. Soon they have cubs of their own, and the cycle continues.
All eyes follow 17-year-old Mike Browne as he carefully pedals his bicycle. This is no ordinary ride. Mike is gliding along 30 feet above the ground on a wire that's only about as thick as your thumb. When he reaches the platform at the end of the wire, the audience bursts into applause. "It's a challenge each time I'm up there," says Mike, a high school senior whose home is in Wenatchee, Washington.

Mike performs his high-wire act as part of the Wenatchee Youth Circus. Traveling 5,000 to 10,000 miles each summer, the group makes more than 70 appearances throughout the northwestern United States. In addition to high-wire acts such as Mike's, the performances include trapeze, tumbling, juggling, and clown routines. Many members of the troupe also play in the circus band and help with the equipment.

Some 90 young people ranging in age from 5 to 21 make up the Wenatchee Youth Circus. "We find a place for anyone who wants to be in the circus badly enough and is willing to practice hard," says Paul Pugh, the circus director. Pugh founded the circus 34 years ago. "The youngsters often start as clowns and work up to being aerial artists. Older performers with experience teach younger ones."

Shannon Hancock, 17, of Wenatchee, performs in seven numbers, including the trapeze acts, "It took me two years to perfect the flying trapeze routine so I could do it in the circus," says Shannon.

Sam Thacker, 18, of Wenatchee, adds, "Learning a difficult stunt gives me a real sense of accomplishment. Then performing that trick in the show is exciting."

Both in performance and rehearsal, safety comes first. The high-wire and the trapeze acts have nets beneath them. During every routine, spotters stand nearby. These people know how to spot and prevent trouble. "We all care about each other and help each other," Sam says. "It's a lot of work for everyone," adds Shannon, "but we have fun while we're doing it."
Listen carefully. Explore with your fingertips. Breathe deeply and smell the forest. As you walk on this special hiking trail, you'll discover that there's more to a forest than meets the eye. The trail, near Edinburg, Virginia, is designed for the blind. It was built jointly by local Lions Clubs and the United States Forest Service.

The unusual trail lies in a section of the George Washington National Forest. Hikers follow a rope along the quarter-mile loop. They smell the flowers, listen to the birds, and splash barefoot through a cold mountain stream.

"I heard the water in the creek flowing by," says Tommy Poe, 15. "And I loved feeling the bark of trees. I would stand up against a tree and use the bark to scratch my back." Tommy hiked along the trail with classmates from the Virginia School for the Deaf and Blind, in Staunton. The trail, named Lion's Tale, has signs posted along the way. On them, an imaginary mountain lion tells its life story. On one sign, for example, the mountain lion recalls: "It was fun to roll in a lush carpet of spongy moss and tickle my nose with the interesting little ferns. Can you feel the softness of this carpet of moss?" The signs are written in both Braille and in extra-large print.

The trail, however, is not just for the visually handicapped. Dark goggles are supplied for sighted people who want to experience the trail as blind people do. Wearing the goggles, sighted hikers discover textures and sounds they had noticed before. "I felt the bark of trees, and I heard new sounds," says Jennifer Looman, 9, of Mount Jackson, Virginia.

Of course, the main purpose of the trail is to help sightless people experience the wonders of nature. "I sure do like the outdoors," says Tommy. "I can't wait to hike the trail again."
Do you think it would be fun to be a ski patroller, swooping down the slopes and helping to keep others safe? That's what some do. They're members of the Junior Ski Patrol, a part of the National Ski Patrol.

Qualifying for the junior patrol isn't easy. Applicants must pass tests in skiing, in handling a rescue sled, and in first aid. "The first aid test is the toughest part," says Diane Lepper, 16, of Pueblo. "You have to take a written test and a practical one, demonstrating what you have learned. If you make one mistake that is considered life-threatening, you fail."

Many ski areas now have junior patrols. Members are 15 to 18 years old. Juniors help adult patrollers check for dangerous conditions, enforce safety rules, and clear the slopes at the end of the day. The adults treat skiers injured on the slopes. The juniors are trained to help take rescue sleds down the mountain and assist in the first aid room.

Here's how 18-year-old Gigetta Dunn, of Arvada, describes a day on patrol: "In the morning, we cover the entire area. We look for things that might be dangerous to skiers, such as rocks, tree stumps, holes, or bare patches. We mark these spots to warn skiers away from them. During the day, we look for injured skiers. We also check skiers' faces for white patches, an early sign of frostbite. The last run of the day is the most serious. We cover every part of the hill to be sure no one is left outside."

Sometimes junior patrollers are called on for special jobs, such as helping to search for avalanche victims. "That can be scary," Gigetta says. But like all junior patrollers, she knows she has the skills to handle difficult situations.
APPENDIX D

INSTRUCTIONS TO SUBJECTS
Congratulations! You have just been named editor of a popular magazine. One of your writers has just submitted a good article, but it's too long for the available space. Your job is to write a new, shorter article, or summary, of around 80 words, but make sure that the main ideas are still included. In addition to shortening the article, please do the following:

1. You may mark on the original article if you wish.

2. Write your summarized article on the lined paper.

3. Scratch paper is included in your materials in case you need it.

4. Feel free to make changes as you write. However, in making changes, do not black out your original words; just draw a single line through them.

5. Make as many drafts as you find necessary to produce a good summary. More paper is available if you need it.

6. When you finish, put all your materials in your folder and bring the folder to the front desk.
Congratulations! You have just been named editor of a popular magazine. One of your writers has just submitted a good article, but it's too long for the available space. Your job is to write a new, shorter article, or summary, of around 80 words, but make sure that the main ideas are still included. In addition to shortening the article, please do the following:

1. After you've read the article, do everything "out loud". In other words, speak all of the thoughts you have while you prepare the article for publication. It doesn't matter how unimportant a thought may seem to you; include all that occurs to you during the article preparation.

2. You may mark on the original article if you wish.

3. Write your summarized article on the lined paper.

4. Scratch paper is included in your materials in case you need it.

5. Feel free to make changes as you write. However, in making changes, do not black out your original words; just draw a single line through them.

6. Make as many drafts as you find necessary to produce a good summary. More paper is available if you need it.

7. When you finish, put all your materials in your folder and bring the folder to the front desk.
Oral Directions Given to Students before Collecting Their Protocols

"When you write, you think. I'm going to ask you to do something you're probably not used to doing. I'd like for you to say, out loud, what you're thinking as you write. In other words, instead of keeping your thoughts in your head as you go through the process of summarizing, speak them. Also, please speak them loudly enough for the microphone to pick them up."

"Here's an example of what I mean. Let's say I've just read this article. It's time to begin deciding what I want to write. Perhaps one idea has struck me as especially important. Rather than just writing it down, I might say 'This idea is important' or 'I want to include this idea.'"

"All of your thoughts are important, so please continue to speak them, no matter how small you may consider them. I want to know everything you're thinking as you summarize, so don't hold anything back."

"Do you have any questions? Please tell me, as well as you can, the directions I've just given you."
APPENDIX E

COMPOSING STYLE SHEETS
### Composing Style Sheet

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Composing Style Sheet

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Section: 3

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draft: 1  wc: 12  sc: 18
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**Session**: 1

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Contemporary Psychology, 8, 133-135.