Thinking Styles (Right-Left Brain Dominance) Of School Administrators And Their Relationship To Leader Effectiveness (Hemisphericity, Supervision)

Bradley Scott Reitz
University of Nevada, Las Vegas

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University of Nevada, Las Vegas

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THINKING STYLES (RIGHT-LEFT BRAIN DOMINANCE) OF SCHOOL ADMINISTRATORS AND THEIR RELATIONSHIP TO LEADER EFFECTIVENESS

By
Brad Reitz

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Administration

Department of Educational Administration and Higher Education
University of Nevada, Las Vegas
March, 1986
The dissertation of Brad Reitz for the degree of Doctor of Education in Educational Administration and Higher Education is approved.

Chairperson, Dr. Anthony Saville

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University of Nevada
Las Vegas, Nevada
March, 1986
ABSTRACT

This study was designed to analyze the thinking styles of selected school administrators and to assess whether specific thinking styles were related to effectiveness. Subjects selected for the study were the 226 applicants to the Tennessee Administrator Career Ladder Program, of which 107 chose to participate.

The Human Information Processing Survey (HIPS) was used to measure the degree of left, integrated, and right preferred thinking styles of the participants. Raw scores were converted to standard scores and analyzed according to the independent variables of gender, position, age, experience, education, type of school, and level of effectiveness. The measure of effectiveness was obtained through the Career Ladder Program results.

Analysis of variance tests (ANOVA) were computed for each of the scores grouped according to the above referenced independent variables. An additional dependent variable measured was overall thinking style, a classification obtained through analyzing the grouping of the thinking style scores. Chi Square tests for independence of classification were calculated for overall thinking style categorized according to the independent variables.
Results of all statistical treatments indicated no significant difference existed among any of the groups compared. Not only was there no difference in the thinking styles of administrators grouped according to the various demographic variables, there also appeared to be no relationship between thinking styles and leadership effectiveness. All null hypotheses of the study were accepted and all research hypotheses rejected.
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CHAPTER I

INTRODUCTION

School administrators confront a multitude of problems each day, many of which are new and complex issues that require effective, and sometimes creative solutions. (Hagar and Scar, 1983) To compound this dilemma, financial support for educational programs is declining as a result of doubts about the public schools ability to produce results. (Brandt, 1983; Cove, 1982) In light of the increased demands placed upon the schools today and the need to demonstrate public education's ability to produce quantifiable results, researchers in the field have studied the decision making process to identify characteristics of effective school administrators. (Drucker, 1982)

Research in the area of brain hemisphericity, commonly known as left-brain/right-brain thinking has been widely publicized in recent years with implications of great significance to education. (Hart, 1983) Very little of this research, however, has been applied to the field of educational administration. The theory that "school administrators can make better educational decisions by applying the findings of brain research" was asserted by
Cove (1982, p. 67) in a recent NASSP Bulletin. Cove stated:

The administrator seeking to apply the findings of the neurosciences to the decision making processes is likely to gain a new perspective into what education is and should be, and be able to justify to a skeptical public with empirical evidence from new and promising scientific studies. (p. 67)

The role of the school principal as a vital determinant of school success has also been a widely discussed topic in the literature. (Leithwood and Montgomery, 1982) The many aspects of the role as well as the variety of psychological, behavioral, and interpersonal skills which are associated with it, have provided researchers in the field of educational administration a complex role with which to study. (Little, 1982)

In an extensive review of the literature, Wynn De Bevoise clearly demonstrated the need for continued study of the many factors associated with instructional leadership as it related to school effectiveness. De Bevoise (1984) stated:

Beyond lists of desirable characteristics and
essential functions, there is a growing awareness of the complexity and uniqueness of each principal’s situation, which dictates an idiosyncratic blend of the desirable and the possible. (p. 20)

Given the current interest in thinking styles and continued research in the area of principal effectiveness, a study was undertaken to determine how, if at all, the two were related.

Statement of the Problem

The purpose of the study was to provide practitioners in the field of education with insight into the thinking styles of school administrators. An accompanying purpose was to examine the extent that leadership effectiveness was related to thinking style. Data were analyzed in terms of exhibited thinking style and correlated with degree of leadership effectiveness and other demographic variables. An analysis of the correlation between variables was evaluated in terms of the null hypotheses. The following questions served as the basis for the collection of data:

1. Do administrators as a group exhibit one specific thinking style pattern more frequently than another?
2. Do administrators in different age groups exhibit different thinking style patterns?

3. Do administrators with more experience exhibit different thinking style patterns than their less experienced colleagues?

4. Do administrators with more formal education exhibit different thinking style patterns than those with less education?

5. Do rural administrators exhibit different thinking style patterns than urban administrators?

6. Do specific thinking style patterns correlate with the degree of measured leadership effectiveness?

Null Hypotheses

The null hypotheses served as the basis for the analysis of data for each question. Subsequent to data analysis, the null hypotheses were accepted for the following statements if the probability of committing a Type I error was at the p < .05 level and

1. There was no significant difference in the thinking styles administrators as a group preferred.
2. There was no significant difference in thinking patterns among different age groups.

3. There was no significant difference in the thinking style patterns of those administrators who have been in the field of educational administration for a longer period of time.

4. There was no significant difference in the thinking style patterns of administrators with more formal education.

5. There was no significant difference in the thinking style patterns of rural and urban administrators.

6. There was no significant relationship between thinking style patterns and effectiveness.

Research Hypotheses

Expected results of the study were obtained through a review of the literature and stated in terms of the following research hypotheses.

1. Administrators, in general, would exhibit left hemispheric processes more often than right.
2. Significant differences would exist when comparing thinking styles to different age groups in that older administrators would be more left or integrated in their thinking.

3. Significant differences would exist when comparing thinking styles to experience levels in that the more experienced administrators would be left oriented.

4. Significant differences would exist in that the greater the level of education, the more likely the administrator would be left oriented.

5. Significant differences would exist in the thinking styles exhibited by rural and urban administrators in that rural administrators would be more right oriented.

6. Specific thinking styles would correlate with the degree of administrative effectiveness in that the more effective administrators would be more integrated or right in their thinking style pattern.
Need for the Study

Coulson and Strickland (1983) emphasized that creative and effective solutions to the problems facing the schools today are desperately needed. This study was a preliminary attempt to identify and label those administrators, or groups of administrators who were most likely to be more effective when seeking solutions to the complex problems they faced. If it could be determined that certain groups of administrators were more likely to use a certain type of thinking style and if that style could be positively related to leadership effectiveness, then practitioners and researchers alike would be able to gain greater insight into the complex business of running an effective school.

Educators have not been alone in their efforts to identify the positive attributes of left and right-brained thinking. Marilyn Ferguson, author of *BRAIN-MIND BULLETIN* and *AQUARIAN CONSPIRACY* believed that professionals in all fields must explore the full capabilities of the brain, especially that of the right hemisphere. Ferguson also documented the fact that many major events of historical significance were accomplished as a result of employing right brained thinking skills. (1980)

Understanding the mysteries of the brain has fascinated scientists for many years. (Teyler, 1978)
Researchers in the field of educational administration have been particularly interested in the behavior of effective administrators. If information in the area of brain hemisphericity as it relates to effectiveness, can be added to the body of knowledge to be learned about educational administration, the results of the study may then be of value to other practitioners and researchers in the field.

Leithwood and Montgomery in their review of the literature on principal effectiveness suggest a paradigm to guide future research. (1982) They stated that a multitude of information is available related to principal strategies when what is needed is more data on how those strategies are related to school or classroom factors. When research assumes the principal is the independent variable and the school or classroom factors the dependent variables, Leithwood and Montgomery believed practical advice for principals may be the result.

Assumptions

1. It is assumed that many school administrators are left-brain dominant for a variety of reasons. Rarely is creativity emphasized in the work they do or in the training they receive. In addition, the structure in which they work does not usually reward creative efforts. (Coulson and Strickland, 1983)
2. It is assumed that men and women approach decisions differently as a result of different experiences they have had related to their gender. As a result, their preferred thinking styles may vary to some extent. (Science News, 1979)

3. It is assumed that different generations are a product of different experiences which may lead them to prefer on specific thinking style over another.

4. It is assumed that urban administrators confront problems which are quite different from their rural counterparts. As a result, their preferred thinking styles may be quite different.

5. It is assumed that the number of years that one is in administration may tend to affect the manner in which problems are approached and may subsequently lead to differences in thinking styles.

6. It is assumed that some administrators are more effective than others for a variety of reasons.
Limitations of the Study

The results of the study were limited as a result of the sample being restricted to volunteering administrators in the state of Tennessee who applied for the Tennessee Career Ladder Program. The study was also limited by the reliability of the subjects’ responses on a self-evaluated paper and pencil test used to measure thinking style.

Normal restrictions also occurred as a result of the standard error of measurement associated with the correlational statistics used in the determination of whether to accept or reject the null hypotheses.

Additional restrictions occurred through the evaluation of effectiveness for the Career Ladder Program. Although extensive sources of data were used for determining advancement on the ladder, some degree of error may be attributed to the individual sources of measurement.

For the purpose of measurement, administrator effectiveness was described as a "tripolar" trait, when in actuality a continuum ranging from the least to the most effective exists.

Limitations also occurred in the use of those administrators who did not advance on the career ladder as
a source of data. The many reasons why one would not advance could not be taken into account in the study and conclusions related to that group must reflect that concern.

Method, Plan, and Design of the Research

School administrators in Tennessee who applied for Career Ladder certification were administered the Human Information Processing Survey as a measure of right or left-brain preferred thinking style. A questionnaire was also administered to measure the occurrence of other relevant variables. Results were tabulated and reported in terms of frequency. Respondents were grouped according to career level certification as either Level I, Level II, or not certified. Analysis of variance (ANOVA) tests were used to measure the relationship of the independent variables to the dependent variables, which were the thinking style scores. The Scheffe a-posteriori test was used to further analyze any significant relationships among subgroups.

Definition of Terms

1. INSTRUCTIONAL SUPERVISOR refers to all certificated personnel not regularly employed as a classroom teacher, principal, or assistant principal but employed
for at least 90% in support of the instructional program and in a teacher supervisory role.

2. **RIGHT-BRAIN THINKING** refers to the use of the right hemisphere of the brain especially used for emotions, intuition, and creativity. (Levy, 1983:68) Right-brained individuals are often creative, expressive, and intuitive. (Coulson and Strickland, 1983)

3. **LEFT-BRAIN THINKING** refers to analytical and rational activities. Left-brain thinkers are often sequential, analytical, and rational thinkers. (Coulson and Strickland, 1983)

4. **RURAL ADMINISTRATOR** refers to those administrators that classified themselves as such on the demographic questionnaire.

5. **EFFECTIVENESS** refers to the classification of the Career Ladder Program each administrator received after thorough evaluation.

**Organization of the Study**

Chapter I included a brief introduction of the study, statement of the problem, research and null
hypotheses, assumptions, limitations, design of the study, and definition of terms. Chapter II included a review of the literature relative to right and left-brain thinking and leadership effectiveness. Chapter III included the research design and the collection and analysis of data in Chapter IV. Chapter V included a summary, conclusions, and recommendations for future study.
CHAPTER II

REVIEW OF RELATED LITERATURE

Chapter II included a review of the literature related to the two areas studied: thinking styles and leadership effectiveness. While many references were available for the study of leader effectiveness, thinking styles was a new area of inquiry, especially as it related to the field of educational administration.

Leadership Effectiveness

According to Wiles (1975) the nature of leadership has been widely studied since the turn of the century. The earliest attempts at defining the characteristics of successful leaders were focused upon the identification of personality traits which were assumed to be a significant element of effective leaders. It was thought that if personality traits could be defined which characterized effective leaders, selecting administrators would merely be the identification of individuals with certain specified traits.

At the turn of the century, most leadership was based upon the Scientific Management Theory, begun by "efficiency
experts" such as Henri Fayol and Frederick Winslow Taylor. (Griffiths, 1964) Effective leaders were believed to be able to create task efficiency, achieved through the organization of worker tasks. Task orientation was the primary concern of the leader.

The Hawthorne experiments, led by Harvard's Elton Mayo, began the discovery of certain leadership practices which were common at the time. (Roethlisberger, 1941) Mayo and his associates found that many leaders operated under the assumption that their workers were basically a mob of unorganized persons driven only by physiological and safety needs and who had little to contribute to the overall benefit of the organization. He termed this common assumption the "Rabble Hypothesis" and believed it resulted in managers assuming task oriented, authoritarian roles, which Mayo believed were ineffective.

The Scientific and Human Relations Movements, which began in the early part of the century characterize the basic elements of leadership dominating the literature today: concern for tasks and concern for relationships.

Along with Mayo, Chester Barnard was considered one of the founders of the Human Relations Movement, largely as a result of his book *The Functions of the Executive*. Barnard (1938) realized the importance of relationships
within an organization and asserted that an executive must maintain a spirit of cooperation and must persuade individuals to work towards the specified goals of the organization.

The work of Mayo and Barnard may have inspired a similar theory of leader effectiveness which was developed by Douglass McGregor. While Mayo realized certain assumptions were prevalent among managers at the time (Rabble Hypothesis), McGregor (1960) added an alternative approach to leadership. Called Theory X-Theory Y, McGregor contrasted opposing as founders of the Human Relations Movement, largely as a result of his book *THE FUNCTIONS OF THE EXECUTIVE*. Barnard (1938) realized the importance of relationships within an organization and asserted that an executive must maintain a spirit of cooperation and must persuade individuals to work towards the specified goals of the organization.

The work of Mayo and Barnard may have inspired a similar theory of leader effectiveness which was developed by Douglass McGregor. While Mayo realized certain assumptions were prevalent among managers at the time (Rabble Hypothesis), McGregor (1960) added an alternative approach to leadership. Called Theory X-Theory Y, McGregor contrasted opposing assumptions managers made about human nature. Theory X assumptions were: 

"(1) work is
inherently distasteful; (2) people are not responsible and prefer to be directed; and, (3) people must be controlled in the work environment and are only motivated by physiological and safety needs. Theory Y assumptions were: "(1) work is a natural process; (2) people can be self-directed and are capable of problem solving; and, (3) motivation can occur at the social, esteem, and self-actualization levels of needs."

Chris Argyris, while at Yale and Harvard Universities, used McGregor's assumptions and developed accompanying managerial value systems for each. He termed Bureaucratic/Pyramidal values as those associated with Theory X assumptions and Humanistic/Democratic values as those associated with Theory Y. Argyris (1962) believed that following bureaucratic or pyramidal values led to an unsafe psychological environment, distrust, and shallow relationships. He further believed that effectiveness was a result of the increased cooperation, trust, and authenticity achieved through following humanistic or democratic values.

Not unlike Argyris' concept of moving people towards more mature behavior, Frederick Herzberg developed a theory based upon the motivation and the hygiene factors of the work environment. Herzberg (1968) identified distinctly different factors responsible for job satisfaction.
Herzberg believed that separate factors needed to be considered when considering either job satisfaction or job dissatisfaction and that the factors were not opposites of each other. That is, the opposite of job satisfaction is not dissatisfaction and the opposite of dissatisfaction is not satisfaction. In other words, the absence of one does not necessarily imply that the other is present. It merely means that the factors which cause each are separate factors and must be considered as such.

According to Herzberg, the effective leader understands the distinctly different factors associated with motivation and job dissatisfaction. When used appropriately, increased responsibility, recognition, achievement, growth, and learning characterize the effective workplace.

The previous theories of human behavior and leadership led to the development of leadership studies at Michigan and Ohio State Universities. The results of those studies began a period of viewing effective leadership styles as a result of two variables: people and task orientation.

The studies conducted at the University of Michigan yielded two aspects of leader orientation related to
effectiveness which were termed "employee orientation" and "production orientation." Employee oriented leaders emphasize relationships, trust, and individual needs while production oriented leaders emphasize the technical aspects of the job related to production. (Katz and others, 1950)

Results of the leadership studies conducted at Ohio State closely related to the dimensions of leader behavior identified at Michigan. The Ohio State staff termed "consideration" and "initiating structure" for the concepts represented by employee orientation and production orientation, respectively. The staff found that the two dimensions were separate and distinct dimensions which could be used to characterize the behavior of a leader. (Stogdill and Coons, 1957)

Robert Blake and Jane Mouton in their books THE MANAGERIAL GRID (1964), and THE ACADEMIC ADMINISTRATOR GRID (1981) identified the types of leadership styles which emerge as a result of the degree of concern for the two dimensions of leader behavior identified in the previous studies. Blake and Mouton charted the basic styles on a grid on the basis of relative degree of concern for each of the two dimensions.

Hersey and Blanchard (1977) in their book MANAGEMENT OF ORGANIZATIONAL BEHAVIOR added to the
idea that leadership styles were a result of concern for tasks and concern for relationships. In their Situational Leadership Theory, the concept of effectiveness was added to the work of their predecessors. In any given situation, depending on intervening variables, one style of leadership will be more effective than others. The task of the leader is to determine which style best meets the situational variables present, style being a mixture of the degree of concern for each of the two dimensions.

The Situational Leadership Theory described the effectiveness of different leadership styles as dependent upon the maturity of the individuals, or group, in relation to the task being confronted. The higher the degree of maturity, the greater concern for relationships. Conversely, when presenting new tasks to a group, a high degree of task behavior is necessary until the group progresses at which time concern for relationships gradually replaces task orientation.

While the literature of the past two decades is abundant with references related to effectiveness and successful schools (Behling, 1981), one recurring aspect of school management continues to emerge: in the multitude of complex relationships and competing factors, the principal is probably the most important determiner of school success. (Little, 1982; Bossert and others, 1982; Leithwood
and Montgomery, 1982; Duke, 1982; Blumberg and Greenfield, 1980; Brandt, 1981) While there are many factors which contribute to a successful school, the presence of a principal who exercises strong leadership abilities is frequently noted. (Brandt, 1981; Brown and Dixon, 1975; Clark, 1980; Edmonds, 1979; NWERL, 1984; Phi Delta Kappa, 1980; Shoemaker and Fraser, 1981)

One of the earliest, and frequently quoted, attempts at identifying quantifiable measures of principal effectiveness was a study by Neal Gross and Robert Herriott. (1960) Voluminous amounts of data from principals, teachers, and higher education administrators from across the United States were gathered to analyze whether the principal can have a significant effect on the school and to isolate determiners of leadership. It was found that leadership directly affects the teacher morale and performance within a school and is slightly related to the reading achievement of the students. Correlational tests found that no relationship existed between many demographic variables with the exception of negative correlations found related to the age of the principal, size of the school, and amount of formal education.

Gross and Herriott also found positive correlations between leadership effectiveness and participative
decision-making, the level of support offered, amount of time spent at work, and the principal's own internalization of professional leadership role and service motive, among other elements.

Austin (1978) and Wyant (1980) further substantiated the claims of Gross and Herriott in their conclusions that principal-teacher relationships were more positive in more successful schools than in less effective schools. In further evidence of the importance of school climate, Austin (1978), Brandt (1981), and Lonoff (1971) found that staff attitudes in general were more positive in more successful schools than in less successful ones.

Unfortunately, not all of the research published has been positive. In two highly publicized studies, Coleman (1966) and Jencks (1972) criticized the public school's ability to make a difference in the achievement levels of poor and minority children. Bickel (1983) attributes much of the current emphasis on principal and school effectiveness partially as an effort to dispute the negative studies.

While there has been a great deal written about the many activities principals engage in on a daily basis, a large portion of the literature on leader behavior can be classified as either affecting school climate or the
instructional organization. (Bossert and others, 1982; Dwyer, 1984; Leithwood and Montgomery, 1982) These two dimensions of concern parallel the task and relationship aspects of leader behavior cited in earlier, and not necessarily education related studies. (Katz and others, 1950; Stogdill and Coons, 1957; Blake and Mouton, 1964 and 1981; Hersey and Blanchard, 1977)

In summarizing their research on effective principals, Leithwood and Montgomery (1982) found that:

Effective principals work toward their goals by attempting to influence a complex set of classroom-based and school-wide factors...Effective principals also work closely and regularly with teachers to identify classroom instructional priorities and means for their achievement...In the school, but outside the classroom, effective principals attempt to establish an organizational backdrop to support and reinforce the effects of classroom activity. (p. 334)

In discussing the Far West Laboratory for Educational Research and Development efforts at examining factors related to principal effectiveness, David Dwyer (1984:36) pointed out that although all the principals studied worked
"to improve climate and instructional organization in their schools, their specific activities and strategies differed." Dwyer believed that to be the most significant outcome of the research. The study found varied successful approaches to similar problems and concluded, as did Leithwood and Montgomery, that the two distinct dimensions of activities present were either school climate or instructional organization oriented. (p. 34, Fig. 1)

Bossert and others (1982, p. 40) also found that there were two basic areas characteristic of effective principal activities: instructional organization and school climate. Their review of the literature revealed that instructional management included six basic factors: time on task; class size and composition; grouping; curriculum; evaluation; and task characteristics.

The authors noted (p. 44) that analysis of instructional management failed to account for many other aspects of successful schools and effective principals. Throughout the research, factors related to school climate appeared as significant indices of effectiveness and as a more problematic area than instructional organization. The informal organizational aspects of sentiments, beliefs, attitudes, cooperation, and consensus of participants towards goals emerged as important elements of overall success.
While the preceding literature provided a broad framework for analysis, Little (1982) pointed out that:

While they do not yet parallel in rigor, breadth, or consistency the effective instruction research or some of the effective schools research, studies of the principalship have generated an array of insights, clues, and curiosities worth pursuing. (p. 39)

Proficiency in articulating the school's goals and objectives has been identified as a specific skill characteristic of effective principals. (Clark, 1980; Lonoff, 1971; Mulford, 1982; NAESP, 1984; Shoemaker and Fraser, 1981; Wyant, 1980) The ability to frame goals and objectives, set appropriate standards and expectations, and provide continuous feedback about performance in relation to the goals and objectives has been established as one indicator of effectiveness.

In an exhaustive study of the literature, Northwest Regional Education Laboratory (1985) reviewed hundreds of documents related to effective schooling. The study concluded:

The effective schooling research base identifies
schooling practices and characteristics associated with measurable improvements in student achievement and excellence in student behavior. The 'effective schooling practices' include elements of schooling associated with a clearly defined curriculum; focused classroom instruction and management; firm, consistent discipline; close monitoring of student performance and strong instructional leadership. (p. 1)

The research synthesis was organized into a paradigm consisting of three parts: classroom characteristics and practices; school characteristics and practices; and district characteristics and practices. The most applicable to the current area of inquiry were the results gleaned from the school characteristics section. In a summary statement about their findings, the authors wrote:

The school is more than a collection of people, subjects, and grade levels. The qualities of the school as a whole can either enhance or detract from the classroom learning environment. Clear expectations, consistency and collaboration among adults, strong instructional leadership and a central focus on learning are all important in pursuing instructional effectiveness. (p. 7)
Tennessee Career Ladder Program

In 1983, the Tennessee Department of Education began reviewing the literature related to effective schools in the areas of teaching and educational administration with the goal of developing a career ladder program designed to address the growing demand for excellence in education. In 1985 the State Board of Education approved the administrator/supervisor evaluation system designed to measure the effectiveness of administrators seeking career ladder certification.

Five domains of competence were selected for evaluation in the program: instructional leadership; organizational management; communication and interpersonal relations; professional growth and leadership; and a screening of basic communication skills. Each domain of competence was described in detail and accompanied by indicators and measurement items used in the assessment of program candidates. Separate domains, indices, and measurement techniques were used for principals, or assistant principals, and supervisors. Following assessment, certification was granted as either Career Level I, Career Level II, or no certification. Identified competencies may be found in Appendix A.
Of primary importance to the validity of the assessment were the data sources which were examined. In reference to the data sources, the Tennessee Administrator/Supervisor Career Ladder Orientation Manual (1985) stated:

The use of multiple data sources is a key concept of the Administrator/Supervisor Evaluation System. Each competency, performance indicator, and measurement item relies on more than one source of information to insure the evaluation process is objective and fair. In addition, only carefully selected and trained evaluators are used to gather the information for the evaluation process. (p. 20)

The multiple data sources used in the evaluation included candidate interviews, observations, multiple questionnaires, a portfolio evaluation, and a professional skills test. Evaluators completed four weeks of intensive training and tested the system with over 140 principals and assistant principals throughout the state. The Professional Skills Test was administered to over 500 persons in the validation process.

In the first year of the program, 226 candidates applied for career ladder certification and were used as
the population for the research study being discussed. Of
the 226 candidates, completed evaluations were obtained
from 217 candidates. Only data obtained from completed
evaluations were used in the statistical analysis,
described more fully in Chapters III and IV.

Thinking Styles Research

The second area of the literature reviewed was that of
brain hemisphericity, or right-brain/left-brain dominance.
The concept of brain dominance began in the mid-nineteenth
century with a discovery by Paul Broca which found that
injuries to a certain portion of the left side of the brain
produced language disorders, while injuries to the same
area of the right side of the brain did not produce the
same disorders. (Walsh, 1978) Shortly thereafter, another
scientist named Carl Wernicke found that injuries to a
different area of the left side of the brain produced an
entirely different language disorder, while injuries to the
same area of the right side of the brain again had no
effect. (Williams, 1983) These two discoveries inspired
further research into the notion that the two hemispheres
of the brain perform entirely different activities and
marked the birth of the theory of brain lateralization.

According to Williams (1983), for quite some time it
was believed that the left hemisphere was the most
important while the right remained insignificant. World War II however, provided a great many patients with injuries to the right side of the brain and proved that both hemispheres control different functions. It was found that although no language disorder was apparent in right-brain injured patients, several spatial, visual, and tactile disorders occurred as a result of injuries sustained to the right hemisphere.

A great deal of the research exploring the different functions of the two hemispheres has been done under the direction of Roger Sperry. Sperry (1975) reported that each area of the brain has its own specialized sensations, precepts, and experiences. Upon surgical disconnection of the different spheres, certain mammals were found to be unable to integrate the information stored with that of other sections.

Along with Sperry, the work of Robert Ornstein (1972) has been noted as establishing the fact that the two sides of the brain perform very different functions. In right handed individuals, the left side of the brain controls analytic, language, and math skills, while the right side of the brain controls holistic patterns, spatial concepts, and imagery. In left handed individuals, according to Ornstein, the same may be true or specialization may be just the opposite.
While hemispheric language specialization has been documented, additional efforts have attempted to define very specific locations within the language dominant hemisphere which are responsible for the various language skills. Using craniotomy patients under local anesthesia, Ojemian and Mateer (1979) found common neural systems for language production and understanding, phoneme identification, facial movements, and short term memory.

The right hemisphere of the brain was shown by Schwartz and others (1975), to play a significant role in emotions which can be predicted depending upon the type of cognitive task undertaken. Using eye movement as a measure of specialization, they found that "spatial and emotional questions tended to reflect more right hemisphere activity than nonemotional and verbal questions." (p. 287) Data were also found to support the hypothesis that "in complex tasks, discrimination of affective processes does occur in terms of hemispheric functioning." (p. 288)

Research conducted by Gur and Packer (1980) suggests that in addition to specialized hemispheric processes, the two sides of the brain are quite different in composition. By using xenon gas in subjects with left hemisphere language specialization, the researchers concluded that a higher ratio of gray to white matter existed in the left
hemisphere. They also found the relative weight of the gray matter to be greater than the white. The authors suggested that the study of magnitude and variability within the two hemispheres may lead to identification of the language dominant location.

Kane and Kane (1979) pointed out that left alone, the right brain tends to be vague, undefined, and inarticulate. When linked with the left, the ability to infer or derive information and process large amounts of data cannot be measured in terms of maximum potential. While the left brain can be evaluated through standard tests, such as those that measure I.Q. which are largely dependent upon verbal abilities, the upper capacity of the right brain has yet to be fully quantified.

The question of whether handedness is related to brain lateralization was discussed by Levy (1976), Levy and Reid (1976), Moscovitch and Smith (1979), and Herron and others (1979). While Levy first reported that normal writing posture was contralateral to the linguistic specialized hemisphere and ipsilateral to those with inverted postures, Moscovitch and Smith questioned that conclusion. In a study measuring a variety of visual, tactile, and auditory skills the authors found that inverted position writers are a result of occipital compensation for perceptual differences occurring at the visual level only. Herron,
Gallin, and Johnstone (1979) arrived at a similar conclusion, finding that "writing position, although it may indicate a different pattern of brain organization, cannot be used to identify the language specialized hemisphere." (p. 1289)

Perelle and Ehrman (1983) found that in right handed individuals, linguistic specialization was in the left hemisphere as a result of efficiency in specialization. That is, since language was in the left and the opposite side of the brain controls fine and gross motor movements, it was a more natural approach. Left handed writers, they concluded, were a result of one of three circumstances: pathological, natural, and learned. Pathological left handers were a result of injury or trauma; natural were because of true contralateral specialization; and learned were from reinforcement at an early age, although the position was not the most efficient.

A new area of inquiry under investigation is the degree to which brain cells and brain growth occur after birth, thereby subject to environmental factors. A study conducted at MIT by Joseph Altman (1981) concluded that up to 90% of the neurons in the brain of some mammals are formed after birth. While proliferation of microneurons in the hippocampus of humans up to four years of age has been proven, current study of the human cortex is underway by
researchers attempting to conclude the same thing. How this affects the degree of lateralization has yet to be determined.

A well publicized author, Herman Epstein (1974, 1978) has also written about brain growth. It was found that children appeared to show sudden gains in head size at roughly the same age as Piaget's different developmental stages begin. This led to claims by Epstein and Brooks and others (1983) about the need to tailor education to the different brain growth periods to more directly coincide with student's cognitive and developmental levels.

The claim of "brain growth spurts" is not without criticism. McQueen (1984) refuted much of Epstein's data and cited supporting evidence to the contrary. He believed that educators must wait until the findings of the neurosciences are more complete and to not do so, would be irresponsible.

The concept of brain lateralization and accompanying belief of hemispheric dominance, without question, has led educators into a new field of inquiry as it relates to learning. According to Hart (1983), biological information about brain development has surfaced with many implications of significance to the educational process. This significance is characterized by the writing of Ned
Herrmann (1982), author of a test for measuring the degree of lateralization used in the processing of information:

For a great majority of people, the left brain is far better at performing logical, analytic, mathematic tasks; particularly those involving lineal and sequential processing. In distinct contrast, the right brain is much better at non-verbal ideation, intuition, holistic and synthesizing activities and tasks; particularly those involving spatial, visual, and simultaneous processing. In other words, the left brain does good at language, does well at arithmetic, and can plan and schedule and organize events very precisely. The right brain is musical and artistic, sees the forest instead of the trees, helps us drive cars and ski without cracking up, and is amazingly good at hunches and 'intuitive' flashes. (p. 31)

Similar descriptions are provided by Andrews (1980), Ornstein (1972), and Sperry (1975), which label the right-brain as dominating affective processes, intuition, and creativity and the left-brain as being sequential, goal-oriented, and analytical.

The differences cited above about the specialization
of hemispheric processes are being taken into consideration by curriculum developers attempting to meet the needs of children with different thinking style strengths. As Leslie Hart (1981) wrote in a recent Kappan article:

It is time to seek methods that work rather than mindlessly continuing to adhere to an inherently defective system...Our need now is for non-rote "intellectual" learning that uses our entire cerebrum effectively. (p. 506)

Madeline Hunter (1976) further cautioned educators to be aware of the unique differences hemispheric specialization causes in the ability of people to learn new information. Hunter suggested that teachers should augment the stimulus given to one hemisphere with a different stimulus aimed at the other. Practice should deliberately be given the weak area of specialization to help students overcome their deficiencies. Hunter further asserted that educators should "practice what they preach" by developing and modeling equal specialization of the two hemispheres.

Telzrow (1981) also concluded that "greater knowledge of the brain and its implications for curriculum and instruction can help educators avoid labeling a child special for his failure to conform to the system. (p. 482) One possible reason for the labeling of some children as
"special" may be the difference in brain development stages of the two sexes. According to Restak (1979) and Levy (1978), boys tend to be slower in developing the left side of the brain, while at the same time they tend to be superior at tasks involving the right. While the boy primarily learns through manipulative and visual means, school usually consists of sitting for extended periods and listening.

Edwards (1982), Hart (1981), Samples (1975), Gaylean (1983), and a host of others have written about the need for schools to refocus their approach on a more integrated method of teaching the curriculum. Gaylean describes various methods which can be used for incorporating right-brain skills with traditional left-brain activities, while Hart (p. 506) argues for a departure from the traditional "rote learning" approach to one that uses our entire cerebrum effectively. Samples recognizes the lack of right-brain activities in the school and attempts to achieve cerebral integration through his approach towards balancing the curriculum.

Margaret Hatcher also emphasized the need for educators to understand the balance which exists between the two hemispheres and how our educational system must begin to equally focus upon both. She cited synectics, the process of teaching metaphorical thinking, as a natural
bridge between the two hemispheres. Also the use of multi-sensory and experiential approaches to begin to involve the right hemisphere more fully in the educational process. Hatcher suggested that education's emphasis on rational, logical thinking may suppress creativity and ignore the strengths of many of our students.

Just as the notion of brain dominance has inspired studies relative to its significance for learning, similar studies have been conducted which investigated its importance to careers in public and private work environments. An experiment was done at the University of Texas (Herrmann, 1982) which measured the EEG waves of accountants and artists—two very different occupations. It was assumed, and confirmed, that accountants would more frequently use the left hemisphere for the processing of information and that artists would dominantly use the right processes for creative and holistic use of visual images, spatial relations, and integrative thought.

A similar study was conducted by Coulson and Strickland (1983) which measured the different thinking styles of managers in two very different leadership roles: private organization chief executive officers and school district superintendents. Results of the study indicated that school superintendents were left-brained, rational quantitative thinkers; while in contrast, private
executives were more emotional, qualitative, experimental, and creative. These results, in addition to those previously cited, are typical of the kinds of applications in which research is being applied to this new area of inquiry.

Of special relevance to the current research investigation in the area of thinking style and leadership effectiveness was a doctoral dissertation completed by Cynthia Norris at the University of Tennessee. Norris (1984) examined the relationship of brain hemispheric specialization to creative leadership characteristics of selected Tennessee administrators. A total of 115 subjects, including superintendents, principals, and supervisors participated in the study which used the Herrmann Brain Dominance Instrument and a researcher developed questionnaire to measure the selected variables of brain dominance patterns and creative leadership.

Norris concluded that superintendents, as a group, had less tendency to use right-brained skills than did supervisors or principals. Similarly, supervisors scored the highest in that area. Results of the study revealed that our highest levels of educational leadership are dominated by persons unable to freely conceptualize visions of the future.
Of additional relevance to the current investigation was the finding that women comprised 79% of the group whose right-brain dominance score was found to be significantly related to high creativity. Norris felt this result suggests the important variable that sex differences represent in leadership positions.

McLean (1978), Cone (1981), and Hart (1983) have written about a new brain concept of significance to educational administrators which coincides with current lateralization research. The idea that the brain evolved in three stages, known as the triune brain theory, asserts that the R-complex was the first area to develop and is responsible for survival. The limbic system, responsible for emotions, evolved next. The last to develop, the neocortex, is cited as responsible for man becoming the dominant species. Cone (1981) asserts that "the administrator would do well to understand and apply brain related knowledge, such as this, to the decision-making process." (p. 72)

As with other areas of brain research, the triune brain theory has caused a considerable amount of disagreement. Hardyck (1981), although not refuting the concept itself, believed its application to education may be unfounded. Cited are contradictions and inconsistencies in the claims made by Leslie Hart (1981) about the
application of the Triune brain concept to education.

Piatt (1983) made a further case for managers to understand and employ the strengths of the two hemispheres within the educational process. He contended (p. 67) that "the most effective managers are those that can be equally as successful on tasks requiring either the left or the right hemisphere." Piatt also believed that integrated managers are more likely to have been right-brain dominant early in their careers and learned left-brain associated skills. The findings of Norris (1984) support this conclusion in that higher level leaders tend to be less right-brain oriented.

Reynolds and Torrance (1980) provided evidence that modification of preferred modes of thinking can occur through training over a relatively short period of time. Their finding, and those of others, adds relevance to inquiry seeking to measure and examine the strengths of the hemispheric processes. The authors found that the direction of the change, towards right or left, can be controlled and the magnitude influenced by the intensity and duration of the sessions.

Hatcher (1983) also suggested methods which can be used to begin employing the strengths of the right hemisphere when attempting to change preferred styles. The
emittance of alpha waves, which occur while we are deeply relaxed, engaged in creative endeavors, or through symbolic expression can be induced through relaxation techniques such as yoga, meditation, guided imagery, or visualization. It is assumed that persons desiring to increase synchronous brain activity may learn to utilize these techniques regularly within the context of regular daily activities to further develop the full range of human potential.

Curtis Gowan (1981) agreed with Hatcher in that any of the relaxation techniques which induce conscious cognition will allow subliminal (right hemisphere) processes to begin the process which can induce creativity. Right hemisphere activity, and the production of alpha waves, can produce the sudden unconscious and unexpected solutions to problems not arrived at through analytical thought. Gowan provided as evidence the fact that Einstein has been frequently quoted as saying he rarely thought in words, but rather by visualizing effects, possibilities, and consequences.

Win Wenger (1982) added to the body of information about right brain development and asserted that the way to develop any area of the brain is to work in the language of that part. The right brain deals with sensory images and impressions, therefore the way to develop it is through descriptions of the images and perceptions sensed. Wenger described in detail a technique using a tape recorder to
assist in the development of the right brains abilities.

In discussing the need for developing an integrated approach, Michael Andrews (1980) stated:

Using the subconscious mind, the right brain makes possible a kind of dynamic integration required for survival in a rapidly changing world that is becoming increasingly complex...The organic integration provides for a preconscious awareness of a complexity and of changing relationships too great for the conscious mind. (p. 83)

Jerre Levy (1985), an often published author in the field of brain research, emphasized that the integration of the two hemispheres, each providing its own specialized abilities, which accounts for the differences in the way people think. She demonstrated the need for educators and researchers to view the degree of skills associated with each hemisphere as a continuum, not to be considered separately, but rather as a part of an integrated whole.

Conclusion

It is an outgrowth of the research in the area of leadership effectiveness and brain hemisphericity that the
current investigation gained theoretical and practical significance. While much data existed to support the measurement of each variable independently, the investigation of the relationship between effectiveness and thinking styles has remained a vastly unexplored area. It was for precisely that reason that the current study sought to add to the body of knowledge in this new area of inquiry.
CHAPTER III

RESEARCH DESIGN

Chapter III included the organization of the study, a description of how the data were obtained from the participants, and a description of the research design used to analyze the results.

The study was organized to incorporate the results of the Tennessee Administrator Career Ladder Certification process conducted during the 1984-85 school year and to compare those results with the thinking style patterns of the participants. An accompanying purpose was to analyze the occurrence of different thinking styles according to selected demographic variables.

Subjects

A total of 226 administrators from throughout the state of Tennessee applied for Career Ladder Certification and became the subjects used in the investigation. A letter explaining the purpose of the study (Appendix B) and a questionnaire (Appendix C) were mailed to each of the Career Ladder applicants requesting their participation in the study. Six independent variables were identified
through a literature review as having a possible relationship to thinking styles and were included on the questionnaire. The eight variables were age, sex, type of position held, years in administration, highest earned degree, and type of work location.

Subjects responded to the questionnaire on an optical mark scanner sheet (Scantron) which was numerically coded to match items and facilitate computer analysis of the data.

**Measurement of Thinking Styles**

Measurement of thinking style was achieved through responses to a paper and pencil test, the Human Information Processing Survey, which consisted of 40 questions. Three possible choices were provided and participants were instructed to choose the response that closely matched their opinions or feelings. No items were allowed to be left blank.

Each question of the test was designed to elicit a response that could be classified as either left, right, or integrated thinking style. Analysis of the subject responses yielded separate scores for each of the three areas. The total of the scores always equaled 40, thus a significantly higher score in any one area automatically
lowered the possibility of high scores in the other areas.

The Human Information Processing Survey (HIPS) was originally developed by Paul Torrance, author of the Torrance Test of Creative Thinking. Entitled "Your Style of Learning and Thinking" (SOLAT), the test measured the same areas and contained many similar questions. The HIPS is a revision of the SOLAT produced by Torrance in collaboration with William Taggert. The original test of 50 items was reduced through items analysis and other measures of internal consistency.

Evidence of construct validity was achieved through correlational studies of the instrument with sixteen other tests or subtests which measured personality traits. Fifteen of the sixteen coefficients of correlation at the .05 level were found to exist and the other approached significance.

Concurrent validity measures of the HIPS attempted to use neuropsychological measures of hemisphericity assessment. Two common tests, the Conjugate Lateral Eye Movement and the Dichotic Listening tests were used in validation attempts. While two studies found no significant correlation, others found positive relationships to exist at the .01 and .05 levels.
In addition to the raw scores obtained from the Human Information Processing Survey, a composite classification of the scores was undertaken by the researcher to group respondents into one of four categories: left, integrated, right, or mixed dominant. The single category of thinking style pattern was used to account for variations in the three scores yielded by the HIPS and to provide a single dependent variable for analysis and further description.

Subjects were classified as having an integrated thinking style pattern when their raw scores on each of the three HIPS measures (left, integrated, right) were between the 40th and 60th percentile. Similarly, subjects with integrated scores above the 60th percentile and the other two scores below the 60th percentile were classified as an integrated pattern. The subjects with left or right scores above the 60th percentile, and the other two scores below that level were classified according to the high score. The fourth thinking pattern, mixed, was added to represent those individuals with low integrated scores and equally strong left and right scores. The authors of the test stated that although the mixed dominant category is not common, it represents individuals capable of applying the strengths of either hemisphere as required by the situation. Table 1 represents examples of typical scores.
**Example of Thinking Style Category Assignment According to Raw Scores**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentile Ranks of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>left</td>
</tr>
<tr>
<td>Left</td>
<td>65</td>
</tr>
<tr>
<td>Left</td>
<td>87</td>
</tr>
<tr>
<td>Integrated</td>
<td>36</td>
</tr>
<tr>
<td>Integrated</td>
<td>51</td>
</tr>
<tr>
<td>Right</td>
<td>39</td>
</tr>
<tr>
<td>Right</td>
<td>23</td>
</tr>
<tr>
<td>Mixed</td>
<td>75</td>
</tr>
</tbody>
</table>
and how they would be classified.

It should be emphasized that the categorization of thinking style pattern was to allow statistical analysis of a single nominal level dependent variable which accounted for a mixed style of processing, in addition to the analysis of variance measures of the three HIPS subtests.

Results of the three individual raw scores obtained from the HIPS were converted to standard scores prior to statistical analysis. Standard score and percentile conversions were made from a table supplied with the instrument. Analysis of variance (ANOVA) tests were conducted and the Scheffe a posteriori contrasts used when an F ratio was found to be significant at the p < .05 level.

Measurement of Leadership Effectiveness

The measurement of leadership effectiveness was accomplished by the Tennessee Department of Education through the Career Ladder Certification process. Five domains of competence were evaluated, each of which contained specific indicators of performance and measurement items which were assessed.

An important aspect of the certification process was the use of multiple data sources for each of the specific
measurement items. Specially trained evaluators were used in the assessment process to gather the information obtained from candidate interviews, observations, questionnaires, a portfolio review, and a specially developed test for administrators and supervisors.

Data sources contained 79 different scores for administrators and 62 different scores for supervisors. Each area of competency contained a different number of scores and was assigned a different weight within the total ranking. Specific minimum scores were established as standards for qualifying as either Career Level I or Career Level II.

Results of the Administrator Career Ladder Certification Process for the 1984-85 school year were provided by the Tennessee Department of Education and used as the measure of leader effectiveness in the study.
All 226 applicants of the Tennessee Administrator Career Ladder Program were asked to participate in the study. A total of 107 responses, or 42 percent were received. The results of statistical treatments, and findings related to each question were presented in Chapter IV.

1. Do administrators as a group exhibit one specific thinking style pattern more frequently than another?

The results of the Human Information Processing Survey raw scores were computed and reported in terms of standard score conversions. The two independent variables which were used to analyze groups of administrators were that of gender and type of position. Statistical treatments were performed first according to gender.

Of the 107 respondents, a total of 59, or 55 percent were men. Women accounted for 48 responses, or a total of 45 percent. Table 2 contains the results of the analysis of variance (ANOVA) measures which were computed for gender as the independent variable and thinking style as the
Table 2

ANOVA of Mean Thinking Style

Scores According to Gender

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>F Ratio</th>
<th>F Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>left</td>
<td>integ.</td>
<td>right</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>99</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>105</td>
<td>100</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>105</td>
<td>98</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.9</td>
<td>19.8</td>
<td>19.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.010</td>
<td>.428</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.919</td>
<td>.514</td>
<td>.545</td>
<td></td>
</tr>
</tbody>
</table>

Note. All standard scores are rounded amounts.
dependent variable.

While no significant differences were found to exist at the $p < 0.05$ level, the mean left thinking style scores for both men and women indicated that as a group, both men and women prefer a more left oriented style than the population used for the normative data of the test. Similarly, both groups scored less than the normative population in right thinking style scores. The fact that no significant differences were found related to gender was important in the statistical treatment of the other variables in that if significant differences were found to exist, the effects of gender would have to be removed to accurately assess the effects of the other variable.

The conversions of the mean standard scores for each group into percentile rankings, as shown in Table 3, demonstrated how the groups of administrators ranked according to the percentile norms of the test.

The second variable related to the first question was groups of administrators according to type of position. Applicants to the Tennessee Administrator Career Ladder Program were principals, assistant principals, and supervisors. Of the 107 responses, 61 (57%) were principals, 6 (6%) were assistant principals, and 40 (37%) were supervisors. Supervisors, defined by the Tennessee Department of Education and used in the study, were those
Table 3

Percentile Ranks of Mean Standard Scores According to Gender

<table>
<thead>
<tr>
<th>Percentile Scores</th>
<th>n</th>
<th>left</th>
<th>integ.</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>107</td>
<td>60</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td>Men</td>
<td>59</td>
<td>60</td>
<td>51</td>
<td>39</td>
</tr>
<tr>
<td>Women</td>
<td>48</td>
<td>61</td>
<td>47</td>
<td>44</td>
</tr>
</tbody>
</table>

Note. Percentile scores are rounded amounts.
persons not employed as a teacher, principal, or assistant principal, but who worked in a teacher supervisory role at least 90% of the time in support of the instructional program. Table 4 presents the ANOVA of mean responses for each of the three HIPS subtests with type of position as the independent variable and thinking style score as the dependent variable.

The analysis of variance tests shown in Table 4, did not demonstrate a significant difference existed in the scores of administrators grouped according to position, and no post hoc comparisons were made. Overall, it appeared that principals and assistant principals tended to more left oriented and less right oriented in their thinking styles than that of supervisors, who overall tended to demonstrate a more balanced pattern.

The conversions of the mean standard scores into percentile rankings, as shown in Table 5, demonstrates how the groups of administrators compared to each other and to the normative data of the test.

The categorization of thinking style scores as a descriptive method of classifying dominance into one nominal level variable, provided an additional method of
Table 4

**ANOVA of Mean Thinking Style**

**Scores According to Position**

<table>
<thead>
<tr>
<th></th>
<th>Mean Standard Scores</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>left</td>
<td>integ.</td>
<td>right</td>
</tr>
<tr>
<td>Total Group</td>
<td>107</td>
<td>105</td>
<td>99</td>
<td>95</td>
</tr>
<tr>
<td>Principal</td>
<td>61 (57%)</td>
<td>107</td>
<td>99</td>
<td>93</td>
</tr>
<tr>
<td>Assist. Prin.</td>
<td>6 (6%)</td>
<td>113</td>
<td>93</td>
<td>92</td>
</tr>
<tr>
<td>Supervisor</td>
<td>40 (37%)</td>
<td>101</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

**Standard Deviation**
- 19.880
- 19.756
- 19.799

**F Ratio**
- 1.556
- .275
- 1.203

**F Probability**
- .216
- .760
- .305

*Note.* All standard scores are rounded amounts.
Table 5

Percentile Ranks of Mean Standard Scores According to Position

<table>
<thead>
<tr>
<th>Percentile Scores</th>
<th>left</th>
<th>integ.</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Group</td>
<td>60</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td>Principal</td>
<td>64</td>
<td>50</td>
<td>36</td>
</tr>
<tr>
<td>Asst. Prin.</td>
<td>75</td>
<td>37</td>
<td>35</td>
</tr>
<tr>
<td>Supervisor</td>
<td>52</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Note. Percentile scores are rounded amounts.
analysis. Chi Square tests for independence of classification were used to determine whether a significant difference existed in classifications of overall thinking style according to gender and position, the two independent variables related to the first research question. Table 6 depicts gender classified according to the four possible thinking style patterns of left, integrated, right, or mixed. The independence of the classification approached significance ($p<0.07$) and demonstrated that females tended to have higher left and right style scores, whereas males reflected a more integrated overall style.

The results of classification according to type of position, as shown in Table 7, showed that principals and assistant principals were more left oriented in overall style and less right oriented than were the supervisors.
Table 6

Classification of Gender by Thinking Style Pattern

<table>
<thead>
<tr>
<th></th>
<th>left</th>
<th>integ.</th>
<th>right</th>
<th>mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>41 (38%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>19 (32%)</td>
<td>27 (46%)</td>
<td>8 (14%)</td>
<td>5 (8%)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>22 (44%)</td>
<td>16 (33%)</td>
<td>10 (21%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Chi Square ($3, N = 107$) = 7.201, $p = .065$

*Note.* Amount in parentheses are row percents.
Table 7

Classification of Position by Thinking Style Pattern

<table>
<thead>
<tr>
<th></th>
<th>left (%)</th>
<th>integ. (%)</th>
<th>right (%)</th>
<th>mixed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>41 (38%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td><strong>Principal</strong></td>
<td>27 (44%)</td>
<td>24 (39%)</td>
<td>8 (13%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td><strong>Asst. Prin.</strong></td>
<td>3 (50%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td><strong>Supervisor</strong></td>
<td>11 (28%)</td>
<td>18 (45%)</td>
<td>9 (23%)</td>
<td>2 (5%)</td>
</tr>
</tbody>
</table>

Chi Square ($\chi^2, N = 107$) = 6.440, $p = .376$

**Note.** Amount in parentheses are row percents.
2. Do administrators in different age groups exhibit different thinking style patterns?

The second question of the study investigated the difference of thinking style patterns of school administrators grouped according to age. Respondents identified themselves in one of the following age groups: 21 - 30; 31 - 40; 41 - 50; 51 - 60; over 60. Raw scores for each of the three subtests of the HIPS were tabulated and converted to standard scores. Mean standard scores for each of the groups and results of the analysis of variance measures are reported in Table 8.

While no significant differences were found to exist at the $p < .05$ level and no post hoc comparisons could be made, all of the groups reflected a left score greater than the mean of the normative data of the test. Similarly, all groups scored at, or below the 50th percentile of right score test norms. Of interest, although not significant, were the scores of administrators, aged 51-60 which appeared to reflect a left/integrated style and the administrators age 60 and over which appeared more integrated than left in style.

Individual scores on each of the three HIPS subtests
Table 8

ANOVA of Mean Thinking Style Scores According to Age.

<table>
<thead>
<tr>
<th></th>
<th>left</th>
<th>integ.</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Group</strong></td>
<td>107</td>
<td>105</td>
<td>100</td>
</tr>
<tr>
<td>21 - 30</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 - 40</td>
<td>21 (20%)</td>
<td>103</td>
<td>97</td>
</tr>
<tr>
<td>41 - 50</td>
<td>49 (46%)</td>
<td>104</td>
<td>100</td>
</tr>
<tr>
<td>51 - 60</td>
<td>29 (27%)</td>
<td>110</td>
<td>98</td>
</tr>
<tr>
<td>Over 60</td>
<td>8 (7%)</td>
<td>101</td>
<td>110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>19.880</th>
<th>19.756</th>
<th>19.759</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Ratio</td>
<td>.745</td>
<td>.823</td>
<td>.879</td>
</tr>
<tr>
<td>F Significance</td>
<td>.523</td>
<td>.484</td>
<td>.456</td>
</tr>
</tbody>
</table>

Note. All standard scores are rounded amounts.
were analyzed and the respondents were classified according to overall thinking pattern. The Chi Square test of independence was used to analyze the results of thinking style pattern according to age groups and is presented in Table 9.

The classification of individuals into a single type of overall thinking style yielded a Chi Square probability that reflected nearly a random assignment of groups. Of interest, although probably an anomaly of the small sample size, was the difference in left and right groups of the 51-60 age group which showed a higher left and lower right oriented style than any of the others.
Table 9

Classification of Age by Thinking Style Pattern.

<table>
<thead>
<tr>
<th></th>
<th>left</th>
<th>integ.</th>
<th>right</th>
<th>mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>41 (38%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>31 - 40</td>
<td>8 (38%)</td>
<td>8 (38%)</td>
<td>3 (14%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>41 - 50</td>
<td>16 (33%)</td>
<td>20 (41%)</td>
<td>11 (22%)</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>51 - 60</td>
<td>14 (48%)</td>
<td>11 (38%)</td>
<td>3 (10%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>over 60</td>
<td>3 (38%)</td>
<td>4 (50%)</td>
<td>1 (13%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Chi Square (9, n = 107) = 4.794, p = .852

Note. Amount in parentheses are rounded amounts.
3. Do administrators with more experience exhibit different thinking style patterns than their less experienced colleagues?

The third question of the study attempted to examine the difference in thinking style patterns of school administrators grouped according to length of time in the field of educational administration. The respondents identified themselves in one of the following groups according to their total years of experience: 1 - 5; 6 -10; 11 - 15; 16 - 20; over 20. Raw scores in each of the three subtests of the Human Information Processing Survey (HIPS) were tabulated and converted to standard scores. Mean standard scores for each of the groups and results of the analysis of variance measures were tabulated and reported in Table 10.

Although no significant differences were found to exist in any of the groups related to length of experience, the variance of right scores approached significance ($p < .10$) and may indicate that less experienced administrators tend to rely on more left oriented thinking style processes at the expense of the right. Also of interest was the apparent balanced thinking style pattern of those administrators with 6-15 years of experience.
Table 10

ANOVA of Mean Thinking Style Scores

According to Experience

<table>
<thead>
<tr>
<th>Mean Standard Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Total Group</td>
</tr>
<tr>
<td>1 - 5</td>
</tr>
<tr>
<td>6 - 10</td>
</tr>
<tr>
<td>11 - 15</td>
</tr>
<tr>
<td>16 - 20</td>
</tr>
<tr>
<td>over 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F Ratio</td>
<td>.687</td>
<td>1.556</td>
<td>2.011</td>
</tr>
<tr>
<td>F Significance</td>
<td>.602</td>
<td>.191</td>
<td>.098</td>
</tr>
</tbody>
</table>

Note. All standard scores are rounded amounts.
The classification of brain dominance into a single nominal level variable was also used to analyze the groups of administrators according to thinking style pattern and experience. The Chi Square test of independence of classification was applied to determine if significantly different thinking style patterns appeared relative to experience. Table 11 depicts the results of this analysis.

Of interest and consistent with the findings presented in Table 10, was the overall classification of thinking styles of the least experienced administrators. Where a possible over reliance on left oriented thinking styles to the neglect of right oriented ones were found in the analysis of variance measures, two-thirds of the group were characterized as predominantly left oriented in overall style, further substantiating the findings.
Table 11

Classification of Experience by
Thinking Style Pattern

<table>
<thead>
<tr>
<th></th>
<th>left</th>
<th>integ.</th>
<th>right</th>
<th>mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>41 (38%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>1 - 5</td>
<td>7 (64%)</td>
<td>4 (36%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 - 10</td>
<td>10 (33%)</td>
<td>12 (40%)</td>
<td>7 (23%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>11 - 15</td>
<td>9 (29%)</td>
<td>12 (29%)</td>
<td>7 (23%)</td>
<td>3 (10%)</td>
</tr>
<tr>
<td>16 - 20</td>
<td>11 (48%)</td>
<td>7 (30%)</td>
<td>4 (19%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>over 20</td>
<td>4 (33%)</td>
<td>8 (67%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Chi Square (12, n = 107) = 14.145, p = .291

Note. Numbers in parentheses are rounded amounts.
4. Do administrators with more formal education exhibit different thinking style patterns than those with less education?

Participants in the study identified the highest degree that they had obtained. Possible groups included bachelors, masters, education specialist, and doctorate, although all respondents possessed at least a masters degree. Results of the Human Information Processing Survey (HIPS) were tabulated and reported in terms of mean standard scores for each of the groups. Table 12 depicts the results of analysis of variance measures and mean standard scores for each of the groups. One response to this item was unscoreable.

While no significant differences existed and no post hoc comparisons could be made, of interest was the decreasing mean right thinking style score and the increasing integrated score as formal education increased. It would appear that as formal education increases, right oriented thinking decreases in favor of a more integrated approach.

Results of the three HIPS subtests were analyzed and each respondent was classified as having a left, integrated, right, or mixed predominant thinking style.
Table 12

ANOVA of Mean Thinking Style Scores

According to Education.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>left</th>
<th>integ.</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Group</td>
<td>106</td>
<td>105</td>
<td>100</td>
<td>95</td>
</tr>
<tr>
<td>Masters</td>
<td>68</td>
<td>105</td>
<td>99</td>
<td>96</td>
</tr>
<tr>
<td>Ed. Spec.</td>
<td>27</td>
<td>107</td>
<td>99</td>
<td>94</td>
</tr>
<tr>
<td>Doctorate</td>
<td>11</td>
<td>101</td>
<td>105</td>
<td>93</td>
</tr>
</tbody>
</table>

F Ratio                .333    .275    .254
F Significance         .802    .843    .854

Note. All standard scores are rounded amounts.
The Chi Square test for independence of classification was used to determine if any of the groups differed significantly from the others. Table 13 depicts the results.

The single category classification was somewhat consistent with the analysis of variance tests in that very few administrators with a doctorate were classified as predominately right oriented in style.
Table 13

**Classification of Education by Thinking Style Pattern.**

<table>
<thead>
<tr>
<th>Single Category Classification</th>
<th>left</th>
<th>integ.</th>
<th>right</th>
<th>mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>41 (38%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>Masters</td>
<td>24 (35%)</td>
<td>38 (41%)</td>
<td>12 (18%)</td>
<td>4 (6%)</td>
</tr>
<tr>
<td>Ed. Spec.</td>
<td>12 (44%)</td>
<td>9 (33%)</td>
<td>5 (19%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Doctorate</td>
<td>4 (36%)</td>
<td>6 (55%)</td>
<td>1 (9%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Chi Square \( (9, n = 106) = 4.190, p = .900 \)

Note. Numbers in parentheses are rounded amounts.
5. Do rural administrators exhibit different thinking style patterns than urban administrators?

Participants in the study classified the type of school in which they worked as either rural or urban. Results of the Human Information Processing Survey (HIPS) were tabulated and reported in terms of mean standard scores. Table 14 depicts those results and the results of analysis of variance measures.

The results of the tests demonstrate how similar the thinking style patterns of administrators were when grouped according to type of school. While virtually no difference at all existed in left scores, very little variability was found in the integrated and right thinking style scores.

Results of the three HIPS subtests were analyzed and each respondent was classified as either left, integrated, right, or mixed dominant thinking style. Table 15 depicts the results of the Chi Square test for independence of classification which showed a slightly higher left and slightly lower right orientation of urban administrators.
Table 14

**ANOVA of Mean Thinking Style Scores of Rural and Urban Administrators**

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>left</th>
<th>integ.</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Group</td>
<td>107</td>
<td>105</td>
<td>100</td>
<td>95</td>
</tr>
<tr>
<td>Rural</td>
<td>52 (49%)</td>
<td>105</td>
<td>98</td>
<td>97</td>
</tr>
<tr>
<td>Urban</td>
<td>55 (51%)</td>
<td>105</td>
<td>101</td>
<td>94</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Standard Deviation</th>
<th>F Ratio</th>
<th>F Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.973</td>
<td>.012</td>
<td>.912</td>
</tr>
<tr>
<td></td>
<td>19.756</td>
<td>.670</td>
<td>.415</td>
</tr>
<tr>
<td></td>
<td>19.799</td>
<td>.752</td>
<td>.387</td>
</tr>
</tbody>
</table>

*Note.* All standard scores are rounded amounts.
Table 15

Classification of Urban and Rural Administrators by Thinking Style Pattern

<table>
<thead>
<tr>
<th></th>
<th>left</th>
<th>integ.</th>
<th>right</th>
<th>mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>41 (39%)</td>
<td>43 (40%)</td>
<td>18 (17%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td><strong>Rural</strong></td>
<td>18 (35%)</td>
<td>20 (39%)</td>
<td>12 (23%)</td>
<td>2 (4%)</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td>23 (42%)</td>
<td>23 (42%)</td>
<td>6 (11%)</td>
<td>3 (6%)</td>
</tr>
</tbody>
</table>

Chi Square ($\chi^2$, $n = 107$) = 2.937, $p = .401$

*Note.* Numbers in parentheses are rounded amounts.
6. Do specific thinking style patterns correlate with the degree of measured leadership effectiveness?

Survey participants were identified on the basis of their application to the Tennessee Administrative Career Ladder Program. Following the extensive evaluation procedures described earlier, the 107 respondents were certified as either Career Level I, Career Level II, or not certified. Results of the Human Information Processing Survey were tabulated and reported in terms of mean standard scores for each of the subtests. Table 16 depicts those results.

The analysis of the groups yielded no significant differences, and in fact demonstrated how similar all three groups were in thinking style patterns. One interesting tendency, albeit slight, was the tendency of the right score to increase as the level of effectiveness increased.

As in the previous questions, the results of each of the three subtests were analyzed and each of the respondents were classified as left, integrated, right, or mixed dominant. The Chi Square test for independence of classification was used to determine if leadership effectiveness was significantly related to thinking style pattern. Table 17 depicts those results and demonstrates
### Table 16

**ANOVA of Mean Standard Scores**

**According to Career Level**

<table>
<thead>
<tr>
<th></th>
<th>Mean Standard Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>107</td>
</tr>
<tr>
<td><strong>Level 0</strong></td>
<td>45 (42%)</td>
</tr>
<tr>
<td><strong>Level I</strong></td>
<td>42 (39%)</td>
</tr>
<tr>
<td><strong>Level II</strong></td>
<td>20 (19%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Standard Deviation</th>
<th>F Ratio</th>
<th>F Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.880</td>
<td>.105</td>
<td>.900</td>
</tr>
<tr>
<td></td>
<td>19.756</td>
<td>.230</td>
<td>.795</td>
</tr>
<tr>
<td></td>
<td>19.799</td>
<td>.337</td>
<td>.714</td>
</tr>
</tbody>
</table>

**Note.** All standard scores are rounded amounts.
Table 17

Classification of Level by Thinking Style Pattern

<table>
<thead>
<tr>
<th></th>
<th>Single Category Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>left</td>
</tr>
<tr>
<td>Total</td>
<td>41 (36%)</td>
</tr>
<tr>
<td>Level 0</td>
<td>14 (31%)</td>
</tr>
<tr>
<td>Level I</td>
<td>20 (48%)</td>
</tr>
<tr>
<td>Level II</td>
<td>7 (35%)</td>
</tr>
</tbody>
</table>

Chi Square \(6, \ n = 107\) = .4048, \(p = .670\)

*Note.* Numbers in parentheses are rounded amounts.
that although not significant, the overall thinking style patterns of the more effective administrators (Levels I and II) were left oriented more frequently than the least effective (Level 0) administrators. Of interest also was the higher percentage of Level II administrators with an overall right oriented thinking style pattern.
Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of the study was to analyze the thinking styles of school administrators who applied for certification in the Tennessee Administrator Career Ladder Program and to assess whether specific thinking styles were related to measured leadership effectiveness. Using the Human Information Processing Survey (HIPS), participants were evaluated according to three subtests which measured the degree of left, integrated, and right thinking styles which they possessed. The three subtest scores were obtained through analysis of responses provided on a numerically encoded optical mark scoring sheet. These scores then served as the independent variables of measurement.

Although standard statistical measures were available to assess the interaction effects among the three independent variables, an additional method of analysis was used to account for a fourth score pattern identified by the authors of the test as significant. When a participant exhibited strong left and right scores
in combination with a weak integrated score, they were classified as having a mixed processing style. To account for this variable, participants were categorized as either left, integrated, right, or mixed in overall style and statistical treatments were employed using measures appropriate to this nominal level independent variable.

Dependent variables used in the study were identified through a review of the literature and assessed through two separate methods. The first method was a questionnaire designed to gather descriptive data about gender, type of position, education, years in administration, and whether the participant was from a rural or urban school. Responses to the questionnaire were provided on an optical mark scoring sheet numerically encoded to match the thinking style subtest scores.

A sixth dependent variable, that of effectiveness, was assessed through the results of the Tennessee Administrator Career Ladder Program. Participants applied for Career Ladder certification and underwent extensive assessment during the 1984-85 school year. Results of the assessment yielded a ranking of either
Career Level I, Career Level II, or not certified.

Raw scores for each of the three subtests were converted to standard scores and reported as group means according to the dependent variables. Analysis of variance (ANOVA) tests were computed at the 5% level of significance. The Scheffe a posteriori tests were applied, although no significant relationships were found. Additionally, each participant's scores were evaluated and categorized into one overall thinking style. Groups according to the category of thinking style were tested using the Chi Square independence of classification tests at the 5% level. A brief summary of the statistical results was provided for each question.

1. Do administrators as a group exhibit one specific thinking style pattern more frequently than another?

Data related to this question were analyzed according to gender and type of position. Of the 107 respondents, 59 (55%) were men and 48 (45%) were women. A total of 61 (57%) were principals, 6 (6%) were assistant principals, and 40 (37%) were supervisors. Analysis of variance tests revealed no significant difference in thinking style tests scores according to
either independent variable. When participants were grouped according to overall thinking style, Chi Square tests also yielded no significance difference of groups.

2. Do administrators in different age groups exhibit different thinking style patterns?

Participants identified the age group in which they belonged. Of the 107 respondents, 21 (20%) were 31-40, 49 (46%) were 41-50, 29 (27%) were 51-60, and 8 (7%) were over 60 years old. Analysis of variance tests yielded no significant difference in the thinking style scores of administrators grouped according to age. Chi Square tests of administrators grouped according to overall thinking style also revealed the same result.

3. Do administrators with more experience exhibit different thinking style patterns than their less experienced colleagues?

Participants in the study identified the total years of administrative experience they possessed. In all, 11 (10%) had 1-5 years of experience, 30 (28%) had 6-10 years, 31 (29%) had 11-15, 23 (21%) had 16-20, and 12 (11%) had over twenty years of experience as an
administrator. Analysis of variance tests demonstrated no significant difference in the thinking style patterns of administrators grouped according to length of experience. The Chi Square tests also yielded no significant difference in the overall thinking style patterns of those same groups.

4. Do administrators with more formal education exhibit different thinking style patterns than those with less education?

Participants in the study identified the highest degree which they had obtained. A total of 68 (64%) had obtained a Master's, 27 (26%) had obtained an Education Specialist's degree, and 11 (10%) had earned a Doctorate. One response to this question was not scored. Analysis of variance results indicated no significance differences in administrators grouped according to this variable. Additionally, Chi Square tests of classification according to overall thinking style produced the same result.

5. Do rural administrators exhibit different thinking style patterns than urban administrators?
Participating administrators identified the type of school in which they worked as either rural or urban. A total of 52 (49%) identified their school settings as rural, while 55 (51%) identified their schools as urban. Analysis of variance tests demonstrated no significant difference in thinking styles according to this variable. Chi Square tests of overall thinking style pattern also found no significant difference between groups.

Do specific thinking style patterns correlate with the degree of measured leadership effectiveness?

Results of the Tennessee Administrator Career Ladder Program evaluation process ranked administrators as not certified, Level I, and Level II administrators with Level II being the highest. Of the respondents, 45 (42%) were not certified, 42 (39%) were Level I, and 20 (19%) were Level II. Analysis of variance tests found no significant difference in the thinking style scores of administrators grouped according to this variable and Chi Square tests found no significant difference in their overall thinking styles.
Conclusions

The statistics obtained from the analysis of variance measures and the Chi Square tests revealed no significant differences in any of the groups of variables which were measured. Not only was there no difference in the thinking styles of administrators grouped according to the various demographic variables, there also appeared to be no relationship between thinking styles and the degree of measured leadership effectiveness. As a result, all null hypotheses were accepted and all research hypotheses rejected.

While the major premise of the study focused upon the analysis of differences which existed among the participants, one apparent similarity repeatedly emerged as consistent among the groups. Regardless of group, the left thinking style mean standard score of school administrators was above the 50th percentile of test norms. That is, overall, school administrators tended to exhibit more left oriented thinking style processes than either integrated or right.

A similar finding was found to exist among the right thinking style mean standard scores of the participants.
Regardless of group, the mean right scores were found to be at, or below the 50th percentile of the test norms, further substantiating the tendency of school administrators to exhibit more left hemisphere oriented processes.

Recommendations

1. Although the data revealed that no significant differences existed in the thinking styles of school administrators that participated in the study, the similarities of their scores suggests that the right processes are a weak area which could be further developed. This appeared especially true for principals and assistant principals, although not surprising when one considers the left oriented tasks which these groups confront on a daily basis. Male principals, as a group, may benefit from this more than their female colleagues.

2. It would also appear that both principals and assistant principals would benefit from utilizing the skills of supervisors in tasks which require more right oriented or integrated thought processes. Tasks such as creative problem solving, brainstorming
new ideas, generating different approaches to existing school procedures, or utilizing personnel in different ways appear to be more appropriate to the group of supervisors who demonstrated higher right oriented and integrated score patterns.

3. Younger aged administrators might be better suited for tasks, such as those described in item 2, which require a greater right thinking style orientation. Overall, it appeared that as the age of administrators increased, their degree of right orientation decreased.

4. The strong orientation towards an integrated thinking style of those participants with doctorates indicated that those persons may do well in situations which require both creative problem solving and the ability to analyze and sequentially carry out the details once a possible solution to a problem is indentified.

Recommendations for Future Study

1. Since the participants in the study were those who had made application to be assessed by the Career Ladder Program, future study in this might include a
more representative sample of school administrators, who may vary more in overall degrees of effectiveness.

2. Although the Tennessee Career Ladder Program was an extensive measure of administrator effectiveness, the analysis of thinking styles according to a different criterion, such as leadership style or school climate might yield greater insights into the different characteristics of school leadership which may be attributed to this new area of study.

3. The different thinking styles of building level school administrators as compared with central office and teaching staff may be an area of future study which would demonstrate that different thinking styles exist overall at these levels and a need to utilize different types of personnel when approaching different kinds of problems.

4. Since the sample size of the those administrators with doctorates was limited in the current study, further examination of this area may yield more evidence to support the tendency of their scores towards a more integrated approach.
5. Future study in this area might exclude the effects of gender as a nuisance variable since statistical treatment yielded no significant differences according to gender.

6. Future researchers might want to consider the use of a different test for assessing thinking styles, although the availability of such instruments is limited at the present time. Similarly, a different criterion for measuring the characteristics of right oriented thinking styles might be considered.
REFERENCES


Appendix A
PRINCIPAL/ASSISTANT PRINCIPAL COMPETENCIES

I. INSTRUCTIONAL LEADERSHIP

A. Establishes and implements clear instructional goals and specific achievement objectives for the school.

1. Involves teachers in developing and implementing school instructional goals and objectives.

2. Insures that school and classroom activities are consistent with school instructional goals and objectives.

3. Evaluates progress toward instructional goals and objectives and makes needed adjustments.

B. Plans, implements, and evaluates instructional programs including learning objectives and instructional strategies for the school.

1. Works with teachers to plan, modify, and implement the instructional program consistent with student needs.

2. Bases instructional program development on sound research and practice.

3. Incorporates the designed state and/or system curriculum in the development of instructional programs.

4. Develops and/or uses appropriate procedures and criteria for evaluating the instructional program.

C. Provides a purposeful school environment conducive to learning.

1. Establishes high expectations for student achievement which are directly communicated to students and teachers.

2. Establishes clear rules and expectations for the use of time allocated to instruction.

3. Supports social and intellectual activities to benefit quality programs.

4. Establishes, implements, and evaluates with teachers and students (as appropriate) procedures
and codes for handling and correcting discipline problems.

II. ORGANIZATIONAL MANAGEMENT

A. Develops and implements administrative procedures consistent with federal law, state school law, state board of education and local school board policy.

1. Establishes, implements, and maintains legal and workable administrative procedures.

2. Applies administrative procedures equitably and consistently.

3. Seeks and/or provides clarification, as appropriate, of federal, state and local school system policies and rule interpretations when making decisions and/or recommendations.

B. Performs delegated management duties related to school fiscal operations, inventories, school plant facilities and equipment and keeps records within established guidelines.

1. Develops and/or implements a system of reporting, record keeping, written communication and accounting.

2. Arranges the use of shared equipment and facilities to benefit the school program.

3. Establishes and/or implements procedures to improve, modify and/or make repairs of school plant facilities and equipment.

4. Establishes and/or maintains safety and security arrangements for school plant facilities and equipment.

5. Administers school budget(s) in accordance with system regulations and board policies and legal requirements.

C. Conducts an effective school program of utilization, induction, and evaluations of teachers and staff members.

1. Reviews and determines the utilization of personnel based upon their capabilities and contributions and staffing needs as determined by school goals and objectives.
2. Provides appropriate orientation and induction programs for teachers and staff members.

3. Develops and/or implements a fair, consistent, and effective program of teacher evaluation.

4. Establishes individual professional growth plans with teachers based upon evaluation results.

III. COMMUNICATION AND INTER-PersonAL RELATIONS

A. Develops and utilizes communication channels and manages conflict with teachers, staff, other administrators/supervisors, parents, and the community.

1. Provides for systematic, two-way communication with teachers, staff, and the community.

2. Communicates with teachers, staff, parents, and other administrators/supervisors.

3. Manages conflict with teachers, parents, staff, and other administrators/supervisors.

B. Demonstrates respect for and works supportively with teachers and staff.

1. Utilizes effective strategies for involving others in decision making.

2. Demonstrates fair and equitable treatment of all teachers, staff and students.

3. Considers interests and needs of teachers and staff in establishing work routines and requirements.

IV. PROFESSIONAL GROWTH AND LEADERSHIP

A. Improves professional skills and knowledge.

1. Develops professional skills consistent with his/her own responsibilities and performance.

2. Participates in non-required professional development programs and activities.

3. Develops and/or uses and evaluates ideas and innovative approaches to improve job performance.
4. Takes formal coursework related to administrative assignment or advancement.

B. Takes a leadership role in improving education.
   1. Actively participates in professional programs.
   2. Disseminates ideas and information to other professionals.
   3. Provides leadership in identifying and solving issues and problems facing the profession.

C. Performs duties in a professional and responsible manner. (Screening only)
   1. Maintains accurate and up-to-date records.
   2. Completes assigned tasks on time.
   3. Arrives on time for school, meetings, and other scheduled activities.
   4. Manages routine business and record keeping efficiently.
   5. Uses leave for its intended purpose.
   6. Exhibits professional conduct while in contact with teachers, other professionals, and students.

V. BASIC COMMUNICATION SKILLS (Screening only)

   A. Writes clearly and correctly.
      1. Handwrites or prints legibly.
      2. Organizes written information
      3. Uses vocabulary and style appropriate to the level of the audience.
      4. Uses correct grammar and mechanics.

   B. Communicates oral information effectively.
      1. Speaks clearly at an appropriate pace and volume.
      2. Organizes oral information.
      3. Uses vocabulary appropriate to the level of the audience.
4. Uses grammar correctly.

C. Reads professionally relevant literature/materials with comprehension.
SUPERVISOR COMPETENCIES

I. INSTRUCTIONAL LEADERSHIP

A. Establishes and implements clear instructional goals and specific achievement objectives for the area supervised.

1. Involves teachers in developing and implementing goals and objectives for the area supervised.

2. Insures that program instructional goals, objectives, and activities are consistent with school system goals and objectives.

3. Evaluates progress toward school system goals and objectives.

B. Plans, implements, and evaluates instructional programs including learning objectives and instructional strategies for designated areas of responsibility.

1. Works with teachers to plan, modify, and implement instructional programs consistent with student needs.

2. Bases instructional program development on sound research and practice.

3. Works with teachers and/or principals to incorporate the designated state and/or system curriculum in the development of instructional programs.

4. Develops and/or uses appropriate procedures and criteria for evaluating the instructional programs.

C. Aids the supervised teachers to formulate and implement instructional objectives and learning strategies for students.

1. Helps teachers develop/select instructional objectives and sequence them in accordance with goals.

2. Helps teachers adjust instructional objectives and learning strategies to accommodate student differences.

3. Helps teachers collect, understand, and use
student assessment data in the formulation of instructional objectives and teaching strategies.

4. Helps teachers identify and/or implement needed changes in his/her instructional practices

D. Seeks out and provides to supervised teachers, instructional resources and curricular materials within the limits of available resources.

1. Identifies needed resources and pursues their acquisition and effective utilization.

2. Utilizes community resources to extend the learning environment.

3. Helps to secure consultants, specialists, and other human and/or community resources for teachers as needed.

E. Provides for professional development consistent with teacher and/or program evaluation outcomes.

1. Works with teachers to assess their professional competence.

2. Provides professional development programs consistent with identified needs of teachers and students.

3. Provides professional development programs consistent with goals and objectives for the area supervised.

II. ORGANIZATIONAL MANAGEMENT

A. Interprets and supports the policies established by federal law, state school law, state board of education and the local board.

1. Develops and/or implements, workable administrative procedures within the law.

2. Applies administrative procedures equitably and consistently.

3. Assists in improving established policy.

4. Seeks and/or provides clarification, as appropriate, of federal, state and local school system policies and rule interpretations when making decisions and/or recommendations.
III. COMMUNICATION AND INTER-PERSONAL RELATIONS

A. Develops and utilizes communication channels and manages conflict with teachers, staff, parents, and the community.

1. Provides for systematic, two-way communication with teachers, staff, parents, and the community.

2. Communicates with teachers, staff, parents, and other administrators/supervisors.

3. Manages conflict with teachers, parents, staff, and other administrators/supervisors.

B. Demonstrates respect for and works collaboratively with principals, teachers and staff.

1. Utilizes effective strategies for involving others in decision making.

2. Demonstrates fair and equitable treatment of all teachers, staff and others.

3. Considers interests and needs of teachers and staff in providing services and soliciting their assistance.

IV. PROFESSIONAL GROWTH AND LEADERSHIP

A. Improves professional skills and knowledge.

1. Develops professional skills consistent with his/her own responsibilities and performance.

2. Participates in non-required professional development programs and activities.

3. Develops and/or uses and evaluates ideas and innovative approaches to improve job performance.

4. Takes formal coursework related to supervisory assignment or advancement.

B. Takes a leadership role in improving education.

1. Actively participates in professional programs.

2. Disseminates ideas and information to other professionals.

3. Provides leadership in identifying and solving issues and problems facing the profession.
C. Performs duties in a professional and responsible manner. (Screening only)

1. Maintains accurate and up-to-date records.
2. Completes assigned tasks on time.
3. Arrives on time for school, meetings, and other scheduled activities.
4. Manages routine business and record keeping efficiently.
5. Uses leave for its intended purpose.
6. Exhibits professional conduct while in contact with teachers, other professionals and students.

V. BASIC COMMUNICATION SKILLS (Screening only)

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B. Communicates oral information effectively.

1. Speaks clearly at an appropriate pace and volume.
2. Organizes oral information.
3. Uses vocabulary appropriate to the level of the audience.
4. Uses grammar correctly.

C. Reads professionally relevant literature/materials with comprehension.
APPENDIX B
June 5, 1985

Dear

I am a doctoral student at the University of Nevada, Las Vegas in the process of collecting data for my dissertation. I am requesting your participation in a study of selected school administrators. Your response to this study should take approximately twenty minutes.

The purpose of the study is to examine right and left brain thinking styles with respect to certain leadership characteristics. Enclosed you will find (1) a Human Information Processing Survey (HIPS) booklet; (2) a demographic questionnaire; and (3) two Scantron scoring sheets for your responses. Although the Scantron sheets are numbered to allow matching, your participation will remain anonymous.

For each of the 40 items on the HIPS, choose the response that best describes your preference. Using a number two lead pencil, mark only a, b, or c on the Scantron sheet. For the demographic questionnaire, mark the response that best describes the category in which you fall. Mark your responses to the questionnaire on the Scantron scoring sheet that is attached.

When you have completed both items, please return the two Scantron scoring sheets along with the HIPS booklet in the stamped and addressed envelope no later than June 28. Your cooperation with this study is greatly appreciated.

Sincerely,

Brad Reitz
Doctoral Student

Approved:

Anthony Saville
Professor, Department of Education Administration and Higher Education
DEMOGRAPHIC QUESTIONNAIRE

Using a number two lead pencil, mark the response that best describes you on the enclosed Scantron scoring sheet.

1. Sex:
   a. Male       b. Female

2. Age:
   a. 21-30     b. 31-40    c. 41-50    d. 51-60    e. over 60

3. Administrative Position:
   a. principal b. assistant principal c. supervisor

4. Years as an administrator:
   a. 1-5 b. 6-10 c. 11-15 d. 16-20 e. over 20

5. Highest earned degree:
   a. Bachelors b. Masters c. Education Specialist d. Doctorate

6. Type of work location:
   a. rural school b. urban school

7. District student population:
   a. less than 1000 b. 1,000-5,000 c. 5,000-10,000 d. 10,000-20,000 e. over 20,000

8. Dominant handedness:
   a. left b. right c. equal

9. State: ___TN___