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APPLICATIONS OF COGNITIVE STYLE AS A PREDICTOR OF RECALL, INFORMATION SALIENCE, AND ATTITUDES TOWARD TELEVISION COMMERCIALS.

The University of Oklahoma, Ph.D., 1978

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APPLICATIONS OF COGNITIVE STYLE AS A PREDICTOR OF RECALL, INFORMATION SALIENCE, AND ATTITUDES TOWARD TELEVISION COMMERCIALS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

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BY

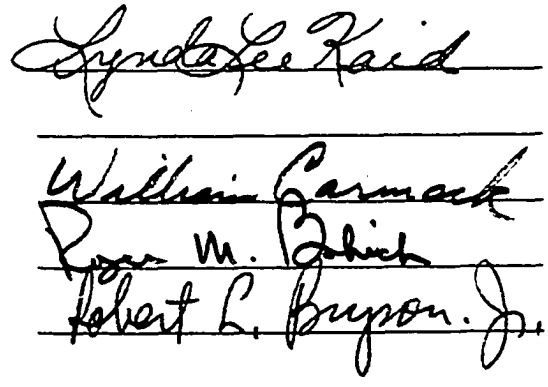
ROGER HENDERSON HADLEY

Norman, Oklahoma

1978

APPLICATIONS OF COGNITIVE STYLE AS A PREDICTOR OF RECALL, INFORMATION SALIENCE, AND ATTITUDES TOWARD TELEVISION COMMERCIALS

APPROVED BY



ABSTRACT

It is the proposal of this study to explore a number of different possible relationships between cognitive style and various cognitive and affective reactions to television commercials. The concept of cognitive style in this investigation seeks to describe individuals in terms of such variables as preference for visual or auditory symbols, willingness to accept the influence of family figures or peers, and preferences for different modes of mental processing in order to derive meaning.

Specifically, the study attempted to compare major and minor cognitive style orientations of theoretical visual linguistic, theoretical auditory linguistic, and qualitative visual for differences in information recall, identification of salient issues, and attitude toward a series of political television commercials. The results failed to indicate that subjects with a major cognitive style orientation recalled more information or identified more salient issues than did subjects with a minor cognitive style orientation from a television commercial which reflected the same cognitive style orientation. The results of the study did provide evidence that cognitive style is not related to

attitude preference. The findings indicate that the relationship of cognitive style and response to television messages is still exploratory which deserves the attention of additional research in mass communication.

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CHAPTER I

INTRODUCTION

Mass communication literature is void of studies which attempt to empirically derive the full set of dimensions individuals use to process information from television. Research has focused on studying the information processing operations that people execute during media use, but the more formidable task of identifying the serial mental activities involving different sections of the conceptual and sensory systems has yet to be accomplished.

The focus of this investigation is to explore the potential of a new method for studying information processing based on television user's "cognitive style." An individual's cognitive style is developed from measurements of three sets of influence on cognitive activity: propensity to use certain senses and symbolic forms, orientations

to different cultural roles, and propensity to reason in different ways. This method of people typing has been attempted in one previous media study (Furse, 1974) as a market segmentation instrument in advertising.

Ray and Ward (1975) recently discussed an interface of consumer behavior research and communication research centering upon the concept of information processing. They stated,

> The information processing perspective may hold the promise of more valid indication of mass media effects. It may be that the processes by which mass communications effects develop are more subtle than communication researchers have previously thought. Studies of intraindividual information processing as a consequence of mass media exposure signal a new direction in communication research. Examination of new variables, often through new research techniques is feasible. More valid assessment of communication effects may be possible if researchers return to the earlier focus on intra-individual responses to mass communication information, armed with . . . new variables, methods, and conceptualizations . . . . (Ray and Ward, 1975, p. 199)

Examination of the literature reveals that information processing appears to be a neglected area of mass communication effects research. The bulk of research directed at political communication (O'Keefe, 1974, p. 147) and marketing communication (Ray, 1973) over the years has dealt almost exclusively with the final outcome of change in behavior (whom is voted for or what is purchased in the end result). Of the three major levels corresponding to a typical attitude structure--cognitive, affective, and conative, the latter two levels are given the majority of the

research emphasis, yet many communications process models suggest that individuals move through cognitive and affective stages before reaching an action stage (Armstrong, Kendall, and Russ, 1975).

The hierarchy of effects model consists of a sequence of stages which an audience member experiences during a mass communication. The typical sequence is from simple to more complex response stages. For example, William McGuire's learning hierarchy includes the levels of attention, comprehension, yielding, and acceptance. Attention and comprehension are variables within the cognitive component. Affective variables include interest, evaluation, attitude, feeling, conviction, and yielding. Finally, the variables of intention, behavior, and action are grouped under the conative level.

Virtually no one doubts the existence of cognitive, affective, and conative reactions to mass communication. There are, however, serious quarrels involving the relationship within the hierarchy, i.e., whether cognitive reactions must precede affective responses which must precede conative responses as in the McGuire hierarchy. Research indicates that such a stairstep hierarchy, learning before attitude change before behavior change is, probably, too simple. Many studies indicate that learning or cognitive response is often not a measureable antecedent of either affect or conation (Ray, 1973, p. 150).

Additionally, research indicates a preponderance of study with the affective and conative, while significantly neglecting the cognitive level. To be sure, measurement of affective and conative variables is much simpler and perhaps even more interesting for study because of its more tangible applications. However, it may be more rewarding to explore recall of the communication content and comprehension of the intended meaning of the message in a study of cognitive style involving televised messages.

The concept of cognitive style was first developed in the 1920's by psychologists to help explain personality effects on behavior. The cognitive style variables to be measured in this investigation are based on concepts used successfully in the field of education. Joseph Hill has been the primary developer of the educational sciences, of which cognitive style is a major component and is integral to assessing individual student needs and developing an appropriate educational program. Cognitive style is known as the method whereby an individual goes about the process of learning; that is, gathering information and obtaining meaning from that information.

This approach to cognitive style offers an integrated and, perhaps, useful approach to describing television audiences. Although its use in media has been tested only once, the applications of cognitive style in education indicate that it may well be a useful tool for describing

television users. The major functions of television are informing, persuading, and entertaining, programming, and there are a number of parallels between the use of cognitive style to prescribe alternative teaching media and methods and needs of television in choosing alternative presentation styles for programming.

Purpose of the Study

The concept of cognitive style used in this investigation seeks to describe individuals in terms of such variables as preference for visual or auditory symbols, willingness to accept the influence of family figures or peers, and preferences for different modes of mental processing in order to derive meaning. Typing television users in this way would appear to be useful to television planners. Still, the feasibility of using cognitive style as a basis for segmenting television audiences depends upon discovering the existence of predictable relationships between audience cognitive style and television response. The major focus of this study will examine the application of cognitive style to various cognitive responses from television messages in order to determine if there indeed are predictable relationships.

The interest in relating the educational science of cognitive style to television stems from the belief that the problems faced in matching instructional programs to

individual students has much in common with those faced by television professionals attempting to match programs and commercials to the needs and desires of demographics segments. The nature of cognitive style is concerned with the way an individual takes note of his total surroundings--how he seeks meaning, how he becomes informed. Is he a listener or a reader? Is he concerned only with his own viewpoint or is he influenced in decision making by his family or peers? Does he reason in categories, in relationships, or deductively? The answers to all these questions could conceivably have appreciable impact on awareness, attention, and comprehension to media content.

As employed by Hill, a cognitive style "map" can be derived for each individual. The cognitive style map is composed of three multivariate sets of cognitive activity: propensity to use certain symbols and senses, orientation to different interpersonal environments, and propensity to use certain thought patterns. From this cognitive style map, teachers develop educational programs geared to individuals particular styles.

Hill's concept of cognitive style combines twenty-seven discrete variables, each of which can appear as either major, minor, or neglibile orientations in an individuals cognitive style. Thus, any individual's cognitive style is unique, and the effect of cognitive style on behavior must be interpreted as the combination of all these variables

working in concert. The cognitive style map determines the ways an individual derives meaning by examining his responses to a cognitive style instrument. The resultant map consists of symbols, which are useful only if one knows the meaning of the symbols on it, the type of behavior the symbol represents, and the interrelationships among the symbols.

Although research on cognitive style has been advanced from a number of diverse fields, there is agreement on one important concept: cognitive style is expected to affect a wide variety of behaviors and situations. For example, several studies have found that individuals who are successful in similar types of activities also share similar cognitive styles. Shuert (1970) using the cognitive style conceptual framework concluded that certain elements of cognitive style seem to increase the probability of the students' success. DeNike (1975) found that different cognitive styles predispose some students to do better than others on classroom simulation games. Griffin's (1975) research revealed that "regular" communication students have much different cognitive styles than do developmental students. London (1975), although insisting that the cognitive model was in need of further validation, found that the qualitative segments of the cognitive map were helpful in isolating lower class students who were prospectively successful in college.

Furse's (1974) study at least partially supports the application to marketing by relating cognitive style to mass media use. Although his principal research hypothesis concerning the relationship of cognitive style and advertising response, product usage rate, and brand loyalty are not proved, the research method he employed was severely limited in that he selected only two cognitive style types and his stimulus objects offered little cognitive style contrast.

Thus, if it is reasonable to expect that cognitive style affects the previous behaviors in predictable ways, then it seems reasonable to investigate the relationship of cognitive style to the behavior of television audiences. If cognitive style elements can be delineated and if cognitive style does interact predictably with television viewing behavior, then conceivably many important questions can be answered for the television professional. For example, do audiences with a particular cognitive style prefer television information, persuasion, or entertainment with a preponderance of written words or pictures?. . . spoken words or nonverbal sounds?. . . content developed primarily inductively or primarily deductively?

Description of Following Chapters

Chapter II will review literature of cognitive style related to the research questions and will present specific

hypotheses to be tested. Chapter III will describe methods of statistical analysis. Chapter IV reports data collected in the experiment and results of analysis of that data. Chapter V includes discussion of the findings, limitations of the study, and directions for future research.

CHAPTER II

REVIEW OF RELATED LITERATURE

Before proceeding with the investigation of cognitive style as a method for measuring the effect of media messages, it is necessary to clarify the evolution of the concept of cognitive style. The concept of cognitive style which forms the basis for this investigation was developed in the 1960's by Joseph Hill in the educational sciences, but the notion of cognitive style was conceived much earlier in the field of psychology.

Cognitive Style in Psychology

As early as 1937 Allport discussed the consistency and pattern with which a person perceives and understands. This characteristic was termed cognitive style.

> There results for each individual a "cognitive style." To some extent culture plants this style, thus accounting for much uniformity in people's thought and behavior. But in the last analysis, each person is unique in the way he blends veridicality, culture, and his own personal existence (1961, p. 274).

Allport's concept of cognitive style was inherent in

his discussion of personality development. He regarded style as the external aspect of the structural consistency of personality, changing as the structure changes. He stated, "style is the gradual externalization of the inner peculiarities and unique characteristics of the individual" (1937, pp. 490, 492).

In 1951 Klein described personal style as the distinctive "adaptive properties" of perception in which individuals come to grips with reality (p. 335). Later Klein noted that a variety of cognitive attitudes contributes to consistency in a person's behavior, and took note of such a structural arrangement of cognitive attitudes by calling it cognitive style. In Klein's words,

> Perceptual experience and its contents reflect stabilized rules of control operating through the perceptual system; the achievements of perception and its motivated selectivity cannot be understood simply as a response to temporary need states. In this view, the organismic controls are not ad hoc constructions but workable strategies that have proved themselves in countless environmental encounters. We referred to them at different times as "perceptual attitudes," "style," and finally, "cognitive controls" (1970, p. 9).

Klein called cognitive style an approach to the nature of personality structure itself. He cautioned against separating cognitive events, such as a particular perception, from those that reflect personality and speak of their "interaction." Rather, personality embodies stabilized dispositions of perception and cognition--or what is referred to as cognitive style (1970, p. 10).

An early theoretical approach arose from psychoanalytic theory. Gardner (1953) sought to study aspects of personality theory which expressed itself through individual differences in adaptative modes of organizing and experiencing the stimulus world. He indicated that individual differences in respect to certain perceptual properties suggest a preferential mode is at work--a factor which is not tied solely either to intelligence or to capacity as these are usually understood. Few studies have hinted at the possibility that personal styles of experiencing may in part account for wide individual differences (1953, pp. 214-215).

Broverman and Lazarus (1958) demonstrated a "cognitive sub-system" involving conceptual and sensorimotor classes of behavior. They suggested that other typologies which have cognitive implications (e.g., inner directed-other directed, body dependent-field dependent, extrovert-introvert, leveler-sharpener, ideational-motoric, anal-phallic, etc.) deal with common cognitive subsystem dimensions while using different terminology or emphasizing different psychological contexts. These, in turn, may be part of a broader regulative mechanism referred to as cognitive controls or styles (1958, pp. 101-102).

In later studies Broverman (1960a, 1960b), discarded the notion of cognitive sybsystems in favor of cognitive styles. He held that cognitive styles are thought to be a

function of common response probabilities or response strengths within certain classes of behaviors. Consequently, a specific style or behavioral pattern occurs whenever a particular class of behavior is elicited. Two cognitive styles were described--"conceptual versus perceptual-motor dominance" and "strong versus weak automatization" (1960a, p. 167). Further, Broverman held that the two cognitive styles were related to intra-individual variations in response strengths in certain classes of behavior. Hence it seems that the cognitive styles are, essentially, intra-individual organization phenomena (1960b, p. 250).

The view of cognitive style advocated by Witkin focuses upon perceptual processes. Perception is broadly defined to include the many cognitive operations associated with the purely physical act of perceiving. Witkin's (1948) early research concentrated on visual orientation in perception which involves the employment of varied and changing frames of reference. Results of his studies demonstrated that the perceptual process cannot be fully understood without considering the characteristics of the people perceiving. He observed that people tending to be self-consistent points to the importance of personal factors responsible for individual differences (1950, p. 13). An individual's perception is influenced by aspects of his psychological make-up, his thinking, his learning, his pattern of intelligence, his

social attitudes, his reactivity, and so forth (1954, p. 503).

Witkin also studied the field dependence-independence principle. His investigations revealed that,

> field-dependent persons tend to be characterized by passivity in dealing with the environment; by unfamiliarity with and fear of their own impulses, together with poor control over them; by lack of self-esteem; and by the possession of a relatively primitive, undifferentiated body image. Independent or analytical perceptive performers, in contrast, tend to be characterized by activity and independence in relation to the environment; by closer communication with, and better control of their own impulses; and by relatively high self-esteem and a more differentiated, mature body image (1954, p. 469).

It would appear that these findings may have formed some developments in the educational sciences regarding the relationships of the social influences, social norms, and role expectations of the cultural determinants of cognitive style and the influence of an individual's modality of inference.

Ausbel and Fitzgerald (1961) saw cognitive style in relation to cognitive organization. In a summary of the literature, they said cognitive style is self consistent and enduring individual differences in cognitive organization.

> Cognitive style refers both to individual differences in general principles of cognitive organization (e.g., simplification and consistency trends) and to self-consistent idiosyncratic tendencies that are not reflective of human cognitive functioning in general (i.e., intolerance of ambiguity, memory for particular kinds of experience). It reflects differences in cognitive capacity and functioning (1961, p. 507).

Another approach was originated by Kagan, Moss, and Sigel (1970). They defined cognitive style as stable individual preferences in mode of perceptual organization and conceptual categorization of the external environment. These investigators identified two orientation dimensions and three categorization dimensions of cognitive style.

> Egocentric--based on the individual's personalized, affective classification of a group of stimuli.
> Stimulus-centered--based on aspects of the external stimulus.
> Analytic-descriptive--based on similarity in objective elements within a stimulus complex, that were part of the total stimulus.
> Inferential-categorical--based on a partial objective attribute of the stimuli, but involve an inference about the stimuli grouped together.
> Relational--based on a functional relationship between or among the stimuli grouped together (p. 204).

A review of the various approaches to cognitive style as defined in psychology shows that it is characterized by the individual's consistent mode of seeking meaning among diverse and often confusing stimuli. Cognitive style is seen as being relatively stable over time and as permeating a wide variety of individual encounters with reality. By presenting a broader conceptual framework rather than piecemeal analysis of personality traits, cognitive style offers a more complete picture of cognitive processing and its effects on overt behavior.

The major aim of those studying cognitive style in the field of psychology is to investigate personality and attempt to develop a comprehensive theory of personality.

The aim of those studying cognitive style in the educational sciences is to determine how one derives meaning from his environment.

Cognitive Style in Educational Science

Cognitive style as developed by Hill and his associates in educational science has some structural differences from cognitive style as outlined in psychology, however the function of cognitive style is the same for both. The approach by Hill is a description of a broad pattern of consistent cognitive behavior using symbolic language to represent preferences for different types of symbols, preferred cultural roles, and preferred reasoning patterns; whereas psychologists have restricted their treatment of cognitive style more within the context of defined social and personality variables.

Educational cognitive style is a composite construct with three substructures: symbols and their meaning, cultural determinants of symbolic meaning, and modalities of inference. Hill defines cognitive style as a Cartesian product, G, composed of the three sets mentioned above, represented by S, E, and H. A Cartesian product is a non-arithmetic display of elements contained in two or more sets, used for showing possible combinations of these elements without actually breaking down each of these possible combinations in graphic form. Thus the Cartesian product

for cognitive style in the educational sciences is represented as:

$$G = S \times E \times H$$

in which "G" is defined as the combination of all possible elements found in S, E, and H.

Cognitive style in the educational sciences is a concept for describing an individual's predominant mode of behavior in searching for meaning. As has been suggested, cognitive style is identified as an individual's disposition or propensity (1) to use certain types of symbolic forms versus others, (2) to derive the meaning of symbols from the cultural role the individual finds most satisfying, and (3) to use one reasoning pattern in preference to others in reaching conclusions from information sources. A graphic representation of the elements included within the three subsets is called a cognitive map. The map provides a graphic description of the individual's mode for deriving meaning from his environment based upon his symbolic orientations, cultural experiences, and methods of reasoning.

The three subsets of the elements which are combined to describe the set cognitive style are called in Hill's schema (1) Symbols and Their Meanings, (2) Cultural Determinants of the Meaning of Symbols, and (3) Modalities of Inference. A fourth subset, Memory-Concern is still being developed by Hill and is not included in this investigation. A summary of cognitive style notations are shown in Figure 1.

FIGURE 1

COGNITIVE STYLE NOTATIONS, ABBREVIATIONS

AND BRIEF DEFINITIONS

Symbols and Senses

1. Theoretical Auditory Linguistic -- T(AL) - the sound of a word.
2. Theoretical Auditory Quantitative -- T(AQ) - the sound of a number.
3. Theoretical Visual Linguistic -- T(VL) - the written word.
4. Theoretical Visual Quantitative -- T(VQ) - the written number.
5. Qualitative Auditory -- Q(A) - sense of hearing.
6. Qualitative Olfactory -- Q(O) - sense of smell.
7. Qualitative Savory -- Q(S) - sense of taste.
8. Qualitative Tactile -- Q(T) - sense of touch.
9. Qualitative Visual -- Q(V) - sense of sight.
10. Qualitative code Empathetic -- Q(CEM) - identification with others.
11. Qualitative code Esthetic -- Q(CES) - appreciation of beauty.
12. Qualitative code Ethic -- Q(CET) - commitment to a set of values.
13. Qualitative code Histrionic -- Q(CH) - artificial behavior.
14. Qualitative code Kinesics -- Q(CK) - nonlinguistic abilities.
15. Qualitative code Kinesthetics -- Q(CKH) - motor skill abilities.
16. Qualitative code Proxemics -- Q(CP) - ability to judge social distance.

FIGURE 1 (continued)

COGNITIVE STYLE NOTATIONS, ABBREVIATIONS

AND BRIEF DEFINITIONS

17. Qualitative code synnoetics -- Q(CS) - knowledge of self.

18. Qualitative code transactional -- Q(CT) - interaction abilities.

19. Qualitative code Proprioceptive -- Q(P) - synthesis abilities.

Cultural Determinants

20. Associates -- A - peer influences.

21. Family -- F - family influences.

22. Individuality -- I - personal influences.

Modes of Inferences

23. Magnitude -- M - categorical thinking.

24. Differences - D - contrast analysis.

25. Relationship -- R - similarity analysis.

26. Appraisal -- L - combination of M, D, and R.

27. Deductive Inferential -- K - deductive analysis.

Symbols and Their Meanings

Hill defines symbols and their meanings as that component of cognitive style which defines an individual's ability to derive meaning from theoretical and qualitative representations of his environment and personal experiences (1972a, p. 1). The two types of symbols, theoretical and qualitative which man encodes for information processing, Hill defines as (1972a, p. 4),

> The theoretical symbols is that symbol which presents to the awareness of the individual something different from that which the sumbol 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.

The theoretical symbol represents something different than the symbol itself such as concepts and ideas. Theoretical symbol might be the written word "flower" or the spoken word "flower" which is the symbol for the object which grows and blossoms. Thus the theoretical symbol represents the object or the idea ordinarily associated with the symbol, not the object itself. Qualitative symbols present sensory experiences to the individual, such as the visual image resulting from the individual's observation of an actual flower, because it presents to the senses that which the symbol itself is to the individual. Both types of symbols are used by man in encoding information from the environment and are, therefore, essential to the process of searching for meaning.

Theoretical Symbols

The two main types of theoretical symbols are auditory and visual. Each of these two categories is divided into linguistic and quantitative elements by Hill. The four theoretical symbols used in his schema of cognitive style are:

1. Theoretical Auditory Linguistic - T (AL) - the sound of a word. For example, the sound of the word "cat" is an auditory linguistic theoretical symbol because it brings to the awareness of an individual an imagery different from the sound itself. In its complex form, this symbol is the set of sounds selected by the individual's awareness from the series of words forming some type of oral expression to form a set of images different from the sounds of the words that are involved. For example, the oral sentence, "Dinner is served," brings an imagery to mind that might involve the "picture" of a person serving food, a dish of steaming vegetables, or a myriad of other possibilities, each of which would be different from the sounds of the words (1972a, p. 9).

2. Theoretical Auditory Quantitative - T (AQ) - the sound of a number. For example the sound of the number "3" brings to the awareness of the individual an imagery different from the sound itself. Although in auditory theoretical symbolic form it is difficult to determine whether the sound "three" is considered to be a number

(quantitative) or a word (linguistic) by the individual, in the interest of clarity the auditory quantitative theoretical symbol is arbitrarily defined and said to exist. In its complex form, this symbol is the set of sounds selected by the individual's awareness from a series of algebraic (in its generic sense) terms forming some type of mathematical expression (1972a, p. 9).

3. Theoretical Visual Linguistic - T (VL) - the written word. For example, the word "cat" brings to the awareness of a literate individual an image different from that of the printed arrangement of letters. When a literate individual sees the word "cat," he tends to associate it with the image he sees when he hears the auditory theoretical symbol of "cat," or the image he associates with the qualitative symbol of "cat." In both cases, however, these imageries are different from the written word itself. In sentence form, the visual linguistic theoretical symbol is the set of printed words selected by the literate individual's awareness from some form of written expression to form a set of images different from the observed arrangement of words involved (1972a, p. 10).

4. Theoretical Visual Quantitative - T (VQ) - the written number. The fact that the visual quantitative theoretical symbol should present to the individual's awareness something different from that which it itself is has been recognized by mathematicians.

The importance of understanding the role of the visual quantitative theoretical symbol in mathematics education cannot be over-emphasized. Students who mistakenly assume that the symbol is actually the concept usually witness difficulty in attempting to understand mathematics.

In a broader context, mathematics is a logical formalism. It is a collection of arbitrarily defined visual quantitative theoretical symbolic systems. It is not primarily designed for practical purposes, nor is it created by bringing about possible social cohesion, a function which ordinary language is expected to serve. Although mathematics has many uses, its practical applications are not the essential aspects of its existence. It should be emphasized that mathematical symbolisms are theoretical and that they constitute purely intellectual systems that are not necessarily determined by the demands of nature and society. Mathematical symbolisms usually occupy an independent, closed-system world of meaning. In their derivation they need not represent things or classes of things in the actual world as do the symbols comprising ordinary language. In a sense, mathematics defines worlds of its own. Its information is composed of completely abstract symbolic forms. Although the applications of these forms might be highly useful, the applications, per se, are considered secondary to the fundamental meanings of these symbolic creations (1972a, pp. 13-14).

Qualitative Symbols

Qualitative symbols are used to convey feelings, commitments, values, and to provide particular insights into the domain of self. According to Hill,

> The main function of the qualitative symbol is figurative expression, not literal statement. Theoretical symbolic languages are oriented toward generalization; qualitative symbolic codes toward subcultural individualism (1972b, p. 1).

The meaning of qualitative symbols is derived from three sources: 1) sensory stimuli, 2) humanly constructed formalisms such as codes or "games," and 3) programmatic effects of objects or phenomena which convey an impression of a definite series of images, scenes, events, or operations (1972b, p. 1). The fifteen forms of qualitative symbols are defined as follows:

A. Sensory stimuli

1. Qualitative-auditory--Q(A) - the ability to perceive meaning through hearing, particularly as it might apply to non-discursive symbolic forms of sound such as absolute music.
2. Qualitative-olfactory--Q(O) - the ability to perceive meaning by the sense of smell.
3. Qualitative-savory--Q(S) - the ability to perceive meaning by the sense of taste.
4. Qualitative-tactile--Q(T) - the ability to perceive meaning by the sense of touch.

5. Qualitative-visual--Q(V) - the ability to perceive meaning by the sense of sight.

B. Cultural codes

6. Qualitative code-emphathetic--Q(CEM) - the ability to identify with, or have a vicarious experience of, another's feelings, ideas, or volitions.
7. Qualitative code-esthetic--Q(CES) - the ability to enjoy the beauty and pureness of a resulting product, situation, or idea.
8. Qualitative code-ethic--Q(CET) a commitment to a set of values, a group of moral principles, obligations, and/or duties.
9. Qualitative code-histrionic--Q(CH) - artificial behavior, staged conduct, or a deliberate exhibition of emotion or temperament to produce some particular effect in, or evoke responses from, other persons.
10. Qualitative code-kinesics--Q(CK) - the ability to communicate by means of nonlinguistic functions and motions of the body.
11. Qualitative code-kinesthetics--Q(CKH) - motor skill abilities and bodily reactions such as threshold of awareness of different weights, athletic performances, ballet, and finger dexterity.
12. Qualitative code-proxemics--Q(CP) - the ability to judge physical and social distance in the act of communication relative to normative behavior

patterns and role interpretation.

13. Qualitative code-synnoetics--Q(CS) - personal knowledge of oneself in relation to one's environment.
14. Qualitative code-transactional--Q(CT) - the ability to maintain a positive communicative interaction which significantly influences the goals of the persons involved in that interaction.

C. Programmatic effects

15. Qualitative-proprioceptive--Q(P) - the ability to synthesize stimuli produced within the body to produce a manifest behavior such as typewriting or playing a musical instrument while reading music.

The basic assumption of the first subset, symbols and their meaning, is that man uses two kinds of symbols: the theoretical and the qualitative. Hill attributes his distinction between theoretical and qualitative symbols to the works of Champlin, Villemain, Pierce, Dewey, Korzybski, Rapaport, and Phenix (1973, p. 4).

Dewey recognized man's ability to mediate two types of symbols into meaning, the qualitative and the theoretical. In his early works Dewey expressed,

> Immediate empirical things are resolved into hard sensory data, which are called the genuine physical things, while the objects of physical science are treated as logical constructions; all that remains to constitute mental existence is images and feelings (1925, p. 118).

Later, Dewey distinguished qualitative thought as that which has to do with objects involved in the concerns and issues

of living. Further, thought which denies the existential reality of qualitative things is bound to end in self-contradiction and in denying itself. "Scientific" thinking, that expressed in physical science, never gets away from qualitative existence (1968, pp. 93, 116).

The distinction between theoretical symbols and qualitative symbols is also noted by Pierce's work on the triadic relationship between an object, its referent and its interpretent. Pierce actually saw three branches of symbols which he called pure grammar, logic proper, and pure rhetoric (1931, pp. 135-136). Although his descriptions of these branches are different from Hill's theoretic and qualitative distinctions, Pierce's ideas impacted upon these notions.

Korzybski's emphasis of the fact that the symbol affects the functioning of the nervous system is important to Hill's generalizations associated with theoretical and qualitative symbols. Korzybski suggested four levels of abstracting within the nervous system as one perceives a happening or event. A first-order happening occurs on non-verbal or "silent" levels; a reflected light impinges on the eye. Second, we get some sort of electro-colloidal configurations in the brain; third, since we are sentient organisms, we react to those configurations with some sort of "feelings," some evaluations about them, on silent levels. Finally, on the verbal levels, we can speak about those

organismal reactions. All of our "feelings," "thinkings," our "loves," "hates," etc., happen on silent un-speakable levels, but may be affected by the verbal levels by a continuing interplay (1951, p. 172). The distinction Korzybski made in nonverbal and verbal levels is analagous to Hill's qualitative and theoretic symbol differences. Korzybski identified his nonverbal or silent levels of abstracting with such terms as visual, tactile, feelings, etc., and called attention to a fundamental inadequacy of human behavior, termed objectification, which is the confusion of words or verbal issues (memories, ideas) with objective un-speakable levels, such as objects or experiences, or feelings. If we objectify, we forget that words are not the objects or feelings themselves (1973, p. 417).

Villemain and Champlin (1959) made additional contributions to the understanding of symbols. Building on the work of Dewey, Villemain and Champlin were concerned with developing a methodological theory of education (intelligence). Different modes of inquiry, with different concepts, locate and study different things. One mode, termed qualitative symbol, differs from that employed in cognitive procedures, referred to as theoretical symbol. The difference is primarily one of emphasis. A distinguishing feature of the theoretical symbol is that it represents without displaying or placing before us what it represents. The authors argue that the qualitative is continuous with theoretical

knowing in human intelligence and therefore does submit to methodological analysis (1959, pp. 347, 351, 354).

Phenix (1964) contributed directly to Hill's elements of qualitative symbols. Six fundamental realms of meaning emerged from Phenix's analysis of the possible distinctive modes of human understanding. These six patterns were designated as symbolics, empirics, esthetics, synnoetics, ethics, and synoptics. The first and second realm, symbolics, and empirics are grossly similar to theoretic and qualitative symbols. However, the realms of esthetics, synnoetics, and ethics are conceptually identical to Hill's qualitative codes for the same terms (1964, pp. 6-7). The final realm, synoptics, refers to meanings that are comprehensively integrative. Although synoptics does not interface with Hill's symbols subset, it does appear to have some relationship to appraisal, one of five modes in inference from his third subset of cognitive style yet to be discussed.

Cultural Determinants of the Meaning of Symbols

The primary assumption of the second subset, cultural determinants, is that symbolic meaning is influenced and changed by culturally created modes of expression and communication (Hill, 1973, p. 5). Proponents of the educational sciences view education as a social system. As such, education must be analyzed in the social context in which it

exists. For this reason, the concept of roles are considered essential to the construct of the educational sciences.

The concept of role in the educational sciences is defined as the behavioral consistencies on the part of one person as he contributes to a more or less stable relationship with one or more others (Newcomb, Turner, and Converse, 1965, p. 323). This relationship involves a set of expectations concerning a person's actions and the actions of those with whom he interacts. The role serves as a point of contact between the individual and the social system. Since man brings meaning to symbols, not as a unique person but as a person cast in a role which has definitions and expectations imposed upon it by societal norms and the roles of the individuals and groups with whom he interacts, the concept of role is essential to the significant influence which a person's family, associates, and individuality can have on the meaning which he attaches to symbols. Each of these three cultural determinants is, in effect, a synthesis of selected aspects of the concepts of roles, norms, and cultural perceptions (Hill, 1967). The three cultural determinants are defined as follows:

1. Associates--A - peers, represented by the various groups with whom the individual has the greatest contact and which changes throughout life.

2. Family--F - either immediate or extended or surrogate family changing throughout life.

3. Individuality--I - person's innate knowledge that his way is best along with his ability and willingness to direct his behavior accordingly.

The point of departure for the second subset, cultural determinants, Hill attributes to the work of Kelley. He also mentions Sherif, Parsons, Merton, Homans, Newcomb, et al., and Tolman as contributing to his developments in this area (Hill, 1973, p. 5).

Sherif (1936) was among the first to demonstrate that group norms and roles can influence judgments. As a consequence of the individual's contact with the social world around him, the social norms, customs, values, etc., become interiorized in him. These interiorized social norms enter as frames of reference among other factors in situations to which they are related, and thus dominate or modify the person's experience and subsequent behavior in concrete situations (1963, pp. 43-44). In addition, Sherif contributed to the development of the concept of Individuality. He acknowledged the notion of "I" as a factor in the regulation and modification of one's psychological totality (1963, p. 167).

Homans (1950) clarified the definition and the influence of norms on behavior. Norms refer to an idea in the minds of the members of a group specifying what the members or others should do, ought to or are expected to do under given circumstances (1950, p. 123). Norms are an integral part of Homan's "internal system" of groups which he refers

to as behavior that is an expression of the sentiments towards one another developed by the group members (1950, p. 110). Within the context of the educational sciences, norms are defined as guides to behavior generated by social organization (Hill, 1967, p. A-9).

Merton (1957) examined five types of adaptation by individuals within the culture-bearing society. The five modes of adaptation are conformity, innovation, ritualism, retreatism, and rebellion. Persons shift from one mode to another as they engage in different spheres of social activity. Merton emphasized that the modes refer to role behavior in specific types of situations, not to personality. These modes were probably focused upon by Hill in helping to clarify the concepts of Associates and Individuality. Merton's initial mode, conformity suggests that the person is sustained by a modal behavior or group members--which is integral to Hill's concept of Associates. Merton's other four modes, innovation, ritualism, retreatism, and rebellion are representations of various stages of Individuality in Hill's cultural determination of cognitive style.

Tolman (1962) addressed the factors which affect acceptance or adoption of certain types of roles. He suggested that the history and strength of the successive positive and negative identifications which are made with father, mother, teachers, gang mates, or external prestige groups determine acceptance of any role (1962, p. 351). Further,

Tolman discerned the concept of individuality,

> It would. . .appear that there are types of unique individuals who deviate relatively widely from their culture and yet achieve an integration of their own--some sort of inner consistency in their various need strengths and belief-value matrices run counter to those of their fellows (1962, p. 354).

Despite references to the concept of individuality in Sherif and Tolman, Hill attributes the development of this concept to Parsons (1964). In his structural components of the social system, Parsons notes three different units of social systems referable to the individual. That which is relevant here is the third unit--the individual himself as a social unit defined as the organized system of all the statuses and roles referable to him as a social object and as the "author" of a system of role-activities (1964, p. 26).

In the educational sciences cultural determinants are based on human reactions to cultural perceptions in terms of roles and norms. Kelley (1947, 1962) has noted that perception is selective on the basis of experience and unique purpose (1962, p. 14); and perception, not the object, is a directive for action (1974, p. 34). Further, Kelley observed that perceptions are unique with individuals, no two individuals have identical perceptions (1947, p. 34). These notions form foundations for Hill's belief regarding the uniqueness and highly individualistic nature of cognitive style.

Modalities of Inference

The third subset of cognitive style, modalities of inference, deals with the process of deriving meaning by employment of two basic types of reasoning, induction and deduction. Inductive processes yield probability conclusions. Deductive processes produce conclusions which are necessary consequences of the premises and the chain of reasoning used.

Within the educational sciences there are four inductive inferential modes and one deductive mode (Hill, 1968).

1. Magnitude--M - a form of categorical thinking, using rules, definitions, and/or classifications. It utilizes norms categorically classified and attitudes accepted as true by the individual as the basis for acceptance or rejection of advanced hypothesis.

2. Difference--D - deals with hypothesis of difference emphasizing one-to-one contrasts of selected characteristics or measurements.

3. Relationships--R - the synthesizing of two or more characteristics or measurements and evaluating their similarities in deriving a conclusion.

4. Appraisal--L - employs, with equal weight, hypothesis of all the previous three types of inference (M, D, R) depending upon the situation with which the individual is confronted in coming to a conclusion.

5. Deductive inferential--K - utilized most frequently in logical proofs particularly in mathematics and symbolic logic.

The cognitive style component of modalities of inference is based on the following assumptions. Man derives and expresses meaning from his environment and personal

experiences by mediating culturally determined theoretical and qualitative symbols. With experience, simple meaning seeking activities are replaced with complex symbolic behaviors. Man uses existing meaning to generate new meanings. He encounters problems and uses symbols strategically to resolve them. He strives for increased understanding, prediction and control of environmental phenomena. With experience, man becomes a hypothesis tester, an inference maker, a problem solver.

Concepts from statistical inference and logic supplemented by the works of Piaget, Bruner, Guilford, and Wertheimer served as the foundation of Hill's development of the subset (Hill, 1973, p. 5).

Piaget's (1952) general theory is in the area of cognitive psychology. He conceived sensorimotor intelligence as comparable to reflective or rational intelligence as parts of man's intelligence function. He suggested two important ways of intelligence functioning: accommodation and assimilation; the latter of which is the act of judgment inasmuch as it unites experimental contents to logical form (1952, p. 410). Judgments include, among others, the operations of recognition and generalization which are defined as the extent that a new object resembles an old one and the extent that a new object differs from an old one. The continuous operations entails the formation of an assimilatory schema (1952, p. 411). In the educational sciences Hill's

notions of Difference and Relation as modes of inference appear to have been influenced by Piaget's conceptualization of assimilatory operations.

Bruner's (1966) theory of instruction yields a structure of a domain of knowledge which varies according to "styles" among learners. He noted that knowledge which is characterized by its mode of representation, its economy, and its effective power may be governed on the basis of principles or rules. The mode of representation of knowledge may be a set of actions appropriate for achieving a certain result, a set of summary images that stand for a concept, or a set of symbolic or logical propositions. Economy relates to the amount of information held in mind and processed to achieve comprehension. Effective power refers to the generative value of one's set of learned propositions (1966, pp. 44-47).

Wertheimer (1959) traced and categorized the major development, in traditional logic, empirical logic, and classical associationism. He was critical of these developments because each was unable to explain the nature of productive thinking. As a result he studied and identified productive thinking processes neglected by the other approaches. He labeled some of these operations, grouping, centering, reorganization, and segregation but cautioned that their meanings are not easily understood and must be expressed in the behavioral terms of the case studies

within his various chapters (1959, pp. 6-11, 234-237).

Guilford's (1967) structure-of-intellect model bears some resemblances to Hill's development of cognitive style. The structure of Guilford's model consists of three major categories: content, operation, and product. Within the content categories he identified four sets of information: figural, symbolic, sematic, and behavioral. Five operation categories make up the unique general ways of functioning: evaluation, convergent production, divergent production, memory, and cognition. Six product categories pertain to the way or form in which any information occurs: units, classes, relations, systems, transformations, and implications. It is worth mentioning that Guilford's overall model presents some interesting similarities to Hill's cognitive style model. The content categories are somewhat like the first subset, symbols and their meaning, and some aspects of the product categories are found in Hill's third subset, modalities of inference.

Cognitive Style Map

A cognitive style map is a pictoral representation of the elements of the three subsets through testing. Mapping is a convenient method of presenting a vast amount of data in a concise form.

There are three forms of symbols used in comprising the cognitive style map: (1) major orientation, (2) minor

orientation, and (3) negligible orientation. Major orientations are listed in upper case letters, minor orientations are listed in lower case letters, and negligible orientations do not appear on the map. Orientations are assigned on the basis of test or inventory scores for each of the cognitive style elements. A major orientation is assigned for scores in the range of the 50-99 percentiles of a population at a given level of development. A minor orientation is assigned for scores in the range of the 26-49 percentiles. A negligible orientation is assigned for scores in the range of 0-25 percentiles (Hill, 1972c, pp. 10-12).

The development of appropriate operations or tests implies a form of further refinement of the definition of the element of cognitive style. Hill suggests that operations consist of short, objective forms of responses (1972c, p. 6). The cognitive style instrument selected for use here is based upon careful investigation and development by Hill and his associates and is reported in Appendix A.

No single element should be interpreted as having an isolated effect on overt behavior, but rather the effects of all elements must be considered simultaneously. Thus, the effects of cognitive style on behavior can be as varied as the number of unique combinations of elements.

In Figure 2 is an example of an individual's entire cognitive style map based on previous discussion of separate cognitive style elements and subsets.

FIGURE 2

COGNITIVE STYLE MAP

	SYMBOLS		CULTURAL DETERMINANTS		MODES OF INFERENCE
g =	T(AL) t(vl) T(VL) t(al) Q(T) Q(CK) Q(CKH) Q(CP) Q(CT) q(cs) q(v) q(a) q(cet)	x	I f a	x	M R d

The individual represented in the map above shows that he prefers to listen, T(AL), to derive meaning, with less preference for reading t(vl). In working with numbers the individual does better when reading, T(VL) than listening, t(al) to them. He has an ability to perceive meaning by the sense of touch, Q(T), communicate by means of nonlinguistic functions and body motions, Q(CK), and use motor skills, Q(CKH). He is able to judge critical social distance so as not to offend others, Q(CP), and he is able to influence others toward his point of view, Q(CT).

The individual shows minor orientations in his knowledge of his own abilities, q(cs); his ability to perceive meaning by the sense of sight, q(v) and hearing, q(a); and his commitment to a set of values and principles, q(cet).

In cultural perception and decision making, the individual is primarily self-oriented, I, although he accepts some of the influencing stimuli from both family, f, and peers, a. The reasoning pattern of the individual indicates that he is dependent upon categorical thinking, M, and comparisons, R. He demonstrates a minor orientation in infering from contrasts of characteristics, d.

Thus, cognitive style offers a broad but integrated concept for describing an individual's mode of behavior in searching for meaning. It is identified by an individual's predisposition to use certain symbolic forms versus others; by the degree of influence from cultural roles the individual has found most satisfying; and by the manner in which he reasons.

Cognitive Style Instrument

The cognitive style map instrument in most common use is a self report inventory. This format has been found to be a highly efficient means of gathering data on the basic 27 learning variables considered in cognitive style (Cogan, Heun, Martin, and Schnucker, 1976, p. 13). The cognitive style map was originally developed utilizing direct skill testing. Behavior was recorded in planned situations and on nationally-normed instruments such as the Nelson-Denny Reading Test. A complex battery of tests and interviews were also developed requiring many hours to administer and score

(Shuert, 1970). Later a Q-sort instrument was developed using items which correlated highly with the direct skill measures (Cogan, et al.). Finally, the items in the Q-sort were used to make up a 216 item self report inventory which consisted of a questionnaire comprised of eight one-sentence statements for each of the 27 cognitive style maps comparable to those derived from the more extensive battery of tests (Furse, 1974, p. 45). In either of these methods the respondent is accorded either a major, minor, or negligible orientation for each cognitive style element.

Reliability and validity measures of the cognitive style instruments are lacking in any published research. An extensive search of unpublished literature yielded two sources on which some judgments may be based. Skeen (1976) field tested the cognitive style instrument on a group of 72 Niagara Falls high school students in early October, 1974. During the third week of November, each student who had participated in the initial testing was retested. A test comparing the means of the two groups found no significant differences between pretest and posttest scores, thus providing evidence of instrument reliability.

Skeen also tested the instrument for content validity, to determine if the items appear to test those qualities which they are intended to test. A factor analysis was performed to ascertain whether all of the assumed 26 (one was omitted) variables were present and also to determine

if the questions that were given in each area, actually tested that particular mode. The results of the factor analysis indicated that 68% of the variance was accounted for by thirteen factors. Further, six modes T(AL), T(AQ), Q(A), Q(V), F, and R did not appear in the factor analysis as loading high on any factor. Thus, the validity measure was not successful for the entire cognitive style instrument.

The reliability and validity of the cognitive style instrument was also investigated by Heun, Heun, and Schnucker (1975) considering the instrument as an edumetric test. Edumetric tests are designed to measure the gain or growth of an individual's knowledge, learning skills, or abilities, and are concerned with differences within an individual. Data was collected from 71 students during the fall semester of 1974. Gain scores were obtained by subtracting pretest scores from posttest scores for the cognitive style instrument and various skill tests and compared. Reliability and validity was computed using the Kuder-Richardson-20 formula and split-half reliability coefficients. Twenty of the 27 Kuder-Richardson-20 correlations were significant at the $p < .05$ level and 22 of the 27 split-half reliability coefficients were significant at the $p < .05$ level. Only four cognitive style elements, Q(A), A, R, and K failed on both reliability measures.

Regarding internal validity only seven of the 216 cognitive style items were not significant at the $p < .05$

level and all 27 cognitive style elements were significant at the $p < .05$ level. Five elements were studied in terms of external validity comparing skill tests with changes in cognitive style tests. Two of the five had external validity coefficients significant at the $p < .05$ level. Thus the cognitive style instrument was determined to be reliable and some evidence for edumetric validity was found.

An abbreviated form of the questionnaire was developed as the cognitive style mapping instrument for this investigation due to the nature of the message presentation. A total of 14 cognitive style elements which appeared to be the most relevant to a response to a television message were selected representing all three cognitive style subsets. These are Theoretical Auditory Linguistic, Theoretical Auditory Quantitative, Theoretical Visual Linguistic, Theoretical Visual Quantitative, Qualitative Auditory, Qualitative Visual, Associates, Family, Individual, Differences, Appraisal, Magnitude, Relationship, Deductive. In cognitive style notation they appear in the following map:

FIGURE 3

ABBREVIATED COGNITIVE STYLE MAP

SYMBOLS	CULTURE	MODES OF INFERENCE
T(AL)		
T(AQ)	A	D
T(VL)	F	L
T(VQ)	I	M
Q(V)		R
Q(A)		K

Each of the 14 elements was included because the response orientations in each of these areas relate directly to television messages. Thirteen cognitive style elements were omitted from the instrument. These are Qualitative Olfactory, Qualitative Savory, Qualitative Tactile, Qualitative Proprioceptive, Qualitative Code Esthetic, Qualitative Code Empathetic, Qualitative Code Ethic, Qualitative Code Kinesthetics, Qualitative Code Histrionic, Qualitative Code Kinesics, Qualitative Code Proxemics, Qualitative Code Synnoetics, and Qualitative Code Transactional. Each of these elements was deleted because the intervention of a television stimulus precludes the use of their orientations in message reception.

All four of the theoretical symbols were included in the abbreviated cognitive style instrument because theoretic symbols are our usual method of communication through mediated messages. Visual and audible words and numbers are represented by the elements T(AL), T(AQ), T(VL), and T(VQ) on the cognitive style instrument. Generally, it was thought that some measure of a respondent's strengths and weaknesses regarding his oral and written work and number using skills was necessary to determine by varying differences in the theoretical symbolic presentation of television messages.

The cognitive elements of Q(V), qualitative visual and Q(A), qualitative auditory were chosen to remain because of obvious visual and audible television messages which are

neither words nor symbols but actually communicate information and thus should be compared for respondent differences. All three cultural determinants, A, Associates, F, Family, and I, Individuality were thought necessary components of the cognitive style typing instrument. Singly or in combination the cultural determinants reflect the societal roles and norms whereby an individual learns. All three elements may be controlled and manipulated for differences via a televised message.

Likewise all five modalities of inferences, D, Difference, L, Appraisal, M, Magnitude, R, Relationships, and K, Deductive were included in the abbreviated cognitive style instrument. Collectively, these five elements describe the various types of reasoning used by all persons. Each element can easily be allowed to vary and represents a common element of television messages.

Of the thirteen cogn[illegible]ve style elements omitted all were qualitative codes, which were thought difficult to activate via a television message. Q(O), qualitative olfactory--the sense of smell, Q(S), qualitative savory--the sense of taste, and Q(T), qualitative tactile--the sense of touch are not communicated through television.

The qualitative code--empathetic, Q(CEM) was deleted because the ability to identify with another was thought to be primarily an interpersonal activity rather than one mediated by television. The qualitative code-ethic Q(CET)

was omitted because a commitment to a set of values or moral principles appeared unrelated to one's receptivity to television messages unless that specific value was identifiable. A specific commitment is not obtainable from the cognitive style instrument. Qualitative code-histrionic, Q(CH) was deleted because it appeared that staged conduct or role playing was primarily a sender communication function and was not activated as a recipient of television messages. Qualitative code-kinesics Q(CK) was deleted because it was the intention of this research to test for linguistic elements of television messages rather than nonlinguistic ones. Qualitative code proxemics, Q(CP) was deleted because the ability to judge physical and social distance is a nonlinguistic skill. Qualitative code synnoetics, Q(CS) or one's general ability to establish realistic goals for oneself did not appear to preclude one's ability to receive television messages. Qualitative code transactional, Q(CT), because it measures communication interaction is unique to face-to-face rather than televised situations. Qualitative proprioceptive, Q(P) was deleted because it was thought that coordinating sensory input with body movements necessary to respond was not a functional goal of most television messages. The qualitative code esthetic, Q(CES), the ability to enjoy the beauty of a product was thought to be unrelated to one's ability to extract information from a television message. The qualitative code kinesethetics, Q(CKH) motor skill abilities did not

appear to either enhance or interfere with the reception of television messages.

Research Questions

Before one can consider cognitive style as a predictor of attention and comprehension in media messages, some basis must be established by which to determine the impact of cognitive style. In a dissertation investigating the use of cognitive style in market segmentation research, Furse evaluated the potential of cognitive style as a market segmentation method by comparing it to attitude, or image typing, which is widely accepted in marketing. Image typing, according to Furse, is a composite of attitudes which measures the interaction between an individual and some specified aspect of his environment (1974, p. 40). It is a "situation-specific" segmentation method based on variables expected to influence behavior in only limited types of situations, specifically those involving the object of a particular perception (p. 44). On the contrary cognitive style types are termed "situation free" types because cognitive style is expected to influence behavior in a variety of situations.

Furse suggested several groups of hypotheses dealing with both cognitive style and image typing. Only those dealing with cognitive style will be reported here. Initially, Furse hypothesized that persons of different cognitive

style types respond differently to the same advertising message with regard to advertisement liking, product liking, and likelihood to purchase the product advertised. Second, persons of different cognitive style types attend differently to the mass media with regard to (a) the number of magazines read regularly, (b) hours spent reading magazines per day, (c) hours spent viewing television daily, (d) hours spent reading newspapers daily, and (e) hours spent listening to the radio each day. Difference in enjoyment of radio, television, newspaper, and magazines were hypothesized for cognitive style types. Third, persons of different cognitive style types are different in their rate of product use and their loyalty to particular product brands; in this case brands of aftershave lotion or cologne.

Fourteen cognitive style elements were selected for testing with each represented by eight statements as the abbreviated cognitive style instrument for Furse's investigation. The instrument was administered to approximately 300 Michigan State University students and after the sample was reduced as a part of the image typing experiment, the resulting cognitive style scores were factor analyzed to yield orthogonal factors representing the dominant cognitive style types. Q-factor analysis, also called inverted R-factor analysis, was employed to develop clusters of individuals with similar cognitive styles. The dependent variables were measured by means of responses to an 18-item

questionnaire administered to the student sample.

Two dominant cognitive style factors emerged in Furse's study. The major differences between the two CS types was in Type I's greater sense of esthetics and orientation to relational information processing, involving the synthesizing of two or more characteristics or measurements and evaluating their similarities in deriving a conclusion. Type II was described principally by its orientation to categorical thinking, indicating an individual who relies heavily on categorical norms and attitudes accepted as true by the individual as rules governing behavior.

The two cognitive style types in Furse's study did not differ significantly in their response to advertisement liking, product liking, or likelihood of purchase. In regard to the media of enjoyment hypotheses, statistical significance was found on two of the four media tested: CS Type I preferred magazines and CS Type II preferred television. CS Type I's indicated preference for print media despite a minor t(vl), theoretical visual linguistic orientation appears inconsistent as does CS Type II's preference for television despite a major T(VL). Furse explained these findings in that most college students, even those with minor T(VL) or T(AL) orientations relative to their peers, still read and listen at a level well above that necessary to use the mass media effectively. It is probably that their scores on both of these cognitive style dimensions

would represent major orientations if ranked against a more heterogenous population of media users. Furse also explained that other cognitive style variables must account for differences in media preference (p. 106).

Significant differences in media usage by cognitive style types were not found. The lack of expressed differences in media use by cognitive style types was attributed by Furse to mean that variables other than cognitive style and media enjoyment may influence more directly the actual media habits of college students (p. 110). Finally, for hypotheses concerning differences in product usage rate and brand loyalty, none of the null hypotheses could be disproved at a significant level.

Some limitations in the Furse study, several of which he acknowledged, deserve mentioning. First, it should not be a surprise that cognitive style was not shown to be related to affective response. Advertisement liking, product liking, and likelihood of purchase are less appropriate to measure as dependent variables of cognitive style than recall or other measures of information gain. In an exploratory study by this author on the effects of recall and attitude toward eight television commercials embedded in a thirty minute public affairs program, recall was found to be more sensitive to the study of cognitive style effects than was the response measure of attitude (Hadley, 1976). The conceptual gap between cognitive style and attitude may be

sufficiently broad to exclude affective responses in marketing (or elsewhere) as a measure of cognitive style.

Second, only two cognitive style types were selected and do not represent all or even most of the different possible cognitive styles. Third, there was no difference in the presentation of the advertisements, that is, all advertisements were presented in print. Print advertisements only utilize visual linguistic and qualitative visual symbols. The best method of presenting the cognitive style stimulus material is of major importance. In this author's previously mentioned study, the embedding of commercials within a thirty minute television program was not found to be effective. Many subjects were observed to be inattentive during the interruptions for commercial messages (Hadley, 1976). This points to a more direct and concise approach to the stimulus materials together with a combination of printed symbols and visual symbols in a television message.

This investigation seeks to measure the learning effects of the media in terms of knowledge acquisition, issue saliency, and attitude toward the message and message communicator. Knowledge is meant to describe the grasping of information, or comprehension and is measured by recall of information. Salience is described as cognitions about the relevance of an issue and is measured by specifying the most important issues of information. Both dependent variables are thought to be more suitable than affective

variables as measures of cognitive style. Affect will be tested, however. A measure of attitudes will be introduced in order to further determine if there is any relation to cognitive style. Knowledge, salience, and attitude are tested for differences in response to cognitive styles to actual television messages.

The broad research questions to be addressed in this study are:

1. Do subjects of different cognitive styles differ with regard to an increase in their knowledge from the same television message?

2. Do subjects of different cognitive styles differ with regard to the salience of issues from the same television message?

3. Do subjects of different cognitive styles differ with regard to their attitudes from the same television message?

Each research question is subdivided into a number of more specific hypotheses. For each hypothesis, the null hypothesis is, of course, that the relationship is not significant, the different cognitive style types will not differ in the dependent variables.

Hypotheses About Information Recall

Hypotheses about information recall concerns information gain immediately after viewing the television stimulus. It is hypothesized that cognitive style clusters with major orientations in theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), and qualitative

visual, Q(V) will differ from those clusters with minor or negligible orientations in the same elements with regard to an increase in learning. Specifically, hypotheses about information recall are as follows:

H_1: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will demonstrate significantly more learning from a television stimulus with a dominant T(AL) than will groups of individuals with a minor or negligible orientation in T(AL).

H_2: Groups of individuals with a major orientation in theoretical visual linguistic, T(VL) will demonstrate significantly more learning from a television stimulus with a dominant T(VL) than will groups of individuals with a minor or negligible orientation in T(VL).

H_3: Groups of individuals with a major orientation in qualitative visual, Q(V) will demonstrate significantly more learning from a television stimulus with a dominant Q(V) than will groups of individuals with a minor or negligible orientation in Q(V).

There is no research evidence in this area on which to cite any expected differences in cognitive response to television stimuli. Differences are hypothesized based on research in the educational sciences which has shown that cognitive style affects disposition to learn certain course materials (Shuert, 1970; London, 1975). Television reflects certain presentation styles just as persons manifest their own individual cognitive styles, and it is conceivable that respondents prefer media and materials which are most compatible with their own cognitive styles. The cognitive style elements hypothesized here represent the most reasonable

elements related to the delivery of an informational message through television.

Hypotheses About Information Salience

Hypotheses about information salience concerns information relevance immediately after viewing the television stimulus. It is hypothesized that cognitive style clusters with major orientations in theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), and qualitative visual, Q(V), will differ from those clusters with minor negligible orientations in the same elements with regard to an increase in identification of salient information. Specifically, hypotheses about information salience are as follows:

H_4: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will identify significantly more salient information from a television stimulus with a dominant T(AL) than will groups of individuals with a minor or negligible orientation in T(AL).

H_5: Groups of individuals with a major orientation in theoretical visual linguistic, T(VL) will identify significantly more salient information from a television stimulus with a dominant T(VL) than will groups of individuals with a minor negligible orientation in T(VL).

H_6: Groups of individuals with a major orientation in qualitative visual, Q(V) will identify significantly more salient information from a television stimulus with a dominant Q(V) than will groups of individuals with a minor or negligible orientation in Q(V).

No specific evidence exists to support differences in information salience based on cognitive style, but as with

information recall it is reasonable to expect that cognitive style may be related to a person's ability to identify important issues.

Hypotheses About Attitude

Hypotheses about attitude effects concern a measure of liking or disliking immediately after viewing the television stimulus. It is hypothesized that cognitive style clusters with major orientations in theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), and qualitative visual, Q(V) will not differ from those clusters with minor or negligible orientations in the same elements with regard to attitude. In each case, it is the null that is being hypothesized. Specifically, hypotheses about attitude are as follows:

H_7: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will demonstrate the same attitude toward a television stimulus with a dominant T(AL) as will groups of individuals with a minor or negligible orientation in T(AL).

H_8: Groups of individuals with a major orientation in theoretical visual linguistic, T(VL) will demonstrate the same attitude toward a television stimulus with a dominant T(VL) as will groups of individuals with a minor or negligible orientation in T(VL).

H_9: Groups of individuals with a major orientation in qualitative visual, Q(V) will demonstrate the same attitude toward a television stimulus with a dominant Q(V) as will groups of individuals with a minor or negligible orientation in Q(V).

Research which forms the basis for these hypotheses has been cited earlier. Furse (1974) was unable to find any significant differences in advertisement liking, product liking, or likelihood of purchase between the two cognitive style types in his study. Hadley (1976) found that attitudes toward television commercials were not related to an individual's cognitive style.

CHAPTER III

RESEARCH DESIGN

This chapter will discuss the procedures for testing the hypotheses under investigation, data gathering instruments, design, and data analysis.

Subjects

The sample was taken from the population of students in the introductory mass communication courses at Central Missouri State University. During the fall term, 1978, 225 students in several classes completed the cognitive style instrument. Approximately one week later 208 who had completed the pretest were tested for differences in information recall, salience, and attitude after viewing the television commercials.

The student sample was chosen because of its availability and the exploratory nature of this study. Due to the time required to complete the cognitive style instrument, view a television stimulus and complete a six-page questionnaire, it was not considered feasible to deal with a random

sample of equivalent size. The introductory mass communication classes are reasonably well representative of the total population of freshman and sophomore students at this institution.

Cognitive Style Instrument

As presented in the previous chapter an abbreviated form of the 216-item questionnaire was developed as the cognitive style instrument for this investigation. Fourteen cognitive style statements were shuffled and typed as a list. Subjects were asked to respond to each statement by indicating "never," "rarely," "sometimes," "usually," or "always" depending on their disposition to agree with or take the action referred to in the statement. For example, responses to such a statement as "I keep good written records in my check book" was given a numerical score and totaled with seven other scores on similar types of statements to determine the respondent's orientation to one of the cognitive style elements.

An additional variation suggested by Furse has been made in the scoring instrument which distinguishes it from that used by Hill and his colleagues in the educational sciences. Their version allows respondents only three response options--rarely, sometimes, or usually--for each statement. The "rarely" response option was awarded one point, "sometimes" three points, and "usually" five points.

Thus the minimum possible score on any single cognitive style element was eight and the maximum forty. It seemed conceivable to Furse (pp. 68-69) and this investigator that a respondent could have no orientation on some elements, or at least he might desire to respond never to some of the statements. In addition, the option of an extended rating scale helped to spread the differences and accentuate differences between the cognitive style types. Scoring for the five option scale was zero for each "never" response, two for "rarely," four for "sometimes," six for "usually," and eight for "always." The possible range of scores for any single cognitive element is zero to 64. Copies of the cognitive style instrument and answer sheet are included in Appendix A.

The resulting 14 cognitive style scores for each subject were analyzed to yield the dominant cognitive style types. Additional analysis was employed to develop clusters of individuals with similar cognitive styles. In addition to Furse (1974) the cognitive style instrument utilized in this investigation was successfully tested previously by Shuert (1970), Lange (1972), DeNike (1975), Griffin (1975), and London (1975), among others.

Media Response Stimulus

Three sixty-second videotapes were produced and selected for use in the study. Scripts for each commercial are

attached as Appendix B. The actual content for each videotape was as identical as possible. The videotapes reflect a political commercial format and the content was written and produced so as not to reveal facts or opinions which subjects could have discerned prior to having viewed the program. Additionally, the content of each commercial was designed to reflect a family, F, cultural orientation and an appraisal, L, mode of inference. The three commercials differed in that one reflected a major theoretical visual linguistic orientation, T(VL), the second reflected a major theoretical auditory linguistic orientation, T(AL), and the third reflected a major qualitative visual orientation, Q(V).

The cultural orientation family, F, was chosen to remain constant throughout each of the three commercials because that cognitive style element appeared to be the most usual method of message delivery via a televised commercial. A major orientation in family, F, assumes that a person who communicates from a position of recognized authority, credibility, stature, leadership, etc., will exert influence on the recipient. A political candidate espousing the virtues of his candidacy on television is almost certain to reflect this cultural orientation.

The mode of inference, appraisal, L, was chosen to remain constant throughout each of the three commercials because that cognitive style element is the usual method of delivering a political commercial message. Appraisal is a

combination of three other inductive reasoning modes--magnitude, M, difference, D, and relationships, R. Although most political messages are developed inductively, none of the three specific modes appears to be predominant over the others. Therefore, because of the predominance of inductive reasoning and the only remaining mode of inference, deductive inferential, K, is mainly utilized in mathematics and symbolic logic, appraisal, L, the combined inductive mode of inference was chosen for the televised stimulus.

In the first television commercial, designated T(AL) a hypothetical political candidate explains his position on several issues involving his candidacy for U.S. Congress. The commercial is approximately 60 seconds in length and consists of 165 narrative words. The video portion of the commercial consists solely of long and medium camera shots as the candidate speaks while sitting in a living room chair. No other visuals, graphics, or printed symbols are used. The audio portion of the commercial consists of the candidate's explanation of the issues of increasing crime rates, his position in favor of handgun legislation, his position favoring the reduction of military spending, and finally, an invitation to urge supporters to join the campaign. The entire commercial was designed to reflect an emphasis on the use of oral symbols without any reference to printed symbols.

The second television commercial, designated T(VL) uses the same political candidate but decreases the number

of specific oral symbols in favor of printed symbols. The commercial is also 60 seconds in length and consists of 155 narrative words. Specific oral symbols omitted from the first commercial are generated in this commercial through a series of graphics in which printed symbols are displayed over the screen at appropriate points in the presentation. For example, the crime rate--explained orally in the first commercial is only abstractly referred to in the candidate's oral comments of this commercial, but the specific statistics and information are reproduced graphically over the screen as the candidate talks. Likewise, at six other points in the commercial specific oral symbols are substituted for abstract oral symbols with the specific information being reproduced in its place over the screen. In this way the commercial designated T(VL) reflects a distinctive visual linguistic rather than oral linguistic orientation.

The third commercial, designated Q(V) uses the identical script as the second commercial. The third commercial differs in that it contains several visual graphs, pictures, and physical objects held by the candidate which emphasize the narrated remarks at appropriate points in the commercial. The commercial was designed to reflect a more general visual orientation, while reducing the preponderance of ordinary printed symbols displayed in the previous commercial. For example, a slide showing a bank robbery in progress was inserted into the commercial during the candidate's general

comments concerning crime. Line graphs, pie graphs, and bar graphs are substituted for the printed symbol graphics of the second commercial. In addition, the candidate actually holds up a handgun, a model airplane fighter, a model army tank, and a broom at appropriate points in order to accentuate the oral remarks.

In selecting the cognitive style elements to vary in the political commercial, several considerations regarding the chosen medium became paramount. First, in the use of theoretical symbols television overwhelmingly employs linguistic rather than quantitative elements. Second, television is primarily a visual medium. Thus, the symbols and senses elements chosen as independent variables are theoretical auditory linguistic, T(AL), the sound of a word, theoretical visual linguistic, T(VL), the written word, and qualitative visual, Q(V), the ability to perceive meaning by the sense of sight. Comparatively, the remaining symbol and senses cognitive style elements are somewhat more difficult to test for via a televised message. The remaining cognitive style elements are primarily recipient centered and are less obviously stimulated by television.

In order to determine whether the commercials were developed according to the intended cognitive styles, seven coders were enlisted to independently type each of the three commercials according to primary symbolic orientation. After receiving a ten-minute presentation contrasting the

differences in each of the theoretical and qualitative symbols, the seven coders were asked to rate each commercial from the corresponding television scripts. Six of the seven coders correctly identified the T(AL) and T(VL) commercials. Although only two of seven coders correctly identified the Q(V) commercial, four of the five incorrect coders recognized the commercial as having a visual rather than an auditory orientation.

Each of the three political commercials, designated T(AL), T(VL), and Q(V) was preceded and followed by one other commercial in order to simulate a more natural viewing setting. The preceding commercial for each of the experimental commercials was a 30-second public service announcement for Cerebral Palsy. The commercial which followed each of the experimental commercials was a 30-seoond advertisement for Gillette Techmatic. Thus, three sets of three commercials were produced in which only the middle commercial was different in order to create the experimental condition.

Questionnaire for Media Response

Immediately after the commercial had concluded, each subject was given a questionnaire attached as Appendix C. In addition to basic demographic and media use data, information was requested regarding recall and salience of the commercial content and attitude toward the candidate. Subjects were asked to write as many important issues as possible which related to the content of the commercial.

Salience was measured by counting the number of important issues which were correctly identified from the commercial. Recall was measured by counting the total number of correct answers to a fifteen-item multiple choice test which subjects were given after the saliency measure. Attitude was measured from the mean scores on a five-scaled twelve-item semantic differential on the political candidate and his remarks. The scale with minor modifications has been successfully used to test political candidate image (Kaid and Sanders, 1978).

Data Collection

The data gathering and handling was accomplished in two stages. The first stage involved administering the cognitive style instrument to the 225 students in the introductory mass communication courses. The cognitive style answer sheets were scored and each subject's 14 cognitive style scores were grouped to isolate major cognitive style clusters. Medians for each of the 14 cognitive style elements were computed and compared with the distribution of cognitive style scores for the total sample in order to assign major or minor orientations on the 14 elements for each of the cognitive style clusters.

In the second stage of data gathering grouped subjects were asked to watch the videotaped commercials in the manner previously described and to complete the questionnaire.

Group number one, which consisted of 30 subjects with a major theoretical auditory linguistic, T(AL) orientation and 34 with a minor t(al) orientation, were assigned to watch the political commercial developed according to a major T(AL). Group number two, which consisted of 39 subjects with a major theoretical visual linguistic, T(VL) orientation and 26 with a minor t(vl) orientation, were assigned to watch the political commercial developed according to a major T(VL). Group number three, which consisted of 45 subjects with a major qualitative visual, Q(V) orientation and 34 with a minor q(v) orientation, were assigned to watch the political commercial developed according to a major Q(V).

Data Analysis

The research hypotheses were tested as follows, with significance level set at .05 for all questions.

Hypotheses 1, 2, and 3 (Relationship of cognitive style to recall of information)--The fifteen-item multiple choice test was used to measure the amount of learning from media stimuli which contained a major cognitive style orientation in either theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), or qualitative visual, Q(V). An overall mean was obtained for each set of designated groups: T(AL) and t(al), T(VL) and t(vl), and Q(V) and q(v) by summing the number of correct responses to the test. Mean scores for each group were tabulated and compared using a t-test.

Hypotheses 4, 5, and 6 (Relationship of cognitive style to salient information)--The open-ended questionnaire was used to measure the identification of important issues from media stimuli which contained a major cognitive style orientation in either theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), or qualitative visual, Q(V). An overall mean was obtained for each set of designated groups: T(AL) and t(al), T(VL) and t(vl), and Q(V) and q(v) by summing the information chunks. Mean scores for each group were tabulated and compared using a t-test.

Hypotheses 7, 8, and 9 (Relationship of cognitive style to attitude)--The twelve-item semantic differential was used to measure candidate and message evaluation from media stimuli which contained a major cognitive style orientation in either theoretical auditory linguistic, T(AL), theoretical visual linguistic, T(VL), or qualitative visual, Q(V). An overall mean was obtained for each set of designated groups: T(AL) and t(al), T(VL) and t(vl), and Q(V) and q(v) by summing the ratings on each scale of the semantic differential. Mean scores for each group were tabulated and compared using a t-test.

CHAPTER IV

RESULTS

This chapter presents data collected in the experiment and statistical analysis of that data according to the research methods described in the preceding chapter.

H_1: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will demonstrate significantly more learning from a television stimulus with a dominant T(AL) than will groups of individuals with a minor or negligible orientation in T(AL).

Results of the tests of H_1 are reported in Table I. Table I presents the comparison of mean recall scores for the group with a major T(AL) and the group with a minor t(al). The mean recall score for the group with a major T(AL) was 7.50. The mean recall score for the group with a minor t(al) was 8.44. A correlated t-test showed that the difference was not statistically significant. The results do no support Hypothesis 1.

H_2: Groups of individuals with a major orientation in theoretical visual linguistic, T(VL) will demonstrate significantly more learning from a television stimulus with a dominant T(VL) than will groups of individuals with a minor or negligible orientation in T(VL).

TABLE I

Major Cognitive Orientation vs. Minor Cognitive Orientation: Comparison of Recall Mean Scores

	Mean	t-value	d.f.	1-Tail Prob.
T(AL)	7.50	-1.49	62	.07
t(al)	8.44			
T(VL)	9.20	-1.05	63	.14
t(vl)	8.50			
Q(V)	7.20	-0.82	77	.20
q(v)	7.61			

Results of the test of H_2 are reported in Table I. Table I presents the comparison of mean recall scores for the group with a major T(VL) and the group with a minor t(vl). The mean recall score for the group with a major T(VL) was 9.20. The mean recall score for the group with a minor t(vl) was 8.50. A correlated t-test showed that the difference was not statistically significant. The results do not support Hypothesis 2.

H_3: **Groups of individuals** with a major orientation in qualitative visual, Q(V) will demonstrate significantly more learning from a television stimulus with a dominant Q(V) than will **groups of individuals with a minor or negligibile orientation** in Q(V).

Results of the tests of H_3 are reported in Table I. Table I presents the comparison of mean recall scores for the group with a major Q(V) and the group with a minor q(v).

The mean recall scores for the group with a major Q(V) and the group with a minor q(v). The mean recall score for the group with a major Q(V) was 7.20. The mean recall score for the group with a minor q(v) was 7.61. A correlated t-test showed that the difference was not statistically significant. The results do not support Hypothesis 3.

H_4: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will identify significantly more salient information from a television stimulus with a dominant T(AL) than will groups of individuals with a minor or negligible orientation in T(AL).

Results of the tests of H_4 are reported in Table II. Table II presents the comparison of mean total of issues identified for the group with a major T(AL) and the group with a minor t(al). The mean total of issues identified for the group with a major T(AL) was 1.96. The mean total of issues identified for the group with a minor t(al) was 2.05. A correlated t-test showed that the difference was not statistically significant. The results do not support Hypothesis 4.

H_5: Groups of individuals with a major orientation in theoretical visual linguistic T(VL) will identify significantly more salient information from a television stimulus with a dominant T(VL) than will groups of individuals with a minor or negligible orientation in T(VL).

Results of the tests of H_5 are reported in Table II. Table II presents the comparison of mean total of issues identified for the group with a major T(VL) and the group with a minor t(vl). The mean total of issues identified for

TABLE II

Major Cognitive Orientation vs. Minor Cognitive Orientation: Comparison of Mean Total of Issues Identified

	Mean	t-value	d.f.	1-Tail Prob.
T(AL)	1.96	-0.29	62	.38
t(al)	2.05			
T(VL)	2.38	0.14	63	.44
t(vl)	2.34			
Q(V)	2.20	-0.13	77	.44
q(v)	2.23			

the group with a major T(VL) was 2.38. The mean total of issues identified for the group with a minor t(vl) was 2.34. A correlated t-test showed that the difference was not statistically significant. The results do not support Hypothesis 5.

H_6: Groups of individuals with a major orientation in qualitative visual, Q(V) will identify significantly more salient information from a television stimulus with a dominant Q(V) than will groups of individuals with a minor or negligible orientation in Q(V).

Results of the tests of H_6 are reported in Table II. Table II presents the comparison of mean total of issues identified for the group with a major Q(V) and the group with a minor q(v). The mean total of issues identified for the group with a major Q(V) was 2.20. The mean total of

issues identified for the group with a minor q(v) was 2.23. A correlated t-test showed that the difference was not statistically significant. The results do not support Hypothesis 6.

H_7: Groups of individuals with a major orientation in theoretical auditory linguistic, T(AL) will demonstrate the same attitude toward a television stimulus with a dominant T(AL) as will groups of individuals with a minor or negligible orientation in T(AL).

Results of H_7 are reported in Table III. Table III presents the comparison of major theoretical auditory linguistic T(AL) and minor theoretical auditory linguistic t(al) mean attitude scores on twelve separate bipolar adjectives. Correlated t-tests on each of the twelve bipolar adjectives showed that only one of the means, the variable of calm-excitable, was statistically significant. The results support Hypothesis 7.

Overall, subjects with a minor orientation in theoretical auditory linguistic felt that the political candidate was slightly less qualified, less sophisticated, less honest, less attractive, less sincere, less successful, less rational, less calm, and less a saver than did subjects with a major T(AL). Thus on 9 of 12 descriptive adjectives, the political candidate was perceived more negatively by t(al) as opposed to T(AL).

H_8: Groups of individuals with a major orientation in theoretical visual linguistic T(VL) will demonstrate the same attitude toward a television stimulus with a dominant T(VL) as will groups of individuals with a minor or negligibile orientation in T(VL).

TABLE III

Major T(AL) vs. Minor t(al):
Comparison of Mean Attitude Scores

	Mean	t-value	d.f.	2-Tail Prob.
Qualified-Unqualified *				
T(AL)	2.76	-0.52	62	.60
t(al)	2.91			
Sophisticated-Unsophisticated *				
T(AL)	2.56	-1.73	62	.08
t(al)	3.02			
Honest-Dishonest *				
T(AL)	2.60	-0.19	62	.84
t(al)	2.64			
Unattractive-Attractive **				
T(AL)	2.93	0.20	62	.84
t(al)	2.88			
Sincere-Insincere *				
T(AL)	2.43	-0.71	62	.48
t(al)	2.61			
Irrelevant-Relevant **				
T(AL)	3.26	-0.79	62	.43
t(al)	3.50			
Successful-Unsuccessful *				
T(AL)	2.53	-1.55	62	.12
t(al)	2.97			
Rational-Irrational *				
T(AL)	2.66	-0.14	62	.88
t(al)	2.70			
Unfriendly-Friendly **				
T(AL)	3.16	-0.62	62	.53
t(al)	3.35			
Not serious-Serious **				
T(AL)	3.73	-0.88	62	.38
t(al)	4.02			
Calm-Excitable *				
T(AL)	1.76	-2.05	62	.04
t(al)	2.32			
Saver-Spender *				
T(AL)	1.93	-0.78	62	.43
t(al)	2.14			

*Higher mean score indicates greater the negative attitude.
**Higher mean score indicates greater the positive attitude.

Results of H_8 are reported in Table IV. Table IV presents the comparison of major visual linguistic T(VL) and minor theoretical visual linguistic t(vl) mean attitude scores on twelve separate bipolar adjectives. Correlated t-tests on each of the twelve bipolar adjectives showed that none of the means were statistically significant. The results support Hypothesis 8.

As with the case of the previous attitude comparison for theoretical auditory linguistic, 9 of the 12 descriptive adjectives showed a slightly more negative perception of the political candidate by the minor orientation group as opposed to the major orientation group. Subjects with a t(vl) felt that the political candidate was less sophisticated, less honest, less attractive, less sincere, less relevant, less rational, less friendly, less calm, and less a saver than did subjects with a T(VL).

H_9: Groups of individuals with a major orientation in qualitative visual Q(V) will demonstrate the same attitude toward a television stimulus with a dominant Q(V) as will groups of individuals with a minor or negligible orientation in Q(V).

Results of H_9 are reported in Table V. Table V presents the comparison of major qualitative visual Q(V) and minor qualitative visual q(v) mean attitude scores on twelve separate bipolar adjectives. Correlated t-tests on each of the twelve bipolar adjectives showed that none of the means were statistically significant. The results support Hypothesis 9.

TABLE IV

Major T(VL) vs. Minor t(vl):
Comparison of Mean Attitude Scores

	Mean	t-value	d.f.	2-Tail Prob.
Qualified-Unqualified *				
T(VL)	3.05	1.18	63	.24
t(vl)	2.80			
Sophisticated-Unsophisticated*				
T(VL)	2.74	-0.41	63	.68
t(vl)	2.84			
Honest-Dishonest *				
T(VL)	2.69	-0.31	63	.75
t(vl)	2.76			
Unattractive-Attractive **				
T(VL)	3.20	0.18	63	.85
t(vl)	3.15			
Sincere-Insincere *				
T(VL)	2.41	-0.85	63	.40
t(vl)	2.61			
Irrelevant-Relevant **				
T(VL)	3.23	0.25	63	.80
t(vl)	3.15			
Successful-Unsuccessful *				
T(VL)	2.71	0.54	63	.59
t(vl)	2.57			
Rational-Irrational *				
T(VL)	2.66	-0.53	63	.60
t(vl)	2.80			
Unfriendly-Friendly **				
T(VL)	3.41	0.37	63	.71
t(vl)	3.30			
Not serious-Serious **				
T(VL)	3.64	-1.17	63	.24
t(vl)	4.0			
Calm-Excitable *				
T(VL)	1.84	-1.80	63	.07
t(vl)	2.26			
Saver-Spender *				
T(VL)	1.82	-1.46	63	.14
t(vl)	2.19			

*Higher mean score indicates greater the negative attitude.
**Higher mean score indicates greater the positive attitude.

TABLE V

Major Q(V) vs. Minor q(v):
Comparison of Mean Attitude Scores

	Mean	t-value	d.f.	2-Tail Prob.
Qualified-Unqualified *				
Q(V)	3.31	0.58	77	.56
q(v)	3.17			
Sophisticated-Unsophisticated *				
Q(V)	3.24	-1.13	77	.26
q(v)	3.52			
Honest-Dishonest *				
Q(V)	2.84	0.83	77	.41
q(v)	2.67			
Unattractive-Attractive **				
Q(V)	2.91	0.82	77	.41
q(v)	2.73			
Sincere-Insincere *				
Q(V)	2.84	-0.15	77	.88
q(v)	2.88			
Irrelevant-Relevant **				
Q(V)	3.17	1.64	77	.10
q(v)	2.76			
Successful-Unsuccessful *				
Q(V)	2.95	-1.67	77	.10
q(v)	3.38			
Rational-Irrational *				
Q(V)	2.80	-1.23	77	.22
q(v)	3.08			
Unfriendly-Friendly **				
Q(V)	3.35	-0.11	77	.91
q(v)	3.38			
Not serious-Serious **				
Q(V)	3.60	-0.90	77	.37
q(v)	3.85			
Calm-Excitable *				
Q(V)	2.31	0.55	77	.58
q(v)	2.17			
Saver-Spender *				
Q(V)	1.86	0.07	77	.94
q(v)	1.85			

*Higher mean score indicates greater the negative attitude.
**Higher mean score indicates greater the positive attitude.

Eight of the 12 descriptive adjectives showed a slightly more negative perception of the political candidate by the q(v) group as opposed to the Q(V) group. Subjects with a minor qualitative visual orientation felt that the political candidate was less sophisticated, less attractive, less sincere, less relevant, less successful, less rational, less calm, and less a saver than did subjects with a major qualitative visual orientation.

CHAPTER V

SUMMARY AND DISCUSSION

Data pertaining to each of the three groups of research hypotheses (information recall, issue salience, and attitude) are discussed in this chapter. The limitations of the study and suggestions for future research are also discussed.

Information Recall

Of the 208 subjects who completed the pre-test cognitive style instrument and later the media questionnaire, the mean for information recall based upon responses to the 15 multiple choice questions about the political candidate was 8.05. Since three separate political commercials were watched, it is necessary to compare recall totals according to the type of commercial. The commercial developed according to a primary theoretical auditory linguistic orientation produced a mean recall total of 8.0 for the 64 subjects who watched this commercial. The commercial developed according to a primary theoretical visual linguistic orientation produced a mean recall total of 8.89 for 65 subjects who

watched this commercial. The commercial developed according to a primary qualitative visual orientation produced a mean recall total of 7.37. Correlated t-tests performed on these mean recall scores found a significant difference at $p < .05$ between commercial T(VL) and commercial Q(V) but no significant differences for other comparisons. The significantly lower mean recall totals for the subjects who watched the Q(V) commercial may have been due to the production characteristics of the commercial itself, which will be discussed later in this chapter.

Frequency distributions performed on the 15-item multiple choice test indicated a wide range in item difficulty. Of the 208 subjects who completed the test, 82.7% correctly answered question #1, the candidate's name but only 25.0% correctly answered question #4, the most important issue named by Americans--inflation. Four other questions could be answered correctly in only about one-third of the cases: question #6, F.B.I. being the source of the crime statistics, 34.1%; question #10, $240 million saved by reducing military spending, 28.4%; question #13, general election being the type of election to be held, 32.7%; and question #15, dishonesty and partisian interests to be removed from government, 30.8%.

Thus, a total of 5 of the 15 questions on the multiple choice test were found to be particularly difficult to answer correctly. Perhaps the alternative answers did not

provide a clear contrast among the choices or the remarks from the commercials disproportionately stressed the issues over which the test was based.

Theoretical Auditory Linguistic

As reported in Table I mean information recall for the T(AL) group, (n=30) was not significantly greater statistically than for the t(al) group, (n=34). As a matter of fact, the mean recall for the t(al) group, ($\bar{x}$=8.44) was higher than the T(AL) group, ($\bar{x}$=7.50). A great deal of perplexity accompanies a possible explanation for this occurrence. The group which rated themselves as having a major cognitive orientation in auditory linguistic abilities actually recalled less information from a commercial with dominant auditory linguistic qualities than did the group who rated themselves as having a minor orientation in auditory linguistic abilities.

This variable seemed to be in need of further examination; therefore, in order to maximize differences between major T(AL) and minor t(al), a quartile split was performed on the 64 cases and another t-test was calculated. Group one was made up of 13 cases representing the highest quartile with a theoretical auditory linguistic orientation. Group two was made up of 18 cases representing the lowest quartile with a theoretical auditory linguistic orientation. As Table VI shows, group means were found to be 7.76 and 7.61

respectively--not significantly different at $p > .05$. By removing 50% of the cases from the midquartiles of the theoretical auditory linguistic cases, a shift in mean information recall totals is noted in the hypothesized direction but not enough to be statistically significant. The quartile split was accomplished by removing all scores of 38-40 from the T(AL) group all scores of 32-36 from the t(al) group. Thus the lowest quartile with scores ranging from 0-30 was compared against scores ranging from 42-64.

TABLE VI

Major Cognitive Orientation vs. Minor Cognitive Orientation: Comparison of Mean Recall Using Quartile Split

	Mean	t-value	d.f.	1-Tail Prob.
T(AL)	7.76	0.19	29	.42
t(al)	7.61			
T(VL)	9.57	1.26	34	.10
t(vl)	8.41			
Q(V)	6.38	-2.29	41	.01
q(v)	7.68			

Theoretical Visual Linguistic

As reported in Table I mean information recall for the T(VL) group, (n=39) was not significantly greater than the

t(vl) group, (n=26). The mean recall for the T(VL) group was 9.20 and for the t(vl) group was 8.50. As with the previous variable a quartile split was performed on the 65 theoretical visual linguistic cases in order to produce 19 cases with a major T(VL) and 17 cases with a minor t(vl). Twenty-nine cases with scores ranging from 38-44 were omitted from further analysis. A correlated t-test calculated from the newly identified groups showed mean recall totals of 9.57 for the T(VL) group and 8.41 for the t(vl) group--a somewhat wider dispersion but not statistically significant.

Qualitative Visual

As reported in Table I mean information recall for the Q(V) group, (n=45) was not significantly greater than the q(v) group, (n=34). As with the case of theoretical auditory linguistic, those cases with a minor q(v) recalled more information than those cases with a major Q(V), ($\bar{x}$=7.61 and 7.20). The quartile split produced 21 cases with a major Q(V) and 22 cases with a minor q(v). Thirty-six cases with scores ranging from 38-42 were omitted from further analysis. Results of a t-test produced mean scores of 6.38 for the Q(V) group and 7.68 for the q(v) group, ($p > .05$) and showed an even wider gap in the non-hypothesized direction.

Issue Salience

Of the 208 subjects who completed the pretest cognitive style instrument and later the media questionnaire, the issue salience mean total was 2.20. Eight salient issues were present in each of the three political commercials. No respondent was able to identify more than five salient issues. The absolute and relative frequencies of salient issues identified is found in Table VII.

The absolute and relative frequencies for each of the eight salient issues from the political commercials is found in Table VIII.

An interpretation of the data from Table VII and Table VIII indicates that subjects were generally unable to mention many salient issues from the political commercial. The salient issues which were mentioned most often by the subjects were the rise in crime and reduction of military spending, both of which were stressed by the candidate in each of the political commercials. Comparing means for issue salience according to the style of commercial watched did not yield statistically significant differences. The T(AL) commercial had a mean of 2.01, the T(VL) commercial had a mean of 2.37 and the Q(V) commercial had a mean of 2.21 for issue salience.

Theoretical Auditory Linguistic

As reported in Table II mean identification of issue salience for the T(AL) group (n=30) was not significantly

TABLE VII

Frequency of Total Salient Issues Identified

Number of Issues	Absolute Frequency	Relative Frequency
0	17	8.2%
1	37	17.8%
2	74	35.6%
3	53	25.5%
4	21	10.1%
5	6	2.9%
TOTAL	208	100.0%

TABLE VIII

Frequency of Individual Salient Issues Identified

Issue	Absolute Frequency	Relative Frequency
Rise in crime	129	62.0%
Gun control	85	40.9%
Inflation	88	42.3%
Reduction of military spending	108	51.9%
Reduction of foreign intervention	3	1.4%
Saving tax dollars	6	2.9%
Removing dishonesty from government	27	13.0%
Restoring trust to government	10	4.8%

greater statistically than for the t(al) group, (n=34). The mean number of salient issues for the t(al) group, ($\bar{x}$ = 2.05) was actually higher than the T(AL) group, ($\bar{x}$ = 1.96). This finding is similar to what was discovered previously with the major T(AL) group recalling less information than the minor t(al) group. Further analysis of the data using the same quartile split previously performed for the theoretical auditory linguistic variable produced salient issues means of 1.92 for the T(AL) group and 1.72 for the t(al) group. These findings are reported in Table IX and although encouraging in that they are in the hypothesized direction, they are not statistically significant ($p > .05$).

TABLE IX

Major Cognitive Orientation vs. Minor Cognitive Orientation: Comparison of Mean Total of Issues Identified Using Quartile Split

	Mean	t-value	d.f.	1-Tail Prob.
T(AL)	1.92	0.46	29	.32
t(al)	1.72			
T(VL)	2.31	0.06	34	.47
t(vl)	2.29			
Q(V)	1.95	-1.48	41	.07
q(v)	2.50			

Theoretical Visual Linguistic

As reported in Table II mean identification of issue salience for the T(VL) group, (n=39) was not significantly greater statistically than for the t(vl) group, (n=26). The mean number of salient issues for the T(VL) group was 2.38 and for the t(vl) group was 2.34. Further analysis of the data using the same quartile split previously performed for the theoretical visual linguistic variable produced salient issue means of 2.31 for the T(VL) group and 2.29 for the t(vl) group ($p > .05$).

Qualitative Visual

As reported in Table II mean identification of issue salience for the Q(V) group, (n=45) was not significantly greater statistically than for the q(v) group, (n-34). The mean number of salient issues for the Q(V) group was 2.20 and for the q(v) group was 2.23. Further analysis of the data using the same quartile split previously performed the qualitative visual variable produced salient issue means of 1.95 for the Q(V) group and 2.50 for the q(v) group. This analysis had the identical effect produced with the Q(V) variable on information recall. The analysis again showed an even wider gap in mean issue salience in the non-hypothesized direction.

Attitude Toward the Political Candidate

For the 208 subjects who completed the pre-test

cognitive style instrument and later the media questionnaire, individual means were computed for each of the 12 bipolar adjectives on a scale of 1-5 used to measure the subjects' attitude toward the political candidate. Results of the computations are reported in Table X.

Comparisons according to the type of commercial watched were computed for differences in attitude toward the political candidate. Statistical significance ($p < .05$) was found for six of the 36 overall comparisons. On the attitude

TABLE X

Combined Mean Attitude Scores Toward Political Candidate

Qualified-Unqualified	3.03
Sophisticated-Unsophisticated	3.01
Honest-Dishonest	2.71
Unattractive-Attractive	2.96
Sincere-Insincere	2.64
Irrelevant-Relevant	3.18
Successful-Unsuccessful	2.87
Rational-Irrational	2.78
Unfriendly-Friendly	3.33
Not serious-Serious	3.78
Calm-Excitable	2.12
Saver-Spender	1.95

variable of qualified-unqualified the mean score was 2.84 for those who watched the T(AL) commercial and 3.25 for those who watched the Q(V) commercial. On the attitude variable of sophisticated-unsophisticated the mean scores for those who watched the T(AL) commercial and T(VL) commercial were 2.84 and 2.78 respectively. Both means were statistically significant when compared to a mean of 3.36 for those who watched the Q(V) commercial. On the attitude variable of irrelevant-relevant the mean score was 3.39 for those who watched the T(AL) commercial and 3.0 for those who watched the Q(V) commercial. On the attitude variable of sincere-insincere the mean score for those who watched the T(VL) commercial was 2.50 and 2.86 for those who watched the Q(V) commercial. On the attitude variable of successful-unsuccessful the mean scores for those who watched the T(VL) commercial was 2.67 and 3.13 for those who watched the Q(V) commercial.

As was reported in chapter four all three research hypotheses regarding attitude toward the political candidate were demonstrated statistically. There was no significant difference in attitude between groups T(AL) and t(al) with the exception of the variable calm-excitable which showed a significant mean difference ($p < .05$). Neither were there significant differences in attitude toward the political candidate between groups T(VL) and t(vl) or groups Q(V) and q(v).

TABLE XI

Mean Attitude Scores Toward Political Candidate According to Type of Commercial Watched

	Mean
Qualified-Unqualified *	
T(AL) Commercial	2.84[a]
T(VL) Commercial	2.95
Q(V) Commercial	3.25[a]
Sophisticated-Unsophisticated *	
T(AL) Commercial	2.81[a]
T(VL) Commercial	2.78[a]
Q(V) Commercial	3.36[a]
Honest-Dishonest*	
T(AL) Commercial	2.62
T(VL) Commercial	2.73
Q(V) Commercial	2.77
Unattractive-Attractive **	
T(AL) Commercial	2.90
T(VL) Commercial	3.17
Q(V) Commercial	2.83
Sincere-Insincere*	
T(AL) Commercial	2.53
T(VL) Commercial	2.50[a]
Q(V) Commercial	2.86[a]
Irrelevant-Relevant **	
T(AL) Commercial	3.39[a]
T(VL) Commercial	3.17
Q(V) Commercial	3.0 [a]
Successful-Unsuccessful*	
T(AL) Commercial	2.76
T(VL) Commercial	2.67a
Q(V) Commercial	3.13a

[a]Indicates a significant difference at $p < .05$ for comparative means using a 2-tailed t-test to test for differences.

TABLE XI (continued)

Mean Attitude Scores Toward Political Candidate According to Type of Commercial Watched

	Mean
Rational-Irrational*	
T(AL) Commercial	2.68
T(VL) Commercial	2.73
Q(V) Commercial	2.92
Unfriendly-Friendly**	
T(AL) Commercial	3.26
T(VL) Commercial	3.35
Q(V) Commercial	3.36
Non serious-Serious**	
T(AL) Commercial	3.89
T(VL) Commercial	3.78
Q(V) Commercial	3.70
Calm-Excitable*	
T(AL) Commercial	2.06
T(VL) Commercial	2.0
Q(V) Commercial	2.25
Saver-Spender*	
T(AL) Commercial	2.04
T(VL) Commercial	1.98
Q(V) Commercial	1.86

*Higher mean score indicates greater the negative attitude.
**Higher mean score indicates greater the positive attitude.

Additional statistical analysis was performed utilizing the quartile split previously explained for each of the three test groups. Although no significant differences were expected, three attitudes variables Sophisticated-Unsophisticated, Sincere-Insincere, and Saver-Spender had statistically significant mean scores ($p < .05$) for T(AL) versus t(al). No differences were noted for the remaining nine attitude measures; neither were there any significant differences in the 24 attitude comparisons for theoretical visual linguistic or qualitative visual.

Limitations of the Study

Due to the lack of research in this area, the nature of this investigation is of necessity exploratory. There was little research evidence upon which to predict any specific differences in information recall, issue salience, and attitude based on differences in cognitive style. The use of cognitive style mapping has proved beneficial in improving instructional planning in the field of education, and the purpose of this investigation was to explore the possibility of similar applications to televised information in the mass communication field.

There appear to be some unanswered questions with regard to the cognitive instrument itself. According to Heun, Heun, and Schnucker (1975) a cognitive style map is an edumetric rather than a psychometric instrument. That is, it measures relative strengths and their growth within an

individual rather than comparing that learning to other learners. Furthermore, each individual through self-report determines what that strength is. If one individual were to answer "Sometimes" and another individual answered "Usually" to the statement, "I keep good written records in my check book," the former may actually have a greater strength comparatively, but this cannot be determined from the cognitive style instrument. Thus, the problem comes in determining at what point an individual possesses a strength with a particular respondent's self-ratings, the validity of the instrument is limited by respondents' willingness and ability to answer honestly and objectively.

Even working within an edumetric framework, using the numerical weights assigned to each response, a problem still exists in determining what numerical total for the eight statements constitutes a strong or moderate cognitive style.

On the other hand, cognitive style can be best determined by administering and scoring the battery of objective examinations previously mentioned. The abbreviated subjective version was utilized in the current study for the sake of time involved; however, an abbreviated version of the objective tests should be a better predictor of cognitive style.

The use of the abbreviated version of the cognitive style instrument suggests another possible limitation in the area of reliability and validity. Previous measures of

reliability and validity cited earlier by Skeen (1976) and Heun, Heun, and Schnucker (1975) tested the entire cognitive style instrument of 27 elements. The abbreviated version utilized 14 elements selected on the basis of which appeared the most relevant to a response to a television message. While there is no evidence to indicate that the reliability and validity of the instrument are reduced as a result of the omission of the 13 elements, this is a possible consideration for future research. Perhaps factor analysis or other statistical reduction techniques would provide findings on which to base additional commentary.

Apart from further evidence in the area of reliability and validity of the instrument containing all 27 cognitive style elements as opposed to an abbreviated version, one might argue for the independent study of the elements. Hill suggests, for example, that a major theoretical auditory orientation indicates a predisposition to learn from the sound of a word. One would expect that the eight statements contained in the cognitive style instrument relating to T(AL) should act as an independent measure of T(AL). However, this issue is not addressed in the cognitive style literature and may be another needed area of future research.

Ideally, all of the cognitive style elements should have been used in the typing instrument because of the

difficulty of determining the effects of single dimensions on the total cognitive style set and, through the total set, its effect on overt behavior. However, because of the extensiveness of the study, requiring subjects to fill out the mapping instrument, watch three commercials, and complete a six-page questionnaire, it was imperative that the cognitive style instrument be abbreviated. The benefits of shortening the instrument seemed to outweigh the risk of impairing its effectiveness.

The research design employed a median split in order to determine a major or minor cognitive style orientation. In the process of assigning subjects to one group or another, subjects were assigned to groups on the basis of one score on one particular cognitive element, regardless of their score on any other cognitive element. In other words, no consideration was given for subjects who may have had a number of dominant cognitive style orientations nor for subjects who perhaps exhibited a single dominant cognitive style orientation together with numerous minor cognitive style orientations. Intuitively, one would expect that subjects with more preferred cognitive styles will exhibit different cognitive reactions to a television message than will subjects with fewer preferred cognitive styles. Future research should focus on the extent to which various cognitive style elements are competing or working in concert to produce a preferred learning style.

Another possible limitation may be that college subjects do not represent as wide a variation as the general population when measured by the cognitive style instrument. College students may be particularly trained to overcome a preferred learning style in order to activate secondary learning modes and thus be able to recall and identify salient issues from an informational stimulus. Therefore, the higher educational status of the subjects involved in this investigation may be less suited to cognitive style typing than the general population for purposes of learning materials presented through television.

Even with the quartile splits performed in order to re-identify major and minor cognitive style orientations, there left little variation between major and minor. In omitting 36 qualitative visual subjects with scores of 38-42, as few as 4 total points separated Q(V) and q(v). Thirty-three auditory linguistic subjects with scores of 32-40 were omitted, leaving a gap of only 8 total points separating some T(AL) and t(al) subjects. Finally, of the 29 visual linguistic subjects with scores of 36-44 which were omitted, as few as 8 total points separated T(VL) and t(vl). A secondary problem concerns the omission of one-half of the subjects from the middle two quartiles in order to compare the upper and lower quartiles. This reduction in subjects reduced the degrees of freedom which make statistical significance more difficult to obtain. Perhaps

a split of thirds, comparing the upper and lower thirds would have been more appropriate.

A final possible limitation concerns the rigidity with which the commercials were produced in order to minimize content variation from commercial to commercial. A great deal of effort was put forth to ensure that the only variation in the three commercials was the presentation style. The similarity of content did not allow the presentations styles to be as unique as they were operationalized to be. This researcher began with what was essentially an auditory linguistic commercial message and then made various adaptations in order to produce a visual linguistic and later a qualitative visual commercial. More innovativeness in the production of the commercials without so rigorous a regard for content variables may have produced a distinctively different presentation style, such as voice-over a visualization of political issues and events, and thus produced differences based on cognitive style.

Directions for Future Research

Although concepts of cognitive style have been treated in psychology since the 1920's as a dimension of personality, mass communication research has ignored them while pursuing vigorously the study of media consumer's demographic characteristics. The approach to cognitive style advanced by Hill offers an integrated theory of the structure of cognitive

style which seems to hold promise for applications in the field of mass communication.

The results of the current study only partially supports this promise by relating three dominant cognitive style elements to political television commercials. The principal research hypothesis concerning the recall of information, identification of salient issues, and attitude toward the political candidate for the television commercials could not be totally proved, and this greatly limits the applicability of cognitive style in television. However, the inability of the current study to show these hypothesized relationships may be an artifact of the research design in that only three cognitive style elements T(AL), T(VL), and Q(V) were tested.

In the current study cognitive style was not shown to be related to information recall or issue salience, but there are several alternative explanations of why this may have occurred. First, there may not have been enough difference in the presentation styles of the political commercials (e.g., all television) to reflect response differences based on cognitive styles. Although the commercials were produced according to different presentation formats, two were visual communication forms using visual linguistic and qualitative visual symbols and the third was an auditory communication form using auditory symbols. However, television is not of the same visual magnitude as newspapers or magazines, neither is it the same auditory magnitude as radio.

Therefore, cognitive style response may be more suited to differences in the message medium rather than differences in the dominant method of presentation. Future research in this area should test response differences to a greater variety of media, such as newspapers, magazines, and radio in addition to television.

A second explanation concerns the mode of inference and cultural orientation chosen to remain constant throughout the three political commercials. The mode of inference appraisal, L, and cultural orientation family, F, were chosen to remain constant throughout each of the three commercials because those elements are the usual method of delivering a political commercial message. Appraisal is a combination of three other inductive reasoning modes -- magnitude, M, difference, D, and relationships, R. A major orientation in family, F, assumes that a person who communicates from a position of recognized authority, credibility, stature, leadership, etc., will exert influence on the recipient. Future research in this area should test for interaction effects of theoretical symbols and modes of inference and cultural orientation to determine if particular cognitive style elements may be overridden by others.

A third explanation stemming from the second is to blame the current research findings on the lack of a wholistic approach to cognitive style typing in arriving at the independent variables. Since an individual's cognitive

style is intended by Hill to mean a collection of 27 elements operating in a consolidated fashion as an expression of an individual's preferred learning style, perhaps dominant groups of cognitive style types should be identified and tested for differences. This was the method used by Furse in his study previously mentioned, but was limited in that only two cognitive style types were selected and were not representative of the different possible cognitive style types.

Finally, it may be that the respondent seeks meaning from a television stimulus based largely on his expectations, thus very little novel information processing is necessary. Cognitive style may affect behavior most strongly in those situations which require a greater amount of new information processing. Information to be derived from encounters with television, however, is well defined and requires less cognitive processing. A significantly less amount of new information is presented through television. Any political television commercial is similar to that encountered in the past with familiar issues, pleas, production qualities, and expectations which have been seen before.

This notion suggests that cognitive style would be more influential on behavior in those situations involving media stimuli which are less familiar or predictable to the respondent. Familiar television content may render extensive cognitive processing unnecessary.

Contributions of the Study

As mentioned previously the purpose of this investigation is to measure the effects of cognitive style on the information processing of a commercial television message. While cognitive style segmenting is new to mass media research, it is in part a reponse to the challenge for reconsideration of previously less regarded media effects. McLeod, Becker, and Byrnes (1974) suggest a divergence from an almost exclusive focus on direct persuasion and conversion to examining knowledge gains and more subtle forms of cognitive change as criteria of effect.

Perhaps another contribution of this investigation concerns the substantiation for the separate relationships of cognitions and attitudes. Behavioral theorists have advanced the concept that attitude is made up of several structural components: the cognitive, or belief component; the affective or feeling component; and the conative or action tendency component. The concept of attitude is tied to the evaluation which individuals attach to specific objects of phenomena in their environment, while cognitive style is concerned with how individuals more generally seek meaning and theoretically reflects stable patterns of information seeking in a variety of situations.

Overall, the results show that information recall and identification of salient issues was more sensitive to the study of cognitive style manipulations than was the response

measure of attitude. Although attitudes contain both cognitive and affective properties, the conceptual gap between cognitive style and attitude and the lack of statistical significance in each of the three attitude response hypotheses, seems sufficient to exclude affective responses to television messages as a measure of cognitive style.

Perhaps another important development from this investigation concerns the overt attempt to produce television programming according to a definitive presentation style. Although television programs can easily be catalogued in various ways, for example, police and detective shows, variety, comedy, movies, public affairs, etc., there does not appear to be any movement on the part od television professionals or researchers to produce programs, which because of their presentation style, appeal to particular audiences. The presentation style, its logical structure, appeals, strategy, organization, and cognitive orientation is secondary to building the program's plot and character development, consistency with previous episodes, and use of devices such as suspense, humor, violence, sex, and daring. In any investigation where the dependent variable seeks to measure the amount of information learned from television content, a particular concern for presentation style according to some of the major cognitive style categories introduced in this investigation may prove fruitful.

Numerous sophisticated techniques are available for

segmenting media users. An important consideration is to determine whether cognitive style can be applied as a means for demographically segmenting media users. If cognitive style data are to be useful, the data must be generalizable to a form suitable for survey research. Of course, mass communication survey research attempts to determine what similar demographic characteristics of media users commonly predict how the users will respond to a medium's message. If cognitive style is generalizable to demographic variables, then survey research could be applied.

As was suggested the ultimate value of cognitive style for mass communication research rests on determining the extent to which various elements of cognitive style are predictors of demographic indicators. Since it would not be possible to administer a cognitive style typing instrument to groups of media users except in experimental situations, the alternative method is to investigate applications for mass communication survey research. For example, if it could be established that groups such as men vs. women, well-educated vs. less educated, or young adults vs. middle-aged adults exhibited consistent cognitive style orientations, this demographic data could be translated into a form useable by survey researchers. Thus armed with the demographic indicators, advertisers, marketers, commercial and educational television producers and others could design presentation styles closely akin to the cognitive styles of the

demographic target.

As a part of the data gathering process of this investigation, information was requested about media enjoyment and use from each of the subjects who participated in the experiment. Frequency distributions were subsequently computed in order to determine if major or minor cognitive style orientations correlated with media enjoyment or use. Results of the data for media enjoyment are reported in Table XII. One would expect, for example, that radio enjoyment would be ranked highest by those with a major theoretical auditory linguistic orientation. This, however, was not the finding. In fact, the results indicate surprising uniformity for radio enjoyment without regard to cognitive style. One would also expect that newspaper and magazine enjoyment would be ranked highest by those with a major theoretical visual linguistic orientation. The results indicate that those with a T(VL) orientation enjoy newspapers more than those with a t(vl) orientation. Results for magazine enjoyment indicate that T(AL) generally enjoy them less than t(al). Results for television enjoyment indicate that T(AL) and t(vl) enjoy it the most. Since television is considered a visual medium this finding was not expected.

Additional data were analyzed to determine if major or minor cognitive orientations correlated with media use. Tables XII through XVIII report magazine, television, newspaper, and radio use according to cognitive orientation.

TABLE XII

Absolute and Relative Frequencies of Media Enjoyment for Major vs. Minor Orientations in Theoretical Auditory Linguistic, Theoretical Visual Linguistic and Qualitative Visual

	TV Rank			
	1	2	3	4
T(AL)	65 (71.4)	19 (20.9)	6 (6.6)	1 (1.1)
t(al)	67 (57.3)	24 (20.5)	15 (12.8)	10 (8.5)
T(VL)	63 (58.3)	25 (23.1)	11 (10.2)	8 (7.4)
t(vl)	69 (69.0)	18 (18.0)	10 (10.0)	3 (3.0)
Q(V)	76 (65.0)	21 (17.9)	12 (10.3)	8 (6.8)
q(v)	56 (61.5)	22 (24.2)	9 (9.9)	3 (3.3)
	Magazine Rank			
	1	2	3	4
T(AL)	2 (2.2)	17 (18.7)	49 (53.8)	21 (23.1)
t(al)	12 (10.3)	28 (23.9)	42 (35.9)	32 (27.4)
T(VL)	8 (7.4)	19 (17.6)	46 (42.6)	34 (31.5)
t(vl)	6 (6.0)	26 (26.0)	45 (45.0)	19 (19.0)
Q(V)	7 (6.0)	26 (22.2)	50 (42.7)	31 (26.5)
q(v)	7 (7.7)	19 (20.9)	41 (45.1)	22 (24.2)
	Newspaper Rank			
	1	2	3	4
T(AL)	2 (2.2)	7 (7.7)	22 (24.2)	58 (63.7)
t(al)	4 (3.4)	14 (12.0)	37 (31.6)	59 (50.4)
T(VL)	5 (4.6)	12 (11.1)	38 (35.2)	52 (48.1)*
t(vl)	1 (1.0)	9 (9.0)	21 (21.0)	65 (65.0)*
Q(V)	4 (3.4)	10 (8.5)	33 (28.2)	67 (57.3)
q(v)	2 (2.2)	11 (12.1)	26 (28.6)	50 (54.9)
	Radio Rank			
	1	2	3	4
T(AL)	22 (24.2)	47 (51.6)	12 (13.2)	9 (9.9)
t(al)	33 (28.2)	48 (41.0)	20 (17.1)	13 (11.1)
T(VL)	31 (28.7)	51 (47.2)	12 (11.1)	13 (12.0)
t(vl)	24 (24.0)	44 (44.0)	20 (20.0)	9 (9.0)
Q(V)	30 (25.6)	58 (49.6)	19 (16.2)	8 (6.8)
q(v)	25 (27.5)	37 (40.7)	13 (14.3)	14 (15.4)

*Kolmogorov-Smirnov two sample test was used to test differences in Major vs. Minor cognitive styles. A cumulative frequency difference of 18-19% at any one point in the paired distributions to conclude with 95% confidence that the paired distributions are significantly different. Newspaper Rank #4 for T(VL) vs. t(vl) comes closest to being significantly different.

TABLE XIII

Absolute and Relative Frequencies of Number of Magazines Read Regularly

	None	1 - 2	3 - 4	5 - 6 +
T(AL)	12(13.2)	42(46.2)	34(37.4)	3(3.3)
t(al)	6(5.1)	52(44.4)	48(41.0)	11(9.4)
T(VL)	8(7.4)	46(42.6)	43(39.8)	11(10.2)
t(vl)	10(10.0)	48(48.0)	39(39.0)	3(3.0)
Q(V)	10(8.5)	50(42.7)	47(40.2)	10(8.6)
q(v)	8(8.8)	44(48.4)	35(38.5)	4(4.4)

TABLE XIV

Absolute and Relative Frequencies of Hours of Magazine Reading Per Day

	Never	½ Hour	1-2 Hours
T(AL)	16(17.6)	55(60.4)	20(22.0)
t(al)	8(6.8)	83(70.9)	26(22.3)
T(VL)	8(7.4)	74(68.5)	26(24.1)
t(vl)	16(16.0)	64(64.0)	20(20.0)
Q(V)	13(11.1)	74(63.2)	30(25.7)
q(v)	11(12.1)	64(70.3)	16(17.6)

TABLE XV

Absolute and Relative Frequencies of Hours of TV Viewing Per Day

	0-1 Hour	2 Hours	3 Hours	4 Hours +
T(AL)	26(28.6)	27(29.7)	18(19.8)	20(22.0)
t(al)	38(32.4)	33(28.2)	25(21.4)	21(17.9)
T(VL)	29(26.9)	34(31.5)	22(20.4)	23(21.3)
t(vl)	35(35.0)	26(26.0)	21(21.0)	18(18.0)
Q(V)	37(31.6)	31(26.5)	22(18.8)	27(23.2)
q(v)	27(29.7)	29(31.9)	21(23.1)	14(15.4)

TABLE XVI

Absolute and Relative Frequencies of Times Reading Newspaper per Week

	0-1 Day	2-3 Days	4-5 Days	6-7 Days
T(AL)	17(18.7)	28(30.8)	20(22.0)	26(28.6)
t(al)	16(13.7)	25(21.3)	33(28.2)	43(36.7)
T(VL)	12(12.1)	21(19.4)	30(27.8)	50(46.3)
t(vl)	21(21.0)	32(32.0)	23(23.0)	24(24.0)
Q(V)	25(21.4)	33(28.2)	24(20.5)	35(29.9)
q(v)	8(8.8)	20(22.0)	29(31.9)	34(37.4)

TABLE XVII

Absolute and Relative Frequencies of Hours Reading Newspaper per Day

	Never	½ Hour	1 Hour	2 Hours
T(AL)	10(11.0)	51(56.0)	26(28.6)	4(4.4)
t(al)	12(10.3)	62(53.0)	35(29.9)	8(6.8)
T(VL)	8(7.4)	58(53.7)	35(32.4)	7(6.5)
t(vl)	14(14.0)	55(55.0)	26(26.0)	5(5.0)
Q(V)	16(13.7)	61(52.1)	32(27.4)	8(6.8)
q(v)	6(6.6)	52(57.1)	29(31.9)	4(4.4)

TABLE XVIII

Absolute and Relative Frequencies of Hours Listening to Radio per Day

	0-1 Hour	2 Hours	3 Hours	More Than 3
T(AL)	20(22.0)	21(23.1)	17(18.7)	33(36.3)
t(al)	22(18.8)	30(25.6)	26(22.2)	39(33.3)
T(VL)	19(17.6)	27(25.0)	25(23.1)	37(34.3)
t(vl)	23(23.0)	24(24.0)	18(18.0)	35(35.0)
Q(V)	27(23.1)	27(23.1)	22(18.8)	41(35.0)
q(v)	15(16.5)	24(26.4)	21(23.1)	31(34.1)

No major differences are noted regarding magazine use for any cognitive orientation. Neither are there differences regarding television or radio use for any cognitive orientation. Some differences are noted, however, for times reading the newspaper per week and hours reading newspapers per week. As might be expected those with a T(AL) orientation read the newspaper fewer days per week than those with a t(al) orientation. Those with a T(VL) orientation read the newspaper more days per week and more hours per day than did those with a t(vl) orientation. These differences are trends in the expected direction but are not significant at $p > .05$.

Overall, the current attempt to correlate cognitive style with the demographic variables of media enjoyment and media use was not successful. None of the relative frequencies for major or minor cognitive style orientation were statistically significant $p > .05$. On the encouraging side there were some noticeable trends which indicate that those with a major theoretical visual linguistic orientation enjoy and read the newspaper more than do those with a minor theoretical visual linguistic orientation.

In summary, the purpose of this investigation has been to explore a number of different possible relationships between cognitive style and various cognitive and affactive reactions to television commercials. This study has attempted to compare major and minor cognitive style orientations

of theoretical auditory linguistic, theoretical visual linguistic, and qualitative visual for information recall, identification of salient issues and attitude toward a series of political television commercials. As predicted, the results of the study provide evidence that cognitive style is not related to attitude preference. However, the results failed to indicate that cognitive style interacted predictably with information recall or identification of salient issues from the television commercials. Representation of more innovativeness in the production of the television commercials in order to produce more distinct differences in presentation styles would have been more beneficial to the potential discovery of more extensive relationships. Also, it is recommended that more objective measures of cognitive style be utilized in future research in order to determine cognitive style types. The results discovered in the current study indicate that the relationship of cognitive style and response to television messages is still exploratory which deserves the attention of additional research in mass communication.

BIBLIOGRAPHY

Allport, G. W. Becoming: basic considerations for a psychology of personality. New Haven: Yale University Press, 1955.

_____. Personality: a psychological interpretation. New York: Henry Holt and Company, 1937.

_____. Pattern and growth in personality. New York: Holt, Rinehart, and Winston, 1961.

Armstrong, G. M., Kendall, C. L., and Frederick, A. R. Applications of consumer information processing research to public policy issues. Communication Research, 1975, 2, 232-245.

Asch, S. E., and Witkin, H. A. Studies in space orientation: I, perception of the upright with displaced visual fields. Journal of Experimental Psychology, 1948, 38, 325-337.

Becker, L. B., McCombs, M., and McLeod, J. M. The development of political cognitions. In S. Chaffee, (ed.), Political Communication: issues and strategies for research. Sage Publications, 1975, 21-63.

Berry, J. J., and Sutton, T. J. The educational sciences: a bibliography with commentary. American Educational Sciences Association, 1973.

Broverman, D. M. Dimensions of cognitive style. Journal of Personality, 1960, 28, 167-185.

_____, and Lazarus, R. S. Individual differences and cognitive interference. Journal of Personality, 1958, 26, 94-105.

_____. Cognitive style and intro-individual variation in abilities. Journal of Personality, 1960, 28, 240-256.

Bruner, J. S. Toward a theory of instruction. Cambridge, Mass.: The Belknap Press of Harvard University Press, 1966.

Clarke, P., and Kline, F. G. Media effects reconsidered: some new strategies for communication research. Communication Research, 1974, 1, 224-240.

Cogan, Max, et al. Cognitive style mapping: a system for planning true personalized instruction. Paper presented at the National Association fo Teacher Education Conference, St. Louis, Missouri, February 4, 1976.

DeNike, L. An exploratory study of cognitive style as a predictor of learning from simulation games. Paper presented at the Association for Educational Communications Technology Annual Convention, Dallas, Texas, April 14-17, 1975.

_____, and Strother, S. D. A learner characteristic vital to instructional development: educational cognitive style. Educational Technology, 1975, 15, 58-59.

Dewey, J. Experience and nature. LaSalle, Illinois: The Open Court Publishing Company, 1925.

Downs, R., and Stea, D. (eds.) Image and environment: cognitive mapping and spatial behavior. Chicago: Aldine Publishing Company, 1973.

Furse, D. H. An exploratory investigation of audience segmentation in advertising based on cognitive style. Unpublished Ph.D. dissertation, Georgia State University, 1974.

_____, and Greenburg, B. A. Cognitive style and attitude as market segmentation variables: a comparison. Journal of Advertising, 1975, 4, 39-44.

Gardner, R. W. Cognitive styles in categorizing behavior. Journal of Personality, 1953, 22, 214-233.

Griffin, T. E. Differences between developmental studies communication students and regular college communication students in their orientation to symbols and their meanings. Unpublished paper, Eric report # ED 103054.

Guilford, J. P. The nature of human intelligence. New York: McGraw-Hill Book Company, 1967.

Guttman, L. An outline of some new methodology for social research. Public Opinion Quarterly, 1954-55, 18, 395-404.

Hadley, R. H. Cognitive style and television commercials: an experimental study. Unpublished paper, University of Oklahoma, May 4, 1976.

Hampton, W. Students find their way to learning with cognitive style mapping. College and University Business, 1972, 10-16.

Heun, R. E., Heun, L. R., and Schnucker, R. V. Edumetric validation of cognitive style map items and elements: I Unpublished Paper, Northeast Missouri State University, 1975.

Hill, J. E. The educational sciences. Oakland Community College Press, 1968.

_____. Cognitive style as an educational science. Oakland Community College Press, 1968.

_____. Symbols and their meanings. Oakland Community College Press, 1972.

_____. Qualitative symbols. Oakland Community College Press, 1972.

_____, and Nunney, D. N. A brief guide to cognitive style mapping symbols and their meanings. Unpublished paper, Eric report # ED 126964.

Homans, G. C. The human group. New York: Harcourt, Brace and World, Inc., 1950.

Jacoby, J. Perspectives on a consumer information processing research program. Communication Research, 1975, 2, 203-215.

Kagan, J., Moss, H. A., and Sigel, I. E. Psychological significance of styles of conceptualization. Cognitive development in children. Society for Research in Child Development. Chicago: The University of Chicago Press, 1970.

Kaid, L. L., and Sanders, K. Political television commercials: an experimental study of type and length. Communication Research, 1978, 5, 57-70.

Kelley, E. C. Education for what is real. New York: Harper and Brothers Publishers, 1947.

_____. The fully functioning self. Perceiving, behaving, becoming. Prepared by the ASCD 1962 Yearbook Committee. Washington, DC: Association for Supervision and Curriculum Development, 1962.

Klein, G. S. The personal world through perception. In R. R. Blake and G. V. Ramsey (eds.), Perception: an approach to personality. New York: The Ronald Press Company, 1951, 328-355.

Klein, G. S. Perception, motives, and personality. New York: Alfred A. Knopf, 1970.

Korzybski, A. The role of language in the perceptual process. In R. R. Blake and B. V. Ramsey (eds.), Perception: an approach to personality. New York: The Ronald Press Company, 1951, 170-205.

_____. Science and sanity. Lakeville, Conn.: The International Non-Aristotelian Library Publishing Company, Fifth edition, 1973.

Lange, C. M. A study of the effects on learning of matching the cognitive styles of students and instructors in nursing education. Unpublished Ph.D. dissertation, Michigan State University, 1972.

Letter to the author from E. J. Chiakmakis, Director of Special Services, Oakland Community College, Bloomfield Hills, Michigan, February 14, 1977.

London, D. T. Concurrent validity of Hill's education cognitive style model as a prototype for successful academic programs among lower class students. Unpublished Ph.D. dissertation, Pennsylvania State University, 1975.

McGuire, W. Persuasion, resistance, and attitude change. In I. de Sola Pool and W. Schramm (eds.), Handbook of communication, Chicago: Rand McNally College Publishing Company, 1973, 216-247.

McLeod, J. M., Becker, L. B., and Byrnes, J. E., Another look at the agenda-setting function of the press. Communication Research, 1974, 1, 131-163.

_____, and Becker, L. B. Testing the validity of gratifications measures through political effects analysis. In J. Blumler and E. Katz (eds.), The uses of mass communications: current perspectives on gratifications research. Beverly Hills: Sage Publications, 1974, 137-164.

Merton, R. K. Social theory and social structure. New York: The Free Press, 1968.

Mullaly, L. Educational cognitive style: implications for instruction. Theory Into Practice, 1977, 16, 238-242.

Newcomb, T. M., Turner, R. H., and Converse, P. E. Social Psychology. New York: Holt, Rinehart and Winston, Inc., 1965.

Nie, N. H., et al. Statistical Package for the social sciences, New York: McGraw-Hill Book Company, 1975.

Nunney, D. N., And Hill, J. E. Personalized educational programs. Audiovisual Instruction, 1972, 17, 10-15.

O'Keefe, G. J. Political campaigns and mass communication research, In S. Chaffee (ed.), Political communication: issues and strategies for research. Beverly Hills: Sage Publications, 1975, 129-164.

Parsons, T. The social system. The Free Press of Glencoe, 1964.

Piaget, J. The origins of intelligence in children. New York: International Universities Press, Inc., 1952.

Phenix, P. H. Realms of meaning. New York: McGraw-Hill Book Company, 1964.

Rapoport, A. What is semantics? American Scientist, 1952, 40, 123-135.

Ray, M. L. Marketing communication and the hierarchy of effects. In P. Clarke (ed.), New models for mass communication research. Beverly Hills: Sage Publications, 1973, 147-176.

_____, and Wards, S. The relevance of consumer information processing studies to communication research. Communication Research, 1975, 2, 195-202.

Runyon, R. P., and Haber, A. Fundamentals of behavioral statistics. Reading, Mass.: Addison-Wesley Purblishing Company, 1974.

Sanders, F. B. Cognitive style and educational technology. The Journal: Technical Horizons in Education, 1977, 4, 24-25.

Schroder, H. M., Driver, M., and Steufert, S., Human information processing. New York: Holt, Rinehart and Winston, 1967.

Sherif, M. The psychology of social norms. New York: Harper and Row, Publishers, 1966.

Shuert, K. L. A study to determine whether a selected type of cognitive style predisponses one to do well in mathematics. Unpublished Ph.D. dissertation, Wayne State University, 1970.

Simon, H. A. How big is a chunk? Science, 1974, 183, 482-487.

Skeen, E. Niagra Falls HEW 309 project 1974-1975: evaluation report. Unpublished paper, Eric report # ED 118907.

Tolman, E. C. Value standards, pattern variables, social roles, personality. In T. Parsons and E. A. Shils (eds.), Toward a General Theory of Action. New York: Harper and Row, Publishers, 1962, 343-354.

Wertheimer, M. Productive thinking. New York: Harper and Row, Publishers, 1959.

Wilkie, W. L. New perspectives for consumer information processing research. Communication Research, 1975, 2, 216-231.

Witkin, H. A. Individual differences in ease of perception of embedded figures. Journal of Personality, 1950, 19, 1-15.

_____, et al. Personality through perception. New York: Harper and Brothers Publishers, 1954.

Wittgenstein, L. Philosophical investigations. New York: The Macmillan Company Third Edition, 1958.

APPENDICES

Appendix A

Cognitive Style Instrument - Adult Form

COGNITIVE STYLE INSTRUMENT - ADULT FORM

INSTRUCTIONS:

1. Read each sentence below.
2. Decide if the sentence accurately describes you "Never," "Rarely," "Sometimes," "Usually," "Always."
3. Notice the number and letter to the left of the sentence. The number refers to the row number on the Tally Sheet.
4. Go to the row number which matches the sentence number.
5. Place the letter of the sentence in the row under the appropriate column--"Never," "Rarely," "Sometimes," "Usually," "Always."
6. Please answer each statement. For some statements you may have to consider analogous situations so that they are most appropriate to you.
7. When you have completed the map, please check each row to see if you have responded to each of the eight sentences for the row. If you have, there will be eight letters across each row.

SAMPLE:

3C It is easier for me to explain things in writing than by talking about them.

2F I can remember a telephone number once I hear it.

TALLY SHEET

	Never	Rarely	Sometimes	Usually	Always
1.					
2.			F		
3.				C	

In the lefthand sample above I read the statement, decided that it was true for me "Usually." I then went down to row "3" on the Tally Sheet and put the letter "C" under the "Usually" column. In the righthand sample, I read the statement, decided that it was true for me "Sometimes." I then went to row "2" on the Tally Sheet and put the letter "F" in the "Sometimes" column.

9D When given a problem to solve, I can come to the best solution by myself.

5G Random sounds interfere with my ability to concentrate.

6B I choose clothes for the way they look.

4C I keep good written records in my check book.

3D I score high on achievement tests which emphasize reading comprehension.

9A I make my own political choices.

7D I like to share ideas with friends and associates.

9C I would rather do things my way even if they don't conform to the expectations of my family or friends.

9E I regard my personal goals as most important.

7E Before taking a new job, I discuss it with my friends.

13E I have no difficulty in understanding how to put puzzles together.

12E In play as well as work and life in general, I find it essential to "play by the rules."

8E I find it important to consult my family in planning vacations.

1E I prefer verbal directions.

4G When I go shopping, I read the prices of my purchases and add them in my head.

6C I enjoy art exhibits.

7C When shopping for clothes I like to have a friend along to help me make choices.

6H I feel better acquainted with someone after seeing pictures of him rather than reading about him.

3C I do well in classes which rely heavily on textbooks.

8C I enjoy outdoor activities more if my family is with me.

8G I consult with my immediate family before making important decisions.

8F I understand events better after I have discussed them with my family.

7F I make personal decisions after discussing them with my friends.

8B The family that prays together stays together.

2B I quote statistics to others in order to prove my point in an argument.

4A I solve written mathematical problems rapidly.

3A After I dictate a letter, I have to read it to be certain it is correct.

4D When I am in a group of people trying to solve a written problem involving numbers, I am among the first to reach the solution.

14B I find reasoning like this statement helps me to clarify my thoughts: "All men are mortal; Socrates is a man; Socrates is mortal."

11G The more I know about a problem, the more I want to know about it.

3H I understand more easily by reading than by hearing.

10D In evaluating the performance of others, I find it helpful to determine how this performance differed from another performance.

9F I have little need for others to help me make decisions.

9G My "best" decisions are made alone.

5C I can recognize who is on the phone just by listening for a few moments.

13H Problem-solving involves related variables.

2C It is easy for me to remember the numbers and formulas I hear during a conversation.

4E I use a written budget in order to manage money for which I am responsible.

13A I would find it interesting to discover how people behave by evaluating things which make people tick (e.g., physiological, sociological, and psychological).

14A I enjoy games or puzzles in which the solution is deduced from information contained in the rules.

10F Holidays are different from other days of the year.

11H There are as many facets to a problem as there are on a well cut diamond.

7A I learn a subject better when I can discuss it with my peers.

9H When given a job to do, I prefer to work on it myself.

10C In my choice of clothing I usually wear contrasting colors.

2C Oral mathematics tests are easy for me.

10G I choose music to fit my mood.

1G People say I speak better than I write.

2H If I were buying a car, I would discuss the engine specifications with the salesman.

1F After I write a letter, I ask someone to read it to me so that I know that it sounds right.

1C I understand the daily news if I hear it on the radio.

13D When looking at something constructed by someone else (e.g., a painting, a building, a piece of furniture) I like to figure out why the person created it as he did.

3F I prefer to read a paper myself rather than have someone read it aloud to me.

3G I prefer to read directions rather than have someone read them to me.

6A I prefer to read articles which are accompanied by pictures or drawings.

5B The tone or inflection of a speaker's voice gives additional meaning to what he says.

11C I don't understand how people can appreciate a problem until they know as much about it as possible.

11B When I attack a problem, I approach it from as many angles as possible.

5H I tune the radio by sound, not by looking at the dial.

5E I am able to tell which groups of instruments are playing at various times during a concert.

10H Characteristics for successful people are not the same as those for unsuccessful people.

2D When taking classes in mathematics, I find it easy to "talk in formulas" with my classmates and teacher.

11F A person can never know enough about life.

13F I try to understand why people break rules.

13G There's always a reason for a person's behavior.

13B I like to figure out how parts of a whole fit together.

13C I tend to see all parts of the world as being inter-connected.

14D I find the type of reasoning demanded by the rules of mathematics suits my style of thinking.

6F I "think" in pictures and graphic models instead of words and phrases.

6G When I tune a radio, I pay close attention to the numbers on the dial.

2F I can remember a telephone number once I hear it.

10A I understand a topic better if I examine it to learn how it differs from other topics.

12C Life is simplified if you go by the rules.

12A I work best in a structured situation.

14H I avoid probability statements in solving problems.

5D I can identify musical notes well enough to recognize a "tune" the next time I hear it.

12D I prefer working in situations where standards and rules are stated explicitly.

7G I value my friends' political opinions.

14F Knowledge flows logically from given premises.

12B I have no sympathy for people who break the law.

1B I do well on a test if it is about information I heard in a lecture.

1D I prefer to communicate with friends and colleagues by telephone rather than writing notes to them.

2G I discuss the "sale" prices before I go shopping.

6D I understand a lecturer better if I can see him while he talks.

7H I would join a particular religious group because my friends belong to it.

1A I can make more sense out of what a person means when he speaks to me rather than when he writes to me.

11E I take longer than others in coming to a conclusion because I want to know more about an issue than they do.

6E A story is easier to understand in a movie than in a book.

4F I find it easy to understand written numerical specifications.

7B I enjoy activity more when my friends participate in it with me.

14C I find the reasoning patterns required in statistics rewarding to use.

14G I understand geometric theorems.

12F When shopping for clothes, if I find the article I had in mind at a fair price, I buy it without further comparison.

10E I "play the devil's advocate" with people to force them to look at other points of view.

12G I don't find sufficient reason to change my mind on a subject once I identify the rule which applies.

10B I use jokes or humorous remarks to change the focus in different situations.

12H In evaluating the performance of others, I find it important to determine the standards which were set for them.

3E I have no difficulty in following a map.

9B Religion is a purely personal thing.

3B My written explanations are better than my spoken ones.

1H I prefer to be in lecture type classes.

2A I find it easy to add spoken or dictated numbers mentally.

11A I often have to make a decision before I know enough about the situation.

8D I talk with my family before doing anything that might affect them.

8A Before voting in an election, I review choices with my family.

8H I make it a point not to let my work interfere with family plans.

4B I score high on written mathematics tests.

4H If I were buying a car, I would ask the salesman to provide written specifications.

14E 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).

5A I can tell if something is wrong with an engine by listening to it.

11D Information should be analyzed in a number of ways before a conclusion is reached.

5F I can tell the difference between two closely related sounds.

TALLY SHEET

NAME: _____ COURSE: _____

No's	NEVER	RARELY	SOMETIMES	USUALLY	ALWAYS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Appendix B

TV Commercial Script - T(AL)

TV Commercial Script - T(VL)

TV Commercial Script - Q(V)

TV Commercial Script - T(AL)

Video	Audio
Fade form black. Candidate in business suit behind desk.	Hello, my name is John Sherman. As the Democratic candidate for U.S. Congress I'd like to make my position clear on some very important issues affecting America today. First is crime in the streets.
Slow zoom to M.S.	F.B.I. crime statistics indicate that serious crime in the cities has risen 14% this past year. Over 63% of these serious crimes involve the use of the "Saturday Night Special" and if elected I propose to support needed hand gun control legislation. Inflation is the number 1 problem named by Americans today and I intend to work toward the reduction of inflation. With your help we can reduce wasteful military spending and intervention in foreign countries. A reduction of military spending could save over $240 million American tax dollars each year.

So on the Nov. 7 general election, join with me, John Sherman, and my "Broom Brigade" so that together we may sweep away dishonesty and partisan interests from Washington and restore integrity and trust to the U.S. Congress.

Fade to black.

TV Commercial Script - T(VL)

Video	Audio
Fade from black. Candidate in business suit behind desk.	Hello, my name is John Sherman. As a candidate for U.S. Congress, I'd like to make my position clear on some very important issues affecting America today. . . . First is crime in the streets. Crime in the cities is rising at a rapid rate. Why? It is the "Saturday Night Special" that is largely responsible. It is for this reason that we must control the widespread use of handguns. In addition to crime, many other problems confront our society. Inflation is the number one problem named by America today. . .What can we do to control the spread of inflation? With your help we can save millions of dollars by cutting wasteful military operations and spending. Furthermore, there are many other additional goals we must work toward in our attempt to restore America as the
Key name & office graphic	
Slow zoom to M.S.	
Key crime statistic graphic #1	
Key crime statistic graphic #2	
Key "Legislation supported" graphic	
Key "$240 million military dollars saved" graphic	

Key Candidate name and campaign slogan graphics	best nation in the world. So, this election year, join my supporters so that I can become a representative voice for you in government.
Fade to black.	

TV Commercial Script - Q(V)

Video	Audio
Fade from black. Candidate in business suit behind desk.	Hello, my name is John Sherman. As a candidate for U.S. Congress I'd like to make my position clear on
L.S.	some very important issues affec-
Key name & office graphic	ting America today. . .First is
Dissolve to slide of crime	crime in the streets. . .Crime in
Dissolve to slide of crime statistic #1 on line graph	the cities is rising at a rapid
Take candidate	rate. Why? It's the "Saturday
Dissolve to slide of crime statistic #2 on pie graph	Night Special," that is largely
Take L.S. of candidate holding handgun	responsible. It is for this reason
Key "legislation supported" graphic	that we must control the widespread
	use of handguns. In addition to
	crime many other problems confront
	our society. Inflation is the num-
	ber one problem named by Americans
Dissolve to slide of military spending bar graph	today. . .What can we do to control
	the spread of inflation? With your
Take L.S. of candidate holding toy airplane	help we can save millions of dollars
	by cutting wasteful military opera-
	tions and spending. Furthermore,
Take L.S. of candidate holding broom	there are many other additional
	goals we must work toward in our
	attempt to restore America as the

Key campaign slogan and candidate name graphics	best nation in the world. So, this election year, join my supporters so that I can become a representative voice for you in
Fade to black	government.

Appendix C

Media Questionnaire

Media Questionnaire

1. Please fill out completely:

   a. Age: _____

   b. Education: (Indicate last year completed) _____

   c. Sex: (Check one)
   _____Male
   _____Female

   d. Political Affiliation: (Check one)
   _____Democrat
   _____Republican
   _____Independent

2. Rank order of the following media as to being a source of enjoyment. Rate 1 for highest, 2 for second, 3 for third, 4 for fourth.

_____newspapers	_____television
_____radio	_____magazines

3. Please check one block for each media use category below:

   a. Number of magazines read regularly:
   _____none
   _____1-2
   _____3-4
   _____5-6
   _____7 or more

   b. Hours of magazine reading per day:
   _____never
   _____½ hour
   _____1 hour
   _____2 hours
   _____3 hours
   _____more than 3 hours

   c. Hours of television viewing per day:

_____never	_____4 hours
_____1 hour	_____5 hours
_____2 hours	_____6 hours
_____3 hours	_____7 hours

d. Times reading newspaper per week:

_____never	_____4 days
_____1 day	_____5 days
_____2 days	_____6 days
_____3 days	_____7 days

e. Hours reading newspaper per day:

_____never	_____2 hours
_____½ hour	_____3 hours
_____1 hour	_____more than 3 hours

f. Hours listening to radio per day:

_____never
_____1 hour
_____2 hours
_____3 hours
_____more than 3 hours

In order to get your reaction to the political commercial you watched on videotape, please list what you consider to be the most important issues the candidate brought out:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Indicate the best answer for each question by circling the correct letter.

Commercial #1

1. What is the name of the disorder mentioned in the commercial?
   a. Cystic Fibrosis
   b. Muscular Dystrophy
   c. Cerebral Palsy
   d. Polio

2. What was the type of disorder indicated by the commercial?
   a. Mental illness
   b. Emotional illness
   c. Physical disease
   d. Birth defect

3. What was the intent of the commercial?
   a. To urge public awareness of the need for medical checkups.
   b. To solicit financial support for the national organization.
   c. To announce new treatments for helping those stricken.
   d. To urge equal opportunities for the handicapped.

Commercial #2

1. What is the political candidate's name?
   a. Sherman Johnson
   b. John Sherman
   c. John Johnson
   d. None of the above

2. What office is the political candidate seeking?
   a. State governor
   b. U.S. Senate
   c. U.S. Congress
   d. State legislature

3. What political party does the candidate represent?
   a. Democratic
   b. Republican
   c. Independent
   d. He did not indicate

4. According to the candidate what issue is named as being most important by Americans?
   a. Crime
   b. Unemployment
   c. Inflation
   d. Taxes

5. According to the candidate what has risen 14% in the past year?
   a. Serious crime
   b. Organized crime
   c. Capital crime
   d. White collar crime

6. What was the candidate's source for his statistics?
   a. Statistical Abstract
   b. F.B.I.
   c. State Crime Commission
   d. None were indicated

7. What solution does the candidate favor for reducing crime?
   a. Additional hand gun control legislation
   b. Registering of hand guns
   c. Banning production of hand guns
   d. No solutions were indicated

8. According to the candidate what steps are necessary to reduce inflation?
   a. Cutting foreign policy aid
   b. Withdrawing from military alliances
   c. Prohibiting foreign investments
   d. Reducing military spending

9. According to the candidate what percentage of serious crimes involve the use of the "Saturday Night Special?"
   a. 14%
   b. 24%
   c. 51%
   d. 63%

10-11. According to the candidate millions of dollars could be saved through a reduction in a government spending program.

10. How much money could be saved?
   a. $63 million
   b. $180 million
   c. $210 million
   d. $240 million

11. Which program should be reduced?
    a. Foreign aid
    b. Welfare
    c. Military spending
    d. Social services

12. What label did the candidate use to describe his supporters?
    a. Broom Brigade
    b. Battle Brigade
    c. People's Party
    d. Campaign Corps

13. What type of election if scheduled to be held?
    a. Run-off election
    b. Primary election
    c. General election
    d. The candidate did not indicate

14. What is the candidate trying to restore to the U.S. Congress?
    a. Honor and justice
    b. Integrity and trust
    c. Representative government
    d. Interest and integrity

15. What is the candidate trying to remove from the U.S. Congress?
    a. Dishonesty and partisan interests
    b. Disrespect and dishonor
    c. Distrust and unethical interests
    d. He did not indicate.

Commercial #3

1. What was the name of the product mentioned in the commercial?
    a. Schick Adjustable
    b. Schick Techmatic
    c. Gillette Adjustable
    d. Gillette Techmatic

2. What was the promise made by the commercial?
    a. Free razor for the price of the razor band.
    b. Free razor band for the price of the razor.
    c. Pay regular price for razor and receive razor band for a penny.
    d. Pay regular price for razor band and receive razor for a penny.

Please rate the political candidate and his message on the following scales. First, in terms of qualified--do you feel that he is very qualified, somewhat qualified, neutral, somewhat unqualified, or very unqualified?

Place a check (✓) mark on the line which corresponds to your rating.

SAMPLE:

	1	2	3	4	5	
HANDSOME:	✓					UGLY
POOR:				✓		RICH

In the above sample the checked ratings indicate that the respondent feels the candidate to be very handsome and somewhat rich.

	1	2	3	4	5	
QUALIFIED:						UNQUALIFIED
SOPHISTICATED:						UNSOPHISTICATED
HONEST:						DISHONEST
UNATTRACTIVE:						ATTRACTIVE
SINCERE:						INSINCERE
IRRELEVANT:						RELEVANT
SUCCESSFUL:						UNSUCCESSFUL
RATIONAL:						IRRATIONAL
UNFRIENDLY:						FRIENDLY
NOT SERIOUS:						SERIOUS
CALM:						EXCITABLE
SAVER:						SPENDER