A Study Employing a Technique for Matching the Cognitive Styles of Graduate Students Specializing in School Librarianship with the Cognitive Style of the “Ideal” Media Specialist, Resulting in a Suggested Career Counseling Model

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A STUDY EMPLOYING A TECHNIQUE FOR MATCHING THE COGNITIVE STYLES OF GRADUATE STUDENTS SPECIALIZING IN SCHOOL LIBRARIANSHIP WITH THE COGNITIVE STYLE OF THE "IDEAL" MEDIA SPECIALIST, RESULTING IN A SUGGESTED CAREER COUNSELING MODEL

by

Susan J. McIntire

A Thesis
Submitted to the
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Susan J. McEntire
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CHAPTER I

INTRODUCTION

Background of Study

At the present time there is a lack of information about the characteristics required if an individual is to become a successful school librarian. There is a need to assess personal characteristics of students in order to provide advice as to potential for success and satisfaction in the field. The present study will attempt to provide a counseling model in relation to school librarianship, and will utilize the method of cognitive style.

For purposes of the present study, cognitive style is defined as the manner in which an individual takes note of the surroundings and seeks meaning. Some of the implications of the foregoing definition are: (1) that individuals vary widely in methods of obtaining meaning from the environment, and (2) that no one style is inherently better than any other style. Although styles cannot be assigned values in an overall sense of good or bad, it is possible to define one particular cognitive style as more suitable in terms of potential for success for a particular task. For example, a person who seeks meaning primarily through categorizing units of information is not as likely to do well with a task which requires a high degree of synthesis as an individual who seeks meaning primarily through examining relationships.
In an attempt to find a method for matching students with educational tasks, Hill and associates began to study the various ways in which people take note of the environment and seek meaning. This work resulted in the development of a conceptual framework for education which is referred to as the Educational Sciences. Four assumptions underlie this framework: "(1) Education is the process of searching for meaning. (2) Thought is different from language. (3) Man is a social creature with an unique capacity for deriving meaning from his environment and personal experiences through the creation and use of symbols. (4) Not content with biological satisfactions alone, man continually seeks meaning."\(^1\)

At this time there are seven Educational Sciences. By administering a cognitive style inventory\(^2\) in relation to the first three sciences, it is possible to determine how an individual seeks meaning or becomes informed about the environment. Cognitive style is described as a Cartesian product of the first three sets of Educational Sciences which are: (1) symbols and their meanings, (2) cultural determinants, and (3) modalities of inference.

The first set, symbols and their meanings, is concerned with that basic unit of the intellect, the symbol. There are two types of symbols: theoretical and qualitative. Theoretical symbols represent something different than that which the symbol actually is, e.g., words and numbers. Qualitative symbols represent that which


\(^2\)The cognitive style inventory is the basic instrument employed in the present study and is more thoroughly described in Chapter III.
the symbol itself is to an individual. Meanings assigned to qualitative symbols are derived from the following sources: (1) sensory stimuli, e.g., taste; (2) programmatic, i.e., physical tasks that an individual has learned to perform such as riding a bicycle; and (3) cultural codes, e.g., an individual's ability to abide by social spacing expectations.

The second set, cultural determinants, deals with cultural influences which affect the way a person interprets symbols. There are three determinants: individuality, associates and family.

Modalities of inference, the third set, is concerned with the way in which people make inferences. There are five elements of the third set: magnitude (categorical reasoning), difference (one-to-one contrasts), relationships (synthesis), appraisal (approximately equal use of the first three modes) and deductive (logical) reasoning.

By administering an inventory that assesses the first three sets, it is possible to construct a map of an individual's preferred learning style. These maps can be used to match students with educational tasks and/or teachers with compatible styles. The maps can also be used to advise individuals about possible success in various tasks.

Significance Of The Study

The way in which individuals gather information and derive meaning should be an extremely important consideration in a field that is based on the gathering, storing, retrieving and disseminating of information. Currently there is a lack of knowledge about
the actual characteristics of library school students, and about the characteristics necessary to be a successful librarian. The present study is designed to test the feasibility of using cognitive style mapping as a tool to compare the cognitive style of the "ideal" media specialist with the mean cognitive style profile of graduate library school students specializing in school librarianship. It is hoped that the exploratory study will: (1) add to the body of knowledge about the actual characteristics of library school students, and (2) provide a model for counseling prospective library school students who wish to specialize in school librarianship. A counseling model may have the potential for maximizing chances for success in the chosen occupation.

Purpose Of Study

The primary purpose of the present study is to formulate a counseling model which can be used to help students determine potential for success and satisfaction in the field of school librarianship.

Sub-purposes of the present study are: (1) to assess the cognitive styles of a select group of graduate library school students specializing in school librarianship, and (2) to identify a model for the "ideal" school media specialist.

Operationally the purpose of the study is to:

(1) Obtain written data from the student sample

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3The student sample will be composed of a select group of graduate library school students specializing in school librarianship at Western Michigan University.
concerning educational and work experience and future employment interests.

(2) Mathematically map the first sets of cognitive style of the student sample. A 216-item cognitive style inventory will be used.

(3) Obtain input from a panel of experts\textsuperscript{4} concerning the proposed model of the "ideal" media specialist. The proposed model was set forth by Sullivan\textsuperscript{5} in a speech.

(4) Obtain a cognitive style map of the "ideal" media specialist. The map for the "ideal" media specialist will be drawn empirically from the Sullivan speech by an expert in empirical mapping.

(5) Determine the degree of match between the mean cognitive style map of the student sample and the cognitive style map of the "ideal" media specialist. Determination of degree of match will be made through utilization of a weighted matching scale developed by Hill and Covello\textsuperscript{6}.

(6) Determine: (a) if there is a correlation between the ranked order mean cognitive style scores of the students and the ranked order mean cognitive style scores of the "ideal"; and (b) if a correlation exists, what is the magnitude of significance of the correlation.

General Question To Be Answered

Is it feasible to use matching and ranking techniques to compare the empirically derived cognitive style of the "ideal"

\textsuperscript{4}The panel will be composed of three faculty members of the School of Librarianship at Western Michigan University who specialize in school librarianship.

\textsuperscript{5}Peggy Sullivan, Desirable Characteristics of School Library Media Personnel; and The Concept of the Future as it is Presented in Children's Books Today, Phineas L. Windsor Lectures in Librarianship (Urbana: University of Illinois Press, 1975).

media specialist with the mean cognitive style profile of graduate
tibrary school students specializing in school librarianship?

Assumptions Underlying The Study

(1) "Education is the process of searching for meaning.
(2) Thought is different from language.
(3) Man is a social creature with an unique capacity for
deriving meaning from his environment and personal
experience through the creation and use of symbols.
(4) Not content with biological satisfactions alone,
man continually seeks meaning.7"
(5) It is desirable to have a counseling model which may
help to maximize chances for success in a particular
occupation.

Definition Of Key Terms

Cognitive Style: The manner in which an individual takes note
of the environment and derives meaning. An individual's cognitive
style can be described as the Cartesian product of three sets:
symbols and their meanings, cultural determinants and modalities
of inference.

Educational Sciences: A conceptual framework with scientific
language for the applied field of knowledge called education. There
are presently seven categories:

(1) symbols and their meanings,
(2) cultural determinants of the meanings of symbols,
(3) modalities of inference,

(4) memory concern,

(5) cognitive styles of individuals,

(6) teaching styles, administrative styles and counseling styles, and

(7) systemic analysis decision-making.

Empirical Mapping: For purposes of the present study, empirical mapping is defined as ascertaining cognitive style based on written material.
CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The present study is concerned with matching the cognitive styles of graduate library school students specializing in school librarianship with the cognitive style of the "ideal" media specialist as well as finding the degree of correlation between the students and the "ideal". It is hoped that the present study will result in additional information concerning the personal characteristics of library school students as well as yielding a proposal for a counseling model. The literature review is intended to present an overview of: (1) cognition and cognitive style as conceptualized by psychologists; (2) the Educational Sciences and cognitive style as defined by Joseph Hill, (3) the personal characteristics of librarians and library school students as indicated by some previous studies, and (4) suggested characteristics of the "ideal" librarian.

Cognition

The terms cognition and cognitive style are used in a variety of ways by different disciplines. The first portion of the literature review will deal with cognition and cognitive style as defined by certain psychologists and educational psychologists.

The term cognition is defined in Webster's Third as follows:

"the act or process of knowing in the broadest sense;
specif: an intellectual process by which knowledge is gained about perceptions and ideas...¹

The *Oxford English Dictionary* traces the first use of the term cognition in the general sense to the year 1447. In the general sense, cognition is defined as:

"The action or faculty of knowing; knowledge, consciousness; acquaintance with a subject."²

In 1651 the word cognition was first used in the philosophical sense which is defined as:

"The action or faculty of knowing taken in its widest sense, including sensation, perception, conception, etc., as distinguished from feeling and motivation; also, more specifically, the action of cognizing an object in perception proper."³

The *Dictionary of Education* defines cognition as:

"in general, the process of knowing; in particular, the process of knowing based upon perception, introspection or memory."⁴

Reynolds and Flagg in an introductory text concerning cognitive psychology have indicated that cognitive psychology relates to "the total set of processes by which people...acquire, store, and use information."⁵ In addition, Reynolds and Flagg have stressed that cognitive psychology is based on the assumption that people are not

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³Ibid.


essentially passive receivers of stimulation but rather actively seek and use information. According to Reynolds and Flagg, cognitive psychologists agree on the following five basic concepts:

(1) "The importance of the selection of stimulus information. Most of the time more information impinges on us than our limited capacities can handle.

(2) The importance of selecting appropriate processing strategies (largely under voluntary control) to meet the demands of the task.

(3) The development of cognitive structures. After repeated applications of processing strategies, stable cognitive structures emerge.

(4) The interrelated functions of the parts of the human mind as a coherent system.

(5) The constantly active nature of cognitive processes. The system is always active and at work.6"

Much work in cognition has been based upon Piaget's theory of cognitive development. Piaget's model assumes four developmental levels of intellectual function which appear during successive stages of childhood and early adolescence. The first stage, the sensory-motor period, is generally encountered in children up to two years of age and is characterized by the development of simple instrumental skills. Instrumental skills include developing muscular coordination and seeking information by varying learned patterns of response, i.e., intentional behavior. An infant does not identify an object apart from the perceptual field in which the object was first presented. During the first level of development the child gains the capacity to conceive of objects and people as existing permanently and

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6Ibid., p. 12.
independently of the child. Similarly the child gains an understanding of the causality of events. The stage of pre-operational thought is encountered in two to seven year olds. The second stage is characterized by development of symbolic function which permits the child to represent the world internally via symbols. Symbolic function implies an ability to distinguish between a symbol and that which the symbol represents. The child is able to relate separate occurrences, however, progress is limited by a high degree of egocentrism which makes communication difficult. Pre-operational thought is further limited by the fact that the child uses transductive reasoning. Transductive reasoning is based on similarity between items in some respect which the child treats as similar in all respects. Children from ages nine to 11 are in the third period, concrete operations. According to Piaget, a third stage child develops a cognitive system for organizing the environment. The system is represented by mathematical-logical structures. For example, the concept of conservation, a key concept in the third stage, is dependent on a mathematically-oriented logical approach. Conservation refers to the ability to accept that, for example, eight ounces of water in a tall, thin glass is still the same amount when poured into a short, wide glass. Similarly, the development of number concepts permits the child to understand that two rows with seven units each do have the same number of units even when one row occupies a short space and the other row is stretched out in length. Also, during the third stage children begin to understand sets and subsets. The final stage, formal operations, is encountered in
children of 11 years and older; and is characterized by increased emphasis on those things which are hypothetically possible. The here-and-now is no longer the ultimate reality. Furthermore, during the formal operations stage the child becomes logically consistent. Perhaps at the final stage of cognitive development logical inconsistencies become a source of cognitive dissonance.⁷

Cognitive dissonance has been defined as "a motivational state brought about when a person has cognitive elements that imply the opposite of one another."⁸ Tension exists until the individual eliminates the dissonant cognitions or until the dissonant cognitions become less important. A key concept in dissonance theory is resistance to change. In some cases resistance to change is very great, e.g., it is difficult to change cognitions about factual matters and about past events, but it is easier to change cognitions about nonfactual judgments. The concept of resistance to change allows for determination of magnitude of dissonance and for predicting the most likely way in which dissonance will be reduced. It is also possible to talk about cognitive dissonance between individuals.

Much of cognitive style work has been based on the dichotomous system developed by Witkin and associates which categorizes people as either field-dependent or field-independent. The field-dependent person has difficulty in locating geometric figures embedded in a

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pattern and does not readily perceive aspects of a particular situation as being separable. The field-dependent person, on the other hand, is able to recognize embedded figures and tends to be more analytical in nature. Kagan, Moss and Siegel have further developed Witkin's framework into the area of classification schemes. An individual will tend to have a preference for either an analytical or a relational type of classification scheme.9

Schroder, Driver and Streufert have also developed a system for analyzing cognitive style according to the number of aspects of a topic that an individual is capable of thinking about and the skill with which the person can relate the aspects. Some individuals tend to compartmentalize the aspects while others integrate the aspects to a high degree. Schroder has postulated that an environment that is either too simple or too complex in terms of the number of ideas which must be integrated will inhibit cognitive development.10

Farnham-Diggory has pointed out that the various cognitive style frameworks have the potential for supplementing IQ tests thus making the IQ tests more meaningful in terms of prescriptive education. For example:

"Instead of saying, 'Johnny has an IQ of 81,' we can say, 'Johnny has a field-dependent style and a low integration index. That means he is going to have difficulty detecting the main concept in his reading -- he will tend to muddle the information together. And he will also have difficulty thinking of alternative concepts. So I


10Ibid., pp. 283-284.
had better prepare a Ditto sheet or outline that will help him perform these abstractions and stimulate his thinking.\textsuperscript{11}

The preceding paragraphs have set forth a general conceptual framework of cognition. The remainder of the first section of the literature review will be devoted to a review of a few studies concerning cognition.

In 1964 Heath\textsuperscript{12} of the Educational Testing Service conducted an exploratory study of cognitive preferences in relation to new and conventional high school physics courses. Heath recognized that innovations in teaching methods require innovations in testing methods. The innovative teaching method Heath was concerned with stressed the way in which knowledge is acquired, evaluated and retained; consequently, Heath developed an instrument to evaluate a student's mode of attending to subject matter. Heath identified four cognitive preferences: (1) memory of specific facts or terms; (2) practical application; (3) critical questioning of information, and (4) identification of a fundamental principle. The instrument was composed of 20 items. Each item began with a statement followed by four "answers". Each "answer" was correct and students were asked to choose the one most preferred in relation to the introductory information. Each of the four answers reflected one of the four cognitive preferences.

In addition to the cognitive preference test, students were given the

\textsuperscript{11}Ibid., p. 285.

School and College Ability Test (SCAT), a conventional standardized physics examination, a standardized physics test designed for the innovative physics curriculum and a concealed figures test. Students in the innovate curriculum displayed a stronger preference for critical questioning and principle identification than did the control group. The control group preferred memory and practical applications. The differences between the groups were statistically significant for all but the practical application preference. The experimental group scored higher on the SCAT, the concealed figures test and the standardized physics test designed for the innovative curriculum. Heath suggested that the experimental group may have scored higher on the embedded figures test due to the type of instruction received in the innovative physics curriculum. The possibility that cognitive preferences could be accounted for by differences in ability was discounted based on very low correlations of SCAT and cognitive preference scores. Heath concluded that cognitive preference testing has the potential for filling a gap in the battery of educational measurement and that additional research is warranted based on the fruitful preliminary investigation.

In a similar study Fazio and Zambotti\textsuperscript{13} defined cognitive style as "the individual's mode of behavior in searching for meaning". The researchers compared the cognitive styles of chemistry majors with the cognitive styles of nonscience majors in an attempt to

determine whether a characteristic cognitive style existed for each of the two sample groups. The researchers were specifically interested in determining which elements of cognitive style are predictive of undergraduate chemistry achievement. Two instruments were used to determine cognitive style. The first was devised by the researchers in order to determine what type of material students preferred. The three types are: (1) memory - preference for simple facts; (2) principle - preference for a theoretical construction; and (3) questioning - preference for challenging or adding to the concept. The second instrument tested for six stylistic variables: Practical Mindedness, Achievement, Variety, Decisiveness, Orderliness, and Goal Orientation. Significant cognitive style differences were found between the two groups of students.

Two library science dissertations have been completed which focused on cognitive style in relation to retrieval systems. In 1974 Davidson examined the possibility that cognitive style variables effect judgments of document relevance. The underlying problem was based on the premise that individuals using a retrieval system do not always place the same degree of relevance on the retrieved document as did the indexer. Davidson postulated that cognitive style influences relevance judgments. The results were inconclusive due to design problems, however, Davidson indicated that with changes the proposed model does hold promise for explaining variance in relevance.

judgments in terms of cognitive style. One year later Bush postulated that: (1) if potential users were permitted to assist in the development of data bases there would be greater acceptance of the data base since the contents would be selected by the users; and (2) that the design would be influenced by the cognitive styles of the developers/users. Based on a hidden figures test the subjects were divided into a field-dependent group and a field-independent group. Bush found that the two data base designs were significantly different as predicted and that user acceptance was slightly higher when the users were involved in the data base development.

The first section of the literature review has been devoted to cognitive style as defined by psychologists. The second portion will be concerned with the concept of cognitive style developed by Hill.

The Educational Sciences

Joseph Hill, the originator of the Educational Sciences, was a professional educator with a mathematical orientation. As a dedicated educator, Hill began to ask how the educational system can be improved to enhance both the learning process and professional communication accuracy. The Educational Sciences, which are inclusive of the concept of educational cognitive style, were developed in response to Hill's questioning.

\footnote{Ronald Bush, "Influence of Cognitive Style in a Methodology for Data Base Design," (Ph.D. dissertation, The University of Texas at Austin, 1975).}
Although much of the work done in the area of educational cognitive style has been related to the formal institutional setting, cognitive style appears to be equally applicable to the education that each individual experiences daily. That is to say each individual constantly takes in information in a personally characteristic pattern and processes that information according to cognitive style preferences. The meaning that a person assigns to an experience is dependent not on some ultimate reality, but rather upon an individual interpretation influenced by past experiences, expectations and modes of deriving inferences.

A substantial body of research has shown that people do not always perceive what is actually present and that individuals confronted with identical sensory inputs do not necessarily experience the same "reality". A brief review of some perceptual studies will be presented to stress the point that individuals do take in information and assign meaning in a wide variety of ways.

Huxley\(^{16}\) has described the central nervous system as a reducing valve which filters out biologically useless materials to ensure physical survival. Once the allotted amount of sensory perceptions have been admitted by the reducing valve, the process of interpretation begins.

Ames\(^{17}\) has developed several physical constructions which


effectively demonstrate that there is not a one-to-one correspondence between reality (objective) and experience (subjective). The foreshortened window frame is a well known Ames construct. The Ames window has a short end or edge which would ordinarily be distal to the larger edge. The window is mounted on a turntable so that rotation occurs around a central perpendicular axis thus alternating the proximity of the two window frame edges to the observer's position. Observers at 20 to 30 feet distant do not accept the apparent distortion of depth perception, but instead "see" the window as if oscillating back and forth with the large end always remaining in the foreground. Misperception occurs because depth perception gives clues that are in conflict with previous memory models of how a window should look.

Another means of exploring perception is through the use of multistable images which are pictures and geometric figures that spontaneously change in appearance. Both images appear to be complete and independent with no transitional overlap, and the images periodically alternate. The classic example of the phenomenon of multistability is a drawing which can be seen as either a pair of faces or as a goblet. Attneave has indicated that the spontaneous alteration of a multistable image is sometimes caused by changing the visual fixation point. However, since alterations do occur without a change in the point of fixation, Attneave has suggested that the most likely explanation is:

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"...that the alternative aspects of the figures are represented by activity in different neural structures, and that when one such structure becomes 'fatigued', or satiated or adapted, it gives way to another that is fresher and more excitable."

Attneave notes that research has indicated that reversal rate increases as the amount of time spent in gazing at a figure increases. Furthermore, Attneave suggests that in some respects neural structures behave like a multistable electronic circuit", e.g., a multivibrator flip-flop circuit. Multistable images effectively demonstrate how a single input can be assigned different meanings even by the same individual and within an extremely short time period.

A study concerning visual observation emphasized the fact that individuals confronted with the same sensory inputs frequently assign different meanings or "realities" to the experience. Hastorf and Cantril\(^{19}\) studied perception in relation to a highly emotional football game. The 1951 Dartmouth-Princeton game involved several injuries, many penalties and an extended argument about which team was the cause of the violence. The researchers showed a film of the game to groups of students on both campuses and administered questionnaires concerning the number and severity of infractions of the rules. The answers of one side bore little resemblance to the answers of the other side. As Hastorf and Cantril noted, each version of the

events were as "real" for any given individual as other versions were for other individuals. The researchers further noted that:

"...the data here indicate that there is no such 'thing' as a 'game' existing 'out' 'there' in its own right which people merely 'observe'. The 'game' 'exists' for a person and is experienced by him only in so far as certain happenings have significances in terms of his purpose. Out of all the occurrences going on in the environment, a person selects those that have some significance for him from his own egocentric position in the total matrix."

Hill examined the body of literature devoted to the study of meaning. The Educational Sciences were structured upon a framework derived from the writings of philosophers and educators such as A. J. Ayer, Boris Carnap, Ernst Cassirer, John Dewey, Lawrence Frank, Alfred Korzybski, George Moore, V. C. Morris, Karl Nagel, K. V. Neuroth, Charles Ogden, Charles Pierce, D. W. Richards, Bertrand Russell, Victor Tarski, Alfred North Whitehead and Ludwig Wittgenstein.20

The Educational Sciences were designed to provide a "conceptual framework and scientific language" for the applied field of education. Hill believed that:

"With the development of the Educational Sciences, the solutions of problems and explanations of phenomena are facilitated, and educational problems accruing to inadequate communication, misinterpretation of information and fragmentation of effort are alleviated.21"

Hill made the following four assumptions when developing the

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Educational Sciences:

(1) "Education is the process of searching for meaning."

(2) Thought is different from language.

(3) Man is a social creature with an unique capacity for deriving meaning from his environment and personal experiences through the creation and use of symbols.

(4) Not content with biological satisfactions alone, man continually seeks meaning.22"

To date seven Educational Sciences have been developed:

(1) "Symbols and their meanings

(2) Cultural determinants of the meanings of symbols

(3) Modalities of inference

(4) Biochemical and electrophysiological aspects of memory-concern

(5) Cognitive styles of individuals

(6) Teaching styles, administrative styles and counseling styles

(7) Systemic decision making23"

The present study is specifically concerned with the Fifth Educational Science, cognitive styles of individuals. Technically cognitive style is composed of the first four Educational Sciences.

In practice, with the exception of three studies24, 25, 26, cognitive  __________________

22Ibid.

23Ibid.


25Judith Eaton, "A Model for Educational Cognitive Style Based
style has been used as if composed of only the first three Educational Sciences. The present study will incorporate the usual pattern of considering only the first three Educational Sciences.

Hill's definition of cognitive style is as follows:

"An individual's cognitive style is determined by the way he takes note of his total surroundings - how he seeks meaning, how he becomes informed. Is he a listener or a reader? Is he concerned with only his own viewpoint or is he influenced in decision-making by his family or associates? Does he reason as a mathematician, or as a social scientist, or as an automotive mechanic."27"

Cognitive style mapping devices were developed to answer the questions listed in the foregoing definition as well as to identify many other aspects which are part of an individual's cognitive style.

At this point the three components or sets of cognitive style will be discussed in some detail. Each set has several elements which will also be dealt with. A total of 27 elements are identified by cognitive style assessment tools.

The first set is called symbols and their meanings. In the present context, symbols are qualitative as well as theoretical in nature. Hill's definitions of symbols are as follows:

"The theoretical symbol is that symbol which presents

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27Hill, "The Educational Sciences," p. 3.
to the awareness of the individual something different from that which the symbol itself is.

The qualitative symbol is that symbol which presents and then represents to the awareness of the individual that which the symbol itself is to that individual.28"

In developmental terms, a child's earliest experiences are qualitative in nature. As language is acquired, the child develops theoretical symbolic capability. Qualitative symbols represent sensory data while theoretical symbols represent words and numbers.

The cognitive style assessment tools identify four types of theoretical symbols. The two main types are auditory and visual and each main type can be divided into linguistic and quantitative elements. The symbols are as follows.

(1) The Theoretical Auditory Linguistic - T(AL) - symbol is the sound of a word. For example, the word elephant is a theoretical auditory linguistic symbol because the word brings to awareness an image different from the sound which is heard. The word elephant may represent to an individual's consciousness a huge land mammal characterized by a large trunk and tusks. The mental image is different than the actual sound of the word.

(2) The Theoretical Auditory Quantitative - T(AQ) - symbol is the sound of a number. Again, the sound of a number (e.g. "3") brings to mind an image which is different than the sound itself. Hill admitted that it is sometimes difficult to determine whether the sound "three" is perceived by the individual to be a number (quantitative) or a word (linguistic). Consequently, the theoretical auditory quantitative symbol has been arbitrarily defined to mean the sound of a number.

(3) The Theoretical Visual Linguistic - T(VL) - symbol is the written word. A literate person who reads the written word elephant has a mental image or

understanding different from that of the arrangement of letters on a page. The written word elephant should bring to mind the same image as does the spoken word elephant.

(4) The Theoretical Visual Quantitative - T(VQ) - symbol is the written number. A written number also presents to an individual's awareness something different from the symbol. The written number three should bring to mind the same image as does the spoken number three. Hill indicated that T(VQ) is very important in mathematics education because a student who assumes the symbol is the same as the concept will not understand mathematics. For example, a young student who has a low T(VQ) orientation may respond to the question, "What is half of 3?" by writing "3".

Theoretical symbols are used in languages (written and spoken) to "communicate ideas in a connected consecutive manner, according to the principles of common logic" whereas qualitative symbols are used "to convey 'feelings', commitments, values and to provide particular types of insights into the domain of 'self'." Hill has described qualitative symbols as:

"...the individual's selective sensory and/or code objectifications of experienced worlds of subjective meanings. For example, the tactile sensation of stroking or touching a swatch of velvet cloth results in a qualitative symbolic meaning that, in essence, is a sensory objectification of that experience by the participating individual. In a similar vein, the quality of empathy which an individual develops over the course of time is a code objectification of many varieties of subjective experiences he has had with people throughout his life."

Hill has also indicated that qualitative symbols derive meanings


30Ibid.

from the following sources: (1) sensory stimuli, i.e., the five senses, (2) humanly constructed formalisms such as codes or "games", e.g. Code Empathetic, and (3) "programmatic effects of objects or phenomena which convey an impression of a definite series of images, scenes, events or operations.\textsuperscript{32}"

Hill has expanded the basic definition of qualitative symbols in the following manner.

"Qualitative symbolic codes have a unique logic, involving distinctive patterns (mosaics), characteristic orders, and relationships. As forms of meaning they are not random, disconnected entities, but neither does their organization tend to follow the necessary sequential patterns of theoretical symbolic rationality. In this context, qualitative symbols are sometimes mistakenly thought of as nonrational expressions of experience such as emotions. Actually, qualitative symbols are employed extensively by man to solve problems and interpret the various worlds that comprise a variety of human situations. Under these circumstances, the essential distinction between ordinary languages and qualitative symbolic codes is not found in their applications, but in differences between classes of symbols in which they are expressed, i.e., between the \textit{theoretical symbols} used in ordinary languages and \textit{qualitative symbolic} forms comprising the codes. Expressions composed of qualitative symbols are more appropriate than theoretical symbolic statements when the purposes of communication are best served by direct presentation of forms instead of sequential elements that ultimately yield conclusions.

Qualitative symbols, whether they be in sensory, code, or programmatic form, are individual (and sometimes subcultural) objectifications of subjective states of meaning. In this context, qualitative codes are unified patterns of subjective meanings, while the qualitative symbols associated with the five senses and programmatic effects become forms of individualized meanings.\textsuperscript{33}

Fifteen qualitative symbols can be identified by cognitive style

\textsuperscript{32}Hill, "Qualitative Symbols," p. 1.

\textsuperscript{33}\textit{Ibid.}, p 2.
assessment tools. The qualitative symbols associated with sensory stimuli are:

(1) **Qualitative Auditory - Q(A)** - the ability to perceive meaning through the sense of hearing.

(2) **Qualitative Olfactory - Q(O)** - the ability to perceive meaning through the sense of smell.

(3) **Qualitative Savory - Q(S)** - the ability to perceive meaning through the sense of taste.

(4) **Qualitative Tactile - Q(T)** - the ability to perceive meaning through the sense of touch (including pain and temperature sensations).

(5) **Qualitative Visual - Q(V)** - the ability to perceive meaning through the sense of sight.

One qualitative symbol is associated with programmatic effects:

(6) **Qualitative Proprioceptive - Q(P)** - "the ability to synthesize stimuli produced within the body to produce a manifest behavior such as typewriting, playing a musical instrument while reading music, or any other seeming 'automatic' activity." The element Q(P) includes gross as well as fine motor movements.

The qualitative symbols associated with cultural codes are:

(7) **Qualitative Code Empathetic - Q(CEM)** - the ability to identify with the feelings or experience of others.

(8) **Qualitative Code Esthetic - Q(CES)** - the ability to enjoy the beauty inherent in an idea or physical object.

(9) **Qualitative Code Ethic - Q(CET)** - commitment to a set of values. Morality is not implied in this element since an individual who is highly committed to a set of "immoral" values is rated as having the same level of Q(CET) as an individual equally committed to a set of "moral" values.

(10) **Qualitative Code Histrionic - Q(CH)** - the ability to juxtapose.

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34Ibid., p. 4.
play a role in order to produce a desired effect on others.

(11) **Qualitative Code Kinesics - Q(CK)** - the ability to understand, and communicate by, body language.

(12) **Qualitative Code Kinesthetic - Q(CK)** - the ability to perform motor movements in accordance with a prescribed form.

(13) **Qualitative Code Proxemics - Q(CP)** - the ability to judge acceptable physical and psychological distance.

(14) **Qualitative Code Synnoetics - Q(CS)** - self-knowledge.

(15) **Code Transactional - Q(CT)** - the "ability to maintain a positive communicative interaction which significantly influences the goals of the persons involved in that interaction (e.g. salesmanship)."

The second cognitive style set is called cultural determinants of the meanings of symbols. The second set is composed of three determinants or elements: (1) **Individuality - I**, (2) **Associates - A**, and (3) **Family - F**. In Hill's words:

"It is through these 'determinants' that cultural influences are brought to bear by the individual on the meanings of symbols. The 'individuality' influence is frequently reflected by the individual's need to quote definitions, or explain situations, in his own words. The 'associates' influence is frequently evidenced by an individual who understands that which is under consideration, but explains or discusses these matters mainly in words of his associates who may be involved with him in the situation. The 'family' determinant is frequently portrayed by the individual possessing it through examples he may use in explaining a situation or solving a problem (e.g., either parents, children, wife, husband, sibling, cousin, etc., are used to illustrate a situation analogous to the one under consideration)."

Cultural determinants are especially pertinent in an individual's

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35Hill, "The Educational Sciences," p. 3.

36Ibid.
in an individual's decision-making. A person can be self-reliant, associates-reliant or family-reliant when making decisions. People usually prefer one mode over the other two modes but often use the others when it is appropriate to do so. For example, a person who prefers to be generally self-reliant in decision-making would be likely to consult the family when the decision would have a direct effect on the family.

The third cognitive style set is called modalities of inference. There are four elements which deal with inductive reasoning and one element which is concerned with deductive reasoning. The elements associated with modalities of inference are defined by Hill as:

1. **Magnitude - M** - "a form of 'categorical reasoning' that utilizes norms or categorical classifications as the basis for accepting or rejecting an advanced hypothesis."

2. **Difference - D** - "This pattern suggests a tendency to reason in terms of one-to-one contrasts or comparisons of selected characteristics or measurements."

3. **Relationship - R** - "this modality indicates the ability to synthesize a number of dimensions or incidents into a unified meaning, or through analysis of a situation to discover its component parts."

4. **Appraisal - L** - "is the modality of inference employed by an individual who uses all three of the modalities noted above (M, D and R), giving equal weight to each in his reasoning process. Individuals who employ this modality tend to analyze, question, or, in effect, appraise that which is under consideration in the process of drawing a probability conclusion."

5. **Deductive - K** - "indicates deductive reasoning, or

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the form of logical proof used in geometry or that employed in syllogistic reasoning."

As was mentioned in the foregoing section, the 27 elements within the three cognitive style sets can be ascertained or mapped through the use of a cognitive style assessment tool or cognitive style inventory. Cognitive style mapping has been shown to be valid and reliable in edumetric terms. Because an individual changes with time and experience, the cognitive style mapping instrument should reflect changes in cognitive style elements. Edumetric tests are designed to measure growth and are valid in the sense that an individual's score will change in reflection of the individual's changes. The Heuns and Schnucker conducted a study using two college classes and found that 96% of the cognitive style elements included in the cognitive style mapping inventory have an acceptable internal validity.

Approximately 100 theses and dissertations have been written which are directly concerned with some aspect of the Educational Sciences. Several of these will be discussed in chronological order to provide a sense of historical development as well as to indicate the potential applications of the Educational Sciences.

One of the earliest dissertations employing cognitive style was

38 Appendix B presents sample items from the cognitive style mapping inventory employed in the present study. Appendix B should help clarify the way in which cognitive style elements are ascertained.

written by Fragale\textsuperscript{40} in 1969. The purpose of the study was to identify the cognitive styles of students enrolled in technical courses offered at the community college level and of teachers of the classes included in the study. Fragale wanted to explore the idea that the educational process can be facilitated by matching students and teachers in terms of compatible cognitive styles. The major contribution of this early study was the formulation and testing of one of the initial cognitive style mapping inventories. Fragale found that it is possible to formulate individual cognitive style profiles that represent behavior patterns which might be displayed by individuals in particular situations. The data further indicated that the educational process is influenced by the cognitive style matching of students and instructors.

One year later Cotter\textsuperscript{41} conducted a study concerning the possible relationship between cognitive style and curricular choice. Cotter obtained the cognitive styles of 65 students enrolled in 19 different programs at three campuses of a suburban community college. Only that portion of cognitive style referred to as cultural determinants of the meanings of symbols (individuality, associates and family) was explored to determine whether cognitive style can be used to predict an individual's choice of curriculum. Cotter's

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{40}Marvin Fragale, "A Pilot Study of Cognitive Styles of Selected Faculty Members and Students in a Community College Setting," (Ed.D. dissertation, Wayne State University, 1969).
\end{itemize}
\end{footnotesize}
results indicate that cultural determinants alone cannot be used to predict curricular choice. The data did indicate that the potential is high for using all three sets of cognitive style to predict curricular choice. Cotter also suggested the use of cognitive style in career counseling.

In 1971 Blosser\textsuperscript{42} examined the relationship between cognitive style and achievement motivation. The goals of the study included determining: (1) if academic achievement motivation is reflected in cognitive style elements, and (2) whether or not academic achievement can be increased by exposure to a course designed for the purpose. Both questions were answered affirmatively.

During the same year McAdams\textsuperscript{43} carried out a study to determine the potential for using the Educational Sciences of cognitive style and teaching style as an approach to personalizing education. Students were tested to determine cognitive styles and preferred teaching styles. Instructors' cognitive style and teaching style were mapped. The findings indicated that: (1) the definition of teaching style in terms of cognitive style provides an excellent means of describing teacher performance in behavioral terms; (2) students whose cognitive styles matched the teacher's cognitive style expressed positive attitudes about the educational experience;

\textsuperscript{42}Charles Blosser, "A Pilot Study to Explore the Relationships Between Cognitive Style, Need Achievement, and Academic Achievement Motivation," (Ph.D. dissertation, Wayne State University, 1971).

(3) students with a poor cognitive style match did not express high interest in the educational experience; (4) when students and faculty were matched in terms of student preferred teaching style and teaching style of the instructor, there was an increase in reading level and educational development as a result of the educational experience; and (5) during the educational experience there was a tendency for student cognitive styles to become more closely matched with the instructor's cognitive style.

Covello\textsuperscript{44} conducted a study in 1975 concerning alienation and satisfaction with work, supervisors and co-workers as correlates of matches with cognitive style. The results indicate that cognitive style can be effectively substituted for more traditional measures of alienation and satisfaction with little loss in predictive ability. The degree of cognitive style match between the employee and supervisor proved to be more important in determining job alienation/satisfaction than the degree of match with co-workers. Covello suggested that cognitive style would provide an excellent framework for research in many disciplines since there would be a common vocabulary and common analytical units and concepts on which to build.

Crookes\textsuperscript{45} examined the possible relationships between cognitive


style, teaching style (also an Educational Science) and curriculum area. The sample consisted of a group of Arts and Sciences instructors and a group of Applied Arts and Sciences instructors. Crookes found that the instructors studied had similar cognitive styles and similar teaching styles, however, there were several interesting variations which would appear to reflect the different orientations of an applied field versus a theoretical field. For example, Applied Arts and Sciences instructors relied more heavily upon associates in decision-making - A, learn better through visual materials (graphs, drawings, etc.) - Q(V), and have a greater facility in learning motor movements - Q(F).

The first three Educational Sciences (symbols and their meanings, cultural determinants of the meanings of symbols, and modalities of inference) are generally combined to equal cognitive style. It is possible to add the Educational Science of memory concern to cognitive style mapping. Because no instruments exist to measure memory concern mathematically, empirical mapping is employed. McIntire, in a 1976 study, hypothesized that the accuracy of prediction of examination scores would be increased when the memory concern set was part of the prediction as compared to utilizing only the customary three sets. A complicated framework consisting of empirical and mathematical cognitive style mapping of the sample, determination of the mode of understanding required (in terms of cognitive style elements) for comprehension of lecture and review materials and for successful achievement on the final exam, matching

46McIntire, p. 12.
of student cognitive styles (three sets only) with the modes of understanding required, comparison of all four sets of cognitive style with the modes of understanding required, prediction of examination scores based on the degree of match between cognitive style (with three sets and with four sets) and the mode of understanding required, and statistical analysis. Predictions of performance were more accurate when all four sets of cognitive style were employed. As was pointed out in the study, there is no need for such a complicated system for predicting grades since quiz scores were also satisfactory in predicting the final grade. Rather, the importance of the findings is that a tool exists which can facilitate early identification of problems that relate to learning. The tool can then be used as a guide to alternative procedures that will allow all students to achieve.

The studies reviewed in the foregoing section reflect the wide scope of application of the Educational Sciences. However, it is important to note that all studies employing cognitive style stress the fact that each individual is unique in terms of the preferences expressed as to ways of taking in information from the environment and deriving meaning. The major implication of the basic concept of uniqueness is that every individual is capable of learning, if allowed to learn in the mode most compatible with that individual's cognitive style. For example, a student with a very strong visual orientation and a minimal auditory orientation requires pictures, graphs, charts, models, etc. to achieve at the highest possible level. The Educational Sciences provide a framework with which to match learners,
instructors, instructional settings and materials. The implications for librarianship are clear: there is a potential method by which library users can be matched with the desired information in the format or style of presentation that is most appropriate to the individual's preferred learning or information processing style. In addition, cognitive style can be used to match individuals with tasks. School librarianship can be viewed as a task which requires a certain cognitive style if the task is to be carried out successfully. It may be possible to advise students of potential for success in the field of school librarianship.

A basic overview of cognitive style in general as well as cognitive style within the framework of the Educational Sciences has been presented. The remainder of the literature review will be concerned with known characteristics of librarians as well as with suggestions for traits which should characterize the "ideal" librarian.

Characteristics of Librarians and Library School Students

During the past twenty years several studies have been conducted which sought to determine the characteristics of librarians and/or library school students. Most of the studies yielded data on personality characteristics.

In 1957 Douglass\(^4^7\) conducted a study designed to determine the extent to which the library profession selects new members with

\[^{47}\text{Robert Douglass, "The Personality of the Librarian," (Ph.D. dissertation, University of Chicago, 1957).}\]
personality configurations characterized by extreme deference, submissiveness and respect for authority. Douglass studied a group of 525 library school students enrolled in 19 accredited library schools. The students responded to a questionnaire and five personality inventories. The study showed that the library profession does exercise selective influence in relation to personality when recruiting members. Douglass found the students surveyed to be generally orderly, conscientious, responsible, conservative, undominating, interested in people and not neurotically anxious.

In an attempt to further increase knowledge of the characteristics of librarians, Morrison surveyed a large group of academic librarians concerning personal characteristics, family background, education, interests, attitudes and motivations. Morrison found that: (1) academic librarians tend to come from families with high educational and social, but not economic, status; (2) the Midwestern United States exports library personnel; (3) executive positions were beginning to be filled by library science doctorates rather than by faculty members with no library training; (4) early commitment to the career choice was associated with high future status and salary; and (5) although intelligent and cultured, academic librarians are lacking in the characteristics of strong leadership.

The early studies conducted by Douglass and Morrison provided a framework upon which subsequent researchers built when exploring the

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characteristics of librarians and/or library school students.

Several studies were designed to attempt to identify characteristics possessed by librarians and which set librarians apart from other subgroups within the population. Reeling\(^{49}\) studied a group of female undergraduates in order to ascertain characteristics typifying potential library science students. Potential students, in comparison with students who rejected librarianship as a career, were found to: (1) have parents with lower educational levels; (2) have higher scores on the Scholastic Aptitude Test; (3) have higher scores on order and lower scores on autonomy, heterosexuality and economic and political values; (4) have higher grades; (5) be more likely to have been an education major and to have taken a library science course; (6) like to read and use libraries; and (7) have had library work experience.

A British study conducted by Sladen\(^{50}\) in 1972 indicated that librarians do not vary significantly from the general population on a standardized personality test except in two areas. Librarians were found to score higher than average on the intelligence section of the test and to score lower than average on the part of the test which measures introversion. Sladen concluded that the findings tend to support: (1) earlier findings of inferiority feelings and lack of confidence on the part of librarians, and (2) the stereotype of the submissive, introverted librarian.


A very similar study with partially conflicting results was conducted by American researchers Lee and Hall\textsuperscript{51} to determine: (1) whether female library science students have different personality characteristics than a female college norm group, and (2) how well the prospective librarians match the occupational stereotype. The library school students were found to be quite similar to a college norm group in terms of personality characteristics. The study also showed that the prospective librarians did not conform to the personality characteristics of the occupational stereotype any more than did the norm group. In fact, library school students scored higher on the intelligence, experimentation and self-sufficiency scales than did the college norm group. Perhaps the disparity of results between the American and British studies is a result of cultural differences.

Two studies have been completed which reveal information about the characteristics of librarians through analysis of the service orientation of library school students and practitioners. Fitzgibbons\textsuperscript{52} conducted a study in 1976 to explore the concept of service orientation and to develop a means of measuring service orientation. Perceptions of service orientation by library school students, librarians and library leaders were measured and compared.

\textsuperscript{51}David Lee and Janet Hall, "Female Library Science Students and the Occupational Stereotype: Fact or Fiction?," College & Research Libraries 34 (September 1973): 265-267.

\textsuperscript{52}Shirley Fitzgibbons, "The Concept of Service Orientation: An Exploratory Study on the Concept in Relationship to the Library and Information Services Field," (Ph.D. dissertation, The State University of New Jersey, 1976).
The sample groups expressed a positive perception of service but found
the professional model of service to be inappropriate for the field
of librarianship. The "open-systems-type" of service orientation
which requires a level of knowledge and expertise surpassing the
traditional level was selected as the ideal type by the sample
groups. In summary, Fitzgibbons found that a cross section of library
school students, librarians and library leaders place a great deal
of emphasis on the importance of a strong service orientation and
express a desire to upgrade the traditional level of service
orientation.

Similarly Adams\textsuperscript{53} carried out a study in 1973 to find out if two
personality inventories could be used to predict a service orientation
in school librarians. Each librarian included in the survey
completed two personality inventories and a questionnaire. In
addition, each participant was observed in the school library
setting for 12 hours. Although, the study was not conclusive, a
significant correlation was found to exist between a personality
factor called personal relations and service orientation. The study
also showed that senior high schools were more demanding of librarians
in terms of special services than were junior high schools, and that
as the length of job experience increases, so does the amount of
time spent on special services.

Two additional studies ascertained selected characteristics of

\textsuperscript{53}Elaine Adams, "An Analysis of the Relationship of Certain
Personality Factors to the Amount of Time Alloted to Specified
Public Service Tasks by Selected School Librarians," (Ph.D.
dissertation, University of Southern California, 1973).
librarians in order to attempt to predict a measure of success.

Baillie\textsuperscript{54} studied a group of graduates who had been working for two years to determine whether it is possible to predict success in library school and on the job. Several correlations of predictor variables with graduate grade point average were found to be significant. The predictor variables included the California Psychological Inventory, the Graduate Record Examination and undergraduate grade point average. Baillie suggests that all of the predictor variables could be relied on for an improved admissions policy. There was only a weak positive correlation between success in school and success on the job. However, Baillie found a strong positive correlation between graduate grade point average and the California Psychological Inventory scales of self-acceptance and dominance and the job success rating scale.

Then in 1974 Madaus\textsuperscript{55} studied school learning resources programs in Texas senior high schools in order to determine what, if any, characteristics are predictive of a high student use of learning resource materials. The factors studied were: (1) the extent to which librarians are involved in the curriculum; (2) the background and personality of librarians; and (3) the teaching structure of the schools. Madaus found no single factor to be predictive of a high level of use. The best combination of factors for predicting strong

\textsuperscript{54}Gordon Baillie, "Objective Admission Variables as They Relate to Academic and Job Success in One Graduate Library Education Program," (Ed.D. dissertation, Washington University, 1961).

\textsuperscript{55}James Madaus, "Curriculum Involvement, Teaching Structures, and Personality Factors of Librarians in School Media Programs," (Ph.D. dissertation, University of Texas at Austin, 1974).
usage is a high extroversion score combined with a high degree of curriculum involvement. Teaching structures did not correlate with degree of materials usage. Madaus found school librarians to be more extroverted, less neurotic and more sociable than the group studied by Douglass.

Several studies which explored the actual characteristics of librarians and library school students have been discussed in the above section. The next section of the literature review will explore studies and articles which suggest ideal characteristics that should be possessed by librarians and/or library school students.

The "Ideal" Librarian

Various attempts have been made to define the personal characteristics of the "ideal" librarian. The definitions have been proposed to help in admissions and guidance work as well as to provide a general standard to use when attempting to evaluate success in the field.

One of the earliest papers on the topic was written by Howe in 1936. Howe examined library science textbooks and compiled a composite list of 35 desirable traits. The eleven most commonly mentioned traits were judgment, professional knowledge, imagination, interest in work, initiative, organization, accuracy, forcefulness, adaptability, health and industriousness. A variety of tests were employed by Howe to assess the characteristics of groups of

catalogers, library school students and prospective library school students. Howe stressed the use of reading and vocabulary tests as indicators of general intelligence and as predictors of academic success. Two personality tests were used to determine emotional stability. The subjects tested were found to be below average in self-confidence. Howe's work consisted primarily of formulating a list of desirable traits and of locating tests to use in admissions and counseling work. The need to know more about the personality characteristics of librarians and the need to find effective ways of counseling students was pointed out by Howe.

Two other writers have also addressed the question of what characteristics are necessary for all types of librarians. Powell\(^57\), in customary rambling style, has set forth five elements which characterize the "good" librarian. The elements are curiosity about all facets of life, perception of the needs of others, courage to stand up to one's moral convictions, a desire to serve others, and a dedicated belief in the value of one's work. Bennett\(^58\) stressed that the library profession does not need recruits with various physical and mental problems who view the library as a retreat from the world. Instead Bennett says librarians need to: (1) be mentally and physically vigorous, (2) possess a great breadth of knowledge; and (3) be capable of making and living with moral


judgments especially in relation to censorship pressures.

In the field of school librarianship two relatively recent publications have identified desirable personal characteristics for media specialists. Whitehead proposed five leadership qualities which school library media personnel should possess. The five qualities are: availability, approachability, accountability, adaptability and awareness. Availability implies a need to spend time on services and people rather than with housekeeping and paper work. Approachability means the ability to facilitate interactions. In the section on accountability, Whitehead stressed the desirability of keeping in close contact with users and superiors. Adaptability requires an ability to listen and a willingness to accept many modes of information sources. Finally, Whitehead uses awareness to mean cognizance of the environment which is necessary if one is to provide the best possible service.

Sullivan pointed out that too little attention is paid to the personal characteristics of school media personnel. In addition, Sullivan was concerned with the waste of resources which occurs when poor counseling and/or employment interviewing allows people to enter a field in which it will be impossible to function effectively. Sullivan acknowledged that a list of desirable qualities should be well balanced, e.g., friendliness should be paired with independence.


60 Peggy Sullivan, Desirable Characteristics of School Library Media Personnel; and The Concept of the Future as it is Presented in Children's Books Today, Phineas L. Windsor Lectures in Librarianship (Urbana: University of Illinois Press, 1975).
in the library setting because it is often necessary to work alone as well as to be friendly in contacts with users and fellow employees. A composite list of desirable traits mentioned by Sullivan includes curiosity, simplicity (integrity and honesty), dedication to goals, enthusiasm, resourcefulness, organizing ability, initiative, power of intellectual stimulation, intellectual alertness, cooperativeness, adaptability, empathy, a sense of humor, being one's self, openness and independence.  

The literature which is closely related to the present study has been reviewed in Chapter II. Cognitive style, as defined by Hill, has received primary emphasis in the literature review since Hill's conception of cognitive style is central to understanding the present investigation. Chapter III defines how cognitive style is to be employed in the present research.

A copy of Sullivan's speech is included in the present text as Appendix D. Sullivan's speech will be subjected to empirical cognitive style mapping as the means of obtaining the cognitive style map of the "ideal" media specialist.

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CHAPTER III

METHODS AND PROCEDURES

Introduction

The background, significance and purpose of the present study has been presented in Chapter I. A list of assumptions underlying the study, the general question to be answered and definitions of key terms were also included in Chapter I. A literature review of cognitive style and known and desirable personal characteristics of librarians was presented in Chapter II. Chapter III will include a description of the subjects, instrumentalities, data collection and data analysis procedures to be utilized in the present study.

Subjects

Source of data

The subjects of the present study will be graduate library school students specializing in school librarianship and enrolled in Library Administration and Management (LIB 622) during the 1978 winter term at Western Michigan University. The LIB 622 course is a required class for all students in the School of Librarianship who are enrolled in the M.S.L. program. The course structure is such that the class meets as a whole for general lectures and breaks down into the following four specialty subgroups: School Libraries,
Public Libraries, Academic Libraries and Special Libraries. Students are free to choose a specialty subgroup. The subjects of the present study will be in the School Libraries subgroup of LIB 622.

Representativeness

The sample will not be random but rather will be a convenience sample.

The population includes all graduate library school students enrolled in the M.S.L. program at Western Michigan University and who are specializing in school librarianship.

Adequacy

The present descriptive study will be model generating rather than hypothesis testing. Consequently, the present study will be designed to test the feasibility of using cognitive style mapping as a tool to compare the cognitive style of the "ideal" media specialist with the cognitive style profiles of the sample. The small sample is sufficient to determine feasibility.

Instrumentalities

Two instruments will be used in relation to the sample. The first (Appendix A) will be a questionnaire concerning educational and work experience and future employment interests. The purpose of the questionnaire is to provide information which will be used to describe the characteristics of members of the sample.
The second instrument to be used in relation to the sample will be a cognitive style mapping inventory. The cognitive style mapping inventory assess the first three sets of the Educational Sciences: (1) symbols and their meanings, (2) cultural determinants, and (3) modalities of inference. Each set can be broken down into measurable components or elements. The purpose of the inventory is to allow measurement of the degree to which various cognitive style elements are present in the cognitive repertoire of an individual.

The sample will be presented with an inventory developed by Hill and associates. The inventory consists of a battery of 216 questions which tests for 27 cognitive style elements. Each question is to be answered by checking one of the following terms: sometimes, usually or rarely. A list of sample questions from the cognitive style mapping inventory is presented in Appendix B.

The results of the 216 items are recorded on a tally sheet (Appendix C) and a numerical score is obtained for each cognitive style element. Scores are obtained for an item by assigning five points for each answer under "usually", three points for each answer under "sometimes" and one point for each answer under "rarely". Consequently, the highest possible score for a given element is 40 and the lowest possible score is eight. In the present study, the set of scores is referred to as the cognitive style map.

Each element of the cognitive style map is defined as major, minor or negligible according to the score received. The terms
major, minor and negligible refer to an individual's orientation toward a particular element, i.e., the extent to which a person makes use of an element while taking note of the environment and deriving meaning. Based on Flanagan's technique of estimating product-moment from data of distribution tails, Hill has established the following orientation scale:

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Score</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-99</td>
<td>28-40</td>
<td>Major</td>
</tr>
<tr>
<td>25-49</td>
<td>18-26</td>
<td>Minor</td>
</tr>
<tr>
<td>0-24</td>
<td>8-16</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

A third instrument is the identification and cognitive style mapping of a model of the "ideal" media specialist. A published speech by Sullivan entitled "Desirable Characteristics of School Library Media Personnel" has been selected as the basis for formulating the model of the "ideal" media specialist. The speech was selected because Sullivan is highly respected in school library circles and because it is possible to empirically draw a cognitive style map from Sullivan's remarks.

1John Flanagan, "General Considerations in the Selection of Test Items and a Short Method of Estimating the Product Moment from the Data of the Tails of the Distribution," Journal of Educational Psychology (December 1939): 674-80.


Sullivan's speech will be submitted to three faculty members of the School of Librarianship at Western Michigan University who specialize in school librarianship. Comments on specific disagreements with Sullivan's views will be requested.

A cognitive style map will be drawn from Sullivan's speech. The mapping will be done by a person with considerable experience with empirical mapping. The present author will assist in compiling the empirical map. The two people who are to do the empirical mapping will be referred to as panel members hereinafter. The panel members will carefully study Sullivan's speech, discuss the various points in relation to cognitive style elements and assign a score to each element. The discussion will be summarized in Appendix G.

Data Collection

Data to be obtained from the sample will be gathered during a regularly scheduled class meeting. During the January 14, 1978 class meeting, the course instructor will introduce the student sample to the concept of cognitive style. The student sample will also be told about the present study and will be asked to participate.

On January 21, 1978 the questionnaire (Appendix A) and the cognitive style mapping inventory (Appendix B) will be presented to the sample during the school library section meeting of LIB 622. In the event any section members are absent on January 21, 1978, the

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4 The mapping will be done by Dr. Cecil L. McIntire who has conducted research which employed empirical mapping of cognitive style.
present researcher will make an announcement at the next class meeting informing absentees that copies of the questionnaire and inventory are available to be taken home and completed. If any absentees fail to take copies of the instruments, the present researcher will ask for an explanation so that results will not be biased by nonrespondents.

The student sample will be assured that all information will be kept confidential, and that no names will be mentioned in the thesis. In relation to the cognitive style mapping inventory, the students will be told to answer the questions directly on the inventory sheets and to mark the first answer that comes to mind rather than belaboring the questions. The student sample will also be informed that the present researcher is willing to interpret the results of individual cognitive style tests, and that students should indicate a preferred day and time if interpretation is desired. The researcher will prepare an interpretation schedule for presentation at the next class meeting.

In relation to the instrument for the identification and cognitive style mapping of a model of the "ideal" media specialist, a copy of the Sullivan speech (Appendix D) will be presented to three faculty members of the School of Librarianship at Western Michigan University who specialize in school librarianship. The three faculty members will be requested to read the speech and comment on any specific disagreements with Sullivan's views. The request will be made in a letter (Appendix E). The purpose of surveying the three faculty members is to insure that Sullivan's
opinions are accepted by experts in the field. Also, since Sullivan presented the speech almost four years ago, there may have been new theories developed which should be reflected in the cognitive style map of the "ideal" media specialist and which will presumably be pointed out in the faculty evaluations.

Any comments received from the three faculty members will be added to the Sullivan speech, and will be considered in the empirical mapping process. Comments received will be included in the present study in the form of an appendix.

The empirical mapping procedure will be carried out by the panel members during the week of March 12, 1978.

Data Analysis

The results of the questionnaire (Appendix A) will be presented in a descriptive manner. The answers to each question will be described either in terms of mean and range or in terms of the number of students who fell in a particular category, e.g. x number of full-time students and y number of part-time students. One of the questions asks employed students to indicate job title and name of employer. The results of this question will be presented in terms of type of employment (library or non-library), and if employment is library related, whether or not the job is of a professional nature. In addition, the number of members of each sex in the sample will be indicated.

The results of the cognitive style mapping inventory for each student will be recorded on a cognitive style mapping inventory tally
sheet (Appendix C) by the researcher. The scoring method has been described earlier in Chapter III.

The empirical cognitive style map of the "ideal" media specialist will also be recorded on a tally sheet.

The mean value for each cognitive style element of the sample and the mean value for each cognitive style element of the "ideal" media specialist (hereinafter called referent) will be matched. The matching technique to be used was developed by Covello and Hill and was employed by Covello\(^5\) to show that certain elements may be more important in one context than in another. Covello's matching technique allows the researcher to place weights or degrees of importance on elements in relation to the context. If a weighted matching technique was not used, all elements would have to be treated as though equal in importance. The degree of importance for elements in the proposed study will be assigned in relation to the stress perceived to be placed on various statements in Sullivan's speech from which the cognitive style map of the referent will be drawn.

Elements that cannot be ascertained from Sullivan's speech will not be used in the matching procedure. For example, it is anticipated that Sullivan's speech will not deal with the sense of smell (Qualitative Olfactory element). Consequently, that particular element will not be dealt with in the matching procedure.

Similarly, Sullivan's speech is expected to indicate that some elements are more important in the context of school librarianship than are other elements. Consequently, with the weighted matching technique, a mismatch of 25% is far less important for an element that is ranked low (relatively unimportant in the context of school librarianship) than is a mismatch of 25% for an element that is ranked high.

The formula for determining the match between the referent and the students on a given element of cognitive style is

$$X_{mi} = \left( \frac{Xr}{40} \right) \left( \frac{40 - |Xr - Xs|}{40} \right)$$

where $X_{mi}$ indicates the degree of weighted match between the referent and the students. The importance factor is $\frac{Xr}{40}$ where $Xr$ is the extent or degree to which the referent element is judged to be desirable (a cognitive style raw score). $Xs$ denotes the mean raw score produced by the students for the element under consideration. The example shown below illustrates how the degree of match between the students and the referent (match score) can be determined for a given element. If the referent score for the cognitive style element Theoretical Auditory Linguistic, T(AL), is judged to be 34 and the students' mean score for the same element is 30, then the degree of match would be $\left( \frac{40 - |34 - 30|}{40} \right) = \frac{36}{40}$

$^6$Cognitive style raw score is simply the score received on any element. Raw scores will always be an even number ranging between eight and 40.
and the importance factor would be 34/40 or an \( X_{m_i} \) of \( (34/40) (36/40) = 0.765 \)

\[
X_{m_i} = \left( \frac{X_r}{40} \right) \left( \frac{40 - |X_r - X_s|}{40} \right) = \left( \frac{34}{40} \right) \left( \frac{40 - |34 - 30|}{40} \right)
\]

\[
X_{m_i} = \left( \frac{34}{40} \right) \left( \frac{40 - 4}{40} \right) = \left( \frac{34}{40} \right) \left( \frac{36}{40} \right) = 0.765
\]

Since the absolute value is taken for the referent score minus the student score \(|X_r - X_s|\), when students have higher scores than the referent, the match is just as poor as when students have the same degree of mismatch due to a lower than referent score.

**Statistical Analysis**

Next, a statistical test will be used to determine if a correlation exists between the ranked order mean scores of the students and the ranked order mean scores of the referent. The two lists of ranked order scores will be submitted to the Spearman rank correlation coefficient test to ascertain: (1) if there is a correlation between the two sets of rankings; and (2) if a correlation exists, what is the magnitude of significance (one tail-test) of the correlation. Although the present study is not designed to be hypothesis testing, the data will nevertheless be subjected to the Spearman rank correlation coefficient test which is designed to be used with small sample sizes. A one-tail, rather than a two-tail test, will be used because of an expectation that a positive correlation will exist between the cognitive style of the ideal media specialist and any graduate student or group of
graduate students. The reason for the expectation of a positive correlation (as opposed to no correlation or a negative correlation) is that generally speaking all graduate students in modern North American society have been subjected to quite similar pressures in relation to development of cognitive style elements which tend to facilitate survival in academia. For example, a high level of goal setting ability (which corresponds to the cognitive style element Q(CET) - Qualitative Code Ethic) would be expected to exist for a student who had reached the graduate level. Similarly a high T(VL) - Theoretical Visual Linguistic would be expected, given the amount of reading required in undergraduate and graduate course work.

Data and statistical analysis is expected to: (1) add to the body of knowledge about the actual characteristics of library school students; (2) provide information that can be used to make a determination as to whether or not it is feasible to use cognitive style mapping as a tool to compare the cognitive style of the "ideal" media specialist with the cognitive style profiles of graduate library school students specializing in school librarianship; and (3) to provide information with which to formulate a model for counseling prospective library school students who wish to specialize in school librarianship. The model will be presented in Chapter V.

Chapter III is a description of how the present study is to be conducted. Chapter IV will be a description of how the present study was conducted and will follow the same general outline that has been used in Chapter III.
CHAPTER IV

RESULTS

Introduction

The background, significance and purpose of the present study has been presented in Chapter I. A literature review was presented in Chapter II, and Chapter III included a description of the subjects, instrumentalities, data collection and data analysis procedures to be utilized in the present study. Chapter IV will follow the format of Chapter III to provide a detailed description of the steps followed in the present investigation.

Subjects

General data (Appendix A) concerning the student sample was obtained during the January 21, 1978 class meeting. At the next class meeting those students absent on January 21, 1978 were requested to complete the questionnaire. The present researcher, a class member, did not complete any instruments in order to prevent introduction of investigator bias. Consequently, out of an initial sample size of 12 (including the present investigator), 10 students completed the questionnaire.

Analysis of the 10 completed questionnaires revealed the following facts about the student sample.

(1) The students ranged in age from 25 to 44 with a mean age of 31.4 years.
(2) There were nine females and one male.

(3) Students had been enrolled in the School of Librarianship for as long as three years and for as short as one semester. There are two full semesters and two half-semesters in a calendar year. The breakdown by date of entry is as follows:

- Winter Semester, 1974: one student
- Fall Semester, 1976: three students
- Summer Half-semester, 1976: one student
- Winter Semester, 1977: one student
- Spring Half-semester, 1977: one student
- Fall Semester, 1977: two students

In addition, one student had received a M.S.L. from Western Michigan University in 1967 and was enrolled in LIB 622 to meet certification requirements.

(4) Four students (Group A) were enrolled in a 30-credit hour program, five students (Group B) were enrolled in a 36-credit hour program and the student completing certification requirements was not enrolled in either program. Since the 30-credit hour program generally applies only to students with an undergraduate minor in the field, the sample represents a nearly balanced mix of students with an undergraduate and no undergraduate background in library science.

(5) The four students enrolled in the 30-credit hour program (Group A) had completed between five and 21 credit hours by the end of the semester prior to the semester during which the present study was conducted. Group A averaged 15.3 completed credit hours. The five students enrolled in the 36-credit hour program (Group B) had completed between 13 and 30 credit hours by the time LIB 622 was taken. Group B averaged 21.0 completed credit hours. The student completing certification requirements had completed approximately 37 credit hours in library science courses.

(6) Group A students were enrolled in from four to seven credit hours during the term in which the present
investigation was undertaken. Only one student in Group A was enrolled in just one course. Group A averaged 6.3 credit hours. Group B students were enrolled in from four to ten credit hours during the same term. Again, only one student was enrolled in just one course. Group B averaged 7.4 credit hours. The student completing certification requirements was enrolled for five credit hours.

(7) Group A students expected to complete coursework from within two half-semesters to two full semesters plus two half-semesters (equivalent of three full semesters) after completion of the semester in which the present research was conducted. The breakdown for expected course completion for Group A is as follows:

- **Summer Half-semester, 1978** one student
- **Fall Semester, 1978** two students
- **Winter Semester, 1978** one student

One Group B student did not state an expected course completion date. The four remaining members of Group B expected to complete coursework during the next two half-semesters. The breakdown for Group B is as follows:

- **Spring Half-semester, 1978** one student
- **Summer Half-semester, 1978** three students

The student working on certification requirements expected to be eligible for certification by the end of the semester in which the present research was conducted. All of the students expected to complete coursework within one calendar year. Over one-half (six) of the students expected to complete coursework before the beginning of the next academic year, i.e., Fall Semester, 1978.

(8) Eight subjects were part-time students and two subjects were full-time students. One student checked both full-time and part-time and was assigned part-time status by the present researcher based on the number of hours attempted during the semester in which the present investigation was conducted.

(9) The students were involved in a number of different types of employment situations. Three students were
not employed. Of the seven students who were employed, three worked full-time and four worked part-time. The breakdown as to type of job and length of employment on the job is as follows:

- **Salesperson**: one student, three months, part-time
- **Student assistant - academic library**: two students, both were part-time, one had worked for two weeks and one had worked for four months
- **Student assistant - learning resources center**: one student, four months, part-time
- **Library assistant - public library**: one student, three years, full-time
- **Media specialist**: two students, both were full time, one had worked for one and one-half years and one had worked for three and one-half years.

**Sample Selection**

Verbal permission was obtained from the instructor of the school libraries section of LIB 622 to request the students to participate in the present investigation. Ten of the 11 students eligible to be included in the sample chose to participate.

**Instrumentalities**

Each member of the student sample was presented with two instruments. The questionnaire (Appendix A) was designed to provide information to be used in describing the characteristics of the sample. The cognitive style mapping inventory (Appendix B) was used to obtain a cognitive style map of each sample member. After the cognitive style mapping inventories were completed, the results were
recorded on individual cognitive style mapping inventory tally sheets (Appendix C).

The third instrument included the identification and empirical cognitive style mapping of the "ideal" media specialist. A published speech by Sullivan (Appendix D) entitled "Desirable Characteristics of School Library Media Personnel" was selected as the basis for formulating the model of the "ideal" media specialist. Sullivan's material was selected for the following reasons:

(1) a review of the pertinent literature indicated that Sullivan's speech is the most comprehensive list of desirable personal characteristics of school media personnel;

(2) Sullivan is highly respected in school library circles; and

(3) it is possible to empirically draw a cognitive style map from Sullivan's remarks.

The speech was submitted to three faculty members of the School of Librarianship at Western Michigan University who specialize in school librarianship. An accompanying letter (Appendix E) requested the faculty members to make comments on any specific disagreements with Sullivan's views. Two out of the three faculty members responded. It is assumed that the third faculty member had no disagreements with the Sullivan speech. The two responding faculty members did not disagree with Sullivan, but chose to add to Sullivan's remarks as well as to stress important characteristics set forth in

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the speech. The comments made by the two faculty members are presented in Appendix F.

The final step in the formulation of the model of the "ideal" media specialist was the empirical mapping of the cognitive style of the "ideal" as set forth by Sullivan and supplemented by the two faculty members. The two panel members carefully studied the speech. A lengthy discussion was held during which cognitive style elements were identified and cognitive style raw scores were assigned. The procedure included the following steps:

1. Read each paragraph.
2. Isolate any words or phrases in each paragraph that have cognitive style correlates.
3. For each phrase select the closest cognitive style element or elements.
4. Assign a cognitive style raw score to each element identified. The quantitative evaluation was determined by the weight the author was perceived to have placed on that characteristic.
5. Determine the mean score for each cognitive style element.

The contributions of the two faculty members were included in the mapping procedure and were evaluated in the same manner as was Sullivan's material. Appendix G is a summary of the discussion held by the panel members. Each paragraph is analyzed in terms of cognitive style elements identified and cognitive style raw scores assigned. The rationale for the analysis of each characteristic is also summarized.

Out of a possible 27 cognitive style elements, 20 were identified in the Sullivan speech as supplemented by the two faculty members.
The following seven cognitive style elements were not identifiable in the material from which the empirical map was drawn:

- T(AQ) - Theoretical Auditory Quantitative
- Q(A) - Qualitative Auditory
- Q(O) - Qualitative Olfactory
- Q(S) - Qualitative Savory
- Q(T) - Qualitative Tactile
- Q(CKH) - Qualitative Code Kinesthetics
- F - Family

It was expected that most of the seven elements listed immediately above would not be identifiable in Sullivan's speech. For example, it would be quite unusual for a list of desirable personal characteristics of media specialists to include a keen sense of smell, taste and touch.

Sullivan and the two faculty members often made more than one reference to a given cognitive style element. For example, 13 different statements were identified which fell under the cognitive style element Qualitative Code Ethics. Consequently, there were 13 cognitive style raw scores for the element. A mean score was derived for each element which had been assigned more than one cognitive style raw score.

The cognitive style map of the ideal media specialist is as follows:

<table>
<thead>
<tr>
<th>Element</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>T(AL) - Theoretical Auditory Linguistic</td>
<td>34.0</td>
</tr>
<tr>
<td>T(VL) - Theoretical Visual Linguistic</td>
<td>36.0</td>
</tr>
</tbody>
</table>
The data analysis instrument consisted of a technique for matching the cognitive style elements in the maps of the students (mean scores) with the same cognitive style elements in the map of the "ideal" media specialist, i.e., the referent. The matching technique employed was developed by Covello and Hill and was employed by Covello\(^2\) to show that certain elements may be more important in

one context than in another. Covello’s matching technique allowed the present researcher to place weights or degrees of importance on elements in relation to the context. If a weighted matching technique had not been used, all elements would have had to been treated as though equal in importance. The degree of importance for elements in the proposed study was assigned in relation to the stress perceived to have been placed on various statements in Sullivan’s speech as supplemented by the faculty members from which the cognitive style map of the referent was drawn.

The seven elements that could not be ascertained from Sullivan's speech were not used in the matching procedure. Similarly, Sullivan's speech indicated that some elements are more important in the context of school librarianship than are other elements. Consequently, with the weighted matching technique, a mismatch of 25% is far less important for an element that is ranked low (relatively unimportant in the context of school librarianship) than is a mismatch of 25% for an element that is ranked high.

Data Collection

During the January 14, 1978 class meeting the instructor introduced the students to the concept of cognitive style. The instructor also told the students about the present study and requested student participation in the study.

On January 21, 1978 the present researcher spoke to the school libraries section of LIB 622 to discuss cognitive style and to
outline the purposes and procedures of the present study. After
the discussion period, the questionnaire (Appendix A) and the cog-
nitive style mapping inventory (Appendix B) were presented to the
students. The students were assured that all information would be
kept confidential, and that no names would be mentioned in the
thesis. In relation to the cognitive style mapping inventory, the
students were told to answer the questions directly on the inventory
sheets, and to mark the first answer that came to mind rather than
belaboring the questions. The students were also informed that the
present researcher was willing to interpret the results of indi-
vidual cognitive style tests, and students were to indicate a
preferred day and time if interpretation was desired. The present
researcher prepared an interpretation schedule for presentation at
the next class meeting.

On January 21, 1978, 10 out of 12 students were in attendance.
Since the present researcher was a class member but did not respond
to the instruments, nine students completed the two instruments on
January 21, 1978. At the next class meeting the present researcher
outlined a list of interpretation times, and requested students who
were absent the preceding week to pick up copies of the instruments
for completion at home. One of the absentees did request copies
of the instruments, and subsequently, returned the completed forms
to the present researcher. The second absentee did not respond to
the verbal request made in class. On February 25, 1978 the second
absentee was approached by the present investigator and was asked
why there had been no response. The present researcher explained to
The student was informed that the purpose of the question was solely to get a response that could be included in the thesis so that the results would not be biased by nonrespondents. The student had intended to request a copy of the instruments but had forgotten to do so. Copies were given to the student but were not returned. On March 21, 1978 the student was asked by the present investigator if the forms had been completed. The student said no and indicated a very busy schedule was the reason for not completing the forms.

As noted above, the present researcher arranged to meet individually with interested students to interpret cognitive style maps. Seven of the 10 students requested an interpretation, and each of the seven students appeared to be quite enthusiastic about the interpretation. Without exception, the students remarked on the accuracy of the results.

On January 9, 1978 a letter (Appendix E) with an attached copy of the Sullivan speech was sent to three faculty members of the Western Michigan University School of Librarianship who specialize in school librarianship. The letter requested a response by February 6, 1978. One of the two responses was received one week after the February 6 deadline, but was accepted because a blizzard had prevented mail delivery for several days. The third faculty member did not respond at all.

The panel members derived an empirical cognitive style map of the "ideal" media specialist during the week of March 12, 1978. The entire procedure was completed in three sessions of approximately two hours duration.
Data Analysis

Covello's weighted matching technique was applied to the mean cognitive style scores the students obtained and the mean cognitive style scores of the referent. The formula for determining the match between the referent and the student on a given element of cognitive style is:

\[ X_{m_i} = \left( \frac{Xr}{40} \right) \left( \frac{40 - |Xr - Xs|}{40} \right) \]

where \( X_{m_i} \) indicates the degree of weighted match between the referent and the students. The importance factor is \( \frac{Xr}{40} \) where \( Xr \) is the extent or degree to which the referent element is judged to be desirable (a mean cognitive style raw score) and \( Xs \) denotes the mean raw score produced by the students for the element under consideration.

Since the absolute value is taken for the referent score minus the student score (\( |Xr - Xs| \)), when students have higher scores than the referent, the match is just as poor as when students have the same degree of mismatch due to a lower than referent score.

The formula was used to compare each mean cognitive style element value of the referent with the same mean cognitive style element value of the student group. For example, the referent received a mean cognitive style score of 38.4 on the element Qualitative Code Synnoetics - \( Q(CS) \) and the students obtained a mean cognitive style score of 35.0 for the element \( Q(CS) \). A match
score between the ideal and the student group for the element Q(CS) was obtained as follows:

\[
X_{n_i} = \left( \frac{X_r}{40} \right) \left( \frac{40 - |X_r - X_s|}{40} \right) = \left( \frac{38.4}{40} \right) \left( \frac{40 - |38.4 - 35.0|}{40} \right)
\]

\[
X_{m_i} = \left( \frac{38.4}{40} \right) \left( \frac{40 - 3.4}{40} \right) = \left( \frac{38.4}{40} \right) \left( \frac{36.6}{40} \right) = .878
\]

The degree of match on the element Q(CS) was .878. The highest possible degree of match for Q(CS) would have been .960 if the student group had obtained the same mean score on Q(CS) as did the referent.

The results of the matching technique for all elements follows. Also included in the results is the highest possible match score (importance factor) that could have been obtained on each element had the student mean score been the same as the referent score.

<table>
<thead>
<tr>
<th>Cognitive Style Element</th>
<th>Referent Mean Score</th>
<th>Student Mean Score</th>
<th>Degree of Match</th>
<th>Highest Possible Match Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q(CS)</td>
<td>38.4</td>
<td>35.0</td>
<td>.878</td>
<td>.960</td>
</tr>
<tr>
<td>Q(CET)</td>
<td>36.9</td>
<td>36.0</td>
<td>.902</td>
<td>.932</td>
</tr>
<tr>
<td>Q(CEM)</td>
<td>36.7</td>
<td>34.6</td>
<td>.869</td>
<td>.918</td>
</tr>
<tr>
<td>T(VL)</td>
<td>36.0</td>
<td>34.2</td>
<td>.860</td>
<td>.900</td>
</tr>
<tr>
<td>L</td>
<td>35.7</td>
<td>31.4</td>
<td>.797</td>
<td>.893</td>
</tr>
<tr>
<td>Q(CES)</td>
<td>38.5</td>
<td>35.0</td>
<td>.879</td>
<td>.963</td>
</tr>
<tr>
<td>I</td>
<td>35.1</td>
<td>31.6</td>
<td>.801</td>
<td>.878</td>
</tr>
<tr>
<td>T(AL)</td>
<td>34.0</td>
<td>27.0</td>
<td>.701</td>
<td>.850</td>
</tr>
<tr>
<td>T(VQ)</td>
<td>34.0</td>
<td>22.8</td>
<td>.599</td>
<td>.850</td>
</tr>
<tr>
<td>Cognitive Style Element</td>
<td>Referent Mean Score</td>
<td>Student Mean Score</td>
<td>Degree of Match</td>
<td>Highest Possible Match Score</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Q(V)</td>
<td>34.0</td>
<td>27.6</td>
<td>.714</td>
<td>.850</td>
</tr>
<tr>
<td>Q(P)</td>
<td>34.0</td>
<td>24.8</td>
<td>.621</td>
<td>.850</td>
</tr>
<tr>
<td>Q(CP)</td>
<td>34.0</td>
<td>27.0</td>
<td>.701</td>
<td>.850</td>
</tr>
<tr>
<td>A</td>
<td>34.0</td>
<td>25.8</td>
<td>.676</td>
<td>.850</td>
</tr>
<tr>
<td>Q(CT)</td>
<td>33.8</td>
<td>28.0</td>
<td>.722</td>
<td>.845</td>
</tr>
<tr>
<td>Q(CK)</td>
<td>33.3</td>
<td>29.0</td>
<td>.743</td>
<td>.833</td>
</tr>
<tr>
<td>D</td>
<td>30.0</td>
<td>28.8</td>
<td>.728</td>
<td>.750</td>
</tr>
<tr>
<td>M</td>
<td>30.0</td>
<td>29.2</td>
<td>.735</td>
<td>.750</td>
</tr>
<tr>
<td>Q(CH)</td>
<td>27.3</td>
<td>25.0</td>
<td>.644</td>
<td>.683</td>
</tr>
<tr>
<td>R</td>
<td>26.0</td>
<td>33.0</td>
<td>.536</td>
<td>.650</td>
</tr>
<tr>
<td>K</td>
<td>26.0</td>
<td>22.8</td>
<td>.598</td>
<td>.650</td>
</tr>
</tbody>
</table>

**SUMMED DECIMAL FRACTIONS**  
14.704 16.705

The decimal fraction resulting from matching the mean scores of the students and referent for each element indicates how closely the mean student cognitive style matches the referent's cognitive style. The higher the decimal fraction (closer to 1.0) the better the students' cognitive style is matched with the referent's cognitive style for each element. The derived decimal fractions are limited by the maximum possible decimal fraction which can be obtained for each element. The limit is based upon the importance factor $X_r$, i.e., elements which are considered to be most important for appearance in student cognitive style will approach unity, whereas relatively unimportant elements will allow for a maximum decimal fraction.
fraction (match score) which is comparatively low. For example, the element K was judged to be desirable at a relatively low score of 26.0 which resulted in a maximum possible decimal match score of .650, that is an individual student who obtained a 26.0 for the element K would receive a match score of .650, but an individual who obtained a raw score of either 16.0 or 36.0 would receive a match score of .488. By adding the decimal fractions for all of the elements of the referent (importance factors) a sum total of 14.704 was obtained. The summed total, 14.704, is also the highest score that any student could possibly obtain in comparison to the referent. In order for the student and the referent to have the same summed decimal fraction, the raw score value that the student has for each element would have to be exactly the same as the mean score of the referent for each corresponding element. Any student score deviation from the referent, either above or below for any element(s), increases the difference between the student's total score (summation of student's total match scores) and the referent's importance factor totals. By looking at only the two summation numbers, that is the summed referent decimal fractions (importance factors) and the student summed decimal fractions (degree of match), it is possible to make a quick, overall comparison. For example, a sample comparison was made between the referent's summed decimal fractions and the summed decimal fractions obtained by a randomly selected member of the student sample. The match scores for the randomly selected student are as follows:
<table>
<thead>
<tr>
<th>Cognitive Style Element</th>
<th>Student Raw Score</th>
<th>Student Match Score</th>
<th>Decimal Fraction Importance Factor (Highest Possible Match Score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T(AL)</td>
<td>26</td>
<td>.680</td>
<td>.850</td>
</tr>
<tr>
<td>T(VL)</td>
<td>34</td>
<td>.855</td>
<td>.900</td>
</tr>
<tr>
<td>T(VQ)</td>
<td>22</td>
<td>.595</td>
<td>.850</td>
</tr>
<tr>
<td>Q(V)</td>
<td>24</td>
<td>.638</td>
<td>.850</td>
</tr>
<tr>
<td>Q(P)</td>
<td>40</td>
<td>.723</td>
<td>.850</td>
</tr>
<tr>
<td>Q(CEM)</td>
<td>40</td>
<td>.842</td>
<td>.918</td>
</tr>
<tr>
<td>Q(CES)</td>
<td>36</td>
<td>.903</td>
<td>.963</td>
</tr>
<tr>
<td>Q(CET)</td>
<td>40</td>
<td>.860</td>
<td>.932</td>
</tr>
<tr>
<td>Q(CH)</td>
<td>24</td>
<td>.627</td>
<td>.683</td>
</tr>
<tr>
<td>Q(CK)</td>
<td>24</td>
<td>.639</td>
<td>.833</td>
</tr>
<tr>
<td>Q(CP)</td>
<td>24</td>
<td>.638</td>
<td>.850</td>
</tr>
<tr>
<td>Q(CS)</td>
<td>38</td>
<td>.950</td>
<td>.960</td>
</tr>
<tr>
<td>Q(CT)</td>
<td>34</td>
<td>.841</td>
<td>.845</td>
</tr>
<tr>
<td>A</td>
<td>28</td>
<td>.723</td>
<td>.850</td>
</tr>
<tr>
<td>I</td>
<td>32</td>
<td>.810</td>
<td>.878</td>
</tr>
<tr>
<td>D</td>
<td>28</td>
<td>.713</td>
<td>.750</td>
</tr>
<tr>
<td>L</td>
<td>34</td>
<td>.855</td>
<td>.893</td>
</tr>
<tr>
<td>M</td>
<td>30</td>
<td>.750</td>
<td>.750</td>
</tr>
<tr>
<td>R</td>
<td>40</td>
<td>.423</td>
<td>.650</td>
</tr>
<tr>
<td>K</td>
<td>24</td>
<td>.618</td>
<td>.650</td>
</tr>
</tbody>
</table>

**SUMMED DECIMAL FRACTION:** 14.683 16.705

In the case of the one randomly selected student, the student's summed decimal fractions were 2.022 lower than the summed decimal
fraction importance factors. However, the difference between the summed decimal fractions of the randomly selected student and the summed decimal fractions of the mean student match scores was only 0.021.

This type of comparison, although easy and simple to interpret, is obviously lacking in detail in reference to the degree of match between specific elements. For example, two students may receive identical summed decimal fractions, but in one case the difference between the student's summed decimal fractions and the referent's summed decimal fraction, i.e., importance factors, may be attributed to a large mismatch between two or three elements considered to be highly important; and in the case of the other student, the difference may be attributed to a mismatch between several (eight or 10) of the medium- or low-level importance elements with a good match between all of the most important elements. In the example of the one randomly selected student, for the seven most important elements, the student had a difference of less than .075 for each element. The student experienced the greatest degree of difference on several mid-level and low-level importance elements. Therefore, the student is somewhat better matched with the referent than the summed decimal fractions would indicate. This is because all of the elements which are considered to be most important (top one-third) are represented in the student's cognitive style map as being well matched with the referent.
The next step was to apply a statistical test for correlation between the ranked mean scores of the students and the ranked mean scores of the referent. The following chart presents: (1) the cognitive style elements, (2) the rank order of element values for the referent, (3) the rank order of element values for the students, (4) the difference between the two rank orders of element values, and (5) the difference squared.

<table>
<thead>
<tr>
<th>Cognitive Style Elements</th>
<th>Rank Order of Element Values - Referent</th>
<th>Rank Order of Element Values - Students</th>
<th>Difference Between Rank Orders of Element Values</th>
<th>Difference Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q(CS)</td>
<td>2.5</td>
<td>1.5</td>
<td>1.5</td>
<td>2.25</td>
</tr>
<tr>
<td>Q(CET)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>Q(CEM)</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>T(VL)</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>9.00</td>
</tr>
<tr>
<td>L</td>
<td>2.5</td>
<td>3.5</td>
<td>3.5</td>
<td>12.25</td>
</tr>
<tr>
<td>Q(CES)</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>T(AL)</td>
<td>10.5</td>
<td>4</td>
<td>6</td>
<td>36.00</td>
</tr>
<tr>
<td>T(VQ)</td>
<td>10.5</td>
<td>9</td>
<td>1.5</td>
<td>6.25</td>
</tr>
</tbody>
</table>

When two or more scores were tied, the ranks which the scores would occupy were added together and divided by the number of ranks that were involved, and each rank was given the mean rank number. For example, the elements D and M in the referent had an elemental evaluation of 30. The average of these two tied ranks (rank 16 and rank 17) was taken, and therefore, each element of these two received a ranking of 16.5.

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<table>
<thead>
<tr>
<th>Cognitive Style Elements</th>
<th>Rank Order of Element Values - Referent</th>
<th>Rank Order of Element Values - Students</th>
<th>Difference Between Rank Orders of Element Values</th>
<th>Difference Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q(F)</td>
<td>10.5</td>
<td>18</td>
<td>7.5</td>
<td>56.25</td>
</tr>
<tr>
<td>Q(CP)</td>
<td>10.5</td>
<td>14.5</td>
<td>4</td>
<td>16.00</td>
</tr>
<tr>
<td>A</td>
<td>10.5</td>
<td>16</td>
<td>5.5</td>
<td>30.25</td>
</tr>
<tr>
<td>Q(CT)</td>
<td>14</td>
<td>12</td>
<td>2</td>
<td>4.00</td>
</tr>
<tr>
<td>Q(CK)</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>25.00</td>
</tr>
<tr>
<td>D</td>
<td>16.5</td>
<td>11</td>
<td>5.5</td>
<td>30.25</td>
</tr>
<tr>
<td>M</td>
<td>16.5</td>
<td>9</td>
<td>7.5</td>
<td>56.25</td>
</tr>
<tr>
<td>Q(CH)</td>
<td>18</td>
<td>17</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>R</td>
<td>19.5</td>
<td>6</td>
<td>13.5</td>
<td>182.25</td>
</tr>
<tr>
<td>K</td>
<td>19.5</td>
<td>19.5</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The squared difference between ranks were summed and a value of 531.00 was obtained. The summed value was then used to find the Spearman rank correlation coefficient (Spearman's Rho) by employing the follow formula:

$$
\rho = 1 - \frac{6 \sum d^2}{N (N^2-1)}
$$

where $$\sum d^2$$ equals the sum of the squared differences between the ranks and N equals the number of pairs or measurements.\(^4\) A rho value of .601 was obtained and when submitted to a table of values,\(^5\) was found to be greater than the value required for an N of 20 at the


\(^{5}\)Ibid., p. 593.
.01 level of significance with a one-tail test. The required rho value for a .01 level of significance with the present number of matched cognitive style element pairs is .534, so the obtained number of .601 indicates a level of significance that is somewhat better than at a .01 level.

In Chapter V conclusions will be drawn about the results presented in Chapter IV.
CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

The background, purpose and significance of the present study has been presented in Chapter I. A review of pertinent literature was included in Chapter II. Chapter III described the present investigation in terms of subjects, instrumentalities, data collection, data analysis and statistical analysis. A detailed account of the procedures followed during the course of the present study was given in Chapter IV. Chapter V will consist of a summary of the present study, conclusions about the results presented in Chapter IV and recommendations for future research.

Summary

The present investigation was conducted for the following reasons:

(1) to add to the body of knowledge about the personal characteristics of library school students;

(2) to determine the feasibility of using matching and ranking techniques to compare the cognitive style of the "ideal" media specialist with the mean cognitive style profile of graduate library school students specializing in school librarianship; and

(3) to suggest a model for counseling prospective library school students who wish to specialize in school librarianship.

The present investigator choose to work with the concept of
cognitive style because an understanding of the ways in which individuals gather information and derive meaning is of central importance in a field which is based on the gathering, storing, retrieving and disseminating of information.

A review of pertinent literature concerning various conceptualizations of cognitive style as well as the literature relating to the known and desirable characteristics of librarians and library school students was conducted and presented in the text of the present paper.

The population from which the 10-student data producing sample was drawn consisted of the students enrolled in the school libraries section of the Library Administration and Management class offered by the School of Librarianship at Western Michigan University during the 1978 winter semester.

Each of the ten students in the data producing sample completed a questionnaire relating to education and employment as well as completing a cognitive style mapping inventory. A cognitive style map was obtained for each student based upon the inventory results.

A speech given by a recognized authority in the speciality of school librarianship was selected as the basis upon which to determine the cognitive style of the "ideal" media specialist. The speech was submitted for review to a group of three faculty members of the School of Librarianship at Western Michigan University. The speech as supplemented by faculty comments was subjected to empirical cognitive style mapping by a two member panel.
The mean cognitive style of the students was compared with the cognitive style of the "ideal" through a weighted matching technique. In addition, the ranked order cognitive style mean scores of the students and the ranked order cognitive style mean scores of the "ideal" were subjected to the Spearman rank correlation coefficient test to ascertain the magnitude of the significance of correlation between the two sets of rank orderings.

Conclusions

One of the stated purposes of the present study was to add to the body of knowledge about the characteristics of library school students. The student sample utilized in the present investigation reflected a convenience sample rather than a representative sample of the larger population of all graduate library school students enrolled in the M.S.L. program at Western Michigan University who are specializing in school librarianship. Nevertheless, an argument can be made that the student sample was quite heterogenous within the constraints of the characteristics of the larger population (graduate students, M.S.L. program at Western Michigan University) of which the ten students were a part. The argument for a degree of representativeness is based on the following information from the sample:

(1) an age range of 25 to 44 existed;

(2) one male student was included;

(3) students had been enrolled in the M.S.L. program
for a time range of as long as three years to as short as four months;

(4) approximately half of the students were enrolled in the 30-hour program and half in the 36-hour program;

(5) the range of completed credit hours was five to 30;

(6) the students expected to complete course work from within two half-semesters to one year;

(7) the students reflected a wide variety of employment situations:

(a) three unemployed students,

(b) four students employed part-time,

(c) three students employed full-time,

(d) one student employed in a non-library related position,

(e) five students employed at a non-professional level in library or library related situations, and

(f) two students employed professionally as media specialists; and

(8) half of the students were interested in professional employment at the elementary school level and half the students were interested in professional employment at the junior high school or senior high school level.

The students may not have been representative in the sense that only two of the 10 were full-time students. It should be noted that 40% of the sample travelled at least 75 miles round trip to take the course, consequently, a large number of part-time students would be expected in this particular sample.

The second stated purpose of the present study was to test the feasibility of using matching and ranking techniques to compare the
empirically derived cognitive style of the "ideal" media specialist with the mean cognitive style profile of the sample. A cognitive style mapping inventory was used to obtain the cognitive style profile of each sample member. The cognitive style raw scores for each element represented in the profiles for all students were averaged to obtain a mean cognitive style map of the sample. The mapping procedure used with the students was easily administered and scored. The mean cognitive style map was also easily obtained. The only financial investment was the expense of duplicating 11, 19-page cognitive style mapping inventories. The time investment included the following:

1. a 10 minute introduction was presented to the sample concerning cognitive style and the purpose of the present investigation;

2. the sample spent approximately 40 minutes completing the inventory;

3. approximately twenty minutes was spent on each inventory to transfer the answers marked on the inventory onto the cognitive style mapping inventory tally sheet thus obtaining each student's cognitive style map;

4. another 30 minutes was required to obtain the mean cognitive style map of the students.

In addition, seven of the 10 students requested interpretation of the results of the inventory. Consequently, the present researcher spent approximately 20 to 30 minutes each with seven of the 10 students discussing each individual's cognitive style profile.

Obtaining the cognitive style of the "ideal" media specialist by empirically mapping a speech about the desirable characteristics of school media personnel proved to be feasible. However, some
problems were experienced in obtaining the cognitive style map of the "ideal" because the speech did not specifically address the desirable characteristics of school media personnel in terms of cognitive style. Consequently, the panel members who did the empirical mapping had to rely primarily on inference based on familiarity with cognitive style when assigning cognitive style correlates to the list of desirable characteristics. In addition, panel members experienced some difficulty in assigning scores to the cognitive style elements identified since the speech rarely indicated clearly just how important a given element (characteristic) was considered to be. In relation to scoring, it should be noted that some cognitive style element correlates were identified in several places in the speech while other correlates were identified only once or twice. Consequently, the mean score ultimately given each of the 20 cognitive style elements identified in the speech was perhaps more representative of the author's intent for those elements that were identified several times than for those elements identified only once or twice.

The weighted matching technique also proved feasible. The matching process is slow when done by hand but could be quickly processed by a programmable calculator.

The results of the present study indicate a positive response to the question of whether or not it is feasible to use matching and ranking techniques to compare the empirically derived cognitive style of the "ideal" media specialist with the mean cognitive style profile of a group of graduate library school students specializing
in school librarianship. Several problems were encountered, especially in the formulation of a model of the "ideal" media specialist, and solutions to some of these problems are suggested in the last section of Chapter V which is concerned with suggestions for additional research.

Finally, the present study was designed to produce a suggested counseling model. The purpose of a counseling model would be to provide students interested in school librarianship with insight into: (1) the cognitive style characteristics deemed desirable for a media specialist, and (2) the degree to which a given student already possesses the desirable cognitive style characteristics. It is not suggested that cognitive style be used as an admission criteria but rather that the results of the cognitive style inventory test be used to help students identify cognitive style strengths and weaknesses which may impact on potential for success in the field.

The proposed counseling model has four stages. In the first stage the counselor would administer the cognitive style mapping inventory to a student interested in school librarianship as a career. The student could be a prospective student, a new library school student or a student at any point in the graduate library school program. Ideally, for maximum benefit from the proposed counseling process, the student should be either a prospective student or a new student.

During the second stage the counselor would place the results of the inventory on a cognitive style mapping inventory tally sheet.

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thus obtaining the student's cognitive style map. Alternatively, the student could answer the inventory questions directly on the tally sheet; and either the student or the counselor could compute the raw scores for each element.

In the third stage the student cognitive style map would be matched with the cognitive style map of the "ideal" media specialist using the matching procedure employed in the present investigation.

The counselor would meet with the student and interpret the results of the inventory during the fourth stage. The interpretation process generally progresses down the list of elements on the tally sheet. The student is given an explanation of the meaning of each of the elements. The student is also told to what extent each cognitive style element is present in the student's cognitive style repertoire. Too much stress cannot be placed on the fact that no value judgment is reflected in cognitive style. A particular cognitive style is neither bad nor good, it merely reflects the way in which a particular individual prefers to take in information and assign meaning. After the student understands the meaning of the cognitive style elements in relation to that student's own cognitive style preferences, the counselor would discuss how the student's cognitive style relates to the cognitive style of a proposed concept of the cognitive style of the "ideal" media specialist. Most students will probably match the ideal closely on some elements and have some mismatches on other elements. For those elements where the student's cognitive style closely matches the
cognitive style of the "ideal", the counselor could present these results in an encouraging manner. The mismatches on the more important elements (as defined in the present study and incorporated in the cognitive style of the "ideal" and in the matching procedure) can be presented in terms of suggestions for potentially improving chances of success in the field. For example, a student with a minor Code Empathetic orientation would be mismatched with the "ideal" on a very important element. The counselor could explain to such a student that empathy is considered to be an important characteristic of a media specialist, and that the student's level of empathy is somewhat lower than the optimum level. The counselor could further explain that cognitive style elements are fluid and change as the individual goes through life. Furthermore, the student should be told that the degree to which a particular element is represented in a person's cognitive style can be consciously changed if the level of motivation is great enough. The student could, for example, be advised to pay more attention to the reactions of other people and to try to understand how another person feels in various situations. Perhaps if the student accepts the need for a school librarian to be empathetic and desires to be a school librarian to a high level, the student may be able to increase the level of empathy possessed. In some cases change may not be necessary but the student could be advised to pay extra attention to certain professional situations which involve certain aspects of cognitive style. For example, a student with a low orientation toward Q(CT) - Qualitative Code Transactional (salesmanship), could
be advised to put special emphasis on the sales aspect when trying to get approval to implement a new project.

There are only four steps in the basic counseling model. The counselor might wish to administer the inventory or an alternative form of the inventory after the student has progressed through the program to some set point. For example, the student could be re-tested at the half-way point and during the last semester. At each meeting the counselor could tell the student about any changes in cognitive style which occurred during the foregoing period. Repeated contacts might be especially helpful to the student with mismatches on the most important elements. The student would receive some feedback about the amount of progress made in increasing the cognitive style orientation toward the most desirable characteristics.

Recommendations For Future Inquiry

In the course of the present investigation many questions have arisen which could not be pursued but which must eventually be investigated if the value of using a comparison between the cognitive style of the "ideal" media specialist and the cognitive style of a student in career counseling is to be realized.

Recommendation One: Repeat the present study in the same manner but include the entire population of graduate students in the M.S.L. program at Western Michigan University who are specializing in school librarianship. A large, more complete sample would make the results of the data and statistical analysis more generalizable.
Recommendation Two: Repeat the present study in the same manner but compare each student's cognitive style map individually with the cognitive style map of the "ideal" to determine the degree of variability that exists within the sample for each cognitive style element, and to find out if the individual summed match scores are different in relation to approximating the summed "ideal" scores than were the student mean summed scores. This proposed type of comparison will bring out the extremes whereas the values for sample means give values which tend toward the center. By looking at the extremes a more realistic evaluation can be made about the measures at which deviations from the "ideal" become important.

Recommendation Three: Duplicate the study but use a different model for obtaining the cognitive style of the "ideal". As was suggested by the present researcher's advisor, the researcher could compile the cognitive style map of the "ideal" based on personal knowledge of cognitive style and of the demands placed on a media specialist in the field. Alternatively, a panel of experts in the area of school librarianship could be exposed to an intensive introduction to cognitive style and then jointly could compile the cognitive style map of the "ideal".

Recommendation Four: The counseling model proposed in the present study could be tested for feasibility.

Recommendation Five: A more complicated study could be conducted which would utilize the counseling model proposed in the present study in which the model would be extended to follow students into the field. Periodic cognitive style assessments and job success
assessments could be made.

Chapter V has consisted of a brief overview of the present investigation, some conclusions about the results and some recommendations for future studies.
APPENDIX A

Questionnaire
APPENDIX A

Questionnaire

Name _______________________________________
Age ____________

1. When did you first enter the School of Librarianship as a graduate student?

Semester ___________________________ Year ____________

2. Are you enrolled in a 30 credit hour program or a 36 credit hour program?

_____ 30 credit hour program   _____ 36 credit hour program

3. How many credit hours had you completed by the end of the 1977 fall semester?

_______

4. How many hours are you taking during the 1978 winter semester?

_______

5. When do you expect to complete your course work?

Semester ___________________________ Year ____________

6. Are you a full-time student or a part-time student?

_____ full-time   _____ part-time

7. Are you employed?

_____ yes   _____ no

8. If you are employed, are you employed full-time or part-time?

_____ full-time   _____ part-time

90
9. If you are employed, please fill in the following:
   a. job title: _______________________________________________
   b. name of employer: ________________________________________
   c. length of employment at present job: _____________________

10. Are you primarily interested in working in an elementary, junior high or senior high school library media center?
    _____ elementary school    _____ junior high school
    _____ senior high school
APPENDIX B

Sample Items From The Cognitive Style Mapping Inventory
APPENDIX B

Sample Items From The Cognitive Style Mapping Inventory

1. Theoretical Auditory Linguistics - T(AL)
   People say I speak better than I write.

2. Theoretical Auditory Quantitative - T(AQ)
   Oral mathematics tests are easy for me.

3. Theoretical Visual Linguistic - T(VL)
   I prefer to read directions rather than have someone read them to me.

4. Theoretical Visual Quantitative - T(VQ)
   I score high on written mathematics tests.

5. Qualitative Auditory - Q(A)
   I can recognize who is on the phone just by listening for a few moments.

6. Qualitative Olfactory - Q(O)
   I can tell "what's for dinner" by the smell.

7. Qualitative Savory - Q(S)
   When cooking, I use various spices until the dish tastes "right".

8. Qualitative Tactile - Q(T)
   I decide that my hair needs washing by the way it feels.

9. Qualitative Visual - Q(V)
   I prefer to read articles which are accompanied by pictures or drawings.

10. Qualitative Proprioceptive - Q(P)
    I can write legibly while another person dictates to me.

11. Qualitative Code Empathetic - Q(CEM)
    I understand how a person feels when being punished.
12. Qualitative Code Esthetic - Q(CES)
   I enjoy the beauty of the stars.

13. Qualitative Code Ethic - Q(CET)
   The rules of our society should apply equally to all.

14. Qualitative Code Histrionic - Q(CH)
   I am a good actor.

15. Qualitative Code Kinesics - Q(CK)
   I interpret a person's mood by the way he sits or poses.

16. Qualitative Code Kinesthetic - Q(CKH)
   I enjoy practicing dance steps until I can do them perfectly.

17. Qualitative Code Proxemics - Q(CP)
   If I bump against another person in a store, I apologize.

18. Qualitative Code Synnoetics - Q(CS)
   I know my capabilities.

19. Qualitative Code Transactional - Q(CT)
   I am able to persuade people in disagreement to strive for agreement.

20. Associates Determinant - A
   When shopping for clothes, I like to have a friend along to help me make choices.

21. Family Determinant - F
   Before voting, in an election, I review choices with my family.

22. Individuality Determinant - I
   My "best" decisions are reached alone.

23. Inference of Difference - D
   I understand a topic better if I examine it to learn how it differs from other topics.
24. Inference of Appraisal - L

Information should be analyzed in a number of ways before a conclusion is reached.

25. Inference of Magnitude - M

Life is simplified if you go by the rules.

26. Inference of Relationship - R

I have no difficulty in understanding how to put puzzles together.

27. Deductive Inferential Pattern - K

I find it easier to win an argument when I state a premise (Blank is true) and give a conclusion to the premise which is inescapable: (Therefore, Blank must be true).
APPENDIX C

Cognitive Style Mapping Inventory

Tally Sheet
APPENDIX C

Cognitive Style Mapping Inventory

Tally Sheet

Name: ___________________________ Date: ______________

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APPENDIX D

Desirable Characteristics Of School Library Media Personnel
DESIRABLE CHARACTERISTICS OF SCHOOL LIBRARY MEDIA PERSONNEL

Although the once-modest shelf of books and other media which are about the people who work in school media programs seems to grow exponentially, I believe that not enough has been said lately about those people as people. We have been concerned with academic requirements, job-related experience, behavioral competencies, and similar attributes which people can acquire and which can make those people do better jobs than they might have done without them. It may seem naive to return, at least for this short survey, to think of the personal characteristics which the personnel who do such important work in school media programs should have. I have no intention of implying that any of those other requirements or competencies are unimportant, but in recent years we have not turned our attention sharply or specifically enough to the personal qualities that are important.

That is not to say that personal characteristics are not mentioned occasionally. There is a throwaway line in every speech or article about a successful media program that says something like: "Of course, none of this could have happened without our wonderful librarian!" Annual reports and even school yearbooks touch fleetingly on the fact that leadership, teamwork, or imagination were responsible for much of what was achieved. And more than once, when I have visited a school library media center, I have come away wondering: "How much of this success could have been won without that person?" Or, sad to say, I may have thought, after a less satisfactory visit: "There is a place with all the possibilities, but nothing will happen while that librarian is there."

I have also faced the problem of trying to predict in advance the success of young people wishing to enter the school media field. Although my recent experience has been as a library school faculty member, it does not differ much from my experience of years ago in interviewing applicants for possible jobs in school libraries. Probably the greatest difference is the lack of panic we feel now. There appear to be more applicants with the "paper qualifications" than many library education programs can accommodate, and what has been called the "warm body syndrome"--in which any warm body would do to fill a job--is long since past. But the responsibility of selection increases. It might be appalling to compute the human and financial resources that are wasted when poor interviewing or unwise counseling leads people to enter, or attempt to enter, a field in which they cannot function well. And the employment of a person who does not succeed is not only a personal trauma for him, but may affect the numerous people with whom he is expected to work.

It is not just that we really have no very sure way of assessing personal characteristics, no quality personality quotient to match against a quality point average for academic grades. Even if one were available, we would probably find disagreement about what its components should be and, more puzzling yet, we might well discover that in terms of almost every characteristic judged to be desirable, we are really seeking balance, not just the most of a quality. For example, while friendliness may be an important characteristic, it may need to be steadied with self-assurance to keep its possessor from being gregarious when there is solitary work to be
done. There are other characteristics which may balance and, indeed, strengthen each other.

It is easier to see some of the importance of personal characteristics if we identify them in the negative, and even then one must judge in terms of his own perceptions of what school library media personnel are and what they do. Although I have thought most about the professional personnel in school media programs, I think the personal characteristics for other personnel would often be the same. I have no intention of entangling myself with concerns about whether all libraries are media centers, whether all librarians are media specialists, or what the precise meaning of any of those terms is. I am assuming some agreement on what occurs in school libraries. This was lacking, I think, in a school administrator who wrote a letter recommending a young teacher for entrance to a graduate library education program. I read the letter when the teacher came to me in great distress at having failed to make the grade in library school. While her failure was in terms of academic grades, they in turn had been low because of her virtual inertness and taciturnity as a student. The warning was there, couched in the letter of recommendation: "She is probably better suited to work in a library than in the life-stirring atmosphere of the classroom." Astute judgment of that letter would have saved much personal anguish on the part of the young teacher, either in pointing out to her the kinds of demands that might be placed on her in librarianship, or in rejecting her firmly in the first place. I mention this incident, based on fact, only to underscore that the kinds of places where I assume media personnel will be working are life-stirring atmospheres, and that the people will do some of that stirring themselves.

One of the personal characteristics I rate high for school media personnel is curiosity; I have my share of that. I found myself wondering whether, after I had begun to sort out my own thoughts, it might be a good idea to see what had already been thought or written on this topic, and also whether any of the views of librarians in general might vary significantly from those of school library personnel, in terms of personal characteristics. I believe they do not, and I can now say that, after having reviewed what many people have said and written about librarians as people. Lawrence Clark Powell, for example, who is the perennial example of librarian as powerful personality, has said: "Human values and human judgments are inseparable from good librarianship." I am not sure that even he has solved the problem of what those human values should be, but in a delightful essay on simplicity, which he suggests as the basis for sound administration, he refers to the Shaker song, "Simple Gifts," which Aaron Copland had in mind when he composed "Appalachian Spring." As Powell says, "Of all the diversity of gifts bestowed by the Lord on his children, the one to seek and the one to cherish is

'The gift to be simple,
The gift to be free,
The gift to come down
Where we ought to be.'"
Yet simplicity is also a good example of a characteristic that may be downgraded by those who think it conflicts with knowledge or competence to deal with complexities. Indeed, simplicity can be one's link to sanity when forced to untangle a difficult problem. It implies integrity, honesty, and a number of the old-fashioned virtues which probably did not need to be mentioned when school librarianship was itself a fairly simple field. When the most egregious offense one could commit was to borrow a nickel from the fines for emergency carefare (leaving a signed note, of course), simplicity could be taken for granted. We should put a higher premium on it today, when ethics are far from universally accepted, and when enlarged responsibilities have also increased opportunities for sharp practices.

To juxtapose what might seem at first a characteristic that is counter to simplicity, I would next cite Frances Clarke Sayers's emphasis on belligerence. Writing almost three decades ago and limiting her concern to children's librarians and much of her belligerence to wiping out indifference to books, she still speaks to us with the sweep and vigor that have always characterized her:

The quality of belligerency was never more greatly needed in the profession that it is at this moment. We have been called many things in our time--gentle and genteel; modest and mousy; learned and lame; dedicated and dowdy; unprepossessing and underpaid. I hope for the day when we shall be called the belligerent profession; a profession that is informed, illuminated, radiated by a fierce and beautiful love of books--a love so overwhelming that it engulfs community after community and makes the culture of our time distinctive, individual, creative, and truly of the spirit.

I read those words a long time ago, and I have quoted them frequently. To my embarrassment, nearly every time someone approaches me later to say that he was glad to be urged to belligerent, because he always did warn the kids not to drop candy wrappers on the chairs or to be more quiet as they went about their work. I think Sayers would be as embarrassed as I to have her words used to justify nagging or crankiness or just general cantankerousness. Her belligerence has more shine, less whine. She sees it as radiant, fierce, overwhelming--the kind of quality that forces us to action toward a goal rather than just urging us on through another day.

I think it is painfully clear that, while there are individuals who have exuded this kind of belligerence, we have failed, as a professional group, to project it as she hoped. In fact, sometimes we must wonder whether we have projected any strong characteristic at all. "The librarian as a person apparently has made relatively little imprint in the minds of professional educators during the twenty years from 1941 to 1960," Robert Edwards wrote in 1961, basing his statement on a survey of 122 texts on educational administration which appeared in that 20-year period. He examined those texts to discover their references to high school librarians, and found that only three discussed the librarian alone, thirty discussed the
library only, while fifty discussed both library and librarian, and thirty-nine discussed neither. (The mere idea of reading more than ten dozen educational administration texts overwhelms and engulfs one, but scarcely anyone has dared suggest that librarians are lacking in persistence or stick-to-it-iveness! Those are qualities we can claim as ours, although they may be two-edged swords, since they can compensate for creativeness or sheer brilliance, of which we are, as a group, seldom accused.) Edwards was writing a master's thesis, so he went on to list and number the qualities mentioned most often by these authors of texts. The top ten included enthusiasm, poise, understanding, approachability, intellectuality, kindness, patience, sincerity, tact, and impartiality. Of the nineteen listed, the two at the end of the list were: power to interest and inspire, and power to encourage.

11 It may well be that those authors of texts were reflecting an attitude which Sanford attributed to administrators when he reviewed a survey some years earlier. Twenty-five school administrators had listed twenty-five desirable traits in teachers, leading off with adaptability, appreciativeness, attractive personal appearance, breadth of interest, considerateness, cooperation, and definiteness. Scholarship was number twenty-four out of twenty-five, open-mindedness was twenty, and progressiveness was twenty-one. Sanford comments mildly in a statement where librarians may be understood to be like the teachers: "We must remember that administrators appreciate most the teachers who are likely to give them the least trouble, who best fit into their systems."

12 We may smile at that assessment, but I must say, with some regret, that as I explored what people cited as important personal characteristics they considered essential for school media personnel, I found myself wondering whether they always acknowledged and accepted the aggressive characteristics they identified, and also whether our selection and education of young people for work in this area of the profession always leads to recognition and further development of those very characteristics we say we prize.

13 Research into the qualities of other kinds of librarians is more recent, and, although disputed by some, is rather damaging. Perry Morrison used the Self-Descriptive Inventory developed at the University of California at Berkeley in his survey of academic librarians, and reported: "As a group, academic librarians can be described as cultured and intelligent, but, like the library science students studied by Douglass, lacking in the traits 'which are most closely associated with forceful leadership'. . . . Those who have the scarce dynamic qualities of initiative and self-assurance tend to rise in the ranks of the profession."

14 Douglass's research, to which he refers, dealt with students in twenty-four accredited library schools in the 1950s, and led to Douglass's conclusion that "the model librarian appears to be characterized by the following traits: Orderliness...Conscientiousness...Sense of responsibility...Conservatism and conformity..." When measuring ascendance, motivation, and drive, Douglass finds "the librarian is not a dominant person....In short, he appears to be weak in the dynamic qualities associated
with social ascendance and leadership," it just as he is high in introspection
and self-sufficiency. We must take what comfort we can from the fact that
the qualities of anxiousness and neuroticism are not unduly present in him. It
would be nice to know what a less than undue presence of anxiousness
and neuroticism might be.

One may disagree with what seem to be very low-key views of the person-
ality of librarians, and even point out that our image might be improved if
we did not spend so much time reflecting on it, but even that reaction,
which I share, does not make it entirely disappear. Another argument to the
effect that times are changing suggests that new entrants to librarianship
are more dynamic than their predecessors, but that dynamism is relative,
and I do not believe that we are attracting the more dynamic of the young,
nor even making the most of the dynamic personalities we have attracted.

Another reaction may be that school librarianship does not suffer from
the same image. Sadly, I believe it does, and that one of the penalties of
its being considered a part of the teaching profession as well as of the
library profession is that other segments of both may look upon school
librarians as some kind of variation in the species in which stranger quirks
may emerge. But our own views of ourselves have tended to be more opti-
mistic. Writing at almost the same time as Sanford and basing her state-
ments on what she had heard from schoolmen in administrative posts while
traveling extensively, Lucile Fargo commented in 1939 on what the school-
man wanted in a librarian: "Furthermore, he wished the librarian to exhibit
traits of approachability, enthusiasm, resourcefulness, organizing ability,
initiative, power of intellectual stimulation, intellectual alertness,
cooperativeness, adaptability, sympathetic understanding of boys and girls,
wide knowledge of and enthusiasm for literature for boys and girls."9

With the spate of materials which have been published about innumerable
aspects of the school media center, it may seem strange to be quoting a
woman of an earlier generation. But I wish to acknowledge my personal debt
to Lucile Fargo—a woman I never knew but one whose ideas have informed me
from my earliest interest in school librarianship, and a writer who has
managed to touch on many aspects of this field with such wisdom that her
ideas still have validity. Recently, for instance, I rediscovered that her
statement on the problem of swiping books is more concise and probably
more timely than that of any other authority I could find. Forty years ago,
she was encouraging amnesty for swipers, although not in those terms, and
saying that taking a book and putting it into one's locker until the end
of the semester is not really stealing, nor a major crime. That comes as a
stunning truth to some librarians today who believe they invented systems
in which no fines are charged. Fargo embodies the breadth of vision that
comes up repeatedly as a desirable personal characteristic for school
media specialists.

Authors who have come from the ranks of school librarians have not been
as explicit as Fargo about what they hope for or even what they look for
in terms of personal characteristics. Jack Delaney, whose books have been
much criticized by librarians, perhaps because they present the interesting
combination of a hard-nosed view of life and of schools along with a
persistent enthusiasm, has touched on what he considers important for various kinds of school librarians. Not surprisingly, he reports that the people who run large high school libraries "are almost unfailingly persons of considerable cultural and intellectual attainment." What I appreciated even more, however, was Delaney's comment on librarians who work in junior high schools. There, he thought, the essential need was for toughness. Anyone who has dealt with that school age or who has even observed them and felt the overwhelming movement, restlessness, and exuberance, would agree.

I have considered these comments from others as benchmarks or touchstones for my own views of the desirable characteristics of school library personnel. They have proliferated and become convoluted so that I found it helpful, in sorting out my own ideas, to ask other people what they considered the essential characteristics I should mention in this statement. I give them to you in alphabetical order, some of them repeated several times, and some few requiring translation: ahead of time, attractive, breadth of vision, enthusiasm, flexibility, friendliness, hard-working, Irish, liking, mental alertness, outgoing, pizzazz, self-directed, sense of humor, vivaciousness. It is a messy list, made up of adjectives, nouns and phrases, but I gave it in the form I received it because I learned, in trying to rephrase some of them, what the perils of that were. The friend who said "liking," for example, used it variously, saying that the school librarian should have likings and be a liking person--liking books, liking people, liking his job, etc. Because it implies the characteristic I consider most desirable, I had not the heart to revise it. I suppose it is axiomatic that in any such group of respondents there will be one who seeks to please both himself and the inquirer with his answer--thus the characteristic of Irishness comes up. Yet if it implies being yourself, with all the background and tradition, all the promise and burden of the generations that have endured to make you you, it can be translated into an important characteristic.

One of the librarians who said a sense of humor is essential--and there were several who felt impelled to justify the inclusion of that--said, "it's the only thing that will get you through the day when the accreditation team is coming and the shelves all fall down." True. I was delighted by its frequent appearance on the list, and I felt some justification for the long-ago day when a college professor, in a lengthy digression from our specified topic, stated firmly that the most important heritage one can give to one's children was a good reputation. I was the only person either awake enough, outraged enough, or just interested enough to respond, and I did so only with a facial expression easily readable by the professor. She asked whether I had something better to offer, and I said, "Well, yes. If you give your children a sense of humor, they can laugh off a bad reputation." In the years since, my esteem for a good reputation has increased, but my value of a sense of humor has not been diminished.

In coming to my own statement of essential characteristics, I found one source coming to mind repeatedly. It was John Gardner who, in Self-Renewal, gave four traits likely to be shared by creative people. It was his definition of openness which made me class it as number one in desir-
ability, because this kind of openness intensifies rather than conflicts with conviction. While it includes openness to all that is around us, it allows one to select the experiences to which one will react most strongly. Further, it requires openness to one's self, one's own emotions, anxieties, and fantasies, as Gardner puts it. And it allows not only for openness in reaction to one's self and to others, but for openness of expression, which I would sharpen into the great need for articulateness among school librarians.

Independence, in Gardner's terms, "is at the heart of [the individual's] capacity to take risks and to expose himself to the probability of criticism from his fellows." It fits the suggestion of the Peter Maurin poster which says: "A leader is a fellow who refuses to be crazy in the way everybody else is crazy...and tries to be crazy in his own crazy way." It is evidence of freedom, rather than singularity for its own sake, and on that basis it is essential. Gardner, like almost everyone else, includes flexibility, but he concludes with the capacity to find order in experience. He refers to the need for one's "profound confidence in his capacity to bring some new kind of order out of this chaos." If the first images that come to mind are those of the librarians sorting through inventory snags or facing the return of a great variety of equipment, some of it in unrecognizable pieces, this need for finding order in experience is readily acceptable as a desirable characteristic. But I would add to that the need for inner peace, a sense of purpose and assurance that allows one to realize that the elements of order are present even in apparent chaos, and that one possesses the competence to discover them in, or perhaps to liberate them from, that chaos.

I would add two characteristics to Gardner's. First, I would add honesty as evidence of an integrity or wholeness which is important in one's expressions of it, as well as in one's quiet acceptance of it. With jargon rampant, with media carrying everything we say and do far beyond earlier limits, it is hard to speak honestly. Increased vocabularies have blurred communications more often than they have improved it, but I think even that honesty in speech is important and, linked with the self-acceptance implicit in many of these characteristics, it is essential. Finally, I would add joy, not in any naive hope that we will always be happy people, but in the sense in which C.S. Lewis speaks of joy as having always some element of surprise and of tragedy hidden within it. The joy a media specialist possesses may look like zest, but it can be communicated to others in one hundred ways.

I was tempted, in preparing this, to conclude with a blank characteristic, where each person would add his own first choice, but I believe the same effect is achieved if we are reminded that no list of characteristics is meaningful until each is tried, thoughtfully and critically, to merge into the "you-ness" that is for each of us the essential. It is not quite the same as being individual. What each of us must be is as much ourselves as we can.
APPENDIX E

Letter Sent To Faculty Members
APPENDIX E

Letter Sent To Faculty Members

1819 Meadow View
Kalamazoo, MI 49008
January 9, 1978

Name
Address

Dear ______________:

I am a student in the School of Librarianship, and I am currently working on my thesis. My research topic concerns cognitive style which, for purposes of my study, may be defined as the way in which an individual takes note of the environment and draws meaning from it. I am specifically concerned with obtaining the cognitive styles of a select group of library school students who are specializing in school libraries. The cognitive styles of the sample will be compared with the cognitive style of the "ideal" media specialist. I would like to ask for your help in obtaining a model of the "ideal" media specialist.

A speech presented by Peggy Sullivan entitled "Desirable Characteristics of School Library Personnel" has been selected as the basis for the model of the "ideal" media specialist. I would very much appreciate it if you would read the attached copy of Dr. Sullivan's speech. After you have read the speech I would like to receive any comments you may wish to make in the event you disagree with any of Sullivan's views. If you have disagreements, please cite specific portions of the text, state the reason for the disagreement and suggest an alternate wording.

I would like to receive a response by Monday, February 6, 1978. If I do not receive a response by this date, I will assume that you do not disagree with the content of the speech. A self-addressed, stamped envelope is enclosed for your convenience.

Thank you for your consideration in this matter.

Sincerely,

Susan J. McIntire

Attachments

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APPENDIX F

Comments Made By Faculty Members
In Relation to Sullivan's Speech
APPENDIX F

Comments Made By Faculty Members
In Relation to Sullivan's Speech

Respondent One

1 "I do not disagree with Peggy Sullivan's article. Openness, Independence, Honesty, Joy -- are these the ones you are using? Are you using the list she got from others, such as humor, friendliness, etc.? I would certainly include in any model the need for human compassion and warmth toward others. I am afraid that her term "Joy" may be misunderstood by people who have not worked with kids in a media center. I think it takes experience to know what she means."

Respondent Two

2 "It seems to me that Sullivan speaks largely to what I would call "leadership" characteristics. To develop a model (i.e., image) of the ideal media specialist. I would want to add some characteristics which I might call functional:

- **Service-oriented**
- well informed across a broad spectrum of both disciplines and formats
- **systematic**
- logical
- **empathetic**
- **unbiased**
  - real vs. lip service
- **diverse in interests** vs. intellectually provincial
- well prepared in teacher-education i.e. methodology, child or y.a. development, counseling, guidance, student assessment

Hope this is helpful."
APPENDIX G

The Cognitive Style Of The "Ideal" Media Specialist
APPENDIX G

The Cognitive Style Of The "Ideal" Media Specialist

An empirical mapping procedure was utilized to obtain the cognitive style of the "ideal" media specialist. The mapping procedure was applied to the Sullivan speech (Appendix D) as supplemented by comments of faculty members (Appendix F).

The remainder of this appendix is intended to clarify the empirical mapping procedure. The format is as follows:

(1) Paragraph number and source, e.g., Paragraph Three - Sullivan, are listed.

(2) By paragraph, each word or phrase that was designated a cognitive style correlate is listed.

(3) The reason for designating each word or phrase as a cognitive style correlate is designated.

(4) The cognitive raw score assigned to each correlate is presented.

(5) The reason for assigning the particular raw score to a correlate is summarized.

The paragraphs in the Sullivan speech (Appendix D) as well as in the comments made by faculty members (Appendix F) have been numbered for easy reference. In addition, the words or phrases designated as cognitive style correlates have been underlined.

Paragraph 1 - Sullivan - no cognitive style correlates.

Paragraph 2 - Sullivan - no cognitive style correlates.

Paragraph 3 - Sullivan - no cognitive style correlates.

Paragraph 4 - Sullivan:

Correlate A - balance = L - Appraisal = 34. The statement
indicated that Sullivan believed desirable characteristics should be balanced. The only correlate of balance in cognitive style terms is the element L which implies an ability to use the most appropriate inferential mode at a given time. A mid-range major score of 34 was assigned because the panel members perceived that Sullivan thought balance was an important characteristic but not of the highest order of importance.

Correlate B - friendliness = Q(CT) - Qualitative Code Transactional = 32. In terms of cognitive style, friendliness indicates an ability to maintain a positive interaction. A low major of 32 was assigned because Sullivan did not put a great deal of stress on the desirability of friendliness but on the other hand found it important enough to mention.

Correlate C - self-assurance = I - Individuality = 32 and self-assurance = Q(CET) - Qualitative Code Ethics = 34. Sullivan indicated self-assurance is necessary to keep the possessor from being gregarious so that solitary work can be accomplished. The element I indicates an ability to work alone and make independent decisions when necessary. Again, Sullivan did not put a great deal of stress on the element so a low major was assigned. The panel members perceived that a mid-range major in terms of ethics (goal setting) would be necessary in the situation described by Sullivan.

Paragraph 5 - Sullivan - taciturnity and life-stirring = A - Associates = 34 and taciturnity and life-stirring = Q(CT) - Qualitative Code Transactional = 34. Sullivan present taciturnity as an undesirable characteristic and an opposite cognitive style element
was selected. The terms taciturnity and life-stirring and the
cognitive style correlates were treated jointly. The elements A
and Q(CT) were selected because Sullivan seems to indicate a media
specialist should be able to work with people and facilitate inter-
personal communication. A mid-range major was assigned to both
elements based on the stress given by Sullivan.

Paragraph 6 - Sullivan:

Correlate A - curiosity = Q(CET) - Qualitative Code Ethics =
38 and curiosity = Q(CES) - Qualitative Code Esthetic = 38. The
panel members selected the elements Q(CET) and Q(CES) because it is
necessary to be able to perceive the beauty in a subject to be
curious and once curious, it is necessary to have a strong goal
orientation in order to pursue the subject. Sullivan indicated a
high rating for the trait of curiosity so a high major score of 38
was assigned for each element.

Correlate B - human values and judgments = Q(CET) - Qualitative
Code Ethics = 36 and human values and judgments = Q(CEM) - Qualitative
Code Empathetic = 36. The element Q(CET) was assigned because a
professional must choose a set of values to follow. The term human
judgements was assumed to mean making decisions relating to people,
and empathy is necessary if the decision maker is to understand how
decisions will effect individuals. A high major score was assigned
each element because the characteristics were said to be "inseparable
from good librarianship".

Correlate C - simple = Q(CS) - Qualitative Code Synnoetics =
40. The element Q(CS) was selected based on the assumption that, in
this instance, simple means to act in accordance with one's nature to the greatest extent possible, consequently, it is necessary for one to know one's nature. The highest major possible was assigned because Powell said simplicity is the ultimate gift to seek, and it was assumed Sullivan concurred since the statement was included.

Correlate D - free = Q(CET) - Qualitative Code Ethics = 40. The panel members assumed freedom was meant to indicate being free to follow one's belief, i.e., ethics in cognitive style terms. Again, a very high major was assigned based on Powell's apparent stress of the word free.

Correlate E - come down = Q(CH) - Qualitative Code Histrionic = 24. The term come down was perceived to mean not being excessively concerned with role expectations, consequently, the element Q(CH) was assigned. A mid-range minor score of 24 was assigned because the panel members thought media specialists would have some need for an ability to fulfill role expectations but that the need is not of major importance.

Paragraph 7:

Correlate A - integrity and honesty = Q(CET) - Qualitative Code Ethic = 38. Although integrity and honesty are not perfectly synonymous with the element Q(CET), Q(CET) is nevertheless the closest cognitive style equivalent. A high major was assigned based on the emphasis Sullivan seemed to give the terms.

Correlate B - ethics = Q(CET) - Qualitative Code Ethics = 38. Obviously the word ethics equates with the element Q(CET), and a high major was assigned because Sullivan indicated a "high premium" should
be placed on the characteristic.

Paragraphs 8 and 9 - Sullivan (Two paragraphs were grouped together because both are concerned with a quotation from Sayers):

Correlate A - fierce and beautiful love of books = T(VL) - Theoretical Visual Linguistic = 38 and fierce and beautiful love of books = Q(CES) - Qualitative Code Esthetic = 38. A love of books seems to imply a visual linguistic orientation and an appreciation of the beauty of books. The beauty of books probably refers to the beauty of what books represent but there may also be an appreciation of the physical form. A high major score was given each element since Sayre seemed to stress the phrase heavily and because Sullivan apparently concurred since Sayre was quoted.

Correlate B - community after community = Q(CT) - Qualitative Code Transational = 34. It was assumed that Sayre meant librarians should transmit a love of beauty and culture through the institution of the library which implies a sales aspect which in turn correlates with the cognitive style element Q(CT). A mid-range major was assigned based on the stress perceived to be given by Sayre.

Correlate C - nagging, crankiness and cantankerousness = Q(CEM) - Qualitative Code Empathetic = 32. Sullivan indicated nagging, crankiness and cantankerousness are undesirable characteristics. The panel members selected the element Q(CEM) based on the assumption that empathy would be important in avoiding the three negative elements. A low major was assigned since Sullivan did not seem to place a great deal of emphasis on the concept.
Correlate D - radiant, fierce, overwhelming = I - Individuality = 34. The element I was assigned because it is the individual who must be radiant, fierce and overwhelming. A mid-range major was assigned since an excessively high I would tend to inhibit transmitting such enthusiasm to others.

Correlate E - toward a goal = Q(CET) - Qualitative Code Ethic = 38. The element Q(CET) is concerned with goal setting ability. A high score is indicated by Sullivan's remark that Sayre's concept of belligerence forces the individual to action in contrast to "just urging us on through another day".

Paragraph 10 - Sullivan - no cognitive style correlates.
Paragraph 11 - Sullivan - no cognitive style correlates.
Paragraph 12 - Sullivan - no cognitive style correlates.
Paragraph 13 - Sullivan - no cognitive style correlates.
Paragraph 14 - Sullivan - no cognitive style correlates.
Paragraph 15 - Sullivan - no cognitive style correlates.
Paragraph 16 - Sullivan: Paragraph 16 consists primarily of a list of desirable characteristics suggested by Fargo. The panel members assumed that Sullivan agreed with Fargo's list. Because there was no way of knowing if Fargo or Sullivan believed the first characteristic to be more or less important than the last, each cognitive style correlate was assigned the mid-range major score of 34.

Correlate A - approachability = Q(CEM) - Qualitative Code Empathetic, approachability = Qualitative Code Proxemics, approachability = A = Associates, approachability = T(AL) -
Theoretical Auditory Linguistic, and approachability = \(Q(CK)\) - Qualitative Code Kinesics. A large number of cognitive style concepts were derived from the rather broad concept of approachability. The element \(Q(CEM)\) was included because the panel members believed a user would not want to approach a media specialist who was lacking in empathy. Similarly, a user is probably more comfortable approaching a media specialist who is able to use and read body language - \(\phi(CK)\) and who has a sense of the user's physical and/or psychological comfort distance - \(\phi(CP)\). The element A was included because the approachable media specialist needs to be able to work with and relate to people. Once approached, the media specialist needs to be able to listen to the user; consequently, the element \(T(AL)\) was assigned.

Correlate B - enthusiasm = \(Q(CES)\) - Qualitative Code Esthetic. The element \(Q(CES)\) was assigned because the panel members assumed enthusiasm is rooted in perception of beauty of the idea or object under consideration.

Correlate C - resourcefulness = \(L\) - Appraisal = 34; \(\text{Appraisal} = M\) - Magnitude = 26, \(D\) - Difference = 26, \(R\) - Relationship = R and \(K\) - Deductive Reasoning = 26. The element L was assigned because the panel members believed a resourceful person would be able to use the most appropriate inferential mode in a given situation. The elements M, D, R and K are the various modes of inference and each should be represented in the cognitive style map of an individual with an L orientation. A high minor score of 26 was assigned to M, D, R and K since an excessively high score on any would tend to limit the use.
of other inferential modes.

Correlate D - organizing ability = \( Q(CT) \) - Qualitative Code Transactional, organizing ability = \( Q(P) \) - Qualitative Proprioceptive and organizing ability = \( M \) - Magnitude. The element \( Q(CT) \) was deemed to be desirable when the organizing refers to organizing people. The element \( Q(P) \) was assigned because organizing frequently requires synthesizing a number of separate items and Hill partially defined \( Q(P) \) as the ability to synthesize a number of symbolic mediations. Organizing also frequently requires an ability to place material into categories. An individual with an \( M \) orientation has such an ability.

Correlate E - initiative = \( I \) - Individuality. Individuality was assigned because a person who exhibits initiative must be able to make decisions and follow through independently.

Correlate F - power of intellectual stimulation = \( Q(CT) \) - Qualitative Code Transactional, power of intellectual stimulation = \( Q(CP) \) - Qualitative Code Proxemics and power of intellectual stimulation = \( Q(CH) \) - Qualitative Code Histrionic. The element \( Q(CT) \) was assigned because the media specialist will be stimulating the intellects of other people. Proxemics was judged to be necessary to be able to judge how much to push (stimulate) a patron. Histrionics was thought to be important because it is desirable that a media specialist be able to provide intellectual stimulation for all patrons at all times whether the media specialist feels like it or not.

Correlate G - cooperativeness = \( Q(CEM) \) - Qualitative Code
Empathetic, cooperativeness = Q(CP) - Qualitative Code Proxemics, and cooperativeness = A - Associates. The panel members included Q(CEM) because it is easier to cooperate if one has an understanding of the positions of others. Similarly it is easier to cooperate when one has an understanding of the comfort distance (physical and psychological) of others. The element A was assigned because it is not possible to cooperate in isolation.

Correlate H - adaptability = L - Appraisal. Again, L was selected because an adaptable person would be able to meet a given situation by processing necessary information in the most appropriate manner.

Correlate I - sympathetic understanding of boys and girls = Q(CEM) - Qualitative Code Empathetic. The panel members perceived a sympathetic understanding to mean an ability to identify with the positions of patrons.

Correlate J - wide knowledge of and enthusiasm for literature for boys and girls = T(VL) - Theoretical Visual Linguistic, wide knowledge of and enthusiasm for literature for boys and girls = T(VQ) - Theoretical Visual Quantitative and wide knowledge of and enthusiasm for literature for boys and girls = Q(CES) - Qualitative Code Esthetic. The cognitive style elements T(VL) and T(VQ) were selected because each one reflects an orientation toward written material. Esthetics was selected because appreciation of beauty was perceived to be necessary for enthusiasm.

Paragraph 17 - Sullivan - amnesty = Q(CEM) - Qualitative Code Empathetic = 34. In the context of Sullivan's remarks the panel
members thought empathy would be necessary for a media specialist to understand the students' motives in "swiping" books.

Paragraph 18 - Sullivan - toughness = \( Q(CET) \) - Qualitative Code Ethic = 38, toughness = \( Q(CS) \) - Qualitative Code Synnoetics = 38, and toughness = \( Q(CEM) \) - Qualitative Code Empathetic = 38. In the context of Sullivan's speech the panel members believed toughness to include a need for the media specialist to be able to set and accomplish goals, to know one's limitations and be able to empathize with students. A high score was assigned because Sullivan was quoting Delaney who said toughness is essential.

Paragraph 19 - Sullivan: A mid-range major score of 34 was assigned to each element identified in the list in Paragraph 19 since it was not possible to tell if any characteristic was considered to be more important than any other element.

Correlate A - ahead of time = D - Difference. According to Hill a person with a D orientation tends to be ahead of the times because of an ability to perceive differently from other people, e.g., artists tend to have a strong D orientation.

Correlate B - attractive = \( Q(CK) \) - Qualitative Code Kinesics and attractive = \( Q(V) \) - Qualitative Visual. Attractive was thought to correlate with approachability which in turn correlates with kinesics in cognitive style terms. The element \( Q(V) \) was assigned because an individual has to have an ability to pay attention to visual information in order to look attractive.

Correlate C - enthusiasm = \( Q(CES) \) - Qualitative Code Esthetic. The element \( Q(CES) \) was assigned because it is necessary to have the
ability to see the beauty in a person or topic to be enthusiastic.

Correlate D - flexibility = L - Appraisal. The element L was selected based on the perceived need to be able to utilize any of the inferential modes according to the demands of a given situation.

Correlate E - friendliness = Q(CT) - Qualitative Code Transactional and friendliness = Q(CEM) - Qualitative Code Empathetic. Q(CT) was selected because friendliness implies maintaining a positive interaction with others and Q(CEM) was assigned because it is easier to be friendly when there is an understanding of the position of the other person.

Correlate F - hardworking = Q(CET) - Qualitative Code Ethic. Hardworking implies an ability to set and carry out goals.

Correlate G - Irish = I - Individuality and Irish = Q(CS) - Qualitative Code Synnoetics. Sullivan seems to have indicated that Irishness means being oneself thus the element I was assigned. Similarly Q(CS) was selected because Sullivan said part of knowing oneself means knowing one's background.

Correlate H - liking = Q(CES) - Qualitative Code Esthetic. Again it is necessary to see beauty to like something.

Correlate I - outgoing = Qualitative Code Transactional. The element Q(CT) was assigned because outgoing indicates not only interacting with people but also holding the attention and influencing the decisions of those people.

Correlate J - pizzaz = Q(CT) - Qualitative Code Transactional. See reasoning for Correlate I, Paragraph 19.
Correlate K - self-directed = I - Individuality and self-directed = Q(CET) - Qualitative Code Ethic. Ethic was assigned because it means sticking to a certain direction and in this case it is self-initiated so individuality was also assigned.

Correlate L - sense of humor = Q(CT) - Qualitative Code Transactional. The panel members perceived sense of humor to indicate a pleasant interaction with people which requires holding the attention of people thus the assignment of the element Q(CT).

Correlate M - vivaciousness = Q(CT) - Qualitative Code Transactional. See reasoning for Correlate I, Paragraph 19.

Paragraph 20 - Sullivan - no cognitive style correlates.

Paragraph 21 - Sullivan - openness = Q(CS) - Qualitative Code Synnoetics = 40. The element Q(CS) was assigned because it is necessary to know oneself if one is to be open to "one's self, one's own emotions, anxieties and fantasies. A score of 40 was assigned because Gardner called openness a characteristic which is "number one in desirability".

Paragraph 22 - Sullivan.

Correlate A - independence = I - Individuality = 38 and independence = Q(CET) - Qualitative Code Ethic = 38. The element I was selected because independence indicates a person should take risks and be responsible for the consequences in so far as receiving criticism from fellows. A person can't do that if the individual relies predominately on others to make decisions. Q(CET) was selected because it is necessary to stick with what one believes when taking risks. A score of 38 was assigned based on the stress...
Sullivan was perceived to have placed on independence.

Correlate B - flexibility = L - Appraisal = 38. Gardner indicated a need for confidence in one's ability to bring some kind of order out of chaos which indicates a need for high level capacity in dealing with various inferential modes. Again a score of 38 was assigned based on the stress Sullivan was perceived to have placed on independence.

Paragraph 23 - Sullivan - honesty and integrity = Q(CET) - Qualitative Code Ethic = 38, honesty and integrity = Q(CK) - Qualitative Code Kinesics = 32 and honesty and integrity = Q(CH) - Qualitative Code Histrionic = 24. Q(CET) was assigned because Sullivan seemed to be talking about a need to adhere to a code of values. A score of 38 was assigned to Q(CET). The element Q(CK) was selected because Sullivan was concerned with communication of joy in "one hundred ways" and the panel members felt many of these ways would be through body language. A score of 32 was assigned. Finally, a Q(CH) of 24 was assigned because acting ability might be helpful in the communication of joy. A low score of 24 was assigned since the panel members felt histrionics would only be occasionally helpful.

Paragraph 24 - Sullivan - being ourselves = Q(CS) - Qualitative Code Synnoetics = 40 and being ourselves = I - individuality = 40. The element Q(CS) was assigned because it is necessary to know oneself to be oneself and there was perceived to be an indication of acting individualistically as a result of knowing oneself. A 40 was assigned each of these elements based on Sullivan's statement that
being oneself is essential.

Respondent One - Paragraph 1 - human compassion and warmth toward others = Q(CEM) - Qualitative Code Empathetic = 40. This characteristic was the only element not strictly repetitious of Sullivan's remarks listed by Respondent One, consequently, a high score of 40 was assigned the cognitive style correlate of empathy.

Respondent Two - Paragraph 2: a high score of 40 was assigned each cognitive style correlate identified in Respondent Two's comments because the respondent apparently felt they were important enough to mention in addition to Sullivan's characteristics.

Correlate A - service oriented = Q(CEM) - Qualitative Code Empathetic. The element Q(CEM) was selected since a desire to provide service is often based on empathy with those to be served.

Correlate B - systematic = L - Appraisal. The element L was assigned because systematic indicates a need to deal with different kinds of systems and, therefore, different styles of inferential modes would be called for.

Correlate C - empathetic = Q(CEM). The correlation here is obvious.

Correlate D - unbiased = Q(CET) - Qualitative Code Ethic. Q(CET) was selected because one has to be ethical to avoid introducing personal bias.

Correlate E - diverse in interests = Q(CES) - Qualitative Code Esthetic. Q(CES) was selected because to have a diverse répertoire of interests means to have an appreciation of beauty in its diverse forms.


________. "Qualitative Symbols." Bloomfield Hills, Michigan, Oakland Community College, n.d.


