

THE RELATIONSHIP BETWEEN DIMENSIONS OF COGNITIVE  
STYLE AND SUCCESS WITH DIFFERENTIATED  
READING INSTRUCTION OF KINDERGARTEN  
CHILDREN

By

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of the Oklahoma State University  
in partial fulfillment of the requirements  
for the Degree of  
DOCTOR OF EDUCATION  
July, 1980

Thesis  
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## ACKNOWLEDGMENTS

Many thanks are extended to the people who made the completion of this study possible. To my committee chairman, Dr. Darrel Ray, thanks are expressed for sharing his knowledge, accepting my differences, and encouraging my strengths. Appreciation is extended to the members of the doctoral committee, Dr. Bill Elsom, Dr. Judith Dobson, Dr. Larry Perkins, and Dr. Bernard Belden, for their encouragement and support during my academic career.

Sincere gratitude is expressed to the Stillwater and Enid School systems for permitting the data collection. Deep appreciation is given to Calvin McEntire, June Black, and Linda Bruder, their enthusiastic support led to the completion of this study. To the kindergarten children at Skyline, thank you for being uniquely yourselves.

Appreciation is extended to Johnnye Morton, who participated in a companion study, for sharing the anxieties and rigor that the research demanded.

To Dr. Steve Grissom, a special thanks is given for the many long hours he spent contemplating the statistical analysis.

Special thanks are due to my close friends who left me to my insanity during the final stages before completion -- Tim and Merry Baldwin, Marleen Osborne, Susan Slifer, and Alex Dingman.

Deep gratitude is expressed to my mother and father who have

believed in my unique person through the many long years of nurturing. They have known when to encourage, when not to judge, and when to admire.

To my husband, Lorrin, thanks are given for his encouragement when I feared success and failure, for sharing his thoughts and perspective about learning and for being a tremendous father to our children.

This study is dedicated to my two children who, by being very different individuals, provided the impetus for this research. To Sharon Rose, my field-independent, reflective learner, thank you for sharing your joy of learning to read. To my son, Christopher Kenneth, my field-dependent, impulsive learner, thank you for awakening my curiosity about learning.

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## CHAPTER I

### PRESENTATION AND REVIEW OF THE PROBLEM

#### Introduction

In the classroom children learn different concepts even though the same material has been presented to them at the same time. The manner in which one processes the information differentiates one learner from another. Reading theorists contend, therefore, that the teacher should capitalize on the learner strengths in both the classroom and remedial instruction (Singer, 1976; Ray, 1971). Since not all children profit equally from a given quality or quantity of teaching, the concern is one of planning instruction that is differentiated in terms of student capability, interest, and need (Betts, 1946).

The research showing a relationship between cognitive style and learner preference supports the theory that children do, in fact, learn to read in different ways. Since a preferred form of information processing emerges in differing individuals, these processes should be utilized in reading instruction. It is often the case that children exhibiting reading difficulty have "not been offered the opportunity to utilize preferences in the teaching-learning situation in the classroom and, therefore, fail to make adequate progress" (Ray, 1971, p. 181). It is the exhibited or displayed preference for unique cognitive style or information processing that this study investigates.

### Purpose of the Study

The purpose of this study is to predict the relationship of cognitive style and success in differentiated reading instruction for kindergarten children. Specifically, the purpose of the study is to determine whether certain dimensions of cognitive style, the field dependent-independent dimension and/or the impulsivity-reflectivity dimension, exhibited by a student can be matched to a specific method of learning to read, therefore providing optimal reading achievement. Each child approaches the reading situation using his established patterns of cue identification and selection. Although language, visual, and auditory strengths indicate a preference for the type of cue selected, cognitive style patterns indicate how that cue is selected. Thus, an interaction of the content (language, auditory, and visual cues) and process (cognitive style) influences the success a reader experiences. Research findings lend support to the hypothesis that individual differences in cognitive style can be identified, and that these differences interact with reading achievement. It is hoped that this study will contribute needed information about reading success and the nature of the methodology preference of young children. Such information will be useful to the placement of children in reading programs.

### Theoretical Framework

For the past decade reading theorists have increasingly refined theories of reading. Although Goodman (1967) suggests that reading theorists are leaning toward an information processing model of reading, little effort has been made to include cognitive style or the how of

information processing into a global reading theory. Research into cognitive style suggest that particular processes of intellectual functioning are highly related to success in reading (Davey, 1976).

Smith's (1973) basic contention that reading is the reduction of uncertainty speaks to the how of information processing rather than the content itself. Thus, in an effort to understand individual differences in learning to read, cognitive style deals primarily with the form rather than the content of the cognitive activity. Individual differences in cognitive style refer to individual variation in how one perceives, thinks, solves problems, and remembers.

Through extensive research, Witkin et al. (1967) have established the stability and unique tendency of field dependent-independent cognitive style. This dimension shows "the extent to which the person perceives part of a field as discrete from the surrounding field as a whole" (Witkin et al., 1977, p. 6). The field independent style of perceiving is characterized by experiencing parts of a field as discrete from an organized background. A field independent person imposes structure on a field and so perceives, organizes, and selects cues according to his own imposed structure. According to Shapson (1973) the field independent learner tends to sample more fully from an array of cues that are objectively available for concept definition. Conversely, the field dependent style of perceiving is characterized by a relative inability to perceive parts of a field as discrete. This global quality is indicative of limited differentiation. Being more global in their perception, field dependent students need more explicit instruction in selecting appropriate cues in the learning situation. Because aspects of the field are perceived as fused, this

child prefers specificity in cue selection (Witkin et al., 1977). It appears that field dependent students require a more structured, directed, and salient cue selection strategy while the field independent student prefers to select cues according to his own strategies.

In the beginning word learning situation, response uncertainty is high because the basic components of the reading process are mediated and have not reached the automatic level. According to Kagan (1966) in situations of response uncertainty individuals differ in their selection and evaluation of possible solutions. He identified the reflective-impulsivity dimension of cognitive style which evaluates the time and accuracy of a response in situations of highly similar visual stimuli. In these situations, the impulsive child tends to act on his first response resolving his uncertainty with little or no critical analysis. This suggests that initial word learning which is unstructured and cue selection deductive would be detrimental to this learner. The reflective child, on the other hand, tends to ponder various possibilities comparing their validity before deciding. Generally, the research indicates that reflective children are better readers than impulsive children (see Table I). According to Messer (1976), p. 1037) "impulsives do not scan the field for distinctive features as systematically as reflectives." Bush and Dweck (1975) suggested that the impulsive child needs his attention directed to word recognition cues as well as increasing his response time.

Related to the impulsivity dimension of cognitive style, Salkind and Wright (1977) have defined the cognitive efficiency dimension using the sum of Z scores for latency and errors on the Matching Familiar Figures Test to establish a measure of efficient information processing.

This measure reflects a trade-off strategy where a ratio of speed and accuracy are inherent in a response. The efficient student uses a minimum amount of time on task to produce the desired response. This dimension classifies the students who are fast but inaccurate and slow but accurate as inefficient. The cognitive efficient style requires the student to use a minimum amount of visual information to illicit the most probable guess. This style of processing information is related to the psycholinguistic guessing game (Goodman, 1967) where the reader uses a minimal amount of available cues to make an appropriate guess of the printed material.

Investigations into cognitive style indicate that people differ in the way they assimilate information (Witkin et al., 1977; Kagan, 1966; Kogan, 1976) and that this difference can be related to reading achievement (see Table I). Reading is a decision-making process whereby a reader selects only those linguistic cues necessary for him to reconstruct meaning (Goodman, 1967). It is precisely this cue selection that cognitive style investigates.

The process of selecting recognition cues is influenced by the presentation of the words to be learned as well as individual variation in preference for type of cue presented. Investigations into the reading process have established that children learn to read through auditory, visual, and kinesthetic sensory modes.

Further research shows that auditory and visual perceptual abilities progress through stages involving increasing ability to reduce uncertainty involved in these processes (Morency, 1968; Haith, 1971; Gibson, 1966; Rodenborn, 1969). Perceptual development proceeds first through the child's preferred mode and with age the other modes increase

TABLE I  
COGNITIVE STYLE AND READING

Study	Cognitive Style	Sample (Number)	Results
Blanton (1970)	FD-I	Grade 1 (127)	Significant predictive relationship between reading readiness, IQ, and FI.
Gluck (1972)	FD-I	Grade 1 (54)	Positive relationship between FI and those reading tests measuring word recognition and phonics knowledge.
Gorton (1975)	FD-I	Grade 1 (132)	No difference between FD-I whether taught with synthetic phonics, analytic phonics, or both.
Dermott (1977)	FD-I	Grade 1 (241)	Drill on decoding in an intensive phonics program affects the ability to disembed to the degree that the relationship between the embedded dimension of FD-I is diminished.
Kagan (1965)	R-I	Grades 1-3 (130)	I made significantly more oral reading errors.
Erickson and Otto (1973)	R-I	Kindergarten (80)	R were superior to I on the word recognition task only under the condition of high intralist similarity.
Cook (1973)	R-I	Grade 1, 3, and 4 (105)	3rd and 4th grade LD's exhibited behaviors similar to 1st graders on the MFF and reading tasks.
Margolis (1976)	R-I	Kindergarten (88)	R performed significantly better than I on the Metropolitan Readiness test and the Birch and Belmont's auditory-visual integration test.
Margolis, Peterson, and Leonard (1977)	R-I	Kindergarten (92)	R perform better than I on the Wepman Auditory Discrimination test and the Kindergarten Auditory Screening test.

TABLE I (Continued)

Study	Cognitive Style	Sample (Number)	Results
Readance and Baldwin (1977)	R-I	Grade 2 (170)	R were superior to I in reading vocabulary only under the synthetic phonics condition. R were significantly better only on the variable of comprehension in the analytic approach.

FD = field dependence  
 FI = field independence  
 R = reflective  
 I = impulsivity



in specificity establishing an integration of perceptual processing.

In his review of the sensory modality strengths needed for reading, Derevensky (1977) concluded that auditory-visual integration is a component of reading performance. Reading is the integration of auditory and visual processing components. Figure 1 is a representation of this integration, however the component space has not been defined by research; therefore, the integration represented is not quantitative.

Not only has research in the field of reading supported the contention that reading is a perceptual process, but also that language and linguistic processes are necessary for success in reading (Kohlers, 1973; Smith, 1979; Tooker, 1977). Elkind (1965) suggests that reading is a language process requiring the categorization of meaning. In a factor analytic study of the Weschler Intelligence Scale Revised (WISC-R) and reading comprehension, Smith (1979) found that the verbal comprehension factor of the WISC-R loaded to reading achievement at second, fourth, and sixth grades. Pearson (1978) postulates that reading occurs when the grapho-phonemic, syntactic and semantic associational sources of information are used concordantly. However, his model places primary importance on the semantic/syntactic (meaning) processes emphasizing the role language plays in the reading process. In this model the grapho-phonemic source of information interacts with the semantic/syntactic processes. Thus as Singer (1976) suggests reading is the ability to transform printed stimuli into mental processes so that meaning can be associated with these stimuli. Therefore, language processing is not an isolated part of the reading process but interacts with the other processing components.

In this study reading is defined as the integration of visual,

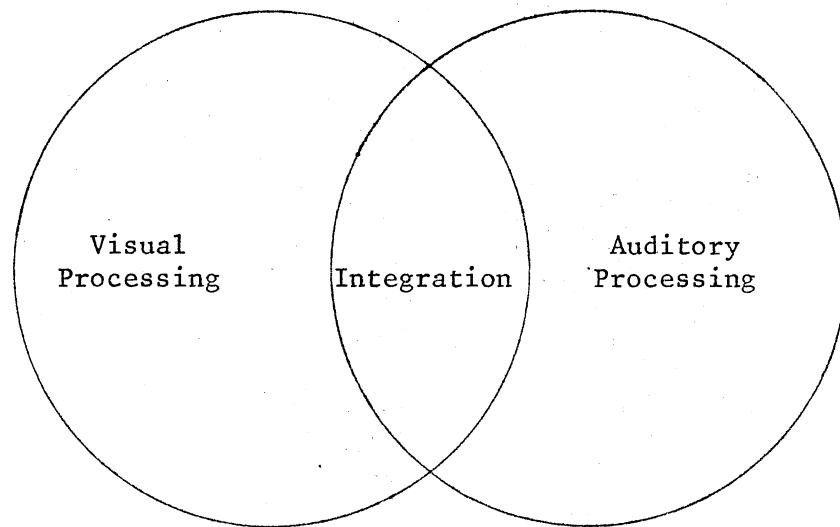


Figure 1. The Reading Process -- Integration of Auditory and Visual Processing Components

auditory, language, and cognitive style processing components (see Figure 2). Each time a person reads, these four components are interacting in varying degrees.

The integration among the components is dependent upon the reader's strengths, preferences and purposes. As the purpose for reading changes in relation to the material being read, so does the degree of integration needed among the four components. In this model (see Figure 2), the amount of integration is not quantified, however, for graphic representation the component space is equal. This does not indicate that the integration is equal among the four components.

#### Selection of Method Preference

Gagne (1970) stressed that individual variation in knowledge acquisition is not simply a matter of more or less, but rather that more or less may be learned dependent upon the match between the individual characteristics of the pupil and the kinds of instructional procedures to which he is exposed. Singer (1976, p. 307) supported this contention emphasizing that an individual forms a unique working system composed of his strengths and that reading errors "might not only arise from determinants within the individual, but also from an interaction between these determinants and method of instruction." Further research showed that patterns of oral reading errors of first grade students reflected the differences in the method by which they had been taught to read (Ogle, 1974). These contentions influenced a wealth of literature matching sensory modality preference to the content validity of a particular method of teaching reading; ergo, auditory strength to phonics instruction. In an auditory-visual method of

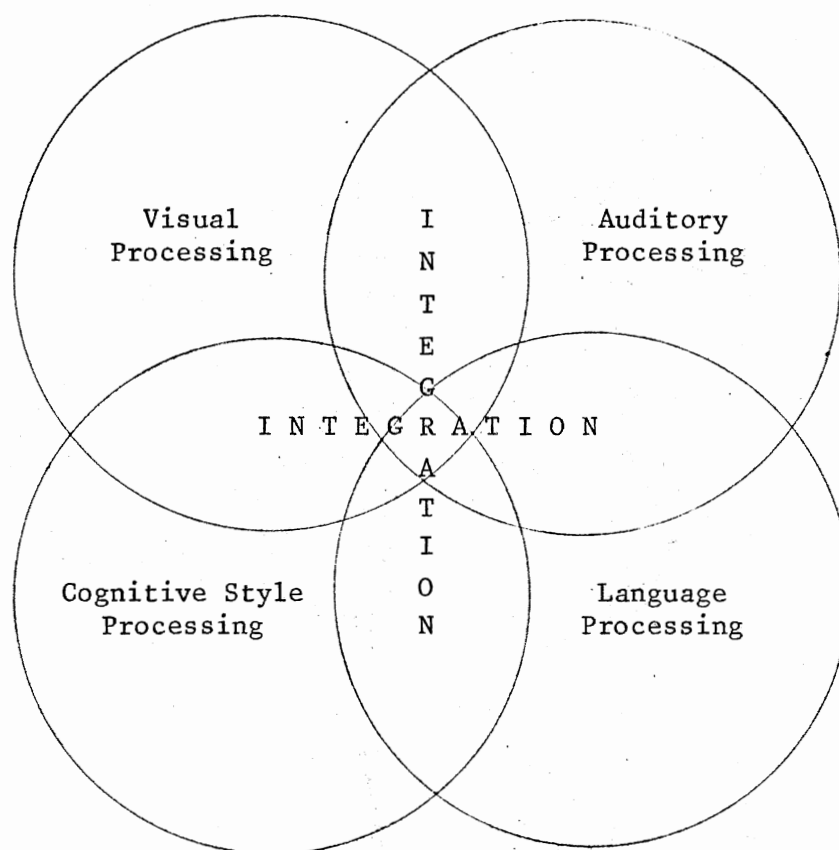


Figure 2. The Reading Process

instruction, the sounds of letters are learned prior to the synthesis of these sounds into words. Therefore, it was hypothesized that a strength in the auditory mode matched to an auditory-visual approach to reading would result in increased reading proficiency and elimination of reading failure. Various measurements have been used to assess the sensory channels and consistently the research confirmed that children display a preference for one sensory modality over another (see Table II).

Reviewing the literature on modality studies, it is evident that sensory modality preference has not interacted significantly with method of teaching reading (see Table III). Questions could be asked relative to the procedure used in these studies. In several studies instruction in a preferred modality was not pure. Often the instruction was an extra feature of the developmental basal reader program (Harris, 1965; Ringler, Smith, and Cullinan, 1971; Scott, 1973). Other studies report teaching procedures and influences of teacher effectiveness that were uncontrolled (Harris, 1965). Many of the subjects in other studies were above average in verbal intelligence (Miller, 1974; Bateman, 1968; Mills, 1955). It is possible that these populations prejudiced an adequate assessment of matching perceptual strengths to methods of teaching reading. In some studies the interaction of past years in school and well-established word recognition techniques interacted with reading preferences (Bruininks, 1968; Scott, 1973; Vandever and Neville, 1974; Waugh, 1973). In these studies the accumulated reading experience may have served to reduce the original auditory and visual perceptual differences among the subjects. The inclusion of a kinesthetic method which is an addition to a defined method (Ray, 1971) rather than a discrete method itself could have influenced results (Harris, 1965; Ringler, Smith and

TABLE II  
MODALITY PREFERENCE

Study	Sample (Number)	Measures	Modality Preference	Modality Preference Displayed
deHirsh, Jansky, and Langford (1966)	Kindergarten (53)	GRRT, IRP, WADT, BVMGT	A,V	YES
Harris (1965)	Grade 1 (20)	BVMGT, GRRT	A,K	YES
Robinson (1968)	Grade 1 (448)	GPQ, WADT	A,V	YES
Bateman (1968)	Grade 1 (87)	ITPA	A,V	YES
Bruininks (1968)	Grades 2 & 3 (40)		A,V	YES
Freer (1971)	Grade 1 (278)	WISC (C&DS) WPPSI (MFS) BVRT, WADT	A,V	YES
McCarthy (1971)	Kindergarten (362)	ITPA	A,V	YES
Ringler, Smith, and Cullinan (1971)	Grade 1 (91)	NYULMT	A,V,K, AVK	YES
Waugh (1973)	Grade 2 (27)	ITPA	A,V	YES
Bohning (1973)	Grade 1 (30)	DTLA	A,V	YES
Miller (1974)	Grade 1 (60)	ITPA	A,V	YES
Scott (1963)	Grade 2 (32)		A,V	YES

GRRT = Gates Reading Readiness Test

ITP = Imitation of Tapped Patterns

WADT = Wepman Auditory Discrimination Test

BVMGT = Bender Visual Motor Gestalt Test

GPQ = Goins Perceptual Quotient

WISC (C&DS) = Wechsler Intelligence Scale for Children  
(Coding and Digit Span)

WPPSI (MFS) = Wechsler Preschool and Primary Scale  
of Intelligence (Memory for Sentence)

BVRT = Benton Visual Retention Test

DTLA = Detroit Test of Learning Abilities

NYULMT = New York University Learning Modalities Test

STEP = Sequential Tests of Educational Progress

A = auditory modality

V = visual modality

K = Kinesthetic modality

TABLE III  
SENSORY MODALITY PREFERENCE MATCHED WITH METHOD

Study	Modality Preference	Teaching Methods Used	Significant Results
deHirsh, Jansky, and Langford (1966)	A,V,K A,V,K	Basal program with and without supplemental phonics.	NO
Harris (1965)	A,K	Language Experience with reinforcement in preference.	NO
Robinson (1968)	A,V	A = Hay-Wingo Phonics V = Basal reader	NO
Bateman (1968)	A,V	A = Sound-symbol Approach V = Basal reader	NO
Bruininks (1968)	A,V	Modified Mills Learning Methods Test	NO
Freer (1971)	A,V	A = Auditory method V = Basal reader	NO
McCarthy (1971)	A,V	Ray Reading Methods Test	NO
Ringler, Smith, and Cullinan (1971)	A,V,K	Bank Street Reader with small group instruction in preferred method	NO
Waugh (1973)	A,V,K	A = Auditory Method V = Visual Method	NO
Bohning (1973)	A,V	A = Auditory feedback V = Visual feedback	NO
Miller (1974)	A,V	A = Palo Alto Reading Program V = Bank Street Readers	NO
Scott (1973)	A,V,K	American Basic Reading Program with twenty minutes of instruction in preferred method.	

A = Auditory Preference  
V = Visual Preference  
K = Kinesthetic Preference

Cullinan, 1971). Not only was instruction contaminated and IQ not held constant, all these studies have one deficit in common. The studies began with a preconceived idea of the sensory strengths needed to succeed in a particular method. Realizing that the auditory-visual method of reading instruction requires not only auditory acuity but also synthesis of sound, perhaps it is the synthesis or processing style that needs to be assessed rather than the auditory modality skills.

Using a learning methods test involving trial lessons in the different methods, it was found that matching learning preference with instructional techniques produced significant results (Mills, 1955; Manwarren, 1972). Manwarren (1972) found a significant difference between the groups in visual-auditory and language experience instruction in favor of the groups taught by their preferred method. However, in contrast to many of the modality studies, Manwarren (1972) established preferred method of instruction by using the trial lessons of the Ray Reading Methods Test. As with Mills (1955) the significant results of the study may be due to the manner in which methodology preference was selected. These results lend support to the hypothesis that differentiated instruction increases the efficiency of initial reading instruction (see Table IV).

The modality studies failure to define subabilities necessary for selection of methodology preference was investigated by Treadway (1975) and Young (1975). From a variety of tasks measuring subabilities, they identified significant predictors of word recognition success under four discrete methods of beginning reading instruction (see Appendix A and Appendix B).

In contrast to the studies which claim a strength in the auditory



modality necessitates phonic instruction, Young (1975) and Treadway (1975) found significant predictors to be abilities involving the use of language and learning rate. Visual association, a subtest of the Illinois Test of Psycholinguistic Abilities that many authors have used to identify a visual learner was a significant predictor of success with an auditory-visual method of instruction while the auditory association and auditory reception subtests were significant predictors of success in both visual-auditory and linguistic methods of reading instruction.

The studies using trial lessons as the criterion for methodology selection rather than modality strengths did not assume methodology preference to be equated with sensory modality strengths. These studies, however, did show significant relationships between specific reading tasks and instruction in the preferred method (see Table IV).

According to Traver and Dawson (1978) there are other learning variables operating in learning to read besides subability strengths and weaknesses. They suggest that reading achievement is also influenced by the impulsivity-reflectivity and the field dependence-independence dimensions of cognitive style.

#### Differentiated Methodology Questions

According to Ray (1971) initial reading instruction should proceed from the preferred method of instruction to the development of flexible word recognition techniques. In initial word learning the child will demonstrate a preference in the selection of recognition cues (Ray, 1971). Because cognitive style is a broad dimension of individual differences that extends across both perceptual and intellectual activities, it may influence cue selection during beginning reading (Witkin

TABLE IV  
METHODOLOGY PREFERENCE DEFINED BY TRIAL LESSONS

Study	Methodology Preference	Criterion Used	Significant Results
Mills (1955)	A,V,K,C	Mills Learning Methods Test	YES
Coleman (1962)	A,V,K,C	Mills Learning Methods Test	YES
Manwarren (1972)	A-V,V-A, LWS,LEA	Ray Reading Methods Test and Reading Achievement	YES
Young (1975)	A-V,V-A, LWS,LEA	Ray Reading Methods Test	YES
Treadway (1975)	A-V,V-A, LWS,LEA	Ray Reading Methods Test	YES
Vandever and Neville (1974)	A,V,K	A = letter sound V = meaning and distinctive feature K = words were textured and Reading Achievement	NO

A = Auditory Method  
 V = Visual Method  
 K = Kinesthetic Method  
 C = Combination Method  
 A-V = Auditory-Visual Method  
 V-A = Visual-Auditory Method  
 LWS = Linguistic Word Structure Method  
 LEA = Language Experience Method

et al., 1977). This study is designed to determine if there is a relationship between cognitive style and success with word recognition when differentiated methods of instruction are utilized with kindergarten students.

Evaluating reading methods, Ray (1971) identified four discrete reading methods based on the unit of instruction and skill development sequence. They can be classified as an auditory-visual method, a visual-auditory method, a linguistic word structure method, and a linguistic-language experience method. The auditory-visual approach to instruction is synthetic and rule-oriented requiring the learner to categorize sound-symbol associations and apply them to phonetically consistent material. Thus, the child learns a number of subordinate capabilities (sound/symbol associations) before he is asked to generate hypotheses and the process of generating hypotheses is structured from simple to progressively more complex (Gagne, 1970). Relating the results of Treadway (1975) and Young (1975) to the theory of reading under investigation, new hypotheses can be generated. In contrast to the studies which claim a strength in the auditory modality necessitates phonic instruction, Treadway (1975) and Young (1975) found significant predictors in the auditory-visual method of instruction to be abilities involving the use of language and learning rate as well as sound blending abilities. The child preferring an auditory-visual approach to reading will possess high skill in the language processing component and the auditory processing component at the onset of reading instruction. Visual processing interacts with language and auditory processing; however, the interaction of cognitive style processing is undefined. This gives rise to the following research question:

1. In regard to the criterion variable, auditory-visual instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

Further evidence from the research of Treadway (1975) and Young (1975) indicate that the visual-auditory method of reading instruction requires greater processing in the visual processing component. Knowledge of letter names is considered the categorization of visual stimuli (Elkind, 1976). This approach to instruction utilizes the whole word taught in meaningful context. Skill development is based on the accumulation of a sight vocabulary and an analytical approach to decoding. Thus, initially the reader must select the right cues and relate them to relevant established cue systems understanding the similarity and dissimilarity of the words learned, subsequently integrating the new words with previous conceptual learning (Ausubel, 1974). In this preference the interaction of the language component and the auditory component play a lesser role in the initial word learning (Treadway, 1975; Young, 1975). However, the interaction of cognitive style has been undefined. This gives rise to the following research question:

2. In regard to the criterion variable, visual-auditory instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

In the linguistic word structure approach to initial reading instruction, the basic unit of instruction is the word pattern using an accumulation of spelling patterns to develop skill transfer. This

approach is based on the premise that meaning comes naturally as the code is broken. Thus, reading becomes a process of discrimination training using consonant-vowel combinations. Relating this to the research of Treadway (1975) and Young (1975), initial word learning using the linguistic approach basically taps the visual and auditory processing components. The language processing component plays a lesser role; however, the influence of cognitive style is undefined. This gives rise to the following research question:

3. In regard to the criterion variable, linguistic word structure instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

The language experience approach to reading instruction is a linguistically based method emphasizing the relationship of oral language to written language. Language anticipation is employed to decode words as the learner uses his understanding of meaningful language units to generate understanding of the technical concepts of written language. From the research of Treadway (1975) and Young (1975) the language experience approach requires an integration of visual, auditory, and language processing components. However, the interaction of cognitive style has not been investigated. This gives rise to the following research question:

4. In regard to the criterion variable, language experience instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

## Hypotheses

The hypotheses to be tested are stated in the null form.

Hypothesis I When using the auditory-visual method of teaching reading, there is no significant relationship between scores on word recognition and

- a. field dependence/independence
- b. impulsivity/reflectivity
- c. efficiency/inefficiency

Hypothesis II When using the visual-auditory method of teaching reading, there is no significant relationship between scores on word recognition and

- a. field dependence/independence
- b. impulsivity/reflectivity
- c. efficiency/inefficiency

Hypothesis III When using the linguistic word structure method of teaching reading, there is no significant relationship between scores on word recognition and

- a. field dependence/independence
- b. impulsivity/reflectivity
- c. efficiency/inefficiency

Hypothesis IV When using the language experience method of teaching reading, there is no significant relationship between scores on word recognition and

- a. field dependence/independence
- b. impulsivity/reflectivity
- c. efficiency/inefficiency

### Definitions of Terms

The following are definitions of terms as they are used in this study:

Methodology Preference - method of reading instruction in which the child learns more efficiently in relation to other methods of reading instruction.

Visual-Auditory Method (Ray Reading Methods Test) - The method of reading instruction that uses the whole word taught in meaningful context as the basic unit of instruction. Skill development is dependent upon the development of a large sight vocabulary and follows an analytical approach to decoding.

Auditory-Visual Method (Ray Reading Methods Test) - The method of reading instruction that uses the sounds of letters as the basic unit of instruction. Skill development is dependent upon the accumulation of sound-symbol relationships and follows a synthetic approach to decoding.

Linguistic Word Structure Method (Ray Reading Methods Test) - The method of reading instruction that uses word patterns as the basic unit of instruction. Skill development is dependent upon the development of numerous spelling pattern associations. A minimum contrast approach to decoding is used.

Language Experience Method (Ray Reading Methods Test) - The method of reading instruction that uses the child's oral language as the basic unit of instruction. Skill development is based on the transfer of the unique language structures of the child to visual recognition in context. Language anticipation is the basis for decoding.

Cognitive Style - Individual variation in modes of perceiving,

selecting, sorting, and organizing information.

Field Independence (measured by the Children's Embedded Figures Test) - An analytical way of organizing input where information is perceived as discrete parts of a whole.

Field Dependence (measured by the Children's Embedded Figures Test) - A global process of selecting information where input is perceived as wholes rather than the distinguishing parts.

Reflective (computed from the Matching Familiar Figures Test) - The extent to which an individual considers carefully the correctness of various responses until there is a high possibility of being correct.

Impulsivity (computed from the Matching Familiar Figures Test) - The extent to which a person tends to act upon his immediate response with little reflection issuing a solution with little or no critical analysis of its possible accuracy.

Cognitive Efficiency (computed from the Matching Familiar Figures Test) - The extent to which a person organizes input such that a trade-off of accuracy and speed results in a correct response.

#### Assumptions

For the purpose of this study, it was assumed that the instruments used in this study were sufficiently valid and reliable to actually measure the behaviors they are designed to measure.

#### Limitations of the Study

The results and conclusions were restricted to the sample of kindergarten children enrolled in the two schools represented in this study.



### Summary

For the purpose of this study reading is defined as the integration of visual, auditory, language, and cognitive style processing components. Extensive research has been conducted showing the relationship of visual, auditory, and language processing components to the reading process; however, little research has related cognitive processes to differentiated reading instruction.

Studies on modality preferences have repeatedly shown that children do differ in their modality preference (deHirsh, Jansky, and Langford, 1966; Robinson, 1968; Freer, 1971; McCarthy, 1971; Ringler, Smith, and Cullinan, 1971). However, subsequent matching of auditory modality preference with phonic instruction and visual modality preference with visual instruction produced nonsignificant results (Harris, 1965; Robinson, 1968; Bateman, 1968; Bruininks, 1968; Freer, 1971; McCarthy, 1971; Ringler, Smith, and Cullinan, 1971; Waugh, 1973; Bohning, 1973; Miller, 1974; Scott, 1973). In contrast, using a learning methods test involving trial lessons in the different methods, it was found that matching methodology preference with instructional techniques produced significant results (Mills, 1955; Manwarren, 1972). Using the success in a particular method of instruction as the criterion measure, Young (1975) and Treadway (1975) identified significant predictor variables for four instructional methods. These studies indicated that preference for a method does not necessarily indicate strengths in the corresponding perceptual channel. Concurrent with the research of Treadway and Young (1975), Traver and Dawson (1978) suggest that there are other learning variables operating in learning to read besides modality strengths and weaknesses. The research showing a

relationship between cognitive style and learner preference supports the contention that children learn to read in different ways. In the initial reading situation, children utilize their established strategies for cue selection. Treadway (1975) and Young (1975) identified preference for the type of cue selected: language, auditory, or visual cues. They did not, however, investigate how that cue is selected. Cognitive style indicates how that cue is selected. Research findings lend support to the hypothesis that cognitive style interacts with reading achievement (Blanton, 1970; Gluck, 1972; Dermott, 1977; Kagan, 1975; Margolis, 1977; Cook, 1973; Readence and Baldwin, 1978). Thus, the way a child perceives, selects, sorts, and organizes input may influence his preference for instructional presentation during initial reading instruction.

## CHAPTER II

### METHOD AND PROCEDURE

#### Population and Sample

The population for this study was all kindergarten students in two public elementary schools of comparable size in two central Oklahoma towns. Both towns included Universities with mobile populations. Thus, they included a variety of subcultures, socio-economic levels, and occupational endeavors. One hundred and twenty-one kindergarten students participated in the study. There were four morning sessions and four afternoon sessions.

The following criteria were met by all the students included in this study:

1. All subjects were between the ages of 5.0 and 6.5 years of age.
2. All subjects were identified as nonreaders.
3. All the subjects were categorized as functioning within the normal range of intelligence as defined by the DIQ score falling between 84 and 116 on the Slosson Intelligence Test for Children and Adults.
4. All subjects were evaluated as being free of gross visual, speech, and/or hearing disabilities.
5. All subjects completed all of the necessary tests.

The sample consisted of those students who met all the criteria.

Of the 121 subjects, 65 were females and 56 were males. The mean IQ for the sample was 113 with a standard deviation of 15. The average age of the subjects was 5.8 years.

#### Testing Procedure

The following tests were administered by qualified examiners to the sample from February through April of 1980.

1. Children's Embedded Figures Test. Stephen A. Karp and Norma L. Konstadt, 1971.
2. Matching Familiar Figures Test. Unpublished Test, Jerome Kagan, 1965.
3. Ray Reading Methods Test. Experimental Form, Darrel Ray, 1970.
4. Slosson Intelligence Test for Children and Adults. Richard L. Slosson, 1963.

For the individually administered tests, the Matching Familiar Figures Test, the Children's Embedded Figures Test, and the Slosson Intelligence Test for Children and Adults, the subjects were removed from the classroom. These individual tests were administered in rooms relatively free from distraction by qualified persons.

The administrators of the Ray Reading Methods Test (RRMT) were this writer and a doctoral colleague who is involved in a companion study. The teaching sessions extended continuously from March to the first of April. The subjects were randomly assigned to groups of 4-6 children resulting in 32 treatment groups. The teaching formats employed were the same as the procedures described in the manual of directions for the Ray Reading Methods Test.

Several procedural modifications were made to ensure that all words

were clearly visible to all children at three feet. On the visual-auditory portion, large flash cards were used with three inch high letters instead of the small three-by-five cards that were provided in the kit. The same procedure was followed with cards from the other methods of the test.

The instructional sessions were scheduled so as not to interfere with recess, P.E., and music periods of the children. All of the checking sessions were done individually with the other children away from the child being checked.

#### Instrumentation

The following is a description of the instruments employed in this study.

#### Children's Embedded Figures Test, (CEFT)

The CEFT was developed by Karp and Konstadt (1971) to assess field independence-dependence for young children. It is the downward extension of the Embedded Figures Test developed by Witkin and associates. Instead of the abstract geometric designs of the standard Embedded Figures Test, the children's version uses tent and house-like simple figures. It is composed of a series of items which require the subject to find a simple form in a complex one. The standard procedure involves the administration of an 11-item test series in which a tent-like simple figure is to be found embedded in the stimulus figure and a 14-item "house" series in which a house-like simple figure is to be found embedded in the stimulus figure. The test-retest Pearson correlations between scores on CEFT in kindergarten and first grade was .87 (Dreyer, Nebelkopf, and Dreyer, 1969). The test is designed for use with

children from 5 to 12 years old. Concurrent validity has been established between the Embedded Figures Test and the Children's Embedded Figures Test reporting correlations ranging from .83 to .86 for 11 and 12 year olds and .70 to .73 for 9 and 10 year olds (Karp and Konstadt, 1971). Concurrent validity was established between the Children's Embedded Figures Test and the Portable Rod and Frames Test, another measure of field dependence-independence, reporting correlations ranging from .61 to .66 for kindergarten children (Dreyer, Nebelkopf, and Dreyer, 1969).

#### Matching Familiar Figures Test (MFF)

The MFF was developed by Jerome Kagan et al. (1964) to measure reflection-impulsivity in young children. In this test the subject is shown a picture (standard) and six similar stimuli, only one of which is identical to the standard. The subject is instructed to find the picture that is exactly the same as the picture at the top of the page. Correct responses are praised. However, if a similar variant is selected, the child is told that it is incorrect and asked to select another until the correct variant is selected. Two scores are available. The total number of errors and the total response time to first selection across the 12 test items. Short term test-retest and equivalent form reliability have produced internal consistency coefficients ranging from .62 to .98 (Messer, 1974).

Evaluating the convergent validity, Hall and Russell (1974) report a correlation of .54 with the Raven's Coloured Progressive Matrices, an instrument involving high response uncertainty. Further research into the validity of the MFF found that measures involving a high

degree of uncertainty entered a multiple regression before those of low uncertainty (Margolis, Leonard, Brannigan, and Heverly, 1980). The following correlations were reported with the MFF, impulsivity score as computed by the Salkind and Wright formula: Columbia Mental Maturity Scale, .58; Wepman's Auditory Discrimination Test, .55; and Birch and Belmont's Auditory-visual Intergration Test, .52 (Margolis, Leonard, Brannigan, and Heverly, 1980). Each test involves a high degree of uncertainty lending construct validity to Kagan's theoretical framework of the MFF.

#### Slosson Intelligence Test for Children and Adults (SIT)

This is an individually administered screening test with tasks similar to those of the Stanford-Binet. Correlation coefficients ranging from .90 to .98 with the Stanford-Binet are reported in the manual. Test-retest reliability coefficients of .97 are also reported.

#### Ray Reading Methods Test (Experimental Edition)

The Ray Reading Methods Test (RRMT) was designed to provide the teacher and/or clinician with a process of evaluating a preferred learning method for the initial reading experiences of children (Ray, 1970). According to Ray (1970) the learner will demonstrate a preference in the selection of recognition cues during beginning reading instruction. The four methods evaluated by the RRMT are the visual-auditory method, the auditory-visual method, the linguisticword structure method, and the linguistic-language experience method. The purpose of the test is to evaluate the performance of children by measuring the

response to the teaching-learning experience utilizing each of the four methods.

Administering the RRMT to 163 kindergarten children, Manwarren (1972) established a .88 split half reliability for the visual-auditory subtest of the RRMT. The correlation for the auditory-visual method was .98 while the correlation for the linguistic-word structure method was .95. The reliability of the language experience method was less predictable with reliability of .68.

The test is designed to be used with individuals or small groups consisting of six or less individuals. Basically, the procedure for each method follows a structured lesson plan based on the distinct unit of instruction. Ten words are taught in two instructional periods separated by 24 hours. Delayed recall scores are taken 24 and 72 hours after instruction.

### Statistical Analysis

The statistical analysis was performed at the Oklahoma State University Computer Center. Several different treatments yielded the information for this study.

First, z scores for the MFF were computed to avoid the difficulties of the division of the two continuous variables of response time and errors into four categories. According to Kerlinger (1964) continuous variables should not be reduced to partitioned variables. To avoid the dichotomy suggested by Kagan (1965), Salkind and Wright (1977) proposed that the MFF result in two independent and continuous dimensions: "impulsivity" and "cognitive efficiency." Using this theoretical framework, z scores were computed for errors and latency of each subject



using the normative data accumulated by Salkind (1979). Impulsivity was the difference between the z score for errors and the z score for latency ( $Z_e - Z_l$ ). Large positive scores were indicative of impulsivity while large negative scores indicated reflectivity. Cognitive efficiency was computed by adding the z score for errors and the z score for latency ( $Z_e + Z_l$ ). Thus, positive scores were indicative of inefficiency while negative scores indicated efficiency.

These analyses were performed using Version H, Release 8.0 of the SPSS (Statistical Package for the Social Sciences; Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975) at Oklahoma State University Computer Center.

Next, the relationship between one specific measure of cognitive style and a specific method of instruction was examined using a Pearson product-moment correlation. These analyses were performed using Version H, Release 8.0 of the SPSS (Statistical Package for the Social Sciences; Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975) at the Oklahoma State University Computer Center. The relationship between measures of cognitive style their interactions and word recognition success under four methods of instruction was examined using a stepwise multiple regression analysis. A separate regression analysis was performed for each method of instruction. The analyses were run under release 79.3A of SAS (Statistical Analysis System; Barr, Goodnight, Sall, and Helwig, 1976) at Oklahoma State University Computer Center.

### Summary

Chapter II has presented a description of the sample represented in this investigation. One hundred and twenty-one kindergarten students

who had not learned to read were randomly assigned to instructional groups. The predictor variables were measured by scores on the Children's Embedded Figures Test and the Matching Familiar Figures Test.

The criterion variable was measured by the delayed recall score on the four subtests of the Ray Reading Methods Test. The statistical analysis employed was the Pearson product-moment correlation and a stepwise multiple regression. The analysis was computed at the Oklahoma State University Computer Center.

## CHAPTER III

### ANALYSIS OF THE DATA

#### Introduction

This study investigated the relationship between dimensions of cognitive style and success with specific reading methods. Four methods of reading instruction were used in teaching ten words to kindergarten children. Appropriate cue selection for each method was stressed. Delayed recall scores provided the criterion measures for each method. Independent variables measuring cognitive style were employed to establish the relationship between field dependence-independence, impulsivity-reflectivity, and efficiency-inefficiency with word learning under the four methods. The results were analyzed using the Pearson product-moment correlation. Further analysis of the data to establish the best possible combination for prediction was established by a stepwise multiple regression analysis.

#### Results Relating to Hypotheses

Results of the Pearson product-moment correlations establish a basis for the interpretation of the results of this predictive study. In Table V the criterion variables are shown with the respective coefficients of correlations.

TABLE V  
RESULTS OF THE CORRELATIONS OF COGNITIVE STYLE  
VARIABLES WITH FOUR INSTRUCTIONAL METHODS

Cognitive Style Dimension	Auditory Visual	Visual Auditory	Linguistic Word Structure	Language Experience
Field Dependence/Independence (CEFT)	.14	.09	.17*	.23**
Impulsivity/Reflectivity (MFF)	-.14	-.15	-.17*	-.15
Efficiency/Inefficiency (MFF)	-.14	-.21*	-.16*	-.06

\* $p < .05$

\*\* $p < .01$

### Hypothesis I

When using the auditory-visual method of teaching reading, there is no significant relationship between scores on word recognition and

- a) field dependence/independence,
- b) impulsivity/reflectivity,
- c) efficiency/inefficiency.

Hypothesis I is not rejected. The correlations indicated that delayed recall scores on the criterion measure, auditory-visual instruction, were not significantly related to the field dependence dimension, the impulsivity dimension, and the efficiency dimension of cognitive style.

### Hypothesis II

When using the visual-auditory method of teaching reading, there is no significant relationship between scores on word recognition and

- a) field dependence/independence,
- b) impulsivity/reflectivity,
- c) efficiency/inefficiency.

Hypotheses IIa and IIb are not rejected. The results of the correlations did not reach a significant level; therefore, the field dependence-independence dimension as measured by the CEFT and the impulsivity-reflectivity dimension as measured by the MFF do not have significant relationships with delayed recall on the visual-auditory method of instruction. Hypothesis IIc is rejected. The results of the correlation of the efficiency-inefficiency dimension as measured by the Matching Familiar Figures test was significant ( $p < .05$ ) showing a relationship of  $-.21$  with the criterion measure, visual-auditory

instruction. This indicates that the more efficient the student's responses on the MFF the higher he scored on the criterion measure, visual-auditory instruction (see Table V).

### Hypothesis III

When using the linguistic word structure method of teaching reading, there is no significant relationship between scores on word recognition and

- a) field dependence/independence,
- b) impulsivity/reflectivity,
- c) efficiency/inefficiency.

Hypotheses IIIa, IIIb, and IIIc are rejected. The results of the correlations were significant beyond the .05 level of confidence. The correlation indicated that the more field independent ( $r = .17$ ), reflective ( $r = -.17$ ), and efficient ( $r = -.16$ ), the student scored on measures of cognitive style, the higher his delayed recall score on the criterion measure of linguistic word structure instruction (see Table V).

### Hypothesis IV

When using the language experience method of teaching reading, there is no significant relationship between scores on word recognition and

- a) field dependence/independence,
- b) impulsivity/reflectivity,
- c) efficiency/inefficiency.

Hypothesis IVa is rejected at the .01 level of confidence. The positive correlation of the field dependence-independence dimension with

the language experience method indicates that the more field independent the student scored on the CEFT the higher he scored on this criterion measure. The correlation coefficient is .23 with a  $p = .006$  level of confidence. Hypothesis IVb and IVc are not rejected. The correlation of the impulsivity dimension as computed from the MFF and the efficiency dimension as computed from the MFF did not have significant relationships with delayed recall on the language experience method of teaching reading (see Table V).

### Results Relating to the Research Questions

#### Question 1

In regard to the criterion variable, auditory-visual instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

There is no significant contribution to the multiple regression when measures of cognitive style and their interactions are employed. The five variable model of the multiple regression had an  $R^2$  of .0427 accounting for 4% of the variation of the criterion measure. However, the results of the multiple regression did not have a significant predictive relationship ( $p = .40$ ) (see Table VI).

In order to investigate these results further, the best two variable model was selected. The results account for 3% of the variation in criterion variable, auditory-visual instruction (see Table VII). No significant multiple correlation was found.

#### Question 2

In regard to the criterion variable, visual-auditory instruction,

TABLE VI

RESULTS OF THE FIVE VARIABLE MULTIPLE REGRESSION  
ANALYSIS FOR THE AUDITORY-VISUAL METHOD  
WITH  $R^2 = .0427$  AND  $p = .40$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	.075	1.18	.27
Impulsivity/Reflectivity (MFF)	-.66	1.18	.28
Efficiency/Inefficiency (MFF)	-.01	.00	.99
Field Dependence-x-Impulsivity (CEFT-x-MFF)	.07	.75	.38
Field Dependence-x-Efficiency (CEFT-x-MFF)	.04	.08	.78

TABLE VII

BEST TWO VARIABLE MODEL OF PREDICTOR VARIABLES FOR  
AUDITORY-VISUAL METHOD WITH  $R^2 = .0317$   
AND  $p = .15$

Cognitive Style Dimension	B Value	F	Probability
Efficiency/Inefficiency (MFF)	-.46	1.57	.21
Field Dependence/Independence	.12	1.44	.23



will there be a significant relationship when measures of cognitive style and their interactions are employed?

When measures of cognitive style and their interaction were included in the five variable multiple regression the resulting 9% variance was not at a significant level ( $p = .08$ ) (see Table VIII).

However, the impulsivity dimension as computed from the MFF was significant at the  $p > .05$  level of confidence indicating a predictive relationship between performance on the visual-auditory method and the impulsivity-reflectivity dimension of cognitive style. This relationship indicates that the more reflective the student scored on the MFF the higher he scored on the criterion measure, visual-auditory instruction.

Further analysis was conducted with the stepwise multiple regression. The best one variable model to predict a relationship with visual-auditory instruction was the efficiency-inefficiency dimension of cognitive style. This model was significant at the .02 level of confidence accounting for 4.2% of the variation. The best three variable model of predictor variables was significant beyond the .05 level of confidence (see Table IX). This illustrates that the predictor variables are related to the criterion measure, visual-auditory instruction. This combination of predictor variables accounts for 8% of the variation in word learning. The impulsivity dimension is a significant predictor variable in this model indicating again that the more reflective one scored on the MFF the higher he scored on the visual-auditory method. Another significant predictor variable was the interaction of the field dependence dimension with the impulsivity dimension. In this equation the interaction of these two styles is a better predictor than

TABLE VIII

RESULT OF THE FIVE VARIABLE MULTIPLE REGRESSION  
 ANALYSIS FOR THE VISUAL-AUDITORY METHOD WITH  
 $R^2 = .0789$  AND  $p = .087$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	- .022	.05	.82
Impulsivity/Reflectivity (MFF)	-1.04	4.18	.04*
Efficiency/Inefficiency (MFF)	.08	.01	.93
Field Dependence-x-Impulsivity (CEFT-x-MFF)	.13	3.67	.06
Field Dependence-x-Efficiency (CEFT-x-MFF)	- .09	.43	.52

\* $p < .05$

TABLE IX  
BEST THREE VARIABLE MODEL OF PREDICTOR VARIABLES FOR  
VISUAL-AUDITORY METHOD WITH  $R^2 = .0785$  AND  $p = .02^*$

Cognitive Style Dimension	B Value	F	Probability
Impulsivity/Reflectivity (MFF)	-.99	5.13	.03*
Field Dependence-x-Impulsivity (CEFT-x-MFF)	-.13	4.15	.04*
Field Dependence-x-Efficiency (CEFT-x-MFF)	-.07	2.79	.10

\*  
p < .05

the field dependence dimension alone. The efficiency dimension which was the best one variable model does not enter the equation in this combination of variables. However, the interaction of the field dependence dimension and the efficiency dimension does enter the equation.

### Question 3

In regard to the criterion variable, linguistic word structure instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

In reference to question three, there is no significant contribution to the multiple regression when measures of cognitive style and their interactions are employed (see Table X). The results of the multiple regression did not reach a significant level ( $p = .24$ ) and accounted for 5.6% of the variation in the criterion measure, linguistic word structure.

In order to investigate these results further, the best two variable model of predictor variables was selected (see Table XI). In this equation 4% of the variation was accounted for at the  $p = .07$  level of confidence.

### Question 4

In regard to the criterion variable, language experience instruction, will there be a significant relationship when measures of cognitive style and their interactions are employed?

In the five variable model of the multiple regression analysis 9% of the variation in the criterion variable, language experience instruction, is represented. This equation is significant at the

TABLE X

RESULTS OF THE FIVE VARIABLE MULTIPLE REGRESSION ANALYSIS  
FOR THE LINGUISTIC WORD STRUCTURE METHOD WITH  
 $R^2 = .0561$  AND  $p = .24$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	.08	.71	.40
Impulsivity/Reflectivity (MFF)	-.54	1.12	.29
Efficiency/Inefficiency (MFF)	.02	.00	.98
Field Dependence-x-Impulsivity (CEFT-x-MFF)	.05	.57	.45
Field Dependence-x-Efficiency (CEFT-x-MFF)	-.04	.14	.71

TABLE XI

BEST TWO VARIABLE MODEL OF PREDICTOR VARIABLES FOR  
LINGUISTIC WORD STRUCTURE WITH  $R^2 = .0443$  AND  
 $p = .07$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	.12	2.19	.14
Efficiency/Inefficiency (MFF)	-.44	2.07	.15

$p = .04$  level of confidence (see Table XII). Two predictors in the equation are significant predictors of the criterion measure, language experience instruction. There is a significant predictive relationship between the dimension of impulsivity/reflectivity as computed from the MFF and success on the language experience method. This relationship indicates that the more reflective a student scored on the MFF the higher he scored on the delayed recall of the language experience method. The interaction of the field dependence dimension and the impulsivity dimension is also a significant predictor of success with the criterion variable ( $p > .05$ ). The best one variable model for predicting the criterion measure is the field dependence-independence dimension as measured by the CEFT. This model accounts for 5% of the variance and is significant at the  $p = .012$  level of confidence. The best three variable model of predictor variables accounts for 9% of the variance and is significant at the .011 level of confidence (see Table XIII). The impulsivity dimension is a significant predictor variable in this equation indicating that the more reflective student scored on the MFF the higher he scored on the criterion measure, language experience instruction. The interaction of the field dependence dimension with the impulsivity dimension is a significant predictor variable in this equation. In the three variable model the field dependence-independence dimension adds to the prediction, but it does not reach a level of significance in this equation.

#### Summary

This chapter has presented the statistical analysis of the data. The relationship between dimensions of cognitive style and success in a

TABLE XII

RESULTS OF THE FIVE VARIABLE MULTIPLE REGRESSION ANALYSIS  
 FOR THE LANGUAGE EXPERIENCE METHOD WITH  $R^2 = .0929$   
 AND  $p = .04^*$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	.15	2.41	.12
Impulsivity/Reflectivity (MFF)	-1.11	4.9	.03*
Efficiency/Inefficiency (MFF)	.41	.19	.66
Field Dependence-x-Impulsivity (CEFT-x-MFF)	.07	4.2	.04*
Field Dependence-x-Efficiency (CEFT-x-MFF)	- .04	.08	.77

\*  
 $p < .05$

TABLE XIII

BEST THREE VARIABLE MODEL OF PREDICTOR VARIABLES FOR  
 LANGUAGE EXPERIENCE METHOD WITH  $R^2 = .0903$  AND  
 $p = .011^*$

Cognitive Style Dimension	B Value	F	Probability
Field Dependence/Independence (CEFT)	.15	3.08	.08
Impulsivity/Reflectivity (MFF)	-.99	4.99	.03*
Field Dependence-x-Impulsivity (CEFT-x-MFF)	.13	4.18	.04*

\*  
 $p < .05$

specific method of reading instruction were analyzed using the Pearson product-moment correlation and a stepwise multiple regression. Each hypothesis relating to a method of instruction was evaluated by the significant predictive relationship for each independent variable. The research questions were answered using the stepwise multiple regression.

For the criterion measure, auditory-visual instruction there was no significant predictor or combination of significant predictor variables. For the criterion measure, visual-auditory instruction, the efficiency dimension of cognitive style was a significant single predictor. The three variable model for visual-auditory method reached a significant level accounting for eight percent of the variation in the criterion measure. In this model reflectivity and the interaction of field independence and reflectivity reached significant levels. For the criterion measure, linguistic word structure, all three dimensions of cognitive style were significant single predictor variables; however, no combination of predictor variables reached significance in the multiple regression analysis. For the criterion measure, language experience instruction, field independence was a significant single predictor. Both the five variable model and the three variable model were significant predictors of success in the language experience method of instruction accounting for nine percent of the variation in the criterion measure. In these models, the reflectivity dimension and the interaction of the field independence dimension and the reflectivity dimension reached significant levels.



## CHAPTER IV

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary and Interpretation of the Investigation

The purpose of this study is to predict the relationship of dimensions of cognitive style and success in differentiated reading instruction for kindergarten children. Students were randomly assigned to instructional groups where subtests for the Ray Reading Methods Tests were employed. Appropriate cue selection strategies were stressed. Scores obtained from the delayed recall of the four subtests of the methods test were used as the criterion variables. The predictor variables were dimensions of cognitive style. Field dependence-independence was assessed using Children's Embedded Figures Test. The Matching Familiar Figures Test was employed to assess the dimensions of impulsivity-reflectivity and cognitive efficiency-inefficiency.

Four hypotheses were presented in the null form to investigate the relationship of the predictor variables, dimensions of cognitive style, with the four criterion measures, differentiated methods of instruction. The first hypothesis stated that when using the auditory-visual method of teaching reading, there would not be a significant relationship between scores on word recognition and (a) field dependence/-independence, (b) impulsivity/reflectivity, and (c) efficiency/-inefficiency. The second, third, and fourth hypotheses were identical

to the first except they dealt with visual-auditory instruction, linguistic word structure instruction, and language experience instruction, respectively. Each of the four hypotheses were analyzed using the Pearson product-moment correlation technique. There was no significant predictor found for the auditory-visual method of instruction. The lack of a significant relationship with the auditory-visual method of instruction is probably due to the restricted range of scores on this particular instructional method (see Table of Means, Appendix C) which resulted in a floor effect in the delayed recall scores. It was found that the cognitive efficiency dimension had a significant predictive relationship when the visual-auditory method was employed ( $p > .05$ ). However, the Pearson product-moment correlation was only  $-.21$  resulting in a low predictive relationship with delayed recall on the visual-auditory method. The correlation does show a tendency that the more efficient the child's responses were on the MFF the higher he scored on the delayed recall score in the visual-auditory method. There was also a tendency to show that the more inefficient the child's responses were the fewer words he remembered in the delayed recall evaluation. For the linguistic word structure method it was found that all three measures of cognitive style correlated significantly with delayed recall ( $p > .05$ ). This relationship indicated that the more efficient, field independent, and reflective the student scored on the measures of cognitive style the higher he scored on this instructional method. However, each relationship has a correlation of  $.16$  to  $.17$  with the linguistic word structure method. Thus, care should be taken in predicting success with this method on the basis of such a low correlation. In the investigation, it was found that the field dependence-independence dimension correlated

significantly ( $p = .006$ ) with the language experience method. Although the correlation of .23 is relatively low, it must be remembered that the range on the methods test and the CEFT was restricted inhibiting stronger correlations. A large percentage of the students scored at or near the mean of the Children's Embedded Figures Test. It is possible that the predictive correlations were influenced by the large and relatively homogeneous group clustered close to the mean CEFT score. However, this correlation did indicate a tendency for the field independent student to score slightly higher in the language experience approach while the field dependent student tended to recall fewer words.

Four research questions were analyzed pertaining to the multiple correlation of the predictor variables in relation to the four criterion variables, differentiated methods of instruction. The first question asked if regarding the criterion variable, auditory-visual instruction, there would be a significant relationship when measures of cognitive style and their interactions were employed. The second, third, and fourth research questions were identical to the first except they dealt with visual-auditory instruction, linguistic word structure instruction, and language experience instruction, respectively. Each of the four questions were analyzed using a stepwise multiple regression analysis.

When using the auditory-visual method, no significant combination of predictor variables were found. The best three variable model of predictor variables for visual-auditory method of instruction was significant beyond the .05 level of confidence. This combination accounted for only eight percent of the variation in the criterion measure, with both the impulsivity-reflectivity dimension and the interaction of the field dependence dimension and the impulsivity dimension employed as

significant predictors in the three variable model. For the criterion variable linguistic word structure, no significant combination of predictor variables were found. The weak correlations found in the Pearson product-moment analysis could not be combined to increase the efficiency of the prediction. When using the language experience method of instruction, it was found that the single best predictor was the field dependence-independence dimension. Both the three variable model and the five variable model were significantly related to success in word recognition under this method. The three variable model approached significance at the .01 level of confidence ( $p = .011$ ) accounting for nine percent of the variation in the language experience method. In this model the impulsivity-reflectivity dimension and the interaction of the field dependence dimension with the impulsivity dimension were significant predictors in this method.

#### Discussion and Conclusions

According to the research and theory of cognitive style, children differ in their approach to cue selection in varying task situations. The literature suggested that children using field dependent and impulsive styles of information processing might prefer a more structured approach to cue selection. Approaches to reading instruction were evaluated as to their cue selection strategies stressed in presentation. The appropriate amount of structure was utilized. Thus, the importance of cognitive style in the selection of an approach to beginning reading instruction was investigated. In the beginning word learning situation, responses are mediated and have not reached an automatic stage. According to Kagan (1965) in situations of response uncertainty,

reflective students tend to evaluate closely solution alternatives. It was found that this student did perform slightly better in instructional situations where cue selection required appropriate evaluation of available cues. On the visual-auditory approach where the whole word is taught in meaningful context, the reflective student tended to score higher. In this approach the reader must select the right cues understanding the similarity and dissimilarity of the words learned.

Therefore, by evaluating various solution alternatives involving distinctive features in initial word learning he tended to profit from the instructional procedure. The impulsive learner in turn scored significantly lower in this method, indicating a slight tendency for him not to evaluate the similarity and dissimilarity of the words learned.

These results are consistent with those of Kagan (1965) and Readence and Baldwin (1977), involving reading instruction using the basal reader (visual-auditory) approach. Using the linguistic word structure method, the correlation did show a slight tendency for the reflective student to profit from a minimum contrast approach to recalling words learned.

This finding agrees with the results of Erickson and Otto (1973). They found that reflectives were superior to impulsives on word recognition tasks under the condition of high intralist similarity.

It was also found that the reflective student tended to score slightly higher on the language experience method of learning to read. Here, the student was required to use the anticipation of language cues to evaluate the new words learned. Word recognition was based on the structure of language in the story. There was a slight tendency for the more reflective student to evaluate the stimulus carefully as he was using the semantic structure of the story.

A cognitive efficient style indicates that the student made accurate choices in situations where similar visual stimuli are presented. It was found that the more efficient the student, the slightly higher his score on the visual-auditory approach. Cognitive efficiency was also a significant predictor of success in the linguistic word structure method. This indicates that more information might be gained from evaluating the efficiency of the choices the student makes as well as his impulsive behavior. These results are consistent with the findings of Bush and Dweck (1975) that the cognitive style of reflectives is best understood in terms of a flexible strategy involving an appropriate trade-off of accuracy and speed according to the task demands. This appropriate trade-off results in an efficient processing style.

According to Witkin et al. (1977), the field independent student tends to analyze details without requiring an externally imposed structure. He imposes his own strategies for cue selection and so organizes and remembers material using his established patterns of learning. It was found that this student did perform slightly better in instructional situations where cue selection was unstructured. On the language experience approach where the child uses his knowledge of language to anticipate word recognition, the field independent student scored slightly higher. In this approach the reader uses his prior knowledge of meaningful language units to recall the words presented. Therefore, by imposing his own language structure he tended to profit from the instructional procedure. The field dependent student scored significantly lower in this method indicating that he probably tended not to impose his own language structure in this word learning situation. Although the correlation was low, the field independent student scored

slightly higher on the linguistic word structure method where spelling and minimum contrast were stressed.

The interaction of the field dependence dimension and the impulsivity dimension was also a significant predictor variable in the three variable model for visual-auditory instruction and language experience instruction. This interaction added more to the prediction than the field dependence dimension alone. This interaction indicated that the field independent, reflective student tended to score higher in a situation where word learning was unstructured and he had to evaluate several hypotheses before making a response.

In the auditory-visual method of teaching reading there were no significant predictor variables found. Several reasons could account for this finding. The restricted range and the floor effect of the methods test left little variation in scores for a prediction. Another reason could be that the definite relationship of field independence and reflectivity with word learning is not as great under this method; therefore, inhibiting a predictive relationship. However, it must be remembered that neither was there a relationship showing that field dependent, impulsive learners profit from the structured learning situation provided by the auditory-visual method of instruction. Other researchers have found that reflectivity and field independence are related to reading vocabulary when children are taught with a synthetic (auditory-visual) approach to decoding (Gorton, 1975; Readence and Baldwin, 1977). An inconclusive relationship remains to be investigated as to the relationship of auditory-visual instruction and cognitive style.

From the results it is seen that cognitive style relates to word

learning. Although it accounts for eight or nine percent of the variation in learning to read in the visual-auditory approach and the language experience, respectively, the relationship is significant. Relating these results to the theory of reading under investigation, cognitive style does influence reading success in two of the four approaches to learning to read. It is not certain whether the amount of variation would increase if these measures of cognitive styles were interacted with other predictors of success in differentiated methodology. Or if this variation is mutually exclusive of the other predictors of success in learning to read such as knowledge of letter names, sound blending, and learning rate. The investigations of Margolis (1977) indicates that the impulsivity dimension is significantly related to auditory discrimination and auditory-visual integration for kindergarten children. This gives merit to further investigation into the role cognitive style plays in the reading process.

#### Recommendations

Although there was a significant predictive relationship between cognitive style and three of the four methods of instruction investigated, it accounted for between seven and nine percent of the variation in learning to read. Therefore, until further research is conducted it is not recommended to use cognitive style as a predictor of success in any particular method of reading. Further investigation needs to be conducted regarding the relationship of cognitive style to other predictor variables of differentiated methodology preference. Because of the short instructional session and the restricted range of scores, it is recommended that a more extensive evaluation of reading



performance be conducted in relationship to methodology preference and cognitive style. This would allow for greater range in the variation of possible criterion scores.

It is recommended that the relationship between cognitive style and the reading process continue. An expanded definition of cognitive style might reveal a greater predictive relationship between these measures and success in differentiated reading instruction. This would involve refinement of the measures of cognitive style. Normative data for young children on cognitive style measures are especially necessary if an educational match between cognitive style and instructional preference is to be assessed. Other facets of cognitive style such as attention-concentration, breadth of categorizing, and leveling versus sharpening might be assessed in relationship to learning to read. By limiting the definition of cognitive style, the relationship of cue selection strategies to differentiated methodology was restricted. Therefore, the basic theoretical framework of a component of cognitive style received only limited support.

## SELECTED BIBLIOGRAPHY

- Athey, I. "Reading Research in the Affective Domain." In H. Singer and R. Ruddell (Eds.), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976, 302-316.
- Barr, Anthony J., James H. Goodnight, John P. Sall, and Jane T. Helwig. A User's Guide to SAS 76. Raleigh, North Carolina: SAS Institute, Inc., 1976.
- Betts, Emmett A. Foundations of Reading Instruction. New York: American Book Company, 1946, 1-540.
- Bateman, Barbara. "The Efficacy of an Auditory and a Visual Method on First-Grade Reading Instruction with Auditory and Visual Learning." In H. K. Smith (Ed.), Perception and Reading. Newark, Delaware: International Reading Association, 1968, 124-132.
- Birch, Herbert G., and Lillian Belmont. "Auditory-Visual Integration Intelligence and Reading in School Children." Perceptual and Motor Skills, 20 (1965), 295-305.
- Blanton, William E. "The Interactive Effects of Perceptual Centration and Decentration on Reading Readiness and Reading Achievement at the First Grade Level." (Unpub. doctoral dissertation, University of Georgia, 1970.)
- Bonning, Ed D. "The Effectiveness of Matching Visual and Auditory Information Feedback to the Preferred Learning Modality in Beginning Word Learning." (Unpub. doctoral dissertation, University of Miami, 1973.)
- Bruininks, R. H. Relationship of Auditory and Visual Perceptual Strengths to Methods of Teaching Word Recognition Among Disadvantaged Negro Boys. IMPID Behavioral Science Monograph, No. 12. George Peabody College, 1968.
- Bush, Ellen S., and Carol S. Dweck. "Reflections on Conceptual Tempo: Relationship Between Cognitive Style and Performance as a Function of Task Characteristics." Developmental Psychology, 11 (1975), 567-574.
- Coleman, James C. "Learning Methods as a Relevant Subject Variable in Learning Disorders." Perceptual and Motor Skills, 14 (1962), 263-269.

- Cook, B. D. "A Comparative Study of Reading, Impulsivity and Learning Disabilities." (Unpub. M.S. thesis, Oklahoma State University, 1976.)
- Davey, Beth. "Cognitive Styles and Reading Achievement." Journal of Reading (November, 1976), 113-120.
- deHirsch, K. J., J. Jansky, and W. S. Langford. Predicting Reading Failure. New York: Harper and Row, 1966, 80-83.
- Derevensky, J. L. "Cross Modal Functioning and Reading Achievement." Journal of Reading Behavior, IX (1977), 233-247.
- Derevensky, Jeffry L. "Modal Preferences and Strengths: Implications for Reading Research." Journal of Reading Behavior, X (1978), 7-23.
- Dermott, R. A. "Two Dimensions of Field Dependence-Independence: How They and Nine Other Variables Interrelate and Predict Specific Reading Skills at the End of the First Grade." (Unpub. doctoral dissertation, University of Maine, 1977.)
- Dreyer, Albert S., Edwin Nebelkopf, and Cecily A. Dreyer. "Note Concerning Stability of Cognitive Style Measures in Young Children." Perceptual and Motor Skills, 28 (1969), 933-934.
- Elkind, David. "Cognitive Development and Reading." In H. Singer and R. Ruddell (Eds.), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976, 331-339.
- Erickson, L. G., and W. R. Otto. "Effect of Intra-list Similarity and Impulsivity-Reflectivity on Kindergarten Children's Word Recognition Performance." Journal of Educational Research, 66 (1973), 466-470.
- Freer, F. J. "Visual and Auditory Perceptual Modality Differences as Related to Success in First Grade Reading Word Recognition." (Unpub. doctoral dissertation, Rutgers University, 1971.)
- Gagne, R. M. The Conditions of Learning. New York: Holt, Rinehart, and Winston, Inc., 1970.
- Gibson, E. J. "Trends in Perceptual Development." In H. Singer and R. Ruddell (Eds.). Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976, 186-215.
- Gluck, Elizabeth. "Psychological Differentiation and Reading Achievement in First Grade Children." (Unpub. doctoral dissertation, Boston University, 1973.)
- Goodman, K. S. "Reading: A Psycholinguistic Guessing Game." Journal of the Reading Specialist, 4 (1967), 126-135.

- Gorton, R. T. "The Relationship of Cognitive Style to Reading Achievement of First Grade Pupils Instructed by One of Three Approaches." (Unpub. doctoral dissertation, Lehigh University, 1975.)
- Haith, M. M. "Developmental Changes in Visual Information Processing and Short-Term Memory." Human Development, 14 (1971), 249-261.
- Hall, V., and W. Russell. "Multitrait-multimethod Analysis of Conceptual Tempo." Journal of Educational Psychology, 66 (1974), 932-939.
- Harris, A. J. "Individualizing First Grade Reading According to Specific Learning Aptitudes." Mimeo., N.Y.: City University of New York, Office of Research and Evaluation, Division of Teacher Education, April, 1965, 1-12.
- Holmes, J. A. "Basic Assumptions Underlying the Substrata-Factor Theory." In H. Singer and R. Ruddell (Eds.), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976, 597-618.
- Kagan, J. "Reflection-Impulsivity and Reading Achievement." Child Development, 36 (1965), 609-628.
- Kagan, J., L. Pearson, and L. Welch. "Conceptual Impulsivity and Inductive Reasoning." Child Development, 37 (1966), 583-594.
- Kagan, Jerome. Matching Familiar Figures Test. (Unpublished Test, Harvard University.)
- Karp, S. A., and Norma L. Konstadt. Children's Embedded Figures Test. Consulting Psychologists Press, Inc., 1971.
- Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart, and Winston, Inc., 1964.
- Kohlers, P. A. "Three Stages of Reading." In F. Smith, Psycholinguistics and Reading. New York: Holt, Rinehart, and Winston, 1973, 28-49.
- Kogan, Nathan. "Educational Implications of Cognitive Styles." In G. S. Lesser (Ed.), Psychology and Educational Practice. Scott, Foresman, and Company, 1971, 242-292.
- McCarthy, Raymond G. "The Effects of Visual and Auditory Memory Abilities on Word Recognition Success Under Two Teaching Methods." (Unpub. doctoral dissertation, Oklahoma State University, 1971.)
- Manwarren, Mildred. "A Validity Study of the Ray Reading Methods Test." (Unpub. doctoral dissertation, Oklahoma State University, 1972.)
- Margolis, H. "The Relationship Between Auditory-Visual Integration, Reading Readiness and Conceptual Tempo." The Journal of Psychology, 93 (1976), 181-189.

- Margolis, H., Nedra Peterson, and H. S. Leonard. "Conceptual Tempo as a Predictor of First Grade Reading Achievement." Journal of Reading Behavior, 4 (1977), 359-362.
- Margolis, Howard, H. Skipton Leonard, Gary G. Brannigan, and Mary Ann Heverly. "The Validity of Form F of the Matching Familiar Figures Test with Kindergarten Children." Journal of Experimental Child Psychology, 29 (1980), 12-22.
- Messer, Stanley. "Reflection-Impulsivity: A Review." Psychological Bulletin, 83 (1976), 1026-1052.
- Miller, Etta M. "Relationship Among Modality Preference, Method of Instruction and Reading Achievement." (Unpub. doctoral dissertation, State University of New York at Albany, 1974.)
- Mills, Robert E. "An Evaluation of Techniques for Teaching Word Recognition." Elementary School Journal, 56 (1956), 221-225.
- Morency, Ann. "Auditory Modality and Reading." In H. K. Smith (Ed.), Perception and Reading. Newark, Delaware: International Reading Association, 1968, 16-21.
- Nie, N. H., C. H. Hull, J. G. Jenkins, K. Steinbrenner, and D. H. Bent. Statistical Package for the Social Sciences, 2nd Ed. New York: McGraw Hill, 1975.
- Ogle, D. M. "A Study of the Relationship of Instructional Methods to the Oral Reading Errors Made by First Grade Readers." (Unpub. doctoral dissertation, Oklahoma State University, 1974.)
- Pearson, P. David. "Some Practical Applications of a Psycholinguistic Model of Reading." In S. J. Samuels (Ed.), What Research Has to Say About Reading Instruction. Newark, Delaware: International Reading Association, 1978, 84-97.
- Ray, Darrel D. Ray Reading Methods Test (Experimental Edition). Stillwater, Oklahoma: RRMT Publishers, August, 1970.
- Ray, Darrel D. "Specificity in Remediation." In Barbara Batemen (Ed.), Learning Disorders. Special Child Publications, Inc., 1971, 180-191.
- Readence, John E., and R. Scott Baldwin. "The Relationship of Cognitive Style and Phonics Instruction." The Journal of Educational Research, 72 (1978), 44-52.
- Readence, J. E., and L. W. Searfoss. "The Impulsivity-Reflectivity Dimension of Cognitive Style." Reading World (December, 1976), 88-96.

- Ringler, L. H., I. L. Smith, and B. E. Cullinan. "Modality Preference, Differentiated Presentation of Reading Task, and Word Recognition of First-Grade Children." (Paper presented at the annual convention of the International Reading Association, Atlantic City, New Jersey, 1971.)
- Robinson, H. M. "Visual and Auditory Modalities Related to Two Methods for Beginning Reading." American Education Research Association Paper Abstracts, 1968, 74-75.
- Rodenborn, Leo. "An Examination of the Importance of Auditory-Visual Integration, Visual-Auditory Integration, Auditory Memory, and Visual Memory to Oral Reading." (Unpub. doctoral dissertation, Oklahoma State University, 1969.)
- Salkind, Neil J. "Development of Norms for the Matching Familiar Figures Test." (Unpub. Manuscript, University of Kansas.)
- Salkind, Neil, and John C. Wright. "The Development of Reflection-Impulsivity and Cognitive Efficiency--An Integrated Model." Human Development, 20 (1977), 377-387.
- Scott, Diana. "The Effectiveness of Teaching Strategies Related to Modality Preferences of Pupils with Reading Difficulties at the End of Grade One." (Unpub. doctoral dissertation, Ball State University, 1973.)
- Shapson, S. M. "Hypothesis Testing and Cognitive Style in Children." (Unpub. doctoral dissertation, York University, 1973.)
- Singer, Harry. "Conceptualization in Learning to Read." In H. Singer and R. Rudell (Eds.), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976, 302-316.
- Slosson, Richard L. Slosson Intelligence Test for Children and Adults. Slosson Educational Publications Inc., 1978.
- Smith, Frank. Psycholinguistics and Reading. New York: Holt, Rinehart, and Winston, 1973.
- Tarver, Sara G., and Margaret Dawson. "Modality Preference and the Teaching of Reading: A Review." Journal of Learning Disabilities, 2, 1 (1978), 17-28.
- Tooker, N. M. "The Relationship of Language Abilities and Reading Performance for Adolescent Disabled Readers and Able Readers at Two Grade Levels." (Unpub. doctoral dissertation, Oklahoma State University, 1977.)
- Treadway, Kathryn A. "The Relationship Between Pre-Reading Patterns of Behavior and Success with Specific Reading Methods of Kindergarten Children." (Unpub. doctoral dissertation, Oklahoma State University, 1975.)

- Vandever, Thomas R., and Donald D. Neville. "Modality Aptitude and Word Recognition." Journal of Reading Behavior, 6 (1974), 105-201.
- Waugh, R. P. "Relationship Between Modality Preference and Performance." Exceptional Children, 39 (1973), 465-470.
- Witkin, Herman, Donald R. Goodenough, and Stephen A. Karp. "Stability of Cognitive Style from Childhood to Young Adulthood." Journal of Personality and Social Psychology, 7 (1971), 291-300.
- Witkin, H. A., C. A. Moore, D. R. Goodenough, and P. W. Cox. "Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications." Review of Educational Research, 47 (Winter, 1977), 1-64.
- Young, Dorothy J. "The Relationship Between Pre-Reading Behavior Patterns and Success of Specific Reading Methods with Kindergarten Children." (Unpub. doctoral dissertation, Oklahoma State University, 1975.)

APPENDIX A

SUMMARY OF SIGNIFICANT PREDICTOR VARIABLES-  
TREADWAY (1975)



# SUMMARY OF SIGNIFICANT PREDICTOR VARIABLES-TREADWAY (1975)

Auditory-Visual	Visual-Auditory	Linguistic	Linguistic Language Experience
Grammatic Closure (ITPA)	Alphabet (MRT)	Alphabet (MRT)	Numbers (MRT)
Vocabulary (WPPSI)	Geometric Design (WPPSI)	Picture Completion (WPPSI)	Sound Blending (ITPA)
Visual Association (ITPA)	Word Meaning (MRT)	Sound Blending (ITPA)	Alphabet (MRT)
Numbers (MRT)	Visual Memory (DARD)	Animal House (WPPSI)	Auditory Reception (ITPA)
Sound Blending (ITPA)	Visual Closure (ITPA)	Sentences (WPPSI)	Picture Completion (WPPSI)
Receptive Vocabulary (PPVT)	Similarities (WPPSI)	Grammatic Closure (ITPA)	Information (WPPSI)
Alphabet (MRT)	Auditory Reception (ITPA)	Matching (MRT)	Matching (MRT)
Auditory Reception (ITPA)		Copying (MRT)	Manual Expression (ITPA)
Matching (MRT)		Visual Reception (ITPA)	
		Numbers (MRT)	
		Manual Expression (ITPA)	

Significance was  $F=.05$ .

ITPA = The Illinois Test of Psycholinguistic Abilities; MRT = The Metropolitan Readiness Test;  
 PPVT = The Peabody Picture Vocabulary Test; DARD = Durrell Analysis of Reading Difficulty; WPPSI =  
Weschler Preschool and Primary Scale of Intelligence; WISC-R = Weschler Preschool and Primary Scale of  
Intelligence.

## APPENDIX B

### SUMMARY OF SIGNIFICANT PREDICTOR VARIABLES-

YOUNG (1975)

# SUMMARY OF SIGNIFICANT PREDICTOR VARIABLES-YOUNG (1975)

Auditory-Visual	Visual-Auditory	Linguistic	Linguistic Language Experience
Learning Rate (MD)	Letter Names II (MD)	Letter Names II (MD)	Learning Rate (MD)
Grammatic Closure (ITPA)	Geometric Design (WPPSI)	Learning Rate (MD)	Sound Blending (ITPA)
Sound Blending (ITPA)	Learning Rate (MD)	Picture Completion (WPPSI)	Animal House (WPPSI)
Phonemes I (MD)	Auditory Association	Animal House (WPPSI)	Visual Memory (ITPA)
Visual Association (ITPA)	(ITPA)	Sentences (WPPSI)	Auditory Reception (ITPA)
Vocabulary (WPPSI)	Mazes (WPPSI)	Auditory Association (ITPA)	
Receptive Vocabulary (PPVT)	Picture Completion	Phonemes II (MD)	
Geometric Design (WPPSI)	(WPPSI)	Grammatic Closure (ITPA)	
Information (WPPSI)	Visual Reception (ITPA)	Auditory Closure (ITPA)	

Significance was  $F=.05$

MD = Murphy-Durrell Readiness Test; WPPSI = Weschler Preschool and Primary Scale for Intelligence;  
ITPA = The Illinois Test of Psycholinguistic Abilities; PPVT = The Peabody Picture Vocabulary Test.

## APPENDIX C

### MEANS, STANDARD DEVIATIONS, AND RANGE FOR RAY READING METHODS TEST

MEANS, STANDARD DEVIATIONS, AND RANGE FOR  
RAY READING METHODS TEST  
(N = 121)

	Auditory- Visual Method	Visual- Auditory Method	Linguistic Word Structure Method	Language Experience Method
Mean	3.52	5.36	3.45	6.07
Standard Deviation	3.29	2.79	2.77	2.75
Range	10	10	10	10

## APPENDIX D

MEANS, STANDARD DEVIATIONS, AND RANGE FOR  
MEASURES OF COGNITIVE STYLE

MEANS, STANDARD DEVIATIONS, AND RANGE FOR  
MEASURES OF COGNITIVE STYLE  
(N = 121)

	CEFT	MFF Latency	MFF Errors	Impulsivity z Score	Efficiency z Score
Mean	6.52	7.46	20.6	.639	-.065
Standard Deviation	2.99	4.80	6.72	1.417	.835
Range	16	33.29	29	7.69	4.62

## VITA<sup>2</sup>

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Doctor of Education

Thesis: THE RELATIONSHIP BETWEEN DIMENSIONS OF COGNITIVE STYLE AND  
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