

SPECIFIED COGNITIVE STRUCTURES
AND THEIR EFFECTS ON
LANGUAGE ENCODING BEHAVIORS

Thesis for the Degree of Ph. D.
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HERBERT WAYLAND CUMMINGS
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THEIR EFFECTS ON LANGUAGE ENCODING BEHAVIORS

presented by

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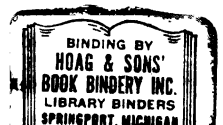
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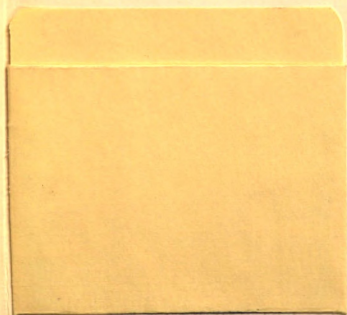
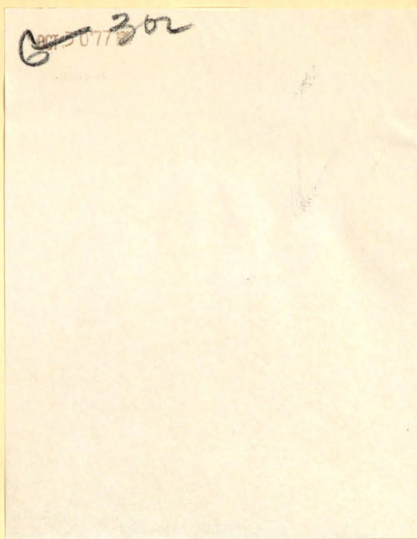
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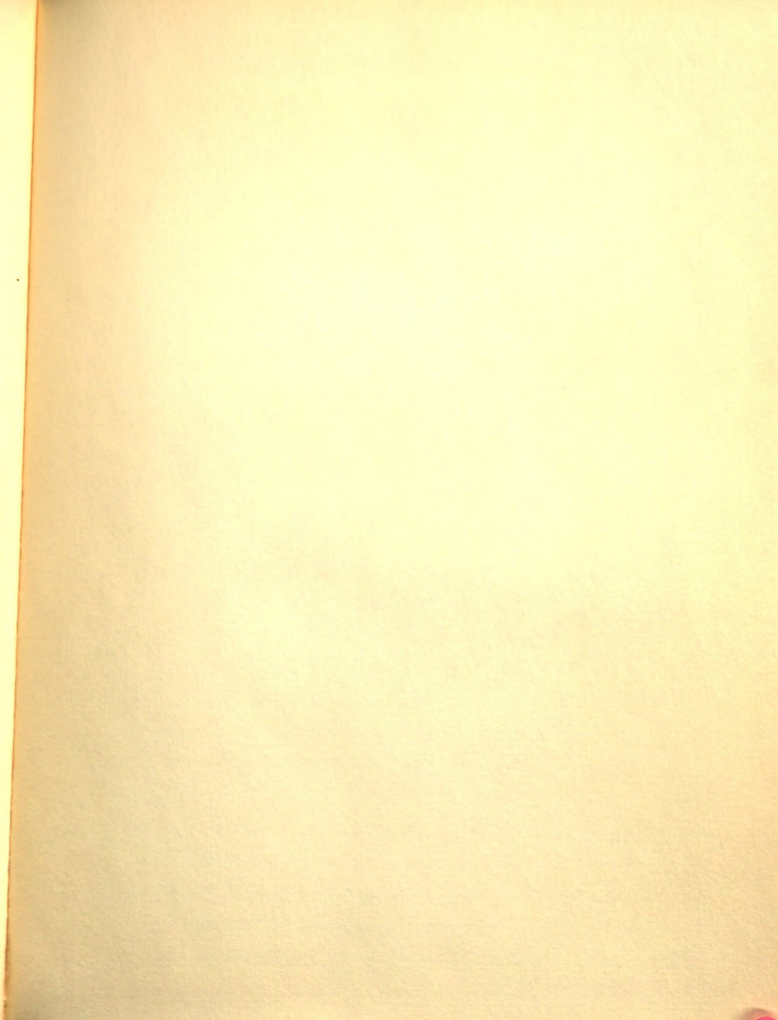
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Major professor

Date May 25, 1970







ABSTRACT

SPECIFIED COGNITIVE STRUCTURES AND THEIR
EFFECTS ON LANGUAGE READING BEHAVIORS

2/

Herbert Hayford Cummings

The purpose of this study was to examine the relationship between certain message variables and independent characteristics of sources, such as dogmatism, anxiety, attitude, vocabulary skills, spatial abilities, age, sex, college level, and school attended. Previous content analysis research typically has analyzed messages in the absence of independent measures of source characteristics. In addition, such research has been directed toward the construction of dictionaries, which has limited the methodology largely to lexical analysis. This study was designed to construct alternatives to previously identified problems using the methodology of content analysis.

A random sample of ninety-eight subjects was taken, with independent measures obtained on each source. In addition, 100 message variables were developed from a consideration of structural linguistics. These variables were conceptually related to extant theories in semiotics.

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and semantics. Of these message variables, a subset of forty were evaluated as appropriate for analyses of variance. Seventy per cent of these forty variables yielded significant information about one or more characteristics of the sources.

The syntactical descriptive system offered in this study had three basic elements: (1) limiters (modifiers); (2) subject words (verb complements); and (3) connectors (verbs). Other distinctions made were the relative frequency of occurrence of: (1) past, present, and future tense verbs; (2) associative and dissociative assertions; (3) action and comparison verbs; (4) indicative and subjunctive verbs, and (5) primitive and defined subject signs and connectors. Each of these variables were analyzed in terms of how they related to cognitive and demographic characteristics of the encoder.

This system allowed for the possibility of subsuming a semantic approach to the study of meaning into a syntactical theory of signs. The study suggested that the gross distinctions made by previous researchers in content analysis have been unfruitful or inconsistent in part because they have failed to utilize a highly developed classification system.

SPECIFIED COMMUNICATIONS STRUCTURES AND WRITING

Accepted by the faculty of the Department of
Communications, College of Communication Arts, Michigan
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EFFECTS ON LANGUAGE ENCODING BEHAVIORS

By

Herbert Wayland Cummings

Scholars need intellectual stimulation, but the human being is also an individual. He is a human being. My humanness has been maintained through graduate school by my wife, Patricia Ann, who has had an unlimited reservoir of love, encouragement, and patience.

For the intellectual stimulation that has made this school meaningful, I must thank Edwin Settingham, Gerald Miller, William Lashbrook, and Murray Newgill.

And finally, my sons--Jane, Ron, and Don--who contributed a part of themselves with the sacrifice they made when their father was too tired to be as human as he wanted to be.

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demographic variables were obtained. These included sex, class, level, age, and school.

Independent variables were found after looking based on the frequency of occurrence of each variable. The following are the independent variables for each subject.

INTRODUCTION

This study explores the relationship between certain specified message characteristics and selected antecedent characteristics of the source. Under the rubric of psycholinguistics and the methodology of content analysis, this study seeks to systematically and objectively identify some subset of 100 message variables that will explain cognitive characteristics of the source.

To facilitate this study, a random sample of 114 subjects was taken from the introductory speech course at Grand Rapids Junior College in the Fall of 1969. Each subject was asked to fill out five instruments which became the criterion measures for this study. Three weeks later, these same subjects were asked to write a speech--all subjects writing on the same topic--choosing any position on the topic they wish. Sixteen subjects were lost, due to absence from the classes when the second stage of the study was conducted.

Criterion measures used in this study included dogmatism, communication anxiety, attitude, vocabulary skills, and spatial relationship abilities. In addition, four

demographic variables were obtained. These included sex, class, level, age, and school.

Independent variables were word index scores based on the frequency of occurrence of 100 message characteristics for each subject. Examples of the most general message variables considered were the relative percentage of occurrence of: (1) past, present, and future tense verbs; (2) associative and dissociative assertions; (3) action and comparison verbs; (4) indicative and subjunctive verbs, and (5) primitive and defined subject signs and connectors.

Based upon previous research in the field, it was believed that verb tenses would explain significant variance in the criterion measure of dogmatism. It was also believed that dissociative assertions would explain significant variance in dogmatism, while defined verbs and signs would explain significant variance in attitude intensity.

The structure for this study is as follows: Chapter I presents a summary of the literature and theoretic approaches in content analysis; Chapter II includes the rationale and hypotheses for the study; Chapter III offers the method of analysis used; Chapter IV includes the results, and Chapter V presents a summary, discussion, and suggestions for further study.

CHAPTER I

BACKGROUND AND THEORETIC APPROACHES

Content analysis is a multipurpose research method designed to investigate numerous problems in which the data for inference is the content of the communication exchange. This chapter examines content analysis as a method, followed by a review of the literature for three general theoretic approaches used in content analysis. There have been probably thousands of studies using some form of content analysis, but many seem to have had little or no theory as a basis for their use. The studies reviewed here have had significant theoretic foundations underlying them which are important to this study. Included in this chapter will be a discussion of some of the general rationales associated with content analytic studies, and issues related to the measurement procedures used in content analysis.

Content Analysis Defined

Ole R. Holsti (1969) defines content analysis as insightful, and quantitative content analysis... any technique for making inferences by systematically and objectively identifying specified characteristics of messages (p. 601).

While Holsti's assertion may seem on the surface to be valid, the same argument might be used for the justification of

Holsti defends this definition as being less restrictive than those definitions held by others, thus allowing for more inclusiveness of relevant literature. While one can quarrel with any definition as being too broad so as not to define anything, the definition provided by Holsti provides useful distinctions. The method of content analysis has generated differences in the field, based on distinctions made between quantitative and qualitative approaches (Holsti, 1969). Pool (1959, pp. 8-9) provides examples of this distinction. He describes typical studies of qualitative analysis as being preliminary readings of communication materials for purposes of hypothesis formation. Another example is the study which makes dichotomous distinctions between attributes which are said to belong or not to belong to an object. He illustrates the quantitative approach as including studies which are a systematic analysis of messages for the purpose of testing hypotheses. Another example would be a study which looks at attributes of a message which can be rank-ordered, or which permit interval measurement. In general, qualitative analysis has depended upon the absence or presence of attributes of messages which were artistically intuited. Pool (1959) argues:

It should not be assumed that qualitative methods are insightful, and quantitative ones merely mechanical methods for checking hypotheses. The relationship is a circular one; each provides new insights on which the other can feed (p. 192).

While Pool's assertion may seem on the surface to be valid, the same argument might be used for the justification of

the distinction between "humanistic" and "scientific" means of knowledge acquisition. It is true, of course, that insightful methods are used in quantitative approaches, but they are made a priori, not concurrent with the analysis of the data.

Theoretic Approaches: Summary of Literature

Holsti (1969) reports that three-fourths of the studies utilizing content analysis have been primarily in three disciplines: (1) sociology/anthropology; (2) political science, and (3) general communication. Although these disciplines are not mutually exclusive, it is possible to structure the literature from these disciplines with Holsti's category scheme. It is also helpful in denoting common assumptions and problems held by all three classes of scholars.

1. Sociology/anthropology. Much of the research in this area is concerned with the comparison of cultural norms, or the change of norms over time as represented by a content analysis of certain messages. Some of the best known researchers have looked at themes of folktales of a given culture, or between cultures. Kalin, Davis, and McClelland (1966) were interested in the effect of the general consumption of alcohol and frequency of drunkenness on folktale themes of differing cultures. McClelland (1958), McClelland and Friedman (1952), and Riesman, Glazer and Reuel (1950) looked at the effects of need for

achievement as indexes of cultural change. Dahlberg and Stone (1966) were interested in authoritarianism as a determinant of message characteristics between cultures. The common theme of these scholars is a content analysis of literature and speeches as indicators of culturally important characteristics. Few studies have obtained direct measures of source characteristics as a means of validating inferences made from the messages. This has been due to the inaccessibility of sources or the huge energy requirements necessary in obtaining samples large enough to generalize to a whole culture.

Representative of much of the work of these researchers is that of Benjamin Colby (1966), who developed an anthropological dictionary for use with the General Inquirer (Stone, Dunphy, et al., 1966). His dictionary was based on data obtained from folktales of Navajo and Zuni Indians.

After considerable preliminary work, Colby developed his Third Anthropological Dictionary, which grouped its tags under five main sections: (1) plot structure; (2) behavioral systems; (3) mental processes; (4) analytic-experimental, and (5) second-order tags. The first section deals with characteristics in the plot and action of those characters. Plot characteristics include sex tags, kinship tags, and pronoun tags. Action tags indicate orientation and movement in space and time, communication and work.

anteced. The second section--behavioral systems--deals with personality, including body, emotions and abilities. A social dimension is also included, which subsumes aspects of social relations. A culture dimension includes values and norms.

ion of this chapter--General National and Measurement Mental processes--a third main section of the dictionary--includes tags of three main subclasses--explanation, description, and perception. The fourth section has tags which look at the connective words related to logical structure, while the fifth section refers to those 3,600 selected words in the Harvard III Psychosocial Dictionary (Stone, Dunphy, et al., 1966).

salient Twenty-seven subjects in Colby's study gave verbal responses to the TAT protocols, 15 Navajo subjects and 12 Zuni subjects. Results of the study, Colby says, "tend to demonstrate" that the TAT texts of Zunis are more concerned with moisture than those of Navajos. This was explained--ex post facto by Colby--as being related to the primary occupations of Zunis as crop growers as distinct from Navajos who were sheep-herders. On the other hand, Navajos who have a cultural theme of travel and movement according to Colby, encoded significantly more travel words than Zunis ($p < .05$). Navajos also produced more affection words, especially between husband and wife, while Zunis encoded more social power and dominance words.

It is significant that the common concern of these researchers is the identification of social and cultural

antecedent conditions which explain differences in messages as response variables. Some anthropologists who have been psychologically oriented have centered their research on the relationships between culture and personality. The next major section of this chapter--General Rationale and Measurement--will elaborate on this significance.

2. Political Science. The antecedent conditions of messages which are of primary interest to political scientists are those of political party membership. The message may be created by one person, or a group of persons. At times, this group is interested in identifying who wrote a message (Mosteller & Wallace, 1964) or determining salient political themes over time (Smith, Stone, & Glenn, 1966; Namenwirth, 1969). Blumberg (1954) sought to measure political bias in editorials in a presidential election, while Namenwirth and Brewer (1966) were interested in comparing messages created by editors in different countries. Leites and Pool (1949) also looked at the frequency of occurrence of political symbols in messages created by editors. The basic concern of the political scientist in using content analysis is: Is there some class of tags in a message which will indicate the identity of a politician and/or the political bias of an encoder? The corpus of messages includes political speeches, newspaper stories and editorials, and political pamphlets.

Ole Holsti (1966) provides an illustration of the research concerns of the political scientist. He studied

the political relationships between the Soviet Union and Red China. Using theoretic formulations from balance theory, i.e., Heider (1946), Newcomb (1953), and Osgood, Suci, and Tannenbaum (1957), Holsti hypothesized that Chinese and Soviet attitudes toward the United States would tend to be similar in periods of high interbloc (East-West) conflict, whereas during periods of decreasing tensions, attitudes toward American policy would diverge. Data for Holsti's analysis were 38 Soviet and 44 Chinese documents, totalling nearly 150,000 words written from 1950 to 1963. The periods included two during which East-West relations were relatively calm, four of high tension, and one in major crises. Three coding operations were performed which:

- (1) separated complex sentences into one or more themes;
- (2) identified the syntactical position of key words; and
- (3) characterized the themes in terms of time and mode of expression. Scores on the evaluative, potency, and activity dimensions were tallied for (1) actions in themes in which the United States was the agent, and (2) qualitative characteristics ascribed to the United States. The dictionary included about 3,600 words with such terms as "nuclear," "blackmail," "industrial," and "achievement," which had been previously tagged and scaled for intensity along the three dimensions. Holsti argued that the results of the study support his hypothesis. During periods of high East-West tension, Soviet and Chinese documents demonstrated similar attitudes. Significant differences between China

and the Soviet Union appeared in periods marked by a more relaxed international atmosphere.

It is important to note that of the many studies done by political scientists, the Holsti study represents the most sophisticated in terms of theoretic basis. The same problem exists here, as for sociology/anthropology, in that inferences are made from message data about source characteristics, but little has been done to ascertain the validity of these inferences. In most cases it is impossible; in others, the energy requirements are often too high. It is impossible because often the sources of the messages are not living, or are social and political leaders who are not willing or available for measurement of their cognitive processes. The energy requirements are often too high because sample sizes necessary to generalize to a political party are impractical. Further, the time and money for coders to analyze several hundred messages has discouraged many researchers. Although computer technology has improved the speed of the coding task, computers can only read what they are told to read, i.e., a dictionary is required. An alternative is that a coder may tag words in specified ways, but this again adds to the energy load of coders and re-sign-using animals, i.e., that humans acquire and/or create signs that represent elements within the human beings' environments. This type of content analysis grew out of Osgood's semantic differential (Osgood, Suci, & Tannenbaum, 1957). One of the basic assumptions of Osgood is that humans are sign-using animals, i.e., that humans acquire and/or create signs that represent elements within the human beings' environments. Following Charles Morris (1938), this approach research in the area of general communication represents a far more heterogeneous grouping of interests than that of objects in the environment, with such sign-significance the previous two approaches. This reflects the varied

3. General Communication. Content analysis research in the area of general communication represents a far more heterogeneous grouping of interests than that of objects in the environment, with such sign-significance the previous two approaches. This reflects the varied

theoretic commitments of communication scholars, who seek to test several models of human behavior purporting to explain message production. For example, Bales (1950) has developed a sign process analysis which seeks to infer roles of members of groups in terms of messages encoded. Other researchers have developed models of internal states of affairs based on personality structure (Allport, 1946; White, 1947; Rokeach, 1960; and Paige, 1966). Others have looked at antecedent conditions (internal) such as anxiety (Mahl, 1959), self-evaluation (Kauffman & Raimy, 1949) logical styles (Schneidman, 1963), and drive production-reduction (Dollard & Mowrer, 1947).

One of the influential models of human behavior is that of Osgood (1957, 1959). Osgood (1959) reports a method of content analysis--Evaluative Assertion Analysis--as attempting to

... extract from messages the evaluations being made of significant concepts, with a minimum dependence on the effects of the messages on coders or on their existing attitudes (p. 41).

This type of content analysis grew out of Osgood's mediation hypotheses (Osgood, Suci, & Tannenbaum, 1957). One of the basic assumptions of Osgood is that humans are sign-using animals, i.e., that humans acquire and/or create signs that represent elements within the human beings' environments. Following Charles Morris (1946), this approach assumes humans using signs to represent significates, or objects, in the environment, with such sign-significate

relationships being considered as the semantic dimension to language, the relation between signs being syntactical, and the relation between signs and the users being pragmatic.

The content for Osgood's representational model was described by himself (1957) and provides a useful tool in understanding the assumptions he makes when undertaking his evaluative assertion analysis. Osgood describes two general approaches by which signs become related to referents. He outlines a "substitution" approach as that situation in which a pattern of stimulation which is not the referent becomes a sign of that referent when it evokes the same response as the referent did in absence of the sign. It is a classical conditioning (Pavlovian) paradigm of how signs (CS) become related to referents (UCS) or objects. and (3) Osgood also describes the mentalistic approach as that situation in which a pattern of stimulation which is not the referent becomes a sign of that referent when it gives rise to the idea associated with that object. Osgood's mediation hypothesis appears to be an attempt to combine both the substitution and mentalistic approaches in order to escape the apparent over-simplified sign-object relationship implied in the substitution view. Osgood's hypothesis states:

A pattern of stimulation which is not the object is a sign of that object if it evokes in an organism a mediating reaction which (a) is a fractional part of the total behavior elicited by that object, and (b) produces distinctive self-stimulation that mediates responses which could not occur without previous

association of non-object and object patterns of stimulation (1957, p. 7).

In content analysis the mediation hypothesis assumes:

. . . (1) that in semantic encoding by the source the occurrence of specific lexical items in his message is indicative of the immediate prior occurrence in his nervous system of the corresponding representational mediation processes; and (2) that in semantic decoding by the receiver the occurrence of specific lexical items in messages are predictive of the occurrence in his nervous systems of those representational mediation processes which he has developed in association with these signs (1959, p. 39).

This hypothesis led Osgood to consider sources of variability in language behavior. He defined them as: (1) availability, which asserts that habits which associate signs with meanings in decoding and meanings with linguistic responses in encoding are variable; (2) the representational process itself, including differences due to acquisition, and (3) associations among representational processes, i.e., variability due to individual differences in the hierarchies of the representational processes.

Osgood's Evaluative Assertion Analysis requires four stages: Stage I, the identification, isolation, and masking of attitude objects; Stage II, the translation of the message into assertion form; Stage III, the assigning of directions and intensities to connectors and evaluators, and Stage IV, the evaluative scale of attitude objects. Summarizing these stages, Osgood's approach requires the identification and isolation of attitude objects (normally proper nouns and any pronouns that refer to proper nouns); the identification of evaluative meanings (adjectives); the

translation into assertions (actor-action-complement form) which can be associated or dissociated, and the formation of such assertions into a message matrix denoted as being associated with a plus (+) sign, and dissociated with a minus (-) sign. These relationships are finally assigned mean values on a seven-step semantic differential scale, based on the independent codings of judges. Application of Osgood's analysis has been made on such messages as Goebbels' diary, and a patient undergoing psychotherapy. It is apparent here, as in the other two general theoretic approaches, that inferences are made from message data about source characteristics. Yet, little has been done to ascertain the validity of these inferences, and for the same reasons: it is impossible (Goebbels), or the energy requirements are too high. Why attempt to infer attitudes of a population from content analysis of their messages, when an attitude scale may be used to measure those attitudes? The answer should become clear in Chapter II--Rationale and Hypotheses.

Theoretic Approaches: General Rationale and Measurement

Regardless of the academic training of the researcher, the one common assumption is that verbal behavior reflects to some degree the condition or state of affairs of the person encoding the message. Jaffe (1966), though primarily interested in psychiatric dysfunctions, is representative of this general assumption. He states that

"psychiatric disorders, regardless of their etiology, are ultimately manifest as disorders of social communication (p. 689)." As sociologists or anthropologists, the cultural norms may be the antecedent variable assumed to be reflected in verbal behavior. As political scientists, it may be political commitments that are the antecedent conditions. As communication scholars, the antecedent conditions may be the "hierarchy of representational process," i.e., Osgood, or certain personality characteristics of the encoder, i.e., dogmatism (Rokeach, 1960), self-evaluation (Kauffman & Raimy, 1949), or drive (Dollard & Mowrer, 1947).

Taken together, the previously described antecedent conditions need represent only the varying and perhaps competing theoretic commitments or interests of the researcher. This assumes, of course, some agreement on response measurement procedures, if theories would be tested. However, of 23 studies previously cited, 15 different measuring procedures were used in analyzing the messages. One study (Blumberg, 1954) used column inches in newspapers as the response measure. Four studies (Kalin, Davis, McClelland, 1966; Mosteller & Wallace, 1964; Leites & Pool, 1949, and White, 1947) used the frequency of occurrence of one or more tags (words of a specified type). Three others (McClelland, 1958; McClelland & Friedman, 1952; and Reisman, Glazer, & Reuel, 1950) used the frequency of a tag per 100 lines.

Two critical questions arise in choosing the measuring procedure: (1) is the raw frequency of some tag the best estimate of the effect of some antecedent condition? and (2) should the researcher control for the varying lengths of message samples by using some common denominator, such as total words or sentences encoded? In two hypothetical messages, where Message A has 100 words with 10 verbs, and Message B has 1,000 words with 100 verbs, an affirmative answer to the first question would show Message B greater than Message A. An affirmative answer to the second question would show Message A equal to Message B. Fifteen of the 23 studies reviewed here generally use the latter approach. It is important to note, however, that none of the studies report the descriptive statistics used, if any, in making such a decision. Scholars resolve the issue on logical grounds. Stone, Dunphy, et al. (1966) raise the problem as follows:

. . . For each tag concept, four numbers [in the General Inquirer] in this set generally can be computed: (1) The raw frequency of occurrence of the tag concept in the document as measured by the sum of the occurrences of all of the entry words of the tag concept in the document; (2) the raw frequency of sentences in the document which contain at least one of the entry terms of the tag concept; (3) the raw frequency of (1) divided by the number of words in the document (word index score); (4) the raw frequency of (3) divided by the number of sentences in the document (sentence tag tally). The most frequently used of these four numbers is the word index score. The others, though easily available, are not as convenient for between-document comparison: the raw word and raw sentence scores are difficult to use if the documents vary in length. The sentence index score is not useful if the length of sentences varies considerably between documents.

As mentioned earlier, the use of the word index score usually means that the researcher has made the assumption that relative frequency of mention is a stable index of intensity over documents of varying lengths. Thus, the use of the word index scores equates two documents on the tag SELF if the first document, which has only one hundred words, contains one reference, and the second, which has one thousand words, contains ten references (p. 227).

An important question which should be answered is: by controlling for varying lengths of message samples, what attributable variance in the message is being removed, leading to the probability of Type II error? At this time, no study to this writer's knowledge has addressed itself precisely to words in the message, or (2) analysis of the structural meaning of the message.

Summary

This chapter described three general theoretic approaches to the study of messages where content analysis was the central methodology. We discussed the common assumption of all three approaches--that language reflects antecedent characteristics of the encoder. Finally, we raised two critical questions regarding measurement procedures used in the literature reviewed.

Chapter II will present the rationale and hypotheses for this study, while Chapter III will deal with the issue of measurement found to be a problem in previous research. The equivalent patterns and frequencies must first be identified (according to some clear-cut criteria) and norms as to relative frequencies established before deviations can be determined. Only then can deviations in frequency be correlated with the behavioral states of the producers of the message (p. 138).

Structural linguists have been most concerned with the comparison of the occurrence of some syntactic form to a criteria of what is "good" or competent form. This in large part explains the general interest in structural approaches to the study of meaning in content analysis. In addition, some have been concerned (Ford, 1959) with the

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Two general approaches are open to the researcher stretch of speech, resulting in the equating of, say, the verb "ran" with the verb "ate." It is obvious that the verb data: (1) analysis of the meaning of specified content words in the message, or (2) analysis of the structural meaning of the message. Osgood's Evaluative Assertion Analysis generally falls into the prior category of determining the meaning of specific content words, although he codes and the frequency of occurrence of such word types. recognizes that structural characteristics of the message also are sources of variance in meaning.

Structural linguistics has largely been concerned with the presence or absence of linguistic phenomena, usually ignoring their relative frequencies. As Saporta and Sebeok (1959) note:

... we have little reliable information [because of the above stated structural approach] on the frequencies of, for example, comparable syntactical patterns. Indeed, even for so well-known a language as English there is probably no definitive information as to what the equivalent patterns are. Presumably these equivalences must first be identified (according to some clear-cut criteria) and norms as to relative frequencies established before deviations can be determined. Only then can deviations in frequency be correlated with the behavioral states of the producers of the message (p. 139).

Structural linguists have been most concerned with the comparison of the occurrence of some syntactic form to a criteria of what is "good" or competent form. This in large part explains the general lack of interest in structural approaches to the study of meaning in content analysis. In addition, some have been concerned (Pool, 1959) with the equation made between the occurrence of elements in any stretch of speech, resulting in the equating of, say, the verb "ran" with the verb "ate." It is obvious that the verb "ran" and "ate" are not the same in meaning, such as in the sentence, "The dog ran," versus, "The dog ate." Yet, it is also obvious that there may be some contribution to the variance explainable in the cognitive structure of the encoder and the frequency of occurrence of such verb types.

With a theoretically and empirically meaningful classification of signs and sign-sign relationships, it is possible to determine the extent of meaning attributable to syntactical structure. Before presenting a descriptive classification of signs, this chapter will begin with the problem of meaning. After these two discussions, the message variables for this study will be summarized. (A copy of the coding instruction booklet is in Appendix A.) The cognitive variables used in this study will then be discussed, followed by hypotheses on the relationship between message behavior and cognitive structures.

cedent conditions, not merely overlap in signs. It is this assumption that makes communication possible, with behavioral

The Problem of Meaning

Once we recognize there is a problem of meaning, at least three possible approaches are available. We can begin with a stimulus-response framework, in which meaning is explained in the classical and/or operant conditioning paradigm (a substitution view). Another way of meeting the problem is to assume meaning is an unobservable, internal construct (a mentalistic approach). A third approach is to form a position which includes characteristics related to both assumptions. Osgood (1957) chose to study the problem primarily from the third approach. He determined that any solution must begin with the self-evident fact that the pattern of stimulation which is a sign is never identical with the pattern of stimulation which is the object. The sign-to-significate meaning is the semantic dimension to meaning, and as he points out, the pattern of stimulation for each is never identical. We might also note that the patterns of each element are never the same across individuals, leading us to the obvious assumption that it is not reasonable to assume that persons "read" the same significates in the same way. Thus, socio-cultural patterns, prior experiences, learning ability, need states, and even physiological states become relevant. Concurrently, we must assume in order for any social communication to take place that there is some degree of overlap of semantic meaning due to these antecedent conditions, not merely overlap in signs. It is this assumption that makes communication possible, with behavioral

consequences in terms of the degree of overlap, social awareness, etc., across subjects.

Another important assumption is that semantic meaning is not independent of pragmatic or syntactical meaning. This assumption is based on the notion that the source of the meaning of a sign can be the significate (denotative meaning), but also the need state of the individual holding that meaning and the degree of perceived contiguity of some other sign to that sign.

Another conceptual discrimination that can be made is that significates for signs can be stimuli, or complexes of stimuli, outside (observable) or inside (hypothetical) of the sign-using animal. Those outside we could term afferent, and those inside we could term efferent. Those referents which are afferent are capable of being seen, heard, smelled, tasted, or touched, while efferent referents are internal states of affairs which cannot be sensed through normal sensory inputs. In addition, we might also note the assumption that those significates outside of the sign-using animal exercise higher stimulus control than those significates inside of the sign-using animal.

It is also worth observing that internal significates may be contiguous to external significates, producing an internal response to an internal state of affairs, but conditioned to an external significate. This is seen in the studies of Staats and Staats (1967), where evaluative responses have been conditioned to nonsense syllables.

Finally, all meaning (semantic, pragmatic, or syntactic) is acquired and maintained by discriminative or associative relationships between significate and significate, significate and sign, sign and sign, interpreter and interpreter, and/or interpreter and sign.

It can be observed that these conceptual distinctions between semantic, pragmatic, and syntactic meaning are on a meta-meaning level, i.e., meaning about meaning. It is quite a different situation, however, to translate these conceptual notions into operational definitions for purposes of empirical research, particularly when we are using content analytic methods. Holsti (1969) observed:

A ... source of disagreement among those defining content analysis is whether it must be limited to manifest content, that is, the surface meaning of the content. Or may content analysis be used to analyze deeper layers of meaning embedded in the content. The requirement of objectivity stipulates that only those symbols [signs] actually appearing in the message may be recorded. In other words, the coding process cannot be one of "reading between the lines." In this sense, content analysis is limited to manifest attributes of the text (p. 600).

Holsti's statement can be interpreted as criticizing those who attempt to use content analysis to answer questions of the meaning of messages. However, semantic meaning as we normally have understood it in the theory of signs is within the technique chosen for this study, has had little or no attention.

Semantic meaning for Osgood is not semantic meaning as these terms are conceptually defined. Osgood criticized (1957) the sign check lists to measure semantic meaning in favor of polar adjectives because of the problem of

measurement of semantic meaning. He also criticized the message matrix procedure on the same grounds. His major criticisms surrounded the issue of comparability. Osgood argued that the semantic differential provided means of comparisons among different individuals and groups, and among different concepts. Message matrices and sign check lists, Osgood said, are context bound. Osgood claimed that a basic distinction must be made between the meaning of a sign and a sign's associations. The semantic differential provides the means of going beyond the context, and allows for comparison of measures of meaning of a sign. However, the solution he accepted to the problem of meaning has not resulted in a "semantic" meaning independent of syntactic or pragmatic meaning, even though the semantic differential in many ways is heuristically more valuable. He uses the term "assign" to refer to meanings given to them (signs) via association with other signs rather than via direct association with the objects signified. He notes that his measurement procedure--the semantic differential--is a measurement of the meaning of assigns. However, semantic meaning as we normally have understood it in the theory of signs is changed. We find it possible to operationalize signs from languages in use; it is not possible, when looking at the message corpus, to operationalize significate to sign relationships independent of the other dimensions of meaning. Thus the semantic differential is a syntactic and pragmatic measure, and not a "semantic" measure alone. The semantic

meaning of a sign is assessed by the measurement of the meaning of concepts (represented by signs) and the relation of that concept sign to another sign, i.e., good-bad, etc. Thus it is clear from the content analytic approach that we are looking at syntactical relationships.

The Problem for a Syntactical Approach
to the Meaning of Meaning

The basic problem in a syntactical approach to the study of meaning is not in the conclusion that there has been nothing done in the area. Rather, at least three studies have explored a relatively small subset of syntactical meaning to the exclusion of others (eg. McEwen, 1967; Kochevar, 1967, and McEwen, 1969 studied the effect of high intense versus low intense verbs on attitude change). In part this is due to a lack of a more complete explication of syntactical meaning, and in part due to the lack of predictability of so many hypothetical constructs. Thus, an operationally adequate but scientifically meaningful classification of signs and sign-to-sign relationships is required. We do not argue that hypothetical constructs can be avoided, nor should be; we argue for hypothetical constructs that have higher explanatory power. Further, it is argued that the pragmatical and semantical dimension of meaning is heuristically and hypothetically valuable, subsumed within a syntactical framework. A syntactical approach to the meaning of meaning in messages is operationally and theoretically valuable.

Syntactical approaches to meaning have led linguists and philosophers as well as psychologists and communication scholars into a study of the grammatical and logical relationships between signs. A descriptive system which defines linguistic or philosophic syntactical relations may be adequate for such scholars. However, communication researchers have sought to go farther by including the characteristics of sources and receivers of messages, not merely the messages themselves. Thus, the category system for describing language syntactically will be different for a communication scholar than for either a linguist or philosopher. Phrased in another way, a descriptive system which is very adequate for a linguist may have little value to a communication scholar. The communication researchers' interests will influence the category of signs and sign to sign relationships provided in this study, and should add to the widely held conclusion that semiotics has provided theoretic impetus for widely divergent academic disciplines.

A Descriptive Classification of Signs

The descriptive classification of signs to be used in this study has three basic elements: (1) limiters (modifiers); (2) subject signs, and (3) connectors. In addition, the term "unit sign" will be defined, providing a distinction which allows for the subsuming of semantic research into a syntactical framework.

~~classes~~ 1. Modifiers as Signs. The work of Osgood, et al., (1957) has produced considerable research interest in what we will term here as modifier signs, but what he calls characterizations in the congruity principle. In most cases, the semantic differential has sought to place a concept word, such as the name of a person, into some semantic space, based on factor analysis of polar adjectives. Osgood notes that they have been able to obtain "evaluative" factors, and to a lesser degree, "activity" and "potency" factors in the measurement of a concept. The same approach has been used in source credibility research, and in attitude change research. Modifiers have also been one component in Osgood's research dealing with congruity theory in the development of his Evaluative Assertion Analysis, and in Rokeach's belief congruence research. In most cases, relevant modifier signs have been extracted from irrelevant modifier signs through factor analytic procedures. The attempt is to be able to identify those relevant and unidimensional modifier signs that are used by the normal population in "evaluation" of other concepts. From the viewpoint expressed here, these have been syntactical studies.

~~signifi-~~
~~cates~~ Osgood's evaluative dimension holds up well in many experiments, and is generally characterized as referring to internal states of affairs (internal significates) of the sign-using animal, i.e., hypothetical responses said to occur in the central nervous system. Other modifiers have broken down into many different factors. These latter

classes of modifiers, such as hot-cold, black-white, etc., have been previously termed in this paper as afferent signs. It is of theoretic interest that the explanation for the evaluative dimension accounting for more variance than the other dimensions may be the result of the effect of the kind of significates on the signs representing them. That is, the response of good-bad may refer to generalized significates within the sign-using animal (as Osgood, et al., argue [p. 179]) which are in turn related to the concept being measured.

The sign response of black and white, since they demand less generalized significates outside of the sign-using animal, exercise more stimulus control over responses than do internal significates. Thus, the high intercorrelation of items on the evaluative dimension may be due to low stimulus control of internal significates, while the low intercorrelation of items on the remaining dimensions may be due to the high stimulus control of external significates. It seems reasonable to assume that two nominal categories important to the classification of modifier signs are the external-internal (afferent-efferent) dichotomy of significates associated with those signs. In order to make this distinction we will require significantly high percentage of independent inter-coder agreement on the nature of the significates referred to by the signs. Thus, an afferent modifier sign is a sign whose significates can be sensed, directly or indirectly, by the five senses; an efferent

modifier sign is a sign whose significate is an internal state of affairs, and cannot be touched, smelled, seen, heard or tasted. An example of an afferent modifier sign would be "black," or, "hot." An example of an efferent modifier sign would be "good," or, "democratic." An extension of the definition of what is meant by modifier is postponed until a discussion of subject signs and connectors is made.

2. Subject Signs. Rokeach and Rothman (1965) discussed what they called "CS units;" that is, the linking together of subjects (S) with characterizations (C). They were recursively defined, with subjects being those words capable of being characterized. This general approach has been used in much research, with subject signs being those concepts measured, such as attitudinal objects in the semantic differential, while the polar adjectives represent the characterizations applied to the concepts. While this is what is usually meant by "subjects," the term subject sign needs a more specific definition since we are generally concerned with continuous discourse. By subject signs, we mean those words in a continuous discourse message that are substantives or complements of verbs (Roberts, 1954). Stated another way, they are the subjects and the objects of verbs, the rationale for which will be discussed later under modifier signs as limiters.

As in the case of modifier signs, subject signs can also be directly or indirectly experienced; they can be

afferent or efferent. However, we can also identify subject signs as being things or places as opposed to people or groups of people. Such a sign may refer to one's self, a specific other person or group, generalized and unspecific other persons, or in the communication event--the other-receiver(s) person. Thus we can categorize subject people signs as having referents to self (source) signs (S-S), specific other signs (A-O), generalized other signs (G-O), and receiver (target) other signs (T-O).

3. Unit Signs. As was pointed out earlier, Rokeach and Rothman note that a characterization and its subject form a CS unit. Since it is considered to be of theoretic interest here to make the distinction between syntactical relationships within a unit and syntactical relationships between units, it is necessary to use the term "unit signs." A unit sign has as its elements a subject sign and all of the modifier signs directly or indirectly related to it. Thus, the "beautiful girl" statement is a unit sign which has as its elements a subject sign, "girl," and a modifier sign, "beautiful." Every unit sign must have a subject sign but does not require, though it may have, a modifier sign associated with it. When a unit sign has no modifiers it is termed a "primitive unit sign (SlP)." When the unit sign includes one or more modifiers, it is termed a "defined unit sign (SlD)."

4. Connectors. Very little research has been done in which the nature of connectors of signs has been

explored. Osgood's (1959) Evaluative Assertion Analysis was concerned with internal responses to connectors, but not with the nature of the syntactical structure beyond associative or dissociative relations. Following Osgood, a research project is presently underway at Michigan State University in an attempt to measure the evaluative meaning of verbs. At this time, no results have been reported. In another study previously cited (McEwen, 1969), the use of subjunctive and indicative moods of verbs was experimentally manipulated in messages, with the assumption that subjunctives are less intense than indicatives. As previously noted, we can conclude we do not have an adequate classification system for connectors, although the importance of them is pointed out in an explication of the Whorfian Hypothesis by Joshua A. Fishman (1966).

J. P. Guilford (1967), in an explication of his theoretical notions on human intelligence, has articulated at least some of the problems in getting such a classification. In his discussion of the relationship between logic and psychology, he notes:

Psychology is an empirical science, one of whose aims is to describe in terms of general principles or laws what actually happens when individuals think. Its approach is that of observation and induction; its operation is mainly cognitive; it seeks to understand. Formal logic, on the other hand, is not an empirical science. Like mathematics, it starts with axioms, statements that it assumes to be true, and it aims at sets of rules for thinking whereby it is possible to determine whether the inferences are true or false (p. 246).

psychol. Guilford's statements seem to be made in the context of formalization--or lack of it--in psychological theory. He argues that before formal logic can be "fully" applied to psychology there must be a stating of psychological events in terms of propositions. He notes that not every statement is a proposition, but that only those that can be either true or false. He says:

A proposition cannot even be partly true and partly false, for logic operates under the principle of the excluded middle; in the excluded middle, part truths dwell. This poses a problem that has to be overcome or circumvented, or it leaves us with a limited application of logic to psychological events. Piaget points out other difficulties. He comments that even much of the usual thinking of an adult is unformalizable in logical terms. Only mathematical thinking is completely formalized. In normal thinking, genetically, propositions come first and axioms last, just in reverse order to that of logic. Furthermore, systems of information do not lend themselves to step-by-step treatment such as is characteristic of logic (p. 247).

While it may be true that psycho-logic events in continuous discourse are not easily reducible to formalized relationships, the relationships identified in logic--without competency or logical validity requirements associated with the use of truth tables--can be used in uncovering of how humans relate a sign to another sign. As has been pointed out before, we have no way of verbalizing referents of "more," or the superlative modifier "most." It is also excepted by the use of signs. Further, it seems to this writer that logical relationships in a philosophical context compared to logic in a psychological context are similar to the linguistic-psycholinguistic distinctions. Philosophy and the relationship between the relationships are adequate or not; unit signs is a "more-than" relationship.

psychology looks at the relationships, without judgements of adequacy, and communication scholars are looking at the relationships in terms of their dyadic demands when two or more people interact in a communication exchange.

Assuming the communication scholar's interest in logic, the following list of possible relations or connectors is offered as defining the relationships between unit signs (i.e., a subject sign and its modifier(s) signs are related to other subject signs and their modifier(s) signs):

a. Equivalence comparison connectors (CE). These connectors denote that a unit sign is the same as another unit sign. It is operationalized as the use of any verb or verb phrase (typically the verb-to-be) such as "is," "was," "will be," as in the example, "Communists are atheists."

b. More-than comparison connectors (CM). These connectors denote that a unit sign has more of some attribute than another unit sign. Normally, this connector occurs in the context of a modifier sign applied to two different subject signs, but denotes that one subject sign has more of the characterization than the other subject sign. It is operationalized as the use of the comparison modifier of "more," or the superlative modifier, "most." It also is denoted by suffixes to a modifier such as "--er," or "--est." It can be seen in the sentence, "Jane is more beautiful than Sally." The unit signs are "beautiful Jane," and, "beautiful Sally," and the relationship between the unit signs is a "more-than" relationship.

The "less than" relationship is considered unnecessary to include as a separate connector, since the order of signs is not assumed to be relevant for this proposed analysis. If one were to say that Sally is less beautiful than Jane, it is the "mirror" meaning of the statement, "Jane is more beautiful than Sally." The meanings are the same, and by transformation, "less than" relationship can be represented by an inversion of unit signs to produce the "more than" relationship. We need only add to our operational definition, "less," and "least," as indicators of the more-than relation.

c. Subset comparison connectors (CS). These connectors denote that a unit sign is included within but not equivalent to another unit sign. It can be operationalized as the use of verbs such as, "belongs to," "is part of," where class relationships are denoted. It can be seen in the statement, "The army is part of the military complex."

d. Spatial comparison connectors (CP). These connectors denote that a unit sign is related, as though in space, in some way with another unit sign. It can be operationalized as the use of verb-type phrases such as "is in front of," "is on top of," "is to the left of," "is to the right of." It can be seen in the statement, "Conservatives are to the right of liberals." It is usually seen as a prepositional phrase which modifies a verb, and answers the question, "Where?"

on reflexive connectors (AR). These connectors show action of a unit sign, with no comparison for the

e. Time comparison connector (CT). These connectors denote that a unit sign is related, as though in time, in some way with another unit sign. It is operationalized as the use of verb-type phrases such as "George went to the store in the evening." It is usually seen as a prepositional phrase which modifies a verb, and answers the question, "When?"

(1) negative (2) dispo-
f. Existence comparison connectors (EXT). These connectors denote the existence of a unit sign, and is operationalized as the use of the verb-to-be such as "is," where a demonstrative pronoun is related to a unit sign as in the sentence, "There is a book."

g. Descriptive comparison connectors (ADJ). These connectors denote the description of a unit sign, and are operationalized as the use of the verb-to-be such as "is," where a unit sign is related to a predicate adjective as in the sentence, "The book is red."

h. Action transitive connectors (T). These connectors differ from the comparison verbs in that they show action. They are transitive action connectors if they show action going from one unit sign to another unit sign. Stated another way, it is a verb which has both a subject and an object, and shows action as in the statement, "George dropped the ball." They are operationalized as the appearance of any transitive verb--past, present, or future.

i. Action reflexive connectors (R). These connectors show action of a unit sign, with no complement for the

connector denoted (a subject of the verb, but no object of that verb). This can be seen in the statement, "George was dropped," and is operationalized as the appearance of any intransitive verb--present, past, or future.

In addition to the categories just described, there are three general classes of connectors which can be applied to all of the relationships just presented (a-i):

(1) negations (N), where any of the comparison or action connectors is a negated relationship, and is operationalized as the presence of the adverb, "not," such as in the sentence, "Jane is not more beautiful than Sally," or by the use of such prefixes as "dis--," "un--," etc.; (2) dispositionals (S), where any of the comparison or action connectors is a dispositional relationship such as in a disposition to act or be related, but not necessarily so. Dispositionals are operationalized as the presence of any words in a connector which show a subjunctive relationship, such as "might be--," "could be--," "may be--," etc., and (3) tenses, where any of the comparison or action connectors can be in the past (PA), present (PR), or future (FU) relationship. Tenses are operationalized as the tense of the verb (simple tense), and excludes distinctions dealing with perfect and plu-perfect tenses.

5. Modifier signs as limiters. It seems reasonable to assume initially that when a person uses a modifier sign in relation to a subject sign, it has been perceived by that person as relevant. The proper question appears to be: What is the syntactic function of modifiers in relation to

a subject sign. This is a broader question than that asked by Osgood's congruity principle or Rokeach's belief congruence principle. We can look, for example, at the limiting relationship that occurs when a modifier is associated with a subject sign. Consider the following:

1. All men are mortal.
2. Some men are mortal.
3. Evil men are mortal.
4. Black men are mortal.

In every case above, we can view modifiers in set theoretic notions as limiting words which change the meaning of the subject sign, "men." "Black men," is not "all men."

We can also note this same function when prepositional phrases are used. Consider these examples:

5. The winter in Florida is beautiful.
6. The summer in Florida is beautiful.

In each of these two cases, the modifiers are limiting words, so that Florida is a limiting word on winter in sentence 5. It is not the same as saying, "The winter is beautiful," or, "The summer is beautiful."

We also can distinguish between modifiers that limit the meaning of other modifiers, or of connectors. The following examples illustrate:

7. The innately beautiful Jane won the contest.
8. Jane walked beautifully.

In each of these two cases, a modifier functioned as a limiter of another word, different from the previous six

examples. In the seventh sentence, "innately" is a limiter of the word "beautiful"--also a modifier, and the two modifiers together with Jane form a defined unit sign. "Innately" is usually classified as an adverb, as would "beautifully" be in sentence 8. However, sentence 8 demonstrates an adverb--"beautifully"--which limits the verb (connector) "walked," and forms a defined connector. The important conclusion is that modifiers have a limiting relationship to the words they modify, and that they can be used to modify subject signs directly, or modifiers of subject signs (indirectly), or connectors.

Because of theoretical concerns, and because not all possible meaning is going to be studied here, we would propose that all messages can be looked at in terms of subject signs and their modifier signs, forming unit signs (primitive or defined); unit signs connected to other unit signs, and connectors in terms of not only the categories previously listed, but modifiers associated with them. Prepositions, other than the denotative function they perform in showing whether a subject sign or a verb is being limited, are held out for separate analysis; articles such as "an," "a," and "the," are also held out. Further, since relative pronouns perform a similar role as do prepositions, they will be used to determine which modifiers belong with which subject signs or connectors, and then summed with interrogatives and demonstratives for separate analysis into a message category called "Other." All questions

(interrogatives) in a message will be treated as denoting subjunctive, or dispositional, relationships between unit signs. Finally, the function of demonstrative pronouns has been traditionally considered by grammarians as denoting the existence of a person, place, or thing (or a unit sign). Such existence may be general, such as in the sentence, "There is a book," and the existence of a book is affirmed. Existence also may be specific, such as in the sentence just described, where the person encoding the message is referring to location. In either case, the demonstrative pronoun is counted as previously stated. The unit sign is retained, and is considered theoretically as a special case of the use of a reflexive connector, although it will form a separate message variable for our analysis here.

Summary and Permutations of Message Variables

In order to crystallize the message variables for understanding and clarity, Table 1 on pages 39-40 shows the message variables to be identified for this study, and the definitions associated with them. In the following chapter on method of analysis, twenty variables derived from these basic variables will be added for analysis. The operational definitions provided in the previous section of this chapter, combined with the code book in Appendix A, represent the sources of data from which inferences will be made about cognitive states of the encoders.

TABLE 1.--Summary of message variables.

Variable	Measure	Definition
TOT-1	f	Total words encoded
SLP	f/TOT-3*	Total subject words which have no modifiers
SLD	f/TOT-3	Total subject words which have one or more modifiers
CLP	f/TOT-3	Total connectors which have no modifiers
CLD	f/TOT-3	Total connectors which have one or more modifiers
SL-A	f/TOT-3	Total subject words which are judged afferent
SL-E	f/TOT-3	Total subject words which are judged efferent
LS1-A	f/TOT-3	Total modifiers of subject words which are judged afferent
LS1-E	f/TOT-3	Total modifiers of subject words which are judged efferent
LC1-A	f/TOT-3	Total modifiers of connectors which are judged afferent
LC1-E	f/TOT-3	Total modifiers of connectors which are judged efferent
IPA	f/TOT-3	Total connectors which are indicative, past tense
IPR	f/TOT-3	Total connectors which are indicative, present tense
IFU	f/TOT-3	Total connectors which are indicative, future tense
ICE	f/TOT-3	Total comparison-equivalence connectors
ICM	f/TOT03	Total comparison-more/than connectors
ICS	f/TOT-3	Total comparison subset connectors
ICP	f/TOT-3	Total comparison spatial connectors
ICT	f/TOT-3	Total comparison time connectors
IADJ	f/TOT-3	Total connectors associating subject sign with adjective
IEXT	f/TOT-3	Total connectors associating subject sign with demonstratives
IT	f/TOT-3	Total action connectors which are transitive, indicative
IR	f/TOT-3	Total action connectors which are intransitive, indicative
SPA	f/TOT-3	Total connectors which are subjunctive, past tense
SPR	f/TOT-3	Total connectors which are subjunctive, present tense
SFU	f/TOT-3	Total connectors which are subjunctive, future tense
SCE	f/TOT-3	Total connectors which are subjunctive, comparison equivalence
SCM	f/TOT-3	Total connectors which are subjunctive, comparison more-than

TABLE 1.--Continued

Variable	Measure	Definition
SCS	f/TOT-3	Total connectors which are subjunctive, comparison subset
SCP	f/TOT-3	Total connectors which are subjunctive, comparison spatial
SCT	f/TOT-3	Total connectors which are subjunctive, comparison time
SADJ	f/TOT-3	Total connectors which are subjunctive, associating subject sign with an adjective
SEXT	f/TOT-3	Total connectors which are subjunctive, associating subject sign with a demonstrative
ST	f/TOT-3	Total connectors which are subjunctive, transitive
SR	f/TOT-3	Total connectors which are subjunctive, intransitive
NS ^{1p}	f/TOT-3	Total primitive subject words negated
NS ^{1D}	f/TOT-3	Total defined subject words negated
NIPA	f/TOT-3	Total negated connectors which are indicative, past tense
NIPR	f/TOT-3	Total negated connectors which are indicative, present tense
NIFU	f/TOT-3	Total negated connectors which are indicative, future tense
NICE	f/TOT-3	Total negated comparison connectors which are indicative, equating
NICM	f/TOT-3	Total negated comparison connectors which are indicative, more-than
NICS	f/TOT-3	Total negated comparison connectors which are indicative, subset
NICP	f/TOT-3	Total negated comparison connectors which are indicative, spatial
NICT	f/TOT-3	Total negated comparison connectors which are indicative, time
NIADJ	f/TOT-3	Total negated indicative connectors which associate a unit sign with an adjective.
NISXT	f/TOT-3	Total negated indicative connectors which associate a unit sign with a demonstrative pronoun
NIT	f/TOT-3	Total negated action connectors which are transitive
NIR	f/TOT-3	Total negated action connectors which are intransitive
NSPA	f/TOT-3	Total negated past tense connectors which are subjunctive
NSPR	f/TOT-3	Total negated present tense connectors which are subjunctive

TABLE 1.--Continued

Variable	Measure	Definition
NSFU	f/TOT-3	Total negated future tense connectors which are subjunctive
NSCE	f/TOT-3	Total negated comparison connectors which are subjunctive, equating
NSCM	f/TOT-3	Total negated comparison connectors which are subjunctive, more than
NSCS	f/TOT-3	Total negated comparison connectors which are subjunctive, subset
NSCP	f/TOT-3	Total negated comparison connectors which are subjunctive, spatial
NSCT	f/TOT-3	Total negated comparison connectors which are subjunctive, time
NSADJ	f/TOT-3	Total negated subjunctive connectors which associate a unit sign with an adjective
NSEXT	f/TOT-3	Total negated subjunctive connectors which associate a unit sign with a demonstrative pronoun.
NST	f/TOT-3	Total negated connectors which are subjunctive, transitive
NSR	f/TOT-3	Total negated connectors which are subjunctive, intransitive
NS1-A	f/TOT-3	Total negated subject words which are afferent
NS1-E	f/TOT-3	Total negated subject words which are efferent
NCLP	f/TOT-3	Total negated connectors which are primitive
NCLD	f/TOT-3	Total negated connectors which are defined
NLS1-A	f/TOT-3	Total negated subject word limiters which are afferent
NLS1-E	f/TOT-3	Total negated subject word limiters which are efferent
NLC1-A	f/TOT-3	Total negated connector limiters which are afferent
NLC1-E	f/TOT-3	Total negated connector limiters which are efferent
AO	f/TOT-3	Total subject words which refer to a specific person or group
GO	f/TOT-3	Total subject words which refer to unspecific persons or groups third person personal pronouns
S-S	f/TOT-3	Total subject words which refer to the source, i.e., first person personal pronouns
T-O	f/TOT-3	Total subject words which refer to the receiver, i.e., second person personal pronouns

TABLE 1.--Continued

Variable	Measure	Definition
NAO	f/TOT-3	Total negated subject words which refer to a specific person or group
NGO	f/TOT-3	Total negated subject words which refer to unspecific persons, groups, or third person personal pronouns
NS-S	f/TOT-3	Total negated subject words which refer to the source, i.e., first person personal pronouns
NT-O	f/TOT-3	Total negated subject words which refer to the receiver, i.e., second person personal pronouns
ART	f/TOT-3	Total articles
PREP	f/TOT-3	Total prepositions
OTH	f/TOT-3	Total other

* Derivation of this total will be explained in Chapter III.

Cognitive Variables, Demographic Characteristics

Five cognitive measures were chosen for analysis of their systematic relationship with the message variables previously described. Three of these variables--dogmatism, anxiety, and attitude--have been of general theoretic interest to communication scholars. Two other variables--spatial relationship abilities and vocabulary skills--were of interest to this researcher because of the intuitive belief they may be important in the kind of message variables described. In addition to these cognitive measures, four demographic variables were considered important--age, sex, level (freshman, sophomore, etc.), and school.

Dogmatism

Milton Rokeach (1960) has described a personality construct which he terms open- and closed-mindedness, or dogmatism. He defines dogmatism conceptually as having three dimensions: (1) a belief-disbelief system, which refers to the relative frequency of occurrence of a person's beliefs and disbeliefs; (2) a central-peripheral system, which refers to the relative frequency of occurrence of beliefs and disbeliefs based on authority, and (3) a time dimension, which refers to the relative frequency of occurrence of beliefs and disbeliefs in time--narrowness or broadness. Thus, a closed-minded person should have the following characteristics: (1) more beliefs than disbeliefs; (2) more beliefs and disbeliefs based on authority,

and (3) beliefs centered in one time--past, present, or future tense--to the relative exclusion of the other tenses. Rokeach (1960) reports a study which purports to test this third dimension. He reasoned that closed-minded people are highly anxious, and would be expected to have more of their beliefs and disbeliefs in the future tense, since that tense is supposedly more ambiguous. Attempts to cope with anxiety should involve a de-emphasis of the present, and instead handling anxiety with a preoccupation with the future.

It . . . follows that persons characterized as having relatively closed systems should manifest not only more anxiety but also more future-orientation than those with relatively open systems (p. 367).

Rokeach tested this notion, using responses on five TAT cards, and counting the frequency of occurrence of past, present, and future tense verbs. He then translated the scores into percentages of the total verbs for each tense. He reported no significant differences between open- and closed-minded persons on the frequency of past tense responses, but did report open groups consistently giving more present tense responses while closed groups consistently gave more future tense responses.

Rokeach has developed a 44-item Dogmatism scale, used in a considerable amount of research on dogmatism. Powell and Troidahl (1965) have reduced this scale to 20 items without losing too much reliability. The operational definition of dogmatism used in this study was the subject's score on the Powell-Troidahl scale.

Anxiety

The theoretic relationship between dogmatism and anxiety has already been suggested (Rokeach, 1960). Within the last three years, an anxiety measure in communication situations has been developed at Michigan State University as part of a project for desensitization to such anxiety. Test-retest reliabilities and split-half reliabilities have been reported (Nichols, 1969). Test-retest on 769 subjects was .83 over a 10-day interval, while split-half reliabilities were reported at .92. Our operational definition of anxiety is that 20-item, Likert-type scale of anxiety used at Michigan State University.

Attitude

Numerous measures of attitude exist in the field, many perhaps better than the one chosen for this study. However, the type of analysis of attitude chosen allows ease in analyzing separately direction and intensity. The measure chosen was that of Louis Guttman and Edward A. Suchman (1947). Direction of attitude is operationally defined as a check-mark response of "agree," "disagree," or "undecided." Intensity of attitude is measured as the response to a second question, "How strongly do you feel about this?" Rated from one to four, the possible responses were: 1--Not at all strongly; 2--Not so strongly; 3--Fairly strongly, and 4--Very strongly. Although Guttman and Suchman developed the scale to look at intensity and a zero

point for attitude analysis, the authors concluded it was usable, but report no reliability scores. They also report a study they conducted (no data in the article) which concluded certain personality characteristic inferiority, hypomania, psychopathic deviate, and depression) were significantly correlated with their measure of intensity. They add:

This suggests a rich field of exploration of the role that personality traits play in attitudes and opinions on political, social, and economic matters, and from a methodological point of view in determining respondents' verbal habits and modes of expression (p. 67) [underlining added].

Spatial Relationships and Vocabulary Skills

Two interesting ability variables--spatial relationship and vocabulary skills--are suggested from some of the research of J. P. Guilford (1959, 1967) related to his structure of intelligence model. He has sought to develop, largely through factor analytic procedures, the dimensions of intellectual abilities. He denotes five: (1) cognition, which is the means of discovery or rediscovery or recognition; (2) memory, which he defines as retention of what is cognized; (3) convergent thinking, which he defines as the "convergence" of diverse information for the purpose of achieving a "right" answer, or at least the recognized "best or conventional answer;" (4) divergent thinking, which he considers to be the different directions one can

go in thinking, and (5) evaluation, which are the decisions one makes as to the goodness and correctness of what he knows.

John W. French, Ruth B. Ekstrom and Leighton A. Price have prepared what they term a "Kit of Reference Tests for Cognitive Factors, 1963 Revision," which is the result of factor analysis of about 100 tests of cognitive abilities. Many of these tests have been developed by Guilford as part of his intelligence model. Based on factor analysis of total scores (not item analysis), French, et al., claim twenty-four factors emerge, among them such ability dimensions as spatial reasoning, induction, semantic spontaneous flexibility, verbal comprehension, syllogistic reasoning, semantic redefinition, and general reasoning. No data on reliability and validity are available. Nevertheless, two of the variables used in this study are those of Spatial Reasoning, and a Wide Vocabulary Test (10-16). It was believed this study could attempt to look at the relationship between these measures and the message variables being analyzed subject to the limitations of inadequate reports on reliability and validity. Since scoring procedure varies in these types of tests, and no recommended scoring procedure is provided by French, this study followed the suggestion of Guilford (1954); separate scores of the number correct and incorrect were obtained, each analyzed as a separate variable.

Hypotheses

The legitimacy of constructing hypotheses in a study which uses one sample, and analyzes the data on the basis to be described in Chapter III is generally conclusive: research hypotheses in this design are not testable. This is a descriptive study, intended to generate hypotheses. No experimental manipulation is taking place. Therefore, the hypotheses offered here cannot be confirmed or rejected without a comparison of two or more samples.

It is also important to note that scores of hypotheses could have been chosen for analysis, but only five were selected. These five were chosen on the basis of theoretic significance, and the conceptual similarities of the category system presented here with previous studies.

With the above stated caution and limitation, the following hypotheses are offered:

- H₁: The relative frequency of occurrence of present (ClPR) and future tense verbs (ClFU) will explain significant variance ($p < .05$) variance in dogmatism and anxiety. A corollary hypothesis is that dogmatism and anxiety are significantly correlated ($p < .05$).
- H₂: The relative frequency of occurrence of verb negations (NC1) will explain significant variance ($p < .05$) in dogmatism and anxiety.
- H₃: Those subjects who hold different attitude intensity levels on the topic will show significant differences ($p < .05$) in the relative frequency of occurrence of defined connectors (ClD) and defined unit signs (SlD).
- H₄: The relative frequency of occurrence of comparison verbs (COMP) will explain significant variance ($p < .05$) in spatial reasoning.

- H₅: The relative frequency of occurrence of subject (Sl) and limiter (L) words will explain significant variance ($p < .05$) in verbal skills.

The first hypothesis is based on the theoretic statements of Rokeach, previously discussed. The second hypothesis is based on the theoretic statements of Rokeach, where beliefs and disbeliefs are operationalized as the relative frequency of occurrence of what one believes and what one does not believe. Specifically, negations should be correlated with open-minded persons, while non-negations should be correlated with closed-mindedness.

The third hypothesis is based on the conclusions of Guttman and Suchman, with the extension that the more intense a person holds his attitude, the more concerned he is that the receiver will understand what he says. A high frequency of occurrence of limiters is believed to be a verbal expression of high concern on the part of the source that his message be understood, while a low frequency of occurrence of limiters is believed to be a verbal expression of low concern on the part of the source that his message be understood.

The fourth hypothesis is related to Guilford's definition of cognition of transformations in his Structure of Intellect model. He defines transformations as follows:

Transformations are changes of various kinds, of existing or known information in its attributes, meaning, role, or use. The most common transformations in figural information include changes in sensory qualities and quantities, in location and in arrangement of parts (p. 100) [underlining added].

It would appear that differential abilities to move objects or symbols of objects in space may be reflected in verbal behavior of a similar type. Comparison verbs, as previously outlined, refer to equating, spatial, time, more-than, and subset relations. All or part of these verb patterns may be related to the differential abilities of subjects in the sample as measured by the spatial reasoning test.

The fifth hypothesis is related to some of the previous research in content analysis. The TTR (Type-Token Ratio), which was determined by the number of different words found in samples of standard length, was found by Johnson (1944) to differentiate between authors. One of the possible variables that differentiates sources is the vocabulary skill that a source has. A roughly similar measure of vocabulary skill would be the number of content words appearing in a text, counting redundancies. Content words can be defined as both subject words and limiters in the message variables previously described. Different from TTR, this measure would include totals regardless of redundancies.

Conclusion

This chapter has presented a theoretic rationale for the study of syntactical meaning, providing categories for the analysis of a sample of messages. Five cognitive measures and four demographic variables have been presented, all intended to "systematically and objectively identify specific

characteristics of a sample of messages for the purpose of making inferences about certain antecedent mental characteristics of the sources."

Five "hypotheses" were offered, although these hypotheses are not testable from one sample. However, based on the type of data analysis to be offered in the following chapter, we can make informal predictions about which variables will explain significant variance compared to those which will not. Although many hypotheses could have been made, the five chosen were justified on the basis of theoretic formulations already extant in the field.

Chapter III will present a step-by-step procedure for analysis of the data, leading to a multiple regression analysis of message variables against the criterion measures of dogmatism, anxiety, vocabulary skills, and spatial relation abilities.

CHAPTER III

METHOD OF ANALYSIS

The purpose of this study is to determine, through multiple regression and analysis of variance techniques, what subset of the 100 message variables covary with specified cognitive structures and certain demographic characteristics of the sample. Eighty of the message variables were presented in Table 1. In addition, 20 mathematically derived variables were obtained from the basic 80, and are summarized in Table 4. Since little is known about the distribution of these message variables, considerable attention was given to the assumptions of multiple regression analysis.

This chapter will outline: (1) the procedures for gathering data, including characteristics of the sample taken; (2) the coding, scoring, and tag consistency of message data; (3) a description of the 20 derived variables, and (4) the procedure for data analysis.

Sampling Procedure, Description

In the fall of 1969, a random sample of 114 subjects from the basic speech course at Grand Rapids (Michigan)

Junior College received a public opinion survey. This survey included measures of attitude, dogmatism, anxiety, vocabulary skills, and spatial relationships abilities.

Grand Rapids Junior College had an enrollment of 5,283 students in the fall of 1969, with 22 sections of the basic speech course. Although the course is not required, approximately 50 per cent of the student body take the course.

Six classes were chosen to complete the survey, all taught by one instructor. The instructor was new to the school, thus allowing for the assumption that no student self-selected himself into the classes on the basis of prior knowledge of the instructor. Two subjects did not complete the questionnaire, leaving a sample of 112 for the first survey.

Three weeks later, the same students were asked to complete another public opinion survey, which included an attitude measure and a topic for a persuasive speech. Fourteen subjects were absent, leaving a sample size of 98 for final analysis. The following instructions were given:

Write the most persuasive speech you are able to do on the following topic, taking the position you favor most. You have 20 minutes to write. Write as though you were to give this speech before an audience that has many different positions on the topic.

The topic chosen was, "Public Aid to Non-Public Schools." It was chosen as that topic, among five pre-tested, which best fit a theoretically expected distribution. The attitude measures taken at the second survey included the topic

chosen along with three others, used as masks. Debriefing followed the week after the last measure was obtained.

Attitude Concepts

Guttman and Suchman (1947) argue that attitude has at least two dimensions--direction and intensity. They explain that attitude direction should take the form of a U-shaped curve, i.e., a high frequency of occurrence of subjects who agree and disagree, with a relatively low frequency of occurrence of subjects who are undecided. In addition, attitude intensity, when plotted against frequency of occurrence, should produce an ascending line, with low intensity producing the lowest frequency of occurrence, and high intensity producing the highest frequency of occurrence.

In order to determine on the basis of the two criteria stated above which topic would be most appropriate for analysis, five concepts were chosen for measure on the first survey. Figures 1 through 10, which plot attitude direction and intensity for each topic against frequency of occurrence, show the observed frequencies occurring on the first test. (Solid lines on Figures 7 and 8 are the pre-test distributions; dashed lines are post-test distributions.) Topic 4 generally conformed to the theoretically expected frequencies, as demonstrated by the U-shaped curve of attitude direction and the ascending curve of attitude intensity.

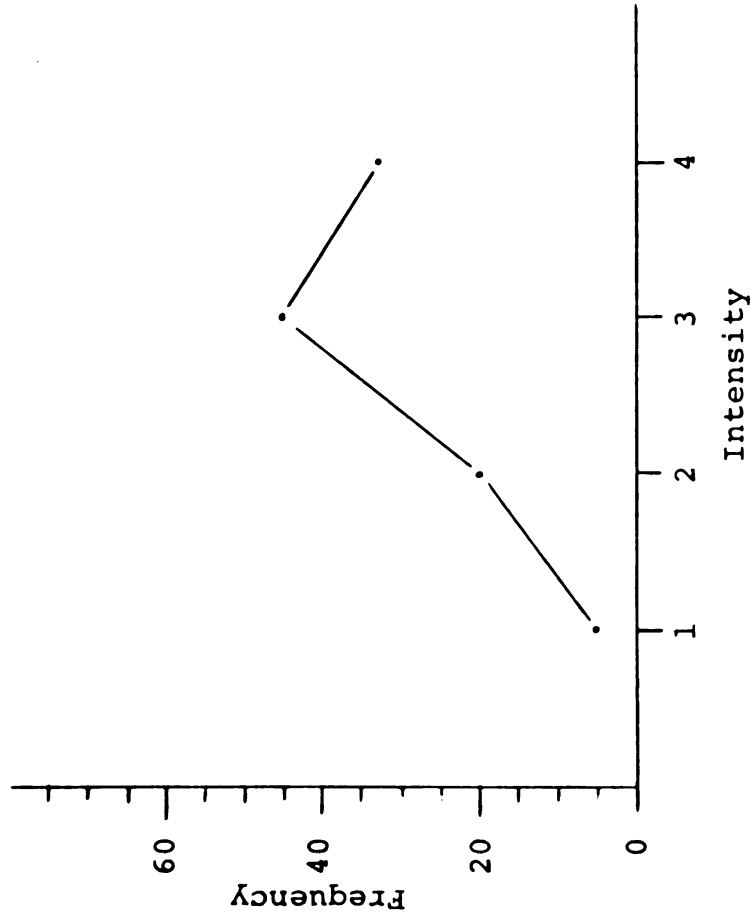


Figure 2.--Frequency Distribution:
Attitude Intensity
Topic 1

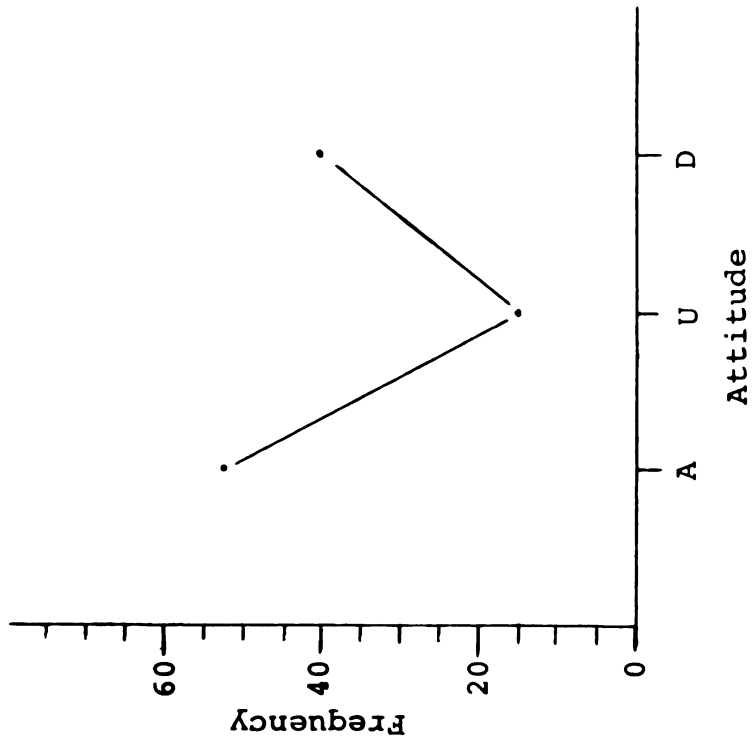


Figure 1.--Frequency Distribution:
Attitude Direction
Topic 1.

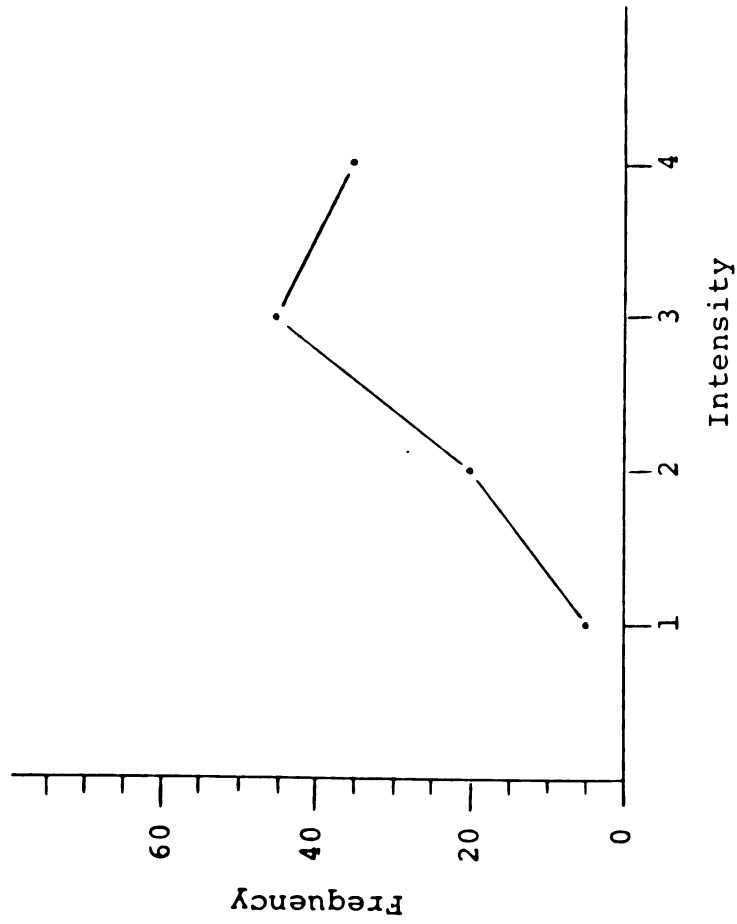


Figure 4.--Frequency Distribution:
Attitude Intensity
Topic 2

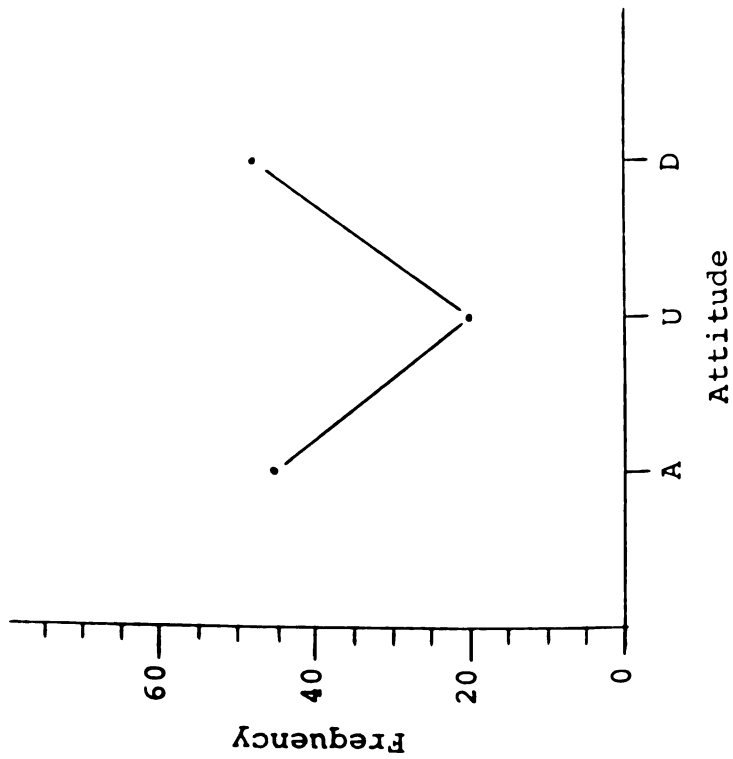


Figure 3.--Frequency Distribution:
Attitude Direction
Topic 2

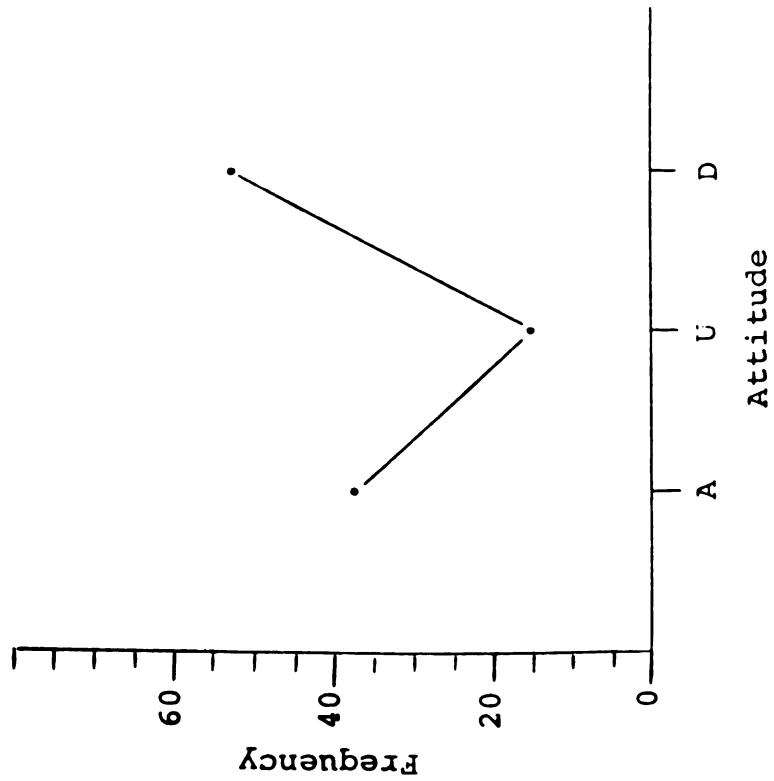


Figure 5.--Frequency Distribution:
Attitude Direction
Topic 3

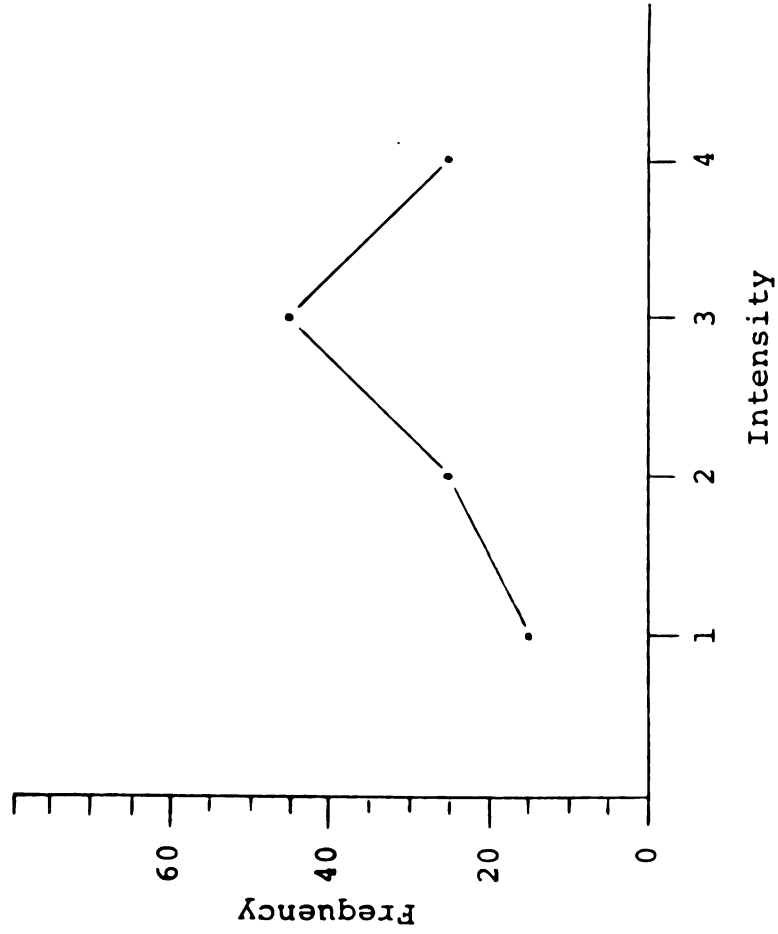


Figure 6.--Frequency Distribution:
Attitude Intensity
Topic 3

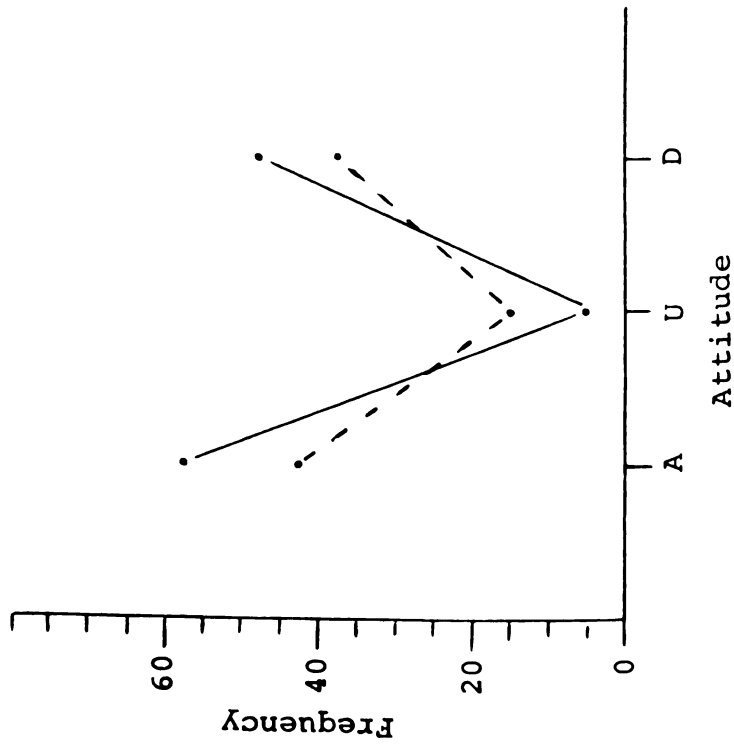


Figure 7.--Frequency Distribution:
Attitude Direction
Topic 4

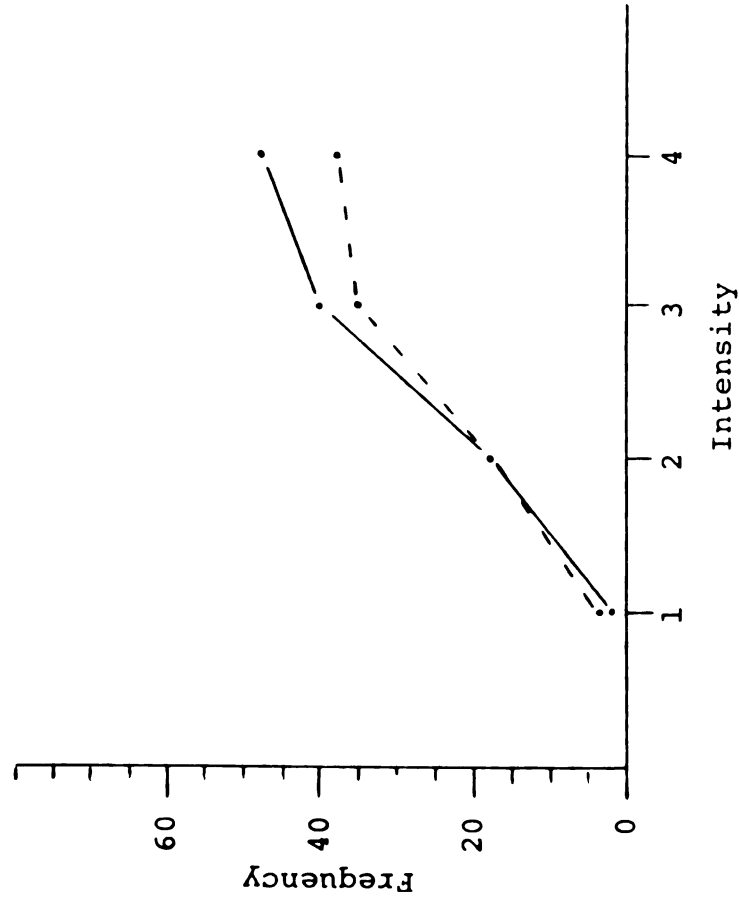


Figure 8.--Frequency Distribution:
Attitude Intensity
Topic 4

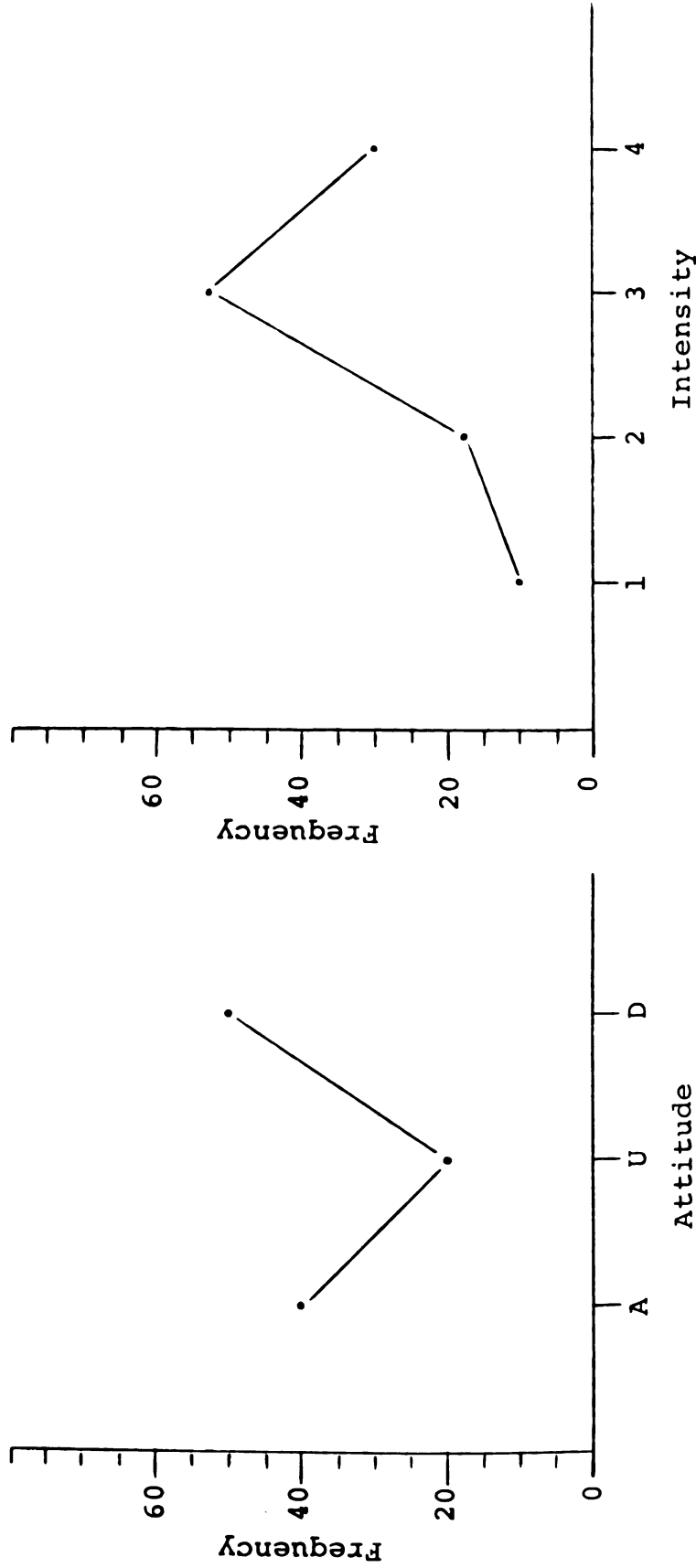


Figure 9.--Frequency Distribution:
Attitude Direction
Topic 5

Figure 10.--Frequency Distribution:
Attitude Intensity
Topic 5

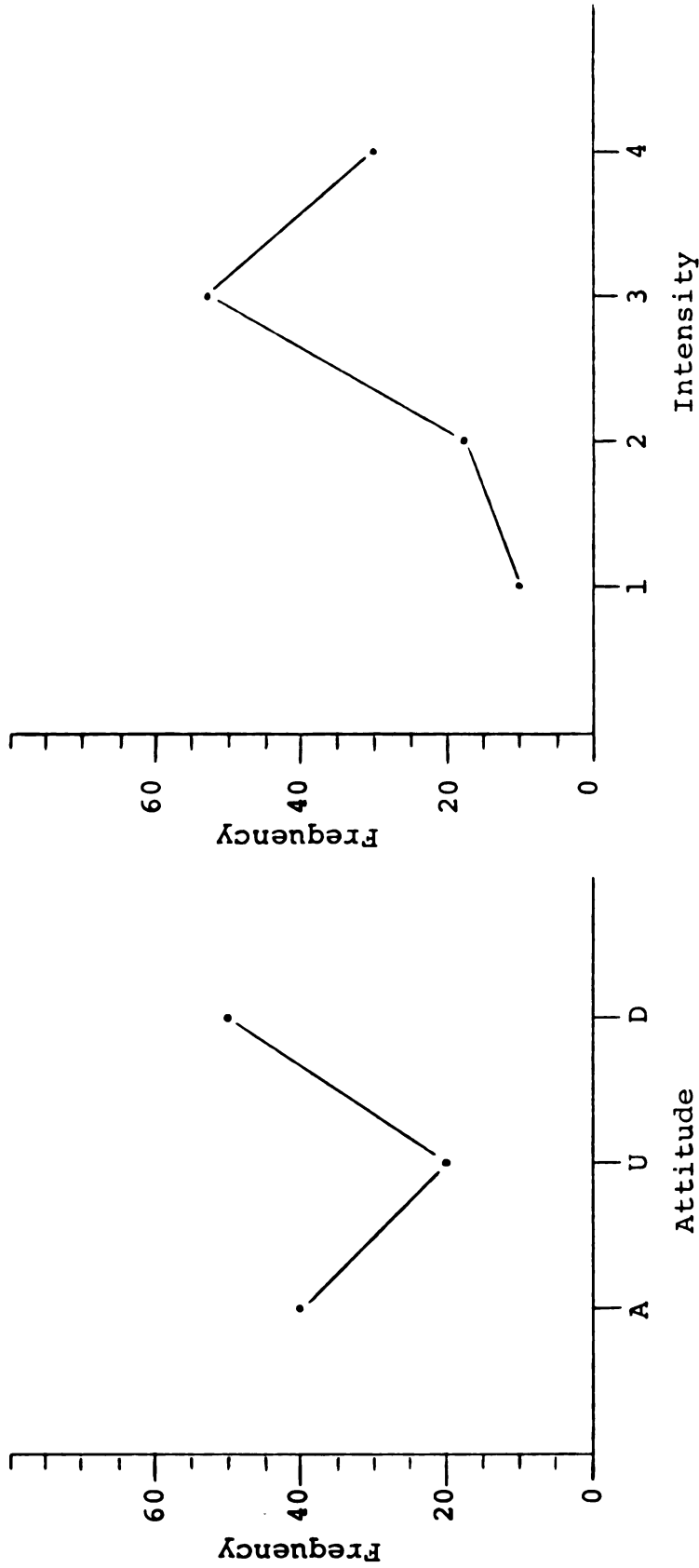


Figure 9.---Frequency Distribution:
Attitude Direction
Topic 5

Figure 10.--Frequency Distribution:
Attitude Intensity
Topic 5

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Tables 2 and 3 present the summaries of the pre-test frequency distributions for both attitude direction and intensity (N=112).

TABLE 2.--Summary of frequency distribution: attitude direction. (N=112)

Direction	Topics				
	I	II	III	IV	V
Agree	54	44	40	59	40
Undecided	16	22	17	5	20
Disagree	42	46	55	48	52

TABLE 3.--Summary of frequency distribution: attitude intensity. (N=112)

Intensity	Topics				
	I	II	III	IV	V
4	34	46	25	50	31
3	48	44	45	42	54
2	24	22	25	18	19
1	5	7	17	2	8

The five concepts included in the first survey were: (1) Do you believe the United States should withdraw all military troop assistance to South Viet Nam? (2) Do you believe Senator Edward M. Kennedy's recent involvement

in the fatal accident disqualifies him for President of the United States? (3) Do you believe churches in general are too involved in politics? (4) Do you believe public aid to non-public schools should be prohibited? and (5) Do you believe the current college student protests are justified? Measures of direction and intensity were as outlined in the previous chapter.

On the second survey, prior to encoding, Topic 4 again was measured in order to insure that effects of time would be controlled. The dashed line of Figures 7 and 8 show the results of the second measure, with 44 subjects who agreed; 38 subjects who disagreed, and 16 who were neutral. Intensity levels show 3 subjects at 1; 18 at 2; 37 at 3, and 40 at 4. The scores generally conformed to the criteria, allowing for the post-test measure of attitude as appropriate for analysis.

Sex, Level, and Age

Since it was considered possible that sex, level, and age might be important independent variables explaining encoding behaviors, frequencies were obtained on the pre-test measure. Fifty-three males and 45 females comprised the final sample of 98 subjects in the study. Level was determined as the frequency of occurrence of freshmen, sophomores, juniors, and seniors. The sample included 30 freshmen, 64 sophomores, 3 juniors, and 1 senior. The latter two

levels were collapsed into the sophomore group for analysis of the data.

The range in age was from 17 to 45, with the modal age being 18. Eleven students were 17; 48 were 18; 21 were 19; 4 were 20; 1 was 21; 6 were 22; 2 were 23; 2 were 24; 2 were 25; 1 was 30, and 1 was 45. Age variables retained for analysis were 17 (N=11); 18 (N=48); 19 (N=21), and 20+ (N=18).

School

Based upon an interview with college officials prior to gathering of the data, it was discovered that Grace Bible College--a four-year, non-accredited, religious institution in the Grand Rapids area--had a significant number of students attending classes at Grand Rapids Junior College. Because of possible bias in the sample, each subject was asked which college he attended. Of the final sample, 28 students reported they also attended Grace Bible College, and 70 students said they attended only Grand Rapids Junior College. Since this variable could prove important in the results of the study, the distinctions were retained for analysis.

Coding and Scoring of Message Data

Seven major stages in the coding of message data were followed sequentially to insure all words would be tagged. In addition, an internal consistency check was

made. Messages were typed from the original handwritten manuscripts, maintaining the language as it was presented without making grammatical corrections. If a word was misspelled, it was corrected at the typewriting stage. For example, the word "thier" (sic) was corrected in order to reduce possible error in coding procedures.

Stage 1

Three coders independently tallied the total number of words encoded by each subject. Where tallies differed, coders were asked to recount. This variable became TOT-1, as described in Table 1.

Stage 2

Five coders consecutively tagged articles "a," "an," and "the," with the best estimate of the total articles used by a subject being that total tagged after the first coder, followed by the second, etc., made the appropriate tags. These were tagged as ART, specified in Table 1. The same procedures were followed for prepositions, conjunctions, interjections, interrogative pronouns, relative pronouns, and demonstrative pronouns. Prepositions were tagged as PREP, as described in Table 1. All other words tagged at this stage were counted as OTHER, as specified in Table 1. Any differences were resolved by the coders.

Stage 3

All words tagged in Stage 2 were masked out, with five coders instructed to tag all subjects and objects of verbs. These words were tagged as S1. In addition, coders tagged these words as having some kind of modifier (becoming S1d in Table 1), or no modifier (becoming S1P in Table 1). Differences were resolved by the coders.

Stage 4

After all words in Stages 2 and 3 were masked out, five coders were instructed to tag all adjectives, adverbs, and objects of prepositions. Prepositions were specially marked on this version of the manuscript to aid coders in identifying objects of prepositions. These words were tagged as limiters (L), with differences again resolved by the coders. In addition, coders determined which limiters modified verbs (LC1), and which modified subject words (LS1).

Stage 5

With all words tagged in Stages 2 through 4 masked out, the remaining unmasked words were assumed to be verbs or verb phrases. Coders tagged each verb (see Table 1 for summary) as action (both I and S), comparison (C), existence (EXT), or predicate adjective (ADJ). Further, these same verbs were coded as negation (N); past (PA), present (PR), or future (FU) tense; indicative (I) or subjunctive (S) mood, and transitive (T) or intransitive (R). Finally,

all verbs which were said to have a modifier were tagged as defined (D), with all others tagged as primitive (P). As before, differences were resolved by the coders.

Stage 6

Subject words (Sl) tagged at Stage 3 were extracted from the messages and, removing redundancies, were judged independently by five coders. They judged the words as to whether the objects to which they referred could be sensed (tasted, smelled, touched, heard, or seen) or not sensed. Words marked as sensed were coded afferent (Sl-A), while not-sensed words were coded efferent (Sl-E). An inter-coder agreement of 60 per cent was required as minimal for the dichotomous distinctions, according to the following formula:

$$\text{Intercoder Agreement} = \frac{\text{Summed Scores}}{2N}$$

where 3 out of 5 judges agreeing scored 0; 4 out of 5 agreeing scored 1, and 5 out of 5 agreeing scored 2. N was the total words judged. Subject words in the messages were then tagged as afferent (sensed) or efferent (not sensed), based upon the majority judgement of coders. Frequency of occurrence of such words for each message was calculated.

Stage 7

Limiters tagged in Stage 4 were extracted from the messages, and, removing redundancies, were judged as were the subject words in Stage 6 (LSl-A; LSl-E; LCl-A, and

LC1-E). The same intercoder agreement criterion and scoring procedure was used.

Internal Consistency

A critical concern of the researcher who uses content analysis is the internal consistency of his tags. Based upon the theoretic identification of three basic elements made in Chapter 2 (subject words, connectors, and limiters), equations were developed to determine inconsistencies in coder tallies. Internal consistency was said to hold if the following equations* for each message were true:

1. $f(S1) = f(S1P) + f(S1d) + f(NS1P) + f(NS1d)$
2. $f(S1) = f(S1-A) + f(S1-E) + f(NS1-A) + f(NS1-E)$
3. $f(C1) = f(C1P) + f(C1d) + f(NC1P) + f(NC1d)$
4. $f(C1) = f(IPA) + f(IPR) + f(IFU) + f(SPA) + f(SPR) + f(SFU) + f(NIPA) + f(NIPR) + f(NIFU) + f(NSPA) + f(NSPR) + f(NSFU)$
5. $f(C1) = f(IT) + f(IR) + f(ST) + f(SR) + f(NIT) + f(NIR) + f(NST) + f(NSR) + f(ICE) + f(ICM) + f(ICS) + f(ICP) + f(ICT) + f(IADJ) + f(IEXT) + f(NICE) + f(NICM) + f(NICS) + f(NICP) + f(NICT) + f(NIADJ) + f(NIEXT) + f(SCE) + f(SCM) + f(SCS) + f(SCP) + f(SCT) + f(SADJ) + f(SEXT) + f(NSCE) + f(NSCM) + f(NSCS) + f(NSCP) + f(NSCT) + f(NSADJ) + f(NSEXT)$
6. $f(L) = f(LS1-A) + f(LS1-E) + f(LC1-A) + f(LC1-E) + f(NLS1-A) + f(NLS1-E) + f(NLC1-A) + f(NLC1-E)$

*The symbols in these equations refer to the frequency of occurrence (f) of a message variable in which the code names of the variables are presented in Table 1.

Whenever any one of the above equations was not true, categories were retallied until the error was found.

Derived Variables

Recall that Table 1 presented 80 message variables. In addition to these variables, it was considered important to obtain 20 derived variables from these basic 80. A summary of the variables is found in Table 4. To give an example of how these variables were obtained, Variable RC1 was obtained by summing the frequency of occurrence of SR, NSR, IR, and NIR (see Table 1). Another example is the derivation of PRIM, which was obtained by summing S1P, NS1P, C1P, and NC1P.

Analysis

It will be remembered in Chapter I that questions were raised on the procedure for counting data, and what transformations should be used, if any, before analysis. Because most of the recent research (Stone, Dunphy, et al., 1966) has used a word index score, we chose to follow this precedence. It should be understood that this study will not be able to answer the question of which counting procedure--raw frequency or word index score--should be used. However, three variables--TOT-1, TOT-2, and TOT-3 (see Tables 1 and 4)--are raw frequency scores, and may give an indication of whether future studies, or this study, should be analyzed based on raw frequency data.

TABLE 4.--Summary of derived variables.

Variable	Measure	Definition
TOT-2	f	Total words encoded less the sum of articles, prepositions, and other
TOT-3	f	Total frequency of subject words, limiters, and connectors
COMP	f/TOT-3	Total frequency of comparison connectors
ACTC1	f/TOT-3	Total frequency of action connectors
IC1	f/TOT-3	Total frequency of indicative connectors
SC1	f/TOT-3	Total frequency of subjunctive connectors
TC1	f/TOT-3	Total frequency of transitive connectors
RC1	f/TOT-3	Total frequency of intransitive connectors
NC1	f/TOT-3	Total frequency of negative connectors
AFF	f/TOT-3	Total frequency of afferent subject words and limiters
EFF	f/TOT-3	Total frequency of efferent subject words and limiters
L	f/TOT-3	Total frequency of limiters
S1	f/TOT-3	Total frequency of subject words
CLPA	f/TOT-3	Total frequency of past tense connectors
CLPR	f/TOT-3	Total frequency of present tense connectors
CLFU	f/TOT-3	Total frequency of future tense connectors
PRIM	f/TOT-3	Total frequency of primitive subject words and connectors
DEFD	f/TOT-3	Total frequency of defined subject words and connectors
PC1	f/TOT-3	Total frequency of positive (non-negative) connectors
CI	f/TOT-3	Total frequency of positive and negative connectors

Following Stone, et al., the following word index transformation score was used:

$$\text{Word Index} = \frac{f(X)}{f(CT)}$$

where $f(X)$ is the frequency of occurrence of a tag divided by the total frequency of occurrence of all tags ($f(CT)$). The denominator was the TOT-3 score, which effectively equates 1 connector in 10 words with 20 connectors in 100 words.

It is not reasonable to assume that all the possible tags a researcher can derive are meaningful. It also is not reasonable to assume that one method of analysis is appropriate for all meaningful distinctions. The hypotheses have been formed in terms relevant for multiple regression and one-way analysis of variance. McNemar (1962) denotes that the assumptions of a multiple regression analysis are: (1) interval data; (2) normal distribution; (3) homogeneity of variance, and (4) linearity. These assumptions--in multiple regression analysis--apply both to predictor and criterion variables. In one-way analysis of variance, assumptions of intervality, normality, and homogeneity of variance are relevant.

Stone, Dunphy, et al. (1966) indicate that the intervality and homogeneity assumptions are justifiable, particularly when using a word index transformations. Based upon the studies they cite in relation to their work on the General Inquirer, it seems justifiable for the current data

to accept these assumptions. Both the assumptions of normality and linearity were considered to be critical for multiple regression analysis, and were checked.

Given these issues, the following step-by-step procedure for analysis and screening of variables was followed:

1. Any variable which had 0 frequencies for all subjects was eliminated before analysis.
2. If one-fourth of the subjects had 0 frequencies on a variable, it was eliminated before analysis.
3. Basic statistics were calculated for each remaining variable, with measures of kurtosis and skewness derived in order to determine whether the distributions were normally distributed or not (McNemar, 1962). Any significantly skewed, leptokurtic or platykurtic distributions ($p < .01$) were eliminated from multiple regression analysis.
4. For those variables retained from Step 3, and which were significantly correlated ($p < .05$) with any one of the four cognitive variables, etas were calculated to determine whether it was reasonable to assume the variables were significantly non-linear ($p < .01$).*

*None of the variables were retained for multiple regression analysis after Stage 3. Stage 4 procedures were done, and are reported in Appendix B. Stage 5 procedures were not done.

5. For those message variables retained after Step 4, a multiple regression analysis was obtained on each of the cognitive measures (dogmatism, anxiety, vocabulary skills, and spatial relationships abilities).*
6. A frequency distribution of variables retained from Step 2 was calculated, with judgements made as to the appropriateness of one-way analysis of variance. Median splits of the cognitive variables were obtained and, using them as independent variables, a one-way analysis of variance on all message variables (as dependent measures) was calculated. Age, sex, level, school, attitude direction, and attitude intensity also formed independent variables for analysis. A significant F was set at $p < .05$.

It will be noted that Step 6 implies less stringent requirements for normality of distribution than that required for multiple regression analysis. Justification for this procedure is based upon the Norton and Boneau studies (Lindquist, 1953) in which the robustness of analysis of variance was supported.

*Ibid.

Summary

This chapter has presented a sample description and procedure for analysis of the data used in this study. Scoring and coding of message data was explained, and a six-stage procedure for analysis of the data was outlined. Chapter IV will present the results of the analysis, with the summary, discussion, and suggestions for further study to be included in Chapter V.

CHAPTER IV

RESULTS

This chapter will have three main divisions. The first will report the inter-coder agreement scores of the afferent-efferent distinctions for subject words and limiters. The second section will present the results of the hypothesized relationships made in Chapter II. Finally, unhypothesized, but significant, results will be reported. Discussion of these results is delayed until Chapter V.

Afferent-Efferent Distinctions

Chapter III described the procedure for establishing the level of reliability of the afferent-efferent distinction, both for subject words and limiters. Inter-coder agreement for subject words was 66.11 per cent, with 509 words judged and a score of 673. Inter-coder agreement for limiters was 68.96 per cent, with 1,872 words judged and a score of 1,291. These percentages met the minimum

*Chapter III presented the formula for determining the level of inter-coder agreement, in which 3 out of 5 judges agreeing on a word was scored as 0; 4 out of 5 was scored as 1, and 5 out of 5 was scored as 2. These scores were summed (reported as "score" in this chapter), and were divided by two times the words judged.

requirement as specified in Chapter III, and allowed for the maintenance of the distinction in analysis.

Hypothesized Relationships

Thirteen variables were included in the hypothesized relationships made in Chapter II, with twelve of these variables submitted for analysis at Stages 1 and 2. The remaining variable--attitude intensity--did not require such procedures, since no assumption was being made as to its intervality, homogeneity, or linearity. Table 5 presents a summary of descriptive statistics of the variables, excluding attitude intensity. While all of these variables were not eliminated at Stages 1 and 2, only dogmatism and spatial abilities were not significantly skewed, leptokurtic, or platykurtic. Table 6 presents a summary of the results of simple correlations for the variables, none of which were significant ($p < .05$). It was concluded that multiple regression analysis was not appropriate, and therefore four of the five hypotheses as stated in Chapter II could not be tested. Hypothesis three still could be tested.

Based upon a frequency distribution for the message variables, a one-way analysis of variance was judged appropriate. All distributions were unimodal, with a curve which approached a bell-shape, although the variables were significantly skewed or kurtotic. As outlined in Stage 6 of analysis in Chapter III, median splits were obtained for dogmatism, anxiety, spatial abilities, and vocabulary

TABLE 5.--Summary of descriptive statistics: hypothesized variables.

Variable	Low	High	Mean	S.D.	Skewness	Kurtosis
Dog	35	109	74.03	14.54	-0.2030	3.0740**
Anx	32	86	58.98	11.99	0.0969	2.5444**
Spa.Rsg.	44	213	140.37	32.99	0.1540	2.7698
V. Skils	2	40	21.15	7.62	0.3750	3.0403**
ClPR	0	.1480	.0607	.0295	0.6731*	3.3571**
ClFU	0	.1430	.0295	.0241	1.5335*	7.2081**
ClD	.0400	.1760	.0959	.0255	0.2655*	3.1088**
SLD	.0640	.2500	.1456	.0375	0.1841*	3.0691**
COMP	0	.0520	.0187	.0133	0.6010*	2.8606**
Sl	.2170	.4440	.2967	.0468	0.6069*	2.9014**
L	.2250	.6030	.4528	.0680	-0.3979*	3.4441**

*Significant skewness, $p < .01$.

**Significant kurtosis, $p < .01$.

TABLE 6.--Summary of correlations: hypothesized variables.

Hypothesis	Variables	Correlation
H ₁	ClPR--Dog	-.06
H ₁	ClFU--Dog	-.06
H ₁	ClPR--Anx	.13
H ₁	ClFU--Anx	-.11
H ₂	NC1---Dog	.12
H ₂	NC1---Anx	.13
H ₄	COMP--Spa Rsg.	-.06
H ₅	S1--V.Skls	-.14
H ₅	L---V.Skls	-.16

skills. These variables became independent variables, with present (ClPR), future (ClFU), and negation (NC1) connectors as dependent variables. Other dependent variables included defined subject words (S1D), defined connectors (ClD), comparison connectors (COMP), subject words (S1), and limiters (L). Following are the results:

Hypothesis 1: The relative frequency of occurrence of present and future tense verbs will explain significant variance in dogmatism and anxiety. Based upon Stage 6 procedures, one-way analyses of variance were calculated with dogmatism and anxiety as independent variables. Anxiety and dogmatism were found to be significantly correlated

($p < .05$), as assumed in a corollary to this hypothesis in Chapter II. Correlation was .31. Tables 7 through 10 present a summary of the one-way analysis of variance, with no significant differences found.

TABLE 7.--Dogmatism; summary of one-way analysis of variance: present tense connectors (ClPR).

Source	df	SS	MS	F
Between	1	.0002	.0002	.24
Within	96	.0840	.0009	
Total	97	.0842		

TABLE 8.--Dogmatism; summary of one-way analysis of variance: future tense connectors (ClFU).

Source	df	SS	MS	F
Between	1	.0002	.0002	.26
Within	96	.0561	.0006	
Total	97	.0563		

TABLE 9.--Anxiety; summary of one-way analysis of variance: present tense connectors (ClPR).

Source	df	SS	MS	F
Between	1	.0002	.0002	.19
Within	96	.0840	.0009	
Total	97	.0842		

TABLE 10.--Anxiety; summary of one-way analysis of variance:
future tense connectors (ClFU).

Source	df	SS	MS	F
Between	1	.0004	.0004	.72
Within	96	.0558	.0006	
Total	97	.0562		

Hypothesis 2: The relative frequency of occurrence of verb negations will explain significant variance in dogmatism and anxiety. This hypothesis as stated could not be tested. However, Stage 6 procedures were used, with dogmatism and anxiety as independent variables, and negative connectors as the dependent variable. Tables 11 and 12 are summaries of the analyses, with no significant differences found.

TABLE 11.--Dogmatism; summary of one-way analysis of variance: negation connectors (NC1).

Source	df	SS	MS	F
Between	1	.0003	.0003	.69
Within	96	.0370	.0004	
Total	97	.0373		

TABLE 12.--Anxiety; summary of one-way analysis of variance: negation connectors (NC1).

Source	df	SS	MS	F
Between	1	.0004	.00044	1.15
Within	96	.0368	.00038	
Total	97	.0372		

Hypothesis 3: Those subjects who hold different attitude intensity levels on the topic will show significant differences ($p < .05$) in the relative frequency of occurrence of defined connectors (ClD) and defined unit signs (SlD). Stage 6 procedures were used with attitude intensity as the independent variable, and defined words (SlD and ClD) as dependent measures. Tables 13 and 14 are the summaries of the analysis, with no significant differences obtained.

Hypothesis 4: The relative frequency of occurrence of comparison verbs will explain significant variance in

TABLE 13.--Attitude intensity; summary of one-way analysis of variance: defined subject words (SlD).

Source	df	SS	MS	F
Between	3	.0003	.0001	.07
Within	94	.1359	.0014	
Total	97	.1362		

TABLE 14.--Attitude intensity; summary of one-way analysis of variance: defined connectors (C1D).

Source	df	SS	MS	F
Between	3	.0016	.0005	.80
Within	94	.0617	.0007	
Total	97	.0633		

spatial reasoning. Again Stage 6 procedures were used, with spatial reasoning as the independent variable, and comparison verbs as the dependent measure. Table 15 is a summary of the analysis, with no significant differences obtained.

Hypothesis 5: The relative frequency of occurrence of subject words and limiter words will explain significant variance in verbal skills. With Stage 6 procedures, verbal skills was used as the independent variable. Dependent measures were subject words and limiters. Tables 16 and 17

TABLE 15.--Spatial reasoning; summary of one-way analysis of variance: comparison connectors (COMP).

Source	df	SS	MS	F
Between	1	.00001	.00001	.08
Within	96	.01708	.00002	
Total	97	.01709		

TABLE 16.--Verbal skills; summary of one-way analysis of variance: subject words (S1).

Source	df	SS	MS	F
Between	1	.0023	.0023	1.07
Within	96	.2101	.0022	
Total	97	.2124		

TABLE 17.--Verbal skills; summary of one-way analysis of variance: limiters (L).

Source	df	SS	MS	F
Between	1	.0090	.0090	1.96
Within	96	.4391	.0046	
Total	97	.4481		

are the summaries of the analysis, with no significant differences found.

Unhypothesized Results

Based upon procedures for analysis outlined in Chapter III, no multiple regression analysis was performed. However, 40 message variables were judged appropriate for one-way analysis of variance, as specified in Stage 6 of the procedure. Appendix B reports three general tables: a summary of descriptive statistics of all variables surviving Stage 2; a summary of correlations, with etas for those

variables significantly correlated, and a summary of one-way analyses of variance of those variables judged adequately distributed. Of forty variables analyzed according to Stage 6, 54 significant differences were obtained out of 480 ANOVAS. The significant results will be reported here according to independent variable.*

Dogmatism

Low dogmatic subjects encoded significantly more words, regardless of which measure was used. Significance levels were beyond $p < .05$ for TOT-1 ($F=7.55$, $p < .007$); TOT-2 ($F=8.45$, $p < .004$), and TOT-3 ($F=11.20$, $p < .001$). However, high dogmatic subjects encoded significantly more articles (ART) ($F=7.63$, $p < .009$); significantly more indicative reflexive connectors (IR) ($F=7.45$, $p < .008$), and significantly more total reflexive connectors (RC1) ($F=7.99$, $p < .006$).

*Twelve variables were eliminated at Stage 1. They included: SCM, NS-S, NT-O, NA-O, NICT, NSCT, NSCS, NSCP, NIADJ, NIEXT, NSADJ, and NSEXT. Thirty-four variables were eliminated at Stage 2, and included: NGO, NLCl-E, NICS, NICP, NIR, NSPA, NSPR, NSFU, NSCE, NSCM, NST, NSR, NSl-A, NSl-E, NLSl-A, NLCl-A, SPA, SFU, SCE, SCS, SCP, SCT, SADJ, SEXT, NSlP, NSlD, NIPA, NIFU, NICE, NICM, ICM, ICS, ICP, and ICT. The remaining 54 variables were eliminated at Stage 3. Of these variables, fourteen were judged inappropriate for Stage 6 procedures. They included: IPA, IFU, ICE, ST, SR, NIPR, NIT, NC1P, NC1D, NLSl-E, T-O, A-O, IADJ, and IEXT. The forty variables judged appropriate for Stage 6 procedures included: TOT-1, SlP, SlD, ClP, ClD, SlA, SlE, LS1-A, LC1-A, LS1-E, LC1-E, IPR, IT, IR, SPR, S-S, G-O, ART, PREP, OTH, TOT-2, TOT-3, NC1, COMP, ClACT, IC1, SC1, TC1, RC1, Cl, AFF, EFF, L, Sl, ClPA, ClPR, ClFU, PRIM, DEFD, PC1. Keys to these variables may be found in Tables 1 and 4.

Anxiety

High anxious subjects encoded significantly more total reflexive connectors (RC1) ($F=5.28$, $p < .02$); significantly more total primitives (PRIM) ($F=4.85$, $p < .03$), and significantly less total defined words (DEFD) ($F=4.86$, $p < .03$). Low anxious subjects encoded significantly more total words using TOT-3 as the measure ($F=5.01$, $p < .03$); significantly more defined subject words (S1D) ($F=4.33$, $p < .04$), and significantly more efferent limiters of subject words (LS1-E) ($F=4.78$, $p < .03$).

Spatial Relationship Abilities

Those subjects who had high spatial relationship abilities encoded significantly more other (OTH) words ($F=5.73$, $p < .02$). This category included relative, demonstrative, and interrogative pronouns, as well as exclamations. Subjects with high spatial skills also encoded significantly more negation connectors (NC1) ($F=4.64$, $p < .03$). For total words, regardless of how they were measured, subjects who were low in spatial abilities encoded more TOT-1 ($F=4.59$, $p < .04$); more TOT-2 ($F=4.79$, $p < .03$), and more TOT-3 ($F=5.94$, $p < .02$).

Vocabulary Skills

Those subjects who had high vocabulary skills encoded significantly more TOT-1 ($F=6.89$, $p < .01$); significantly more TOT-2 ($F=6.15$, $p < .02$); significantly more

TOT-3 ($F=5.39$, $p < .02$); significantly more efferent subject words (Sl-E) ($F=3.96$, $p < .04$); significantly more indicative reflexive connectors (IR) ($F=4.23$, $p < .04$); significantly more prepositions (PREP) ($F=6.00$, $p < .02$), and significantly more total efferent words (EFF) ($F=5.96$, $p < .02$). However, those subjects who had low vocabulary skills encoded significantly more afferent subject words (Sl-A) ($F=12.41$, $p < .001$); significantly more generalized-other words (G-O) ($F=8.90$, $p < .004$); significantly more total comparison connectors (COMP) ($F=6.59$, $p < .01$), and significantly more total afferent words (AFF) ($F=8.29$, $p < .005$).

Attitude Direction

Eight significant differences were obtained in the encoding behaviors of subjects, when related to direction of attitude. Significant differences were obtained for primitive subject words (SlD) ($F=3.83$, $p < .03$); afferent subject words (Sl-A) ($F=3.64$, $p < .03$); indicative comparison equal connectors (ICE) ($F=6.89$, $p < .002$); prepositions (PREP) ($F=3.19$, $p < .05$); total comparison connectors (COMP) ($F=4.21$, $p < .02$); total efferent words (EFF) ($F=4.07$, $p < .02$); total limiters (L) ($F=3.11$, $p < .05$), and total primitive words (PRIM) ($F=3.64$, $p < .03$).

A Scheffe's t-test was used to selectively compare means of attitude directions in the above differences obtained. An F at $p < .05$ was used as the test of significance. Those who disagreed encoded significantly more

primitive subject words (SlP) than those who were undecided, but not significantly more than those who agreed. Those who disagreed encoded significantly more afferent subject words (Sl-A) than those who were undecided, but not significantly more than those who agreed. Those who disagreed encoded significantly more indicative comparison equal connectors (ICE) than either those who were undecided or those who agreed. Those who disagreed encoded significantly fewer prepositions (PREP) than those who were undecided but not significantly fewer than those who agreed. Those who disagreed encoded significantly more comparison connectors (COMP) than those who agreed, but not significantly more than those who were undecided. Those who disagreed encoded significantly fewer efferent words (EFF) than those who were undecided, but not significantly fewer than those who agreed. Those who disagreed encoded significantly fewer limiters (L) than those who were undecided, but not significantly fewer than those who agreed. Those who disagreed encoded significantly more primitive words (PRIM) than those who were undecided, but not significantly more than those who agreed.

Attitude Intensity

Only one dependent variable--subjunctive present tense connectors (SPR)--was found to be significant ($F=2.79$, $p < .05$), when attitude intensity was the independent variable. A check using Scheffe's t-test, however, showed that

low intensity subjects did not encode significantly more subjunctive present tense connectors than those subjects with higher intensity of attitude.

Level

Two message variables were found to be significant when level in college was the independent variable. Sophomores encoded significantly more generalized-other words (G-O) than freshmen ($F=4.79$, $p < .03$), and significantly more articles (ART) ($F=4.44$, $p < .04$).

School

Five message variables were found to be significant, when college--Grace Bible College or Grand Rapids Junior College--were the independent variables. Subjects who also attended Grace Bible College encoded significantly more primitive connectors (ClP) ($F=5.62$, $p < .02$); significantly more efferent subject words (Sl-E) ($F=9.55$, $p < .003$); significantly more articles (ART) ($F=9.61$, $p < .003$); significantly more action connectors (CACT) ($F=5.42$, $p < .02$), and significantly more primitive words (PRIM) ($F=4.82$, $p < .03$).

Errors in Spatial Abilities and Vocabulary Skills

Chapter II noted that in the absence of any recommended scoring procedure by French, errors in spatial relationships and vocabulary skills would be kept as separate variables. Ten significant differences were obtained, when

errors were used as an independent variable. Those who made high errors in spatial relationships encoded significantly more primitive connectors (ClP) ($F=5.05$, $p < .03$); significantly more afferent limiters of connectors (LC1-A) ($F=5.94$, $p < .02$); significantly more indicative comparison equal connectors (ICE) ($F=6.26$, $p < .01$); significantly more comparison connectors (COMP) ($F=8.90$, $p < .004$); significantly more subject words (S1) ($F=8.24$, $p < .005$), and significantly more total primitives (PRIM) ($F=4.73$, $p < .03$). Those subjects who made low errors in spatial relationships encoded significantly more prepositions (PREP) ($F=7.76$, $p < .006$); significantly more total reflexive connectors (RC1) ($F=4.72$, $p < .03$), and significantly more limiters (L) ($F=6.98$, $p < .01$). Those subjects who made low vocabulary errors encoded significantly more articles (ART) ($F=6.36$, $p < .01$).

Sex and Age

No significant differences were obtained with any of the message variables as dependent measures, when sex or age was the independent variable.

Summary

This chapter reported the pre-test results of the distributions of attitude direction and intensity, justifying Topic 4 as the best concept for analysis. Further, reliability scores of the afferent-efferent distinction were reported, demonstrating sufficient agreement between judges

to maintain the distinction. Multiple regression analysis was not used due to failure to meet criteria established in Chapter III. However, Stage 6 procedures were used. No significant differences were obtained on hypothesized relationships. However, 54 significant differences were obtained on relationships not hypothesized. Chapter V will present a discussion of these findings.

CHAPTER V

DISCUSSION

The discussion of the results of this study will be presented in four parts: (1) a summary of the rationale; (2) interpretation of the results; (3) evaluation of the syntactical theory of signs, both as to its theoretic importance and its place in the study of communication, and (4) recommendations for further study. No formal attempt will be made to explain the results in terms of theories associated with the cognitive structures. It is our concern here to see if a syntactical theory of signs is fruitful, and whether it justifies further study.

Summary of Rationale

One of the important assumptions in content analysis stated in Chapter I was that verbal behavior reflects to some degree the condition or state of affairs of the person encoding the message. An argument was presented for a quantitative and syntactical approach to the study of meaning. To make such an approach as meaningful as possible, a broad classification system of signs was considered desirable.

The descriptive system offered in this study included three basic elements: (1) limiters; (2) subject signs, and (3) connectors. Limiters were described as modifying either subject signs or connectors. In addition, they were said to be afferent (referring to objects that could be sensed through normal sensory inputs) or efferent (referring to objects that could not be sensed through normal sensory inputs, i.e., ideas or internal states).

Subject signs were also said to be either afferent or efferent in the same senses as limiters. In addition, subject signs were said to refer to people, which could be one's self (S-S)--the encoder, a specific other person or group (A-O), a generalized other person or group (G-O), or the receiver of the message (T-O). Unit signs were said to include a subject sign and any limiters of that sign. If a subject sign had at least one limiter, it was termed defined (SlD); if the subject sign had no limiter, it was termed primitive (SlP). The use of the term unit sign allowed not only for the above distinction, but a category system which allowed for the study of syntactical meaning, both within unit signs and between unit signs.

A quantitative, comprehensive study of connectors has been generally lacking in the field, as was pointed out in Chapter II. Borrowing from grammar, linguistics, and philosophy, a comprehensive system of between-unit sign syntactical relationships was offered in Chapter II. Termed connectors, these relationships were said to

include distinctions between indicative and subjunctive moods, transitive and reflexive, positive and negative, action and comparison, and, as with subject signs, primitive and defined.

If verbal behavior does reflect the condition or state of affairs of the person encoding the message, it was considered reasonable to assume that such cognitive variables as dogmatism, anxiety, vocabulary skills, spatial skills, and attitude should explain variance in the message variables. Initially, such relationships were posited in the form of multiple regression analysis with the acceptance of attitude. A relatively rigorous procedure was designed to determine the justifiability of such an analysis. The results, as stated in Chapter IV, indicated a multiple regression analysis was not appropriate. One-way analyses of variance were calculated, with 54 significant differences obtained out of 480 analyses. Since demographic characteristics were considered to be potential sources of variance in the message variables, these also were analyzed using Stage 6 procedures (Chapter III).

Five hypotheses--four multiple regression, and one analysis of variance--were presented in Chapter II, with no significant results obtained. It was pointed out, however, that hypotheses might not be appropriate for this study, but should rather be generated as the result of the study. The purpose of the study was not to examine

theories associated with the cognitive processes, but to determine the adequacy of the classification system and to develop hypotheses for future studies. The result is that reliability of these findings must await a replication of the study.

Interpretation of Results

In order to facilitate the goals of this study, an interpretation of results is offered by levels. Based upon the 40 message variables which were analyzed at Stage 6 and the 54 significant differences reported in Chapter IV, this procedure allows an informal comparison of information derivable from the classification system. The procedure begins with examination of the grossest distinctions in the classification system to the finest distinctions. To illustrate, we will ask if Level 2 procedure will evoke more information about antecedent characteristics of the source than Level 1.

Level 1 is concerned with the information yield of basic distinctions, including total words (TOT-1, TOT-2, and TOT-3), subject words (S1), limiters (L), connectors (C1), articles (ART), propositions (PREP), and other (OTH). (See Tables 1 and 4 for an explanation of what these variables include.) While the basic elements of the classification system are three [subject words (S1), limiters (L), and connectors (C1)], the total message corpus is comprised of these three elements and the frequency of

occurrence of articles (ART), prepositions (PREP), and other (OTH). It will be remembered that TOT-1 includes all words encoded regardless of classification; TOT-2 includes TOT-1 minus articles (ART), prepositions (PREP), and other (OTH), and TOT-3 includes the sum of the three basic elements of the classification system.

Level 2 is concerned with the yield of information obtained when we know more than simply the frequency of occurrence of subject words (Sl). For example, we might ask what new information is obtained if we know the relative frequency of occurrence of efferent subject signs (Sl-E) and afferent subject signs (Sl-A).

Level 3 is concerned with the yield of information obtained when we know more than the frequency of occurrence of limiters (L). For example, what new information is obtained if we know the relative frequency of occurrence of afferent limiters of subject signs (LSl-A) and efferent limiters of subject signs (LSl-E).

Level 4 is concerned with the yield of information obtained when we know more than the frequency of occurrence of connectors (Cl). For example, what new information is obtained if we know the relative frequency of occurrence of reflexive connectors (RCl) and the transitive connectors (TCl). Level 4 will include four variables which could not be analyzed at any of the previous levels because of their lack of mutual exclusivity of the variables. These include total afferent words (AFF), which include both

afferent subject words (Sl-A) and afferent limiters (LSl-A and LCl-A); total efferent words (EFF), which include both efferent subject words (Sl-E) and efferent limiters (LSl-E and LCl-E); total primitive words (PRIM), which include both primitive connectors (ClP) and primitive subject words (SlP), and total defined words (DEFD), which include both defined connectors (ClD) and defined subject words (SlD).

Level 1

Table 18 is an intercorrelation matrix of the nine elements which comprise the message corpus, including the three elements basic to the syntactical approach of this study. In general, it is reasonable to assume that the TOT-1, TOT-2, and TOT-3 scores are not independent. In addition, other (OTH) significantly covaries with TOT-3. Table 18 also shows that it is reasonable to assume that the three basic elements (Sl, L, and Cl) are independent of either of the TOT scores.* However, prepositions (PREP) significantly covary with all three basic elements, while articles (ART) significantly covary with only one of the basic elements (Cl), i.e., with prepositions (PREP).

Those variables which significantly covary should evoke the same information, i.e., a cognitive structure which shows significant differences on one message variable

*While a nonsignificant correlation is a necessary condition for independence, it is not sufficient. Therefore, caution is called for in this conclusion. McNemar (1963) notes other procedures necessary beyond a zero-order correlation before two variables can be judged independent. For this study, all statements of independence are subject to this qualification.

TABLE 18.--Intercorrelation matrix of level 1 variables.

	TOT-1	TOT-2	TOT-3	SL	CL	L	ART	PREP	OTH
TOT-1	1.00								
TOT-2	.99	1.00							
TOT-3	.96	.96	1.00						
SL	-.01	.05	-.01	1.00					
CL	.01	+.04	-.06	.25	1.00				
L	.05	-.01	.09	-.87	-.60	1.00			
ART	.08	-.01	-.15	.07	.25	-.09	1.00		
PREP	-.03	-.14	.04	-.54	-.31	.55	.20	1.00	
OTH	-.01	-.09	.32	-.04	.09	-.05	.00	.07	1.00

should show significant differences on those other message variables which covary with the first. In addition, consistent results should show the same pattern (direction of significance) of relative frequency of occurrence of variables which positively covary, while those variables which negatively covary should show the opposite pattern (significant differences in the opposite tail of the distribution). Where inconsistencies occur, it should be attributable to slight or moderate correlations.

Finally, one message variable can be said to evoke more information than another if the first variable orders more cognitive structures than the second message variable.

Results discussed in Chapter IV show that all five cognitive measures (dogmatism, vocabulary skills, spatial abilities, and attitude), the two error scores (vocabulary and spatial, and two demographic variables (school and level) yield information at this first level of interpretation. Significant differences were obtained between all three total word scores (TOT-1, TOT-2, and TOT-3) and dogmatism, vocabulary skills, and spatial abilities considered as the independent variables. These results were consistent as would be expected with such a high positive correlation between the variables (see Table 18). TOT-1 and TOT-2 yield the same information, while TOT-3 yields more information. Subjects who were low dogmatic encoded more TOT-1, TOT-2, and TOT-3; subjects who were high in vocabulary skills encoded more TOT-1, TOT-2, and TOT-3,

and subjects who were low in spatial abilities encoded more TOT-1, TOT-2, and TOT-3. However, low anxiety subjects encoded significantly more TOT-3 than high anxiety subjects. We can conclude that, based on the data for this sample, TOT-3 represents the best variable of the three.

Connectors (C1) evoked no information about the cognitive structures or demographic variables measured. This suggests that connectors (C1) is either an unimportant variable, or--as will be demonstrated later in Level 4--some identifiable subset of connectors is important.

Significant differences were obtained in the relative frequency of subject words (S1) when spatial errors was the independent variable. Subjects who made many spatial errors encoded significantly more subject words than subjects who made few spatial errors. Thus, this variable (S1) evokes different information from that of the previously discussed variables.

Limiters (L) produced significant differences when spatial errors was the independent variable. Subjects who made few spatial errors encoded significantly more limiters than subjects who made many spatial errors. This result, combined with the result obtained with subject words, suggests there may be differences in encoding behavior when errors in general are the independent variable. At this time, however, these results are difficult to interpret, since a theory of "errors" in test taking has not been explored.

Direction of attitude was also a significant predictor of differences in the encoding of limiters (L). Subjects who disagreed with the topic encoded significantly fewer limiters than subjects who were undecided, although not significantly fewer than subjects who agreed. We can generally conclude that limiters (L) evokes different information from either of the previously discussed message variables.

Three additional variables (PREP, ART, and OTH)--completing the elements of the message corpus--were analyzed. Subjects who made few spatial errors encoded significantly more prepositions; subjects who made many spatial errors encoded significantly more prepositions; subjects who had low vocabulary skills encoded significantly more prepositions, and subjects who disagreed on the topic encoded significantly more prepositions. These results were consistent, and prepositions (PREP) evoke more information than subject words (Sl) and limiters (L), but not more information than either of the total word scores (TOT-1, TOT-2, and TOT-3).

Subjects who made few vocabulary errors encoded significantly more articles (ART) than subjects who made many vocabulary errors. Also, high dogmatic subjects encoded significantly more articles than low dogmatic subjects. These results, however, evoke no new information. However, it was also found that subjects who

were sophomores encoded significantly more articles than freshmen, and subjects who attended Grace Bible College encoded significantly more articles than those who attended Grand Rapids Junior College only. While articles (ART) evokes more information, caution should be exercised since the level category of sophomores represents a collapsing of subjects who were juniors and seniors--all attending Grace Bible College, which is a four-year institution.

Figure 11 presents a summary of the information yielded with Level 1 interpretation procedures. It shows that at the most gross distinctions, eight of the nine message variables yield some information about all of the cognitive characteristics of the encoders, and two of the four demographic characteristics of the encoders. With all nine variables at Level 1 taken together, Figure 11 shows that total words encoded (TOT-3) elicits the most information--being related to dogmatism, anxiety, vocabulary skills, and spatial abilities. Prepositions (PREP) and limiters (L) provide information about the encoder's attitude direction; articles (ART), prepositions (PREP), limiters (L), and subject words (S1) provide information about errors in vocabulary skills or spatial abilities, and articles (ART) evokes information about level and school.

If this study had stopped at this point, we would have obtained little new information about messages.

DEMOGRAPHIC CHARACTERISTICS

COGNITIVE CHARACTERISTICS

Sex	Dogmatism TOT-1 TOT-2 TOT-3 ART	
	Anxiety TOT-3	
Age	Vocabulary Skills TOT-1 TOT-2 TOT-3 PREP	
	Spatial Abilities TOT-1 TOT-2 TOT-3 OTH	
Art Level	Attitude	Direction
	PREP	
Art School	L	Intensity
	Errors	Vocab.
	ART	
	PREP	Spatial
	L	
	S1	

Figure 11.--Summary of Level 1 Interpretation.

Researchers (see Chapter I) have known for some time that total words encoded, articles, and prepositions have been useful in inferring differences between encoders. This study, at this point, only adds to the validity of these findings with measures of specified cognitive and demographic characteristics of the source. The next three levels seek to provide more information about the encoder, and at the same time, help to determine the adequacy or inadequacy of the classification system.

Level 2

Table 19 presents an intercorrelation matrix of those message variables which were analyzed using Stage 6 procedures (see Chapter III). In general, it is reasonable to assume that afferent subject words (Sl-A), efferent subject words (Sl-E), source-specific words (S-S), generalized other words (G-O), primitive subject words (SlP), and defined subject words (SlD) are not independent of the total number of subject words (Sl). Only defined subject words (SlD) is independent* of afferent subject words (Sl-A), while defined subject words (SlD) and source specific words (S-S) are independent of efferent subject words (Sl-E). Only generalized other words (G-O) is independent of source specific words (S-S), and defined subject words (SlD) is independent of generalized other words (G-O). All results were consistent.

*Ibid.

TABLE 19.--Intercorrelation matrix of level 2 variables.

	S1	S1-A	S1-E	S-S	G-O	S1P	S1D
S1	1.00						
S1-A	.57	1.00					
S1-E	.25	-.51	1.00				
S-S	.20	.24	-.10	1.00			
G-O	.47	.70	-.22	-.12	1.00		
S1P	.70	.51	.08	.44	.32	1.00	
S1D	.31	.03	.21	-.33	.17	-.47	1.00

Of the seven message variables at Level 2, no significant information about either cognitive or demographic characteristics was obtained from source specific (S-S) words. It has already been noted that total subject words (S1) evokes information about spatial errors of the encoder. It was found, however, that subjects who had low vocabulary skills encoded significantly more afferent subject words (S1-A) than those who had high vocabulary skills. This suggests that subjects who have low vocabulary skills may be more dependent upon sensory (afferent) inputs for their language than non-sensory (efferent) inputs. Subjects who disagreed with the topic encoded significantly more afferent subject words (S1-A) than subjects who were undecided, but not significantly more than subjects who agreed. These two findings suggest the possibility of an interaction effect between subjects who

have low vocabulary skills and disagree with a topic in terms of the relative frequency of occurrence of afferent subject words (Sl-A) and dependence upon sensory inputs for their language.

In addition to the above findings, subjects who were high in vocabulary skills encoded significantly more efferent subject words (Sl-E) than those who were low in vocabulary skills. This is consistent with the results of the previously stated results regarding afferent subject words (Sl-A) and vocabulary skills. It was also found that subjects who attended Grace Bible College encoded significantly more efferent subject words (Sl-E) than those who attended Grand Rapids Junior College. This also suggests a possible interaction effect between religiosity, i.e., subjects attending (or not attending) a religious school and vocabulary skills in terms of the relative frequency of occurrence of efferent subject words (Sl-E) and an inferred dependence upon non-sensory inputs for their language.

Subjects who disagreed with the topic encoded significantly more primitive subject words (SlP) than those who were undecided, but not significantly more than those who agreed. On the other hand, low anxiety subjects encoded significantly more defined subject words (SlD) than high anxiety subjects. This, too, suggests an empirical question: Are subjects who disagree with a topic more anxious? If so, are there interaction

effects between attitude direction and anxiety on the primitive-defined distinction in their encoding behavior.

Level 2 procedures show that five variables (S1-A, S1-E, S1P, G-O, and S1D) evoke more information than the total subject words (S1), while one variable (S-S) evoked no information. Figure 12 is a summary of the information yielded, taking Level 1 and 2 procedures together. We can see that more information is obtained about such antecedent characteristics of the encoder, i.e., anxiety, vocabulary skills, attitude direction, level, and school. No new information was obtained at this point with respect to dogmatism, spatial abilities, attitude intensity, errors, age, or sex.

Level 3

Five variables which related to classifications of limiters were analyzed using Stage 6 procedures (see Chapter III). Of these variables, only three were found to evoke information about the antecedent characteristics of the encoders. In addition to total limiters (L)--discussed at Level 1--afferent limiters of connectors (LC1-A) and efferent limiters of subject words (LS1-E) evoked information. Table 20 presents an intercorrelation matrix of the five variables.

It can be seen that afferent limiters of subject words (LS1-A), efferent limiters of subject words (LS1-E), afferent limiters of connectors (LC1-A), and efferent

DEMOGRAPHIC CHARACTERISTICS		COGNITIVE CHARACTERISTICS	
Sex		Dogmatism	
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;ART	
Age		Anxiety	
		<u>Level 1</u> TOT-3	<u>Level 2</u> S1D
		Vocab. Skills	
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;PREP	<u>Level 2</u> S1-E;S1-A G-O
	<u>Level 1</u> ART <u>Level 2</u> G-O	Spat. Abilities	
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;OTH	
		Attitude	
		<u>Level 1</u> PREP;L	<u>Level 2</u> S1P;S1-A Direction _____
	School <u>Level 1</u> ART <u>Level 2</u> S1-E	Intensity	
		Errors	
		<u>Level 1</u> ART	Vocab. _____
		<u>Level 1</u> PREP;L S1	Spat. _____

Figure 12.--Summary of Level 2 Interpretation.

TABLE 20.--Limiters.

	L	LS1-A	LS1-E	LC1-A	LC1-E
L	1.00				
LS1-A	.31	1.00			
LS1-E	.37	.15	1.00		
LC1-A	.39	-.12	-.27	1.00	
LC1-E	.65	-.11	-.12	.20	1.00

limiters of connectors (LC1-E) are not independent of total limiters (L). However, afferent limiters of subject words (LS1-A) are independent*of efferent limiters of subject words (LS1-E), afferent limiters of connectors (LC1-A), and efferent limiters of connectors (LC1-E). In addition, efferent limiters of subject words (LS1-E) were independent of efferent limiters of connectors (LC1-E), but not independent of afferent limiters of connectors (LC1-A). Finally, afferent limiters of connectors (LC1-A) were not independent of efferent limiters of connectors (LC1-E).

Level 1 procedures showed that limiters (L) were able to evoke two antecedent characteristics of the source --attitude direction, and spatial errors. It was found that subjects who made low spatial errors encoded more total limiters (L) than subjects with high spatial errors. Also, subjects who disagreed with the topic encoded

*Ibid.

significantly fewer limiters (L) than those who were undecided, but not significantly fewer than those who agreed.

When the category of limiters (L) was subjected to a more detailed analysis, it was found that subjects who made many spatial errors encoded significantly more afferent limiters of connectors (LC1-A) than those with few spatial errors. Finally, subjects who were low in anxiety encoded significantly more efferent limiters of subject words (LS1-E) than those who were high anxious. This last result is peculiar, in that we would intuitively expect that high anxious people would be less concerned about sensory inputs as a basis for their language. It suggests further study. Nevertheless, Figure 13 presents a summary of the information yield obtained, including Levels 1 thru 3 interpretation procedures. We have evoked more information about anxiety and spatial errors using this element of the classification system, but no new information was obtained for the remaining cognitive or demographic characteristics.

Level 4

It will be remembered that at Level 1, total connectors (C1) evoked no information about the antecedent characteristics of the encoders. It is considerably different, however, when subsets of total connectors are examined.

Table 21 (Tables 22 and 23 are separate matrices, showing efferent and afferent interrelationships) is an

DEMOGRAPHIC CHARACTERISTICS		COGNITIVE CHARACTERISTICS		
Sex		Dogmatism		
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;ART		
Age		Anxiety		
		<u>Level 1</u> TOT-3	<u>Level 2</u> S1D	<u>Level 3</u> LS1-E
		Vocab. Skills		
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;PREP G-0	<u>Level 2</u> S1-E S1-A	
Level	<u>Level 1</u> ART G-0	Spat. Abilities		
		<u>Level 1</u> TOT-1;TOT-2 TOT-3;OTH		
	School <u>Level 1</u> <u>Level 2</u> ART S1-E	Attitude		
		<u>Level 1</u> PREP;L	<u>Level 2</u> S1P;S1-A	Direction — — — Intensity
		Errors		
		<u>Level 1</u> ART	<u>Level 3</u> LC1-A	Vocab. — — Spat. S1

Figure 13.--Summary of Level 3 Interpretation.

TABLE 21.--Intercorrelation matrix of connectors.

Cl	ClP	ClD	IPR	IT	IR	SPR	NCI	COMP	ACTCl	ICl	SCI	TCI	RCI	ClPA	ClPR	ClFU	PRIM	DEFD	PCl
Cl	1.00																		
ClP	.73	1.00																	
ClD	.10	-.42	1.00																
IPR	.46	.44	.22	1.00															
IT	.34	.45	.01	.60	1.00														
IR	.28	.10	.37	.37	-.16	1.00													
SPR	.04	.11	-.08	-.39	-.34	-.24	1.00												
NCI	-.05	-.25	-.10	-.18	-.25	-.12	.15	1.00											
COMP	.07	.10	-.14	.02	-.18	-.10	-.03	.01	1.00										
ACTCl	.57	.59	.23	.60	.66	.37	.08	-.27	-.28	1.00									
ICl	.56	.50	.16	.79	.60	.46	-.51	.08	.04	.57	1.00								
SCI	.07	.09	-.07	-.39	-.34	-.26	.92	.24	-.02	.07	-.51	1.00							
TCI	.31	.49	-.16	.30	.76	.34	.14	.13	-.27	.63	.35	.16	1.00						
RCI	.34	.12	.40	.32	-.20	.91	-.01	-.11	-.10	.43	.34	-.00	-.32	1.00					
ClPA	.003	-.01	.004	-.27	.04	-.003	-.003	-.13	.16	.04	-.02	.02	.02	-.00	1.00				
ClPR	.06	.10	-.17	-.40	-.27	.76	.63	.51	.06	.03	-.26	.74	.23	-.02	.37	1.00			
ClFU	.11	.01	-.004	-.45	-.15	-.04	.07	.07	-.07	-.09	-.02	.04	-.08	.01	-.04	-.12	1.00		
PRIM	.50	.75	-.31	.28	.35	.29	.23	.22	.13	.48	.42	.25	.56	.02	.07	.40	-.01	1.00	
DEFD	.06	-.24	.42	.01	-.03	-.04	-.01	-.11	-.17	.06	-.02	-.00	-.07	.14	-.09	-.13	.09	-.47	1.00
PCl	.84	.76	.27	.63	.49	.06	.02	-.26	-.002	.79	.64	.05	.41	.42	-.00	-.01	.00	.57	.05

P < .05 = ± .20

TABLE 22.--Intercorrelation matrix for afference.

	AFF	S1-A	LS1-A	LC1-A
AFF	1.00			
S1-A	.79	1.00		
LS1-A	-.21	-.51	1.00	
LC1-A	-.10	-.21	-.12	1.00

TABLE 23.--Intercorrelation matrix for efference.

	EFF	S1-E	LS1-E	LC1-E
EFF	1.00			
S1-E	.52	1.00		
LS1-E	.49	.09	1.00	
LC1-E	.42	-.30	-.12	1.00

intercorrelation matrix of those variables analyzed with Stage 6 procedures (see Chapter III). A survey of the matrix, assuming that non-significant correlations indicate independent relationships,* shows 94 of the 184 relationships represented as being independent. Of the 90 dependent relationships, the significant correlations vary from $-.51$ to $+.92$. Of the 20 variables analyzed, 11 evoked information about antecedent characteristics of the encoders. In general, high dogmatic subjects encoded significantly more indicative reflexive connectors (IR) and

*Ibid.

total reflexive connectors (RC1). High anxious subjects also encoded significantly more total reflexive connectors (RC1). This is not surprising, since dogmatism and anxiety were positively correlated (.31). It may indicate the verbal behavior of high dogmatic and high anxious subjects is more concerned with reflexive (passive voice) action instead of the more assertive, i.e., possibly more intense, language behavior reflected in transitive action connectors (TC1). In addition to these findings, high anxious subjects encoded significantly more total primitives (PRIM), but significantly less total defined (DEFD) connectors. These results are consistent, and indicate the possibility of less concern on the part of high anxious subjects to denote limitations of the meaning of signs than low anxious subjects.

Subjects with high spatial skills encoded significantly more total negation connectors (NC1), a surprising result since no previous studies have linked dissociative assertions to spatial abilities.

Vocabulary abilities yielded information in four message variables: subjects who were high in vocabulary skills encoded more indicative reflexive connectors (IR) and total efferent (EFF) words. It is a reasonable question to ask: Since the results indicate that subjects with high vocabulary skills and who are high dogmatic, encode significantly more indicative reflexive connectors (IR), is there an interaction between the two independent

variables? Such a possibility requires further study. In addition to these findings, subjects who were high in vocabulary skills encoded significantly less total comparison connectors (COMP) and total afferent (AFF) words.

Five significant results were obtained, when attitude was the independent variable. Subjects who disagreed with the topic encoded significantly more indicative comparison equal connectors (ICE), significantly more total comparison connectors (COMP), significantly more total efferent words (EFF), and significantly more total primitive (PRIM) words. These significant differences were found (using Scheffe's t-test) between those subjects who disagreed, and those who were undecided in all cases accept indicative comparison equal connectors (ICE). It was found that subjects who disagreed with the topic encoded significantly more indicative comparison equal connectors (ICE) than either those subjects who were undecided or those who agreed with the topic. This message variable suggests strong, assertive, and perhaps "simple-minded" cognitions in the equating of two unit signs. Whether this generalization about subjects who disagree can go beyond the topic studied is an empirical question. It suggests an interesting hypothesis.

No information was evoked by the message variables concerning sex and level, but total subjunctive present tense verbs (SPR) was related to information about attitude intensity. The trend was for low attitude intensity

subjects to encode more subjunctive tense verbs (SPR) than higher attitude intensity subjects, although not significant. Subjunctive verbs are, logically, dispositional verbs, which denote an action may happen. The relationship between attitude intensity and "dispositional" connectors merits further study.

Subjects who attended Grace Bible College encoded significantly more primitive connectors (ClP), action connectors (ACTCl), and total primitives (PRIM). If attendance at Grace Bible College is an indicator of religiosity, there may be an interaction between religiosity, vocabulary skills, and dogmatism where primitive connectors (ClP), total primitives (PRIM), and action connectors (ACTCl) are dependent measures. This is suggested by the Level 1 interpretation and the results of the Level 4 interpretation.

Spatial errors yielded information on five message variables. Subjects who made high spatial errors encoded significantly more primitive connectors (ClP), more indicative comparison equal connectors (ICE), more total comparison connectors (COMP), and more total primitives (PRIM). Subjects who made high spatial errors encoded significantly less total reflexive connectors (RCl). These results are difficult to interpret since no theory of errors on such tests is extant.

In summary, we can see from Figure 14 the information evoked from Level 4 interpretation. It is readily

DEMOGRAPHIC CHARACTERISTICS			COGNITIVE CHARACTERISTICS			
Sex			Dogmatism			
			<u>Level 1</u> TOT-1;TOT-2 TOT-3;ART		<u>Level 4</u> IR TC1	
Age			Anxiety			
			<u>Level 1</u> TOT-3	<u>Level 2</u> S1D	<u>Level 3</u> LS1-E	<u>Level 4</u> RC1 DEFD* PRIM*
			Vocab. Skills			
			<u>Level 1</u> TOT-1;TOT-2 TOT-3;PREP	<u>Level 2</u> S1-E S1-A G-O	<u>Level 4</u> IR;COMP AFF** EFF**	
			Spat. Abilities			
			<u>Level 1</u> TOT-1;TOT-2 TOT-3;OTH		<u>Level 4</u> NC1	
			Attitude Direction			
			<u>Level 1</u> PREP;L	<u>Level 2</u> S1P;S1-A	<u>Level 4</u> ICE;COMP PRIM*;EFF**	
			Intensity			
			School			
			<u>Level 1</u> ART	<u>Level 2</u> S1-E	<u>Level 4</u> C1P ACTC1 PRIM*	
			<u>Level 1</u> ART		<u>Level 3</u> LC1-A	<u>Level 4</u> C1P;ICE;COMP RC1;PRIM*

*Primitive (PRIM) words include both primitive subject words (S1P) and primitive connectors (C1P). Defined (CEFD) words include both defined subject words (S1D) and defined connectors (C1D).

**Afferent words (AFF) include both afferent subject words (S1-A) and afferent limiter words (LS1-A and LC1-A). Efferent words include both efferent subject words (S1-E) and efferent limiter words (LS1-E and LC1-E).

Figure 14.--Summary of Level 4 Interpretation.

noted that if the analysis had stopped at Level 1, we would have found 21, or about 38 per cent, of the significant differences obtained by making a more detailed analysis. Level 1 procedures allowed us to add 8, or 14 per cent, significant results; Level 3, two (3 per cent), and Level 4, 23 (42 per cent).

Evaluation as a Syntactical Theory of Signs

An evaluation of a descriptive classification of signs necessarily begins with the problem of measurement. The results demonstrate that this problem has not yet been met. The only message variables which were normally distributed were the total word scores (TOT-1, TOT-2, and TOT-3). The fact that the other variables were not normally distributed may be a statistical artifact, due to the transformation (word index score) performed on the data. Two critical questions were raised in Chapter I: (1) Is the raw frequency of a tag the best estimate of the effect of some antecedent condition, and (2) Should the researcher control for the varying lengths of message samples by using some common denominator, such as total words or sentences encoded?

It was noted that these two questions could not be directly answered in this study. Control for the varying lengths of messages was used because of precedence in the field. However, the lack of normality for so many of the message variables suggests that either a different

transformation would be appropriate, or that raw frequencies would be best. At any rate, no definitive results can be obtained until this problem is solved.

Another measurement problem is that associated with the issue raised in Chapter IV, i.e., it is not reasonable to assume that one method of analysis is appropriate for all meaningful distinctions. It is desirable in content analysis to use parametric analysis. This study was designed to use multiple regression and analysis of variance techniques to analyze the data. The fact that 12 variables were eliminated at Stage 1 (0 frequencies for all subjects) may be a function of the population from which the sample came, or the limitations of the laboratory. It may also be that these variables would be relevant, using analysis methods for nominal data. At any rate, no judgment can be made without other samples, gathered under similar and different conditions. If these variables continue to lack significance, the variables are probably meaningless.

Thirty-four variables were eliminated at Stage 2 (Chapter IV). These variables are candidates for analysis, using either nominal or ordinal methods of analysis. Of the 54 variables which were eliminated at Stage 3, fourteen were not analyzed because of the shapes of the distributions following plotting of a frequency distribution. These variables also are candidates for non-parametric analysis.

Among the 40 message variables submitted for one-way analysis of variance with each of the antecedent variables, 28 were found to significantly yield information about a cognitive or demographic characteristic of the encoder.

The result is that a definitive evaluation of this theory of syntactical relationships awaits a solution to the problem of measurement. With 70 per cent of the message variables submitted to Stage 6 procedures producing significant results, it is reasonable to assume that this syntactical approach has merit.

In addition to the problem of measurement, the question of reliability is critical. Again, this question cannot be answered without a replication of the study on a sample from the same population and with similar controls.

One needs to ask at this time: What are the projected benefits of such an approach to the study of communication? We see at least four values:

1. This approach allows for a syntactical analysis of how people process information. It goes beyond that conceptualization of syntactics offered by Osgood and his congruity principle in which syntactics between signs, i.e., unit signs in this analysis, was little more than associative (positive) or dissociative (negative) assertions. Furthermore, the congruity principle of Osgood's and the belief congruence principle of Rokeach (with respect to syntactics) is little more than a within-unit sign analysis.

This approach, if it meets the theoretical problems discussed earlier in this section, provides a means of generalizing the findings of Osgood and Rokeach to include the findings of this study.

2. This approach offers a distinction regarding the nature of referents which had not been tested previously in the continuous discourse situation. This study demonstrated that the nature of the referent, i.e., afferent or efferent, is important in explaining variance.

3. This approach goes beyond any study this writer is aware of in making between-unit sign distinctions, allowing for the possibility of attributing variance not otherwise possible if the total connectors is all that is known. It was demonstrated in the Level 4 procedure of interpretation, where the frequency of occurrence of total connectors (C1) evoked no information about the antecedent characteristics of the encoder. Even the gross distinction of positive connectors (PC1) and negative connectors (NC1) evoked only one distinction, and that with respect to spatial skills. This suggests, though only in a preliminary way, that the message matrix of Osgood's (1959) in which associative and dissociative assertions were denoted hold little value in attributing variance. By making finer distinctions, 42 per cent of the 54 significant differences obtained were attributable to characteristics of connectors, and this in spite of the fact that total connectors (C1)

did not add one piece of new information about any of the antecedent characteristics.

4. This study--other than case studies, and very small samples--is the first of its type to look at the validity of drawing inferences about the cognitive structures of encoders. The problems which have been related to this issue were outlined in Chapter I, i.e., costs in energy and/or the inaccessibility of the sources of the messages.

Recommendations for Further Study

The most critical study at this point in time is the one that attempts to achieve a solution to the problem of measurement. As stated before in this chapter, an answer to the question of what transformations, if any, should be performed on the message data needs to be obtained.

A second recommendation would be the careful replication of the study, with formal hypotheses based on the results of this study in order to determine the reliability of the results. Following this, questions of generalizability to populations can be empirically studied.

A third recommendation is a study which would determine the effects of feedback on these message variables. This would provide a significant bridge between this study and numerous studies which have captured the interest of communication scholars.

Finally, a study which manipulates selected message variables from this classification system to determine their effects on receivers is needed. This study represents only an attempt to explicate the source-message aspect of the communication paradigm. It is not reasonable to assume that all significant differences in the source-message aspect are perceived as relevant to a receiver, i.e., influencing that receiver's behavior.

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APPENDICES

APPENDIX A

CODE BOOK

APPENDIX A

CODE BOOK

Each coder is instructed to do, in successive order, the following tasks and subtasks. You may work as a group with differences of opinion resolved at each step or substep. If you are unsure whether a word should be circled, ask other coders in order to resolve any differences. At each step, record the frequencies of each tag on back of message. Any totals not agreeing should be recoded until agreement is achieved.

- Step 1
- a. Circle all articles "a," "an," and "the."
 - b. Circle all conjunctions "and," "but," "or," "so," "since," etc., where a conjunction is understood to mean a word which links other words to groups of words of the same class (linking clauses, nouns, verbs, adjectives, prepositional phrases, etc., such as in the statement, "Edgar and Stanley. . . ."
 - c. Circle all relative or interrogative pronouns such as:

who	whoever
whose	whosoever
whom	whomsoever
which	whomever
that	whichever
as	whichsoever
but	whatever
what	whatsoever
 - d. Circle all interjections, or words which normally are one-word sentences which usually express emotion. They are often

followed by an exclamation mark in normal literary discourse. Examples of such words are "Oh!" "Ouch!" "Whew!" "tsk-tsk."

- e. Circle all demonstrative pronouns, meaning those words which point out persons or things, such as "This book . . . ," "That person . . . ," "These cars . . . ," and, "Those hooks"

Step 2 a. Circle all words which are the subjects or objects of verbs.

- b. If the word has a word which modifies it, mark the subject or object of the verb as "D;" if not, mark it with a "P."

Step 3 a. Circle all words which are adjectives, adverbs, or objects of prepositions. Words already circled are prepositions, and therefore you should determine what is the object of that preposition.

- b. If the word you circle modifies a subject word, mark it as "LS1," and if the word you circle modifies a verb, mark it as "LC1."
- c. All words circled as objects of prepositions should be marked as "LS1" if the prepositional phrase describes the subject or object of the verb.
- d. If the prepositional phrase describes some kind of action, i.e., modifies a verb, then mark the object of that preposition as "LC1."

Step 4 a. All words you have on this version of the manuscript are verbs or verbal types. If a verb shows action, mark it as "A." If the verb is a linking verb, i.e., "is," "be," etc., mark that verb as "C."

- b. All verb phrases which have a negative in it, i.e., the word "not," or a prefix such as "dis . . . ," "un . . . ," etc., and which you believe to negate the verb, mark that verb as "N."

- c. Mark all verbs which you believe to be past tense as "PA," all verbs you believe to be

present tense as "PR," and all verbs you believe to be future tense as "FU."

- d. Some verbs have words in the phrase which denote that the action might, or could happen, but did not or will not necessarily occur. Where you see the words "might," "may," "could," "should," "ought," etc., mark that verb as "S." All other verbs should be marked as "I."
- e. Of those verbs you marked as "A," if the verb has both a subject and object, mark it "T." If the verb has no object to it, mark it "R."

- Step 5
- a. Of those verbs marked as C, if the verb says the object of the verb is the same as the subject of the verb, mark it "E." i.e., "Republicans are Fascists."
 - b. Of those verbs marked as C, if the verb says either the subject or object of the verb has more or less of some quality, mark it as "M," i.e., "Jan is more beautiful than Sally."
 - c. Of those verbs marked as C, if the verb says either the subject or object of the verb "belongs to," "is part of," etc., the other (subject is part of the object, or object is part of the subject), mark that verb as "S." It can be seen in the sentence, "Girls are part of the human race."
 - d. Of those verbs marked as C, if the verb has a subject, and the verb is followed by a prepositional phrase which answers the question where the subject is located, mark it as "P." It can be seen in the sentence, "Conservatives are to the right of liberals."
 - e. Of those verbs marked as C, if the verb has a subject, and the verb is followed by a prepositional phrase which answers the question when, mark it as "t." It can be seen in the sentence, "George was on ;time."
 - f. Of those verbs marked as C, if the verb links a demonstrative pronoun with a noun, mark that verb as "EXT." It can be seen in the sentence, "There is the book."

- g. Of those verbs marked as C, if the verb links a noun with an adjective, mark it as "PRED." It can be seen in the sentence, "The book is red."

- Step 6
- a. Of those words marked as "L," if the word has a negative, i.e., "no," or "none," modifying it, mark that word as "N."
 - b. Of those words marked as "Sl," if the word has a negative, i.e., "no," or "none," modifying it, mark that word as "N."

APPENDIX B

TABULATED SUMMARY DATA

TABLE B-1.--Summary of descriptive statistics.

Variable	Low	High	Mean	S.D.	Skew.	Kurto
Dogmatism	35	109	74.03	14.54	-0.2030	3.0740
Anxiety	32	86	58.98	11.99	0.0969	2.5444**
Vocabulary	2	40	21.15	7.62	0.3750	3.0403**
Vocabulary Error	1	33	12.81	7.93	0.7439	2.5254**
Spatial	44	213	140.37	32.99	0.1540	2.7698
Spatial Error	0	72	9.26	10.18	3.4823	19.2820**
TOT-1	60	377	226.97	66.12	-0.0395	2.4583
SLP	0.0560	0.3180	0.1496	0.0503	0.5462*	3.2259**
SLD	0.0640	0.2500	0.1456	0.0375	0.1841*	3.0691**
CLP	0.0460	0.2400	0.1300	0.0380	0.2732*	3.0087**
CLD	0.0400	0.1760	0.0959	0.0255	0.2655*	3.1088**
SL-A	0.0660	0.3100	0.1755	0.0513	0.3837*	2.6659**
SL-E	0.0080	0.2360	0.1172	0.0431	0.1623*	3.2987**
LS1-A	0	0.1120	0.0365	0.0220	0.8480*	3.6279**
LC1-A	0	0.1580	0.0631	0.0281	0.5993*	3.7707**
LS1-E	0.0550	0.2800	0.1601	0.0450	0.2744*	3.0177**
LC1-E	0.0080	0.3250	0.1564	0.0544	0.0062	3.8154**
IPA	0	0.0660	0.0153	0.0140	1.2112*	4.6211**
IPR	0.0660	0.3110	0.1576	0.0440	0.6089*	3.7945**
IFU	0	0.1430	0.0194	0.0214	2.5959*	13.7317**
ICE	0	0.0430	0.0100	0.0091	0.8573*	3.6761**
IT	0.0310	0.2130	0.1130	0.0335	0.5264*	3.5079**
IR	0	0.1620	0.0434	0.0239	1.3358*	7.8982**
SPR	0	0.1280	0.0257	0.0228	1.6483*	6.9001**
ST	0	0.0900	0.0184	0.0177	1.5210*	5.9015**
SR	0	0.0430	0.074	0.0098	1.5301*	5.0219**
N1PR	0	0.0570	0.0157	0.0137	1.0613*	3.8410**
N1T	0	0.0570	0.0125	0.0127	1.4862*	5.2677**
NCLP	0	0.0830	0.0144	0.0150	1.8716*	7.4291**
NCLD	0	0.0530	0.0109	0.0104	1.0865*	4.5854**
NLS1-E	0	0.0840	0.0223	0.0202	0.9900*	3.4427**
NLC1-E	0	0.0450	0.0135	0.0126	0.5736*	2.1996**

S-S	0	0.1290	0.0285	0.0266	1.4668*	5.2242**
T-O	0	0.1200	0.0089	0.0184	3.5521*	18.4114**
A-O	0	0.0530	0.0084	0.0124	1.6972*	5.2068**
G-O	0.0510	0.2820	0.1321	0.0468	0.8018*	3.4415**
IPRD	0	0.0340	0.0091	0.0088	0.9037*	3.3449**
IEXT	0	0.0400	0.0063	0.0076	1.3906*	5.7772**
ART	0.0270	0.2340	0.1326	0.0425	0.0002	2.5182**
PREP	0.0540	0.2670	0.1668	0.0451	0.0745*	2.8696**
OTH	0.1010	0.3590	0.2072	0.0499	0.3131*	3.1153**
TOT-2	52	275	160.56	48.30	0.1529	2.5532
TOT-3	37	233	132.27	40.01	0.0063	2.4473
NCL	0	0.0910	0.0253	0.0196	1.1224*	4.2196**
COMP	0	0.0520	0.0187	0.0133	0.6010*	2.8606**
ACTC1	0.1210	0.2830	0.1822	0.0354	0.4998*	2.9110**
IC1	0.1130	0.3670	0.2132	0.0394	0.5168*	5.0735**
SC1	0	0.1650	0.0365	0.0276	1.5260*	7.1047**
TC1	0.0770	0.2430	0.1468	0.0360	0.4368*	2.8181**
RC1	0	0.1620	0.0526	0.0252	0.9137*	5.5064**
CI(TOT)	0.1640	0.4170	0.2592	0.0424	0.4600*	4.1117**
AFF	0.1530	0.4380	0.2766	0.0548	0.2596*	2.8649**
EFF	0.2880	0.6090	0.4695	0.0672	-0.1805*	2.4580**
L	0.2250	0.6030	0.4528	0.0680	-0.3979*	3.4441**
SI	0.2170	0.4440	0.2967	0.0468	0.6069*	2.9014**
ClPA	0	0.0670	0.0173	0.0152	1.1636*	4.2631**
ClPR	0	0.1480	0.0607	0.0295	0.6731*	3.3571**
ClFU	0	0.1430	0.0295	0.0241	1.5335*	7.2081**
PRIM	0.1380	0.5450	0.2941	0.0769	0.3947*	3.2209**
DEFD	0.1360	0.3920	0.2531	0.0388	0.2839*	4.6683**
PC1	0.1510	0.3420	0.2260	0.0358	0.2645*	3.1632**

*Sig. Skewness p < .01

**Sig. Kurtosis p < .05

TABLE B-2.--Summary of simple correlations: message variables with cognitive variable.

Var.	Corr.	Var.	Corr.	Var.	Corr.
DOGMATISM					
ANX	.305*	IT	.085	TOT-2	-.312*
V-C	-.031	IR	.169	TOT-3	-.342*
V-I	.147	SPR	-.124	NC1	.119
S-C	.255*	ST	-.133	COMPAR	-.135
S-I	-.001	SR	-.070	ACTC1	.111
TOT-1	-.310*	N1PR	.089	IC1	.207
S1P	.028	N1T	.180	SC1	-.164
S1D	-.072	NC1P	.138	TC1	.090
C1P	.110	NC1D	.023	RC1	.125
C1D	.001	NLS1-E	.076	C1(TOT)	.143
S1-A	.034	NLC1-E	-.035	AFF	.052
S1-E	.031	S-S	-.003	EFF	-.076
LS1-A	.050	T-O	-.117	L	-.079
LC1-A	-.017	A-O	.046	S1	-.030
LS1-E	-.097	G-O	.035	C1PA	-.010
LC1-E	-.060	IPRD	.116	C1PR	-.061
IPA	-.067	IEX	-.063	C1FU	-.059
IPR	.170	ART	.185	PRIM	.099
IFU	-.011	PREP	.044	DEFD	-.057
ICE	-.107	OTH	.028	PC1	.120
ANXIETY					
DOG	.305*	IT	-.023	TOT-2	-.216*
V-C	-.208*	IR	.080	TOT-3	-.258*
V-I	.111	SPR	.121	NC1	.133
S-C	.120	ST	.167	COMPAR	-.151
S-I	.137	SR	.098	ACTC1	.144
TOT-1	-.230*	N1PR	.131	IC1	.031
S1P	.224*	N1T	.075	SC1	.147
S1D	-.175	NC1P	.196	TC1	.102
C1P	.150	NC1D	-.035	RC1	.134
C1D	-.058	NLS1-E	.178	C1(TOT)	.178
S1-A	.141	NLC1-E	.075	AFF	.169
S1-E	-.014	S-S	.137	EFF	-.217*
LS1-A	-.008	T-O	-.131	L	-.169
LC1-A	.094	A-O	-.044	S1	.097
LS1-E	-.289*	G-O	.214*	C1PA	-.118
LC1-E	-.094	IPRD	.078	C1PR	.126
IPA	-.111	IEX	-.118	C1FU	-.114
IPR	.104	ART	.055	PRIM	.258*
IFU	-.169	PREP	-.094	DEFD	.214*
ICE	-.051	OTH	.151	PC1	.120

TABLE B-2.--Continued.

Var.	Corr.	Var.	Corr.	Var.	Corr.
VOCABULARY SKILLS					
ANX	-.208*	IT	-.001	TOT-2	.247*
COG	-.031	IR	.238*	TOT-3	.198
V-I	-.096	SPR	-1.75	NC1	-.091
S-C	-.126	ST	-.166	COMPAR	-.270*
S-I	-.141	SR	-.023	ACTC1	.071
TOT-1	.245*	N1PR	-.112	IC1	.032
SlP	-.104	N1T	-.050	SC1	-.159
SlD	-.035	NC1P	-.110	TC1	-.114
ClP	-.122	NC1D	-.017	RC1	.248*
C1D	.092	NLS1-E	-.113	Cl(TOT)	-.111
Sl-A	-.286*	NLC1-E	-.051	AFF	-.184
Sl-E	.214*	S-S	-.085	EFF	.224*
LS1-A	.168	T-O	.055	L	.155
LC1-A	.031	A-O	.108	Sl	-.137
LS1-E	.179	G-O	-.257*	ClPA	-.046
LC1-E	.014	IPRD	.113	ClPR	-.200
IPA	-.032	IEX	.088	ClFU	.198
IPR	-.040	ART	.004	PRIM	-.149
IFU	.252*	PREP	.214*	DEFD	.021
ICE	-.151	OTH	-.047	PC1	-.062
SPATIAL ABILITIES					
ANX	.120	IT	.106	TOT-2	-.128
DOG	.255*	IR	-.180	TOT-3	-.171
V-C	-.126	SPR	-.006	NC1	.108
V-I	.105	ST	-.032	COMPAR	-.056
S-I	-.123	SR	.064	ACTC1	-.019
TOT-1	-.131	N1PR	.034	IC1	-.003
SlP	.165	N1T	-.004	SC1	.076
SlD	-.023	NC1P	.053	TC1	.116
ClP	-.004	NC1D	.125	RC1	-.157
C1D	.074	NLS1-E	.051	Cl(TOT)	.096
Sl-A	.127	NLC1-E	.141	AFF	.139
Sl-E	-.005	S-S	.008	EFF	-.182
LS1-A	.052	T-O	-.076	L	-.169
CL1-A	-.021	A-O	.086	Sl	.167
LS1-E	-.203*	G-O	.209	ClPA	-.039
LC1-E	-.105	IPRD	-.031	ClPR	.033
IPA	-.031	IEX	-.004	ClFU	-.052
IPR	.054	ART	.012	PRIM	.115
IFU	-.131	PREP	-.064	DEFD	.069
ICE	-.050	OTH	.206*	PC1	.049

TABLE B-2.--Continued.

Var.	Corr.	Var.	Corr.	Var.	Corr.
VOCABULARY ERRORS					
ANX	.111	IT	-.050	TOT-2	-.138
DOG	.147	IR	-.021	TOT-3	-.121
V-C	-.096	SPR	-.055	NC1	.100
S-C	.105	ST	-.055	COMPAR	.094
S-I	.219*	SR	-.156	ACTC1	-.133
TOT-1	-.144	N1PR	.130	IC1	.008
SlP	-.058	N1T	.220	SC1	-.116
S1D	.018	NC1P	.085	TC1	.013
ClP	-.033	NC1D	.070	RC1	-.108
C1D	-.137	NLS1-E	-.049	Cl(TOT)	-.117
S1-A	.121	NLC1-E	-.156	AFF	.180
S1-E	-.218*	S-S	.185	EFF	-.118
LS1-A	.089	T-O	-.094	L	.068
LC1-A	.030	A-O	-.178	S1	.032
LS1-E	.058	G-O	.089	ClPA	-.158
LC1-E	.032	IPRD	-.064	ClPR	-.073
IPA	-.170	IEX	-.177	ClFU	-.188
IPR	.087	ART	-.248*	PRIM	-.038
IFU	-.180	PREP	-.038	DEFD	-.047
ICE	.031	OTH	-.138	PC1	-.133
SPATIAL ERRORS					
ANX	.137	IT	-.028	TOT-2	.140
DOG	-.001	IR	.113	TOT-3	.180
V-C	-.141	SPR	-.090	NC1	-.075
V-I	.219*	ST	-.119	COMPAR	.367*
S-C	-.123	SR	-.042	ACTC1	-.024
TOT-1	.172	N1PR	.056	IC1	.143
SlP	.034	N1T	-.068	SC1	-.152
S1D	.081	NC1P	-.022	TC1	-.135
ClP	.216*	NC1D	-.108	RC1	.067
C1D	-.084	NLS1-E	.166	Cl(TOT)	.195
S1-A	-.012	NLC1-E	.026	AFF	-.073
S1-E	.101	S-S	-.035	EFF	-.022
LS1-A	.011	T-O	.153	L	-.137
LC1-A	-.119	A-O	.024	S1	.114
LS1-E	-.203*	G-O	-.093	ClPA	.008
LC1-E	-.008	IPRD	.072	ClPR	-.058
IPA	.036	IEX	-.082	ClFU	-.178
IPR	.179	ART	.070	PRIM	.125
IFU	-.117	PREP	-.036	DEFD	-.008
ICE	.251*	OTH	.064	PC1	.170

*Significant correlation $p < .05$.

TABLE B-3.--Summary of analysis of variance [Independent Variable: Sex; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X} Males (N=53)	\bar{X} Females (N=45)
TOT-1	144.9	423952.0	424096.9	.03	.86	225.8	228.3
SLP	.006	.236	.246	2.57	.11	.14	.16
SLD	.003	.134	.136	1.81	.18	.15	.14
CLP	.0006	.139	.140	.39	.54	.13	.13
CLD	.001	.062	.063	2.40	.13	.10	.09
SLA	.0003	.255	.255	.12	.73	.18	.17
SL-E	.002	.179	.181	1.02	.32	.11	.12
LSLA	.0006	.046	.047	1.26	.27	.04	.03
LCLA	.0002	.076	.077	.29	.60	.06	.06
LSLE	.003	.194	.197	1.26	.26	.16	.15
LCLE	.00006	.287	.287	.02	.89	.16	.16
IPR	.0005	.187	.188	.24	.62	.16	.16
ICE	.00003	.008	.008	.36	.55	.01	.01
IT	.0007	.108	.109	.60	.44	.12	.11
IR	.0001	.055	.055	.22	.64	.04	.04
SPR	.0009	.050	.051	1.73	.19	.02	.03
S-S	.00006	.0684	.0685	.08	.78	.03	.03
G-O	.003	.209	.212	1.46	.23	.13	.14
ART	.006	.169	.175	3.25	.07	.13	.14
PREP	.00009	.1975	.976	.05	.83	.17	.17
OTH	.0003	.2411	.2414	.12	.73	.21	.21

TOT-2	3.1	226250.9	226254.1	.001	.97	160.4	160.8
TOT-3	62.7	155246.4	155309.1	.04	.84	131.5	133.1
NC1	.00001	.0372	.0372	.04	.85	.02	.03
COMP	.00005	.0170	.0170	.31	.58	.02	.02
ACTC1	.00001	.1219	.1219	.01	.92	.18	.18
IC1	.0008	.150	.151	.50	.48	.22	.21
SC1	.001	.073	.074	1.69	.20	.03	.04
TC1	.00006	.1255	.1256	.04	.83	.15	.15
RC1	.000004	.06155	.06155	.01	.94	.05	.05
C1	.000008	.1746	.1747	.05	.83	.26	.26
AFF	.0009	.290	.291	.30	.58	.28	.27
EFF	.001	.436	.438	.26	.61	.47	.47
L	.0004	.4477	.4481	.09	.77	.45	.45
SI	.0009	.2115	.2124	.41	.53	.29	.30
ClPA	.00005	.0225	.0226	.21	.65	.02	.02
ClPR	.0007	.0836	.0842	.76	.39	.06	.06
ClFU	.00006	.0562	.0562	.11	.74	.03	.03
PRIM	.009	.565	.574	1.57	.21	.29	.30
DEPD	.006	.140	.146	4.01	.05	.26	.24
PC1	.0002	.124	.125	.18	.68	.23	.22

*Significant at $p < .05$

TABLE B-3.--Continued [Independent Variable: School; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{GBC}	\bar{X}_{GRTC}
TOT-1	3888.1	420208.8	424096.9	.89	.35	236.9	222.9
SLP	.005	.241	.246	2.06	.15	.16	.14
SLD	.0009	.135	.136	.66	.42	.14	.15
CLP	.008	.132	.140	5.62*	.02	.14	.12
CID	.0004	.0628	.0633	.66	.42	.09	.10
SL-A	.005	.250	.255	1.99	.16	.16	.18
SL-E	.016	.164	.181	9.55*	.003	.14	.11
LS1-A	.0004	.047	.047	.76	.39	.040	.35
LC1-A	.001	.076	.077	1.40	.24	.06	.07
LS1-E	.0002	.1963	.1966	.11	.74	.16	.16
LC1-E	.007	.280	.287	2.42	.12	.14	.16
IPR	.002	.186	.188	1.20	.28	.17	.15
ICE	.0001	.0080	.0081	1.31	.26	.008	.011
IT	.0007	.1083	.1089	.59	.44	.12	.11
IR	.0008	.0546	.0554	1.35	.25	.05	.04
SPR	.0008	.0497	.0505	1.49	.23	.03	.02
S-S	.0009	.0676	.0685	1.30	.26	.02	.03
G-O	.0002	.2120	.2121	.07	.79	.13	.13
ART	.016	.159	.175	9.61*	.003	.15	.12
PREP	.00007	.1975	.1976	.04	.85	.17	.17
OTH	.0001	.2413	.2414	.04	.84	.21	.21

TOT-2	2295.9	223958.2	226254.1	.98	.32	168.2	157.5
TOT-3	38.0	155271.1	155309.1	.02	.88	133.3	131.9
NC1	.00003	.0372	.0372	.08	.78	.03	.02
COMP	.0003	.0168	.0171	1.43	.24	.02	.02
ACTC1	.007	.115	.122	5.42*	.02	.20	.18
IC1	.003	.148	.151	1.81	.18	.22	.21
SC1	.001	.073	.074	1.41	.24	.04	.03
TC1	.002	.124	.126	1.52	.22	.15	.14
RC1	.0006	.061	.062	.98	.33	.06	.05
CI	.003	.171	.175	1.87	.18	.27	.26
AFF	.009	.282	.291	2.91	.09	.26	.28
EFF	.0009	.4367	.4375	.19	.66	.47	.47
L	.013	.435	.448	2.91	.09	.43	.46
SI	.002	.211	.212	.80	.37	.30	.29
CI1PA	.0004	.0222	.0226	1.58	.21	.01	.02
CI1PR	.0001	.084	.084	.12	.73	.06	.06
CI1FU	.0009	.0553	.0562	1.50	.22	.03	.03
PRIM	.027	.546	.573	4.82*	.03	.32	.28
DEFD	.003	.143	.146	1.75	.19	.24	.26
PC1	.005	.120	.125	3.63	.06	.24	.22

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Level; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	$\bar{X}_{\text{Fresh.}}$	$\bar{X}_{\text{Soph.}}$
TOT-1	8673.8	415423.2	424096.9	2.00	.16	241.1	220.7
SLP	.004	.242	.246	1.45	.23	.14	.15
SLD	.0003	.136	.136	.23	.63	.15	.14
CLP	.003	.137	.140	1.78	.19	.12	.13
CLD	.0004	.063	.063	.67	.42	.10	.09
SL-A	.003	.252	.255	1.08	.30	.17	.18
SL-E	.0002	.180	.181	.10	.76	.12	.12
LS1-A	.0001	.047	.047	.17	.60	.04	.04
LC1-A	.0001	.077	.077	.19	.67	.06	.06
LS1-E	.0004	.197	.197	.21	.65	.16	.16
LC1-E	.007	.279	.287	2.57	.11	.17	.15
IPR	0.00	.19	.19	0.00	.999	.16	.16
ICE	.00003	.0080	.0081	.40	.53	.01	.01
IT	.00004	.1089	.1089	.03	.85	.11	.11
IR	.00001	.0554	.0554	.02	.88	.04	.04
SPR	.0005	.0500	.0505	.89	.35	.02	.03
S-S	.002	.066	.068	3.57	.06	.04	.03
G-O	.01	.20	.21	4.79*	.03	.12	.14
ART	.01	.17	.18	4.44*	.04	.12	.14
PREP	.004	.193	.198	2.14	.15	.18	.16
OTH	.002	.239	.241	.92	.34	.20	.21

TOT-2	5141.9	221112.2	226254.1	2.23	.14	171.5	155.8
TOT-3	4181.8	151127.3	155309.1	2.66	.11	142.1	127.9
NC1	.0002	.0370	.0372	.56	.46	.03	.02
COMP	.0001	.0170	.0171	.37	.55	.02	.02
ACTC1	.0002	.1217	.1219	.13	.72	.18	.18
IC1	.00003	.15068	.15068	.002	.97	.21	.21
SC1	.00006	.0739	.0739	.08	.78	.04	.04
TCL	.0002	.1253	.1256	.16	.69	.14	.15
RC1	.0002	.0614	.0616	.30	.59	.05	.05
CI	.002	.173	.175	1.06	.31	.25	.26
AFF	.005	.286	.291	1.65	.20	.27	.28
EFF	.004	.434	.438	.82	.37	.48	.47
L	.003	.445	.448	.66	.42	.46	.45
SI	.002	.211	.212	.84	.36	.29	.30
CI PA	.0003	.0222	.0226	1.33	.25	.01	.02
CI PR	.0008	.083	.084	.94	.34	.06	.06
CI FU	.0004	.0558	.0562	.61	.44	.03	.03
PRIM	.011	.563	.574	1.80	.18	.28	.30
DEFD	.002	.143	.146	1.47	.23	.26	.25
PCI	.0008	.1237	.1245	.66	.42	.22	.23

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Dogmatism; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{Hidog}	\bar{X}_{Lodog}
TOT-1	30940.1	393156.8	424096.9	7.55*	.007	209.6	245.1
SLP	.0005	.2453	.2458	.19	.66	.15	.15
SLD	.00008	.1362	.1362	.05	.82	.14	.15
CLP	.001	.139	.140	.68	.41	.13	.13
CID	.0002	.0631	.0633	.31	.58	.10	.09
SL-A	.00003	.255	.255	.01	.91	.17	.18
SL-E	.002	.178	.181	1.19	.28	.12	.11
LS1-A	.0000002	.0469	.0469	.0003	.99	.04	.04
LC1-A	.0001	.0766	.0767	.16	.69	.06	.06
LS1-E	.003	.194	.197	1.24	.27	.16	.17
LC1-E	.002	.285	.287	.53	.47	.15	.16
IPR	.003	.185	.188	1.50	.22	.16	.15
ICE	.000003	.0081	.0081	.03	.86	.010	.010
IT	.00005	.1089	.1089	.04	.81	.112	.11
IR	.0040	.0514	.0554	7.45*	.008	.05	.04
SPR	.0000002	.05052	.05052	.0004	.98	.03	.03
S-S	.0002	.0683	.0685	.23	.63	.02	.03
G-O	.0004	.2117	.2121	.20	.66	.13	.13
ART	.012	.163	.175	7.03*	.009	.14	.12
PREP	.003	.194	.198	1.65	.20	.17	.16
OTH	.0002	.2412	.2414	.10	.75	.21	.21

TOT-2	18333.4	207920.7	226254.1	8.46*	.004	147.2	174.5
TOT-3	16220.4	139088.7	155309.1	11.20*	.001	119.7	145.4
NC1	.0003	.0370	.0372	.69	.41	.03	.02
COMP	.00009	.0170	.0171	.49	.49	.02	.02
ACTC1	.003	.119	.122	2.18	.14	.19	.18
IC1	.004	.147	.151	2.80	.10	.22	.21
SC1	.0002	.0737	.0739	.29	.59	.03	.04
TC1	.00002	.12557	.12558	.01	.92	.15	.15
RC1	.005	.057	.062	7.99*	.006	.06	.05
Cl	.003	.172	.175	1.73	.19	.26	.25
AFF	.0001	.291	.291	.05	.83	.28	.28
EFF	.0006	.4370	.4375	.13	.72	.47	.47
L	.006	.442	.448	1.35	.25	.45	.46
Sl	.0002	.212	.212	.09	.77	.30	.30
ClPA	.0002	.0224	.0226	.79	.38	.02	.02
ClPR	.0002	.0840	.8042	.24	.62	.06	.06
ClFU	.0002	.0561	.0562	.26	.61	.03	.03
PRIM	.006	.568	.573	1.06	.31	.30	.29
DEFD	.0000003	.1457	.1457	.0002	.99	.25	.25
PC1	.002	.122	.125	1.73	.19	.23	.22

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Anxiety; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{HiAnx}	\bar{X}_{LoAnx}
TOT-1	12418.2	411678.7	424096.9	2.90	.09	215.9	238.5
SLP	.008	.237	.246	3.36	.07	.16	.14
S1D	.006	.130	.136	4.33*	.04	.14	.15
CLP	.002	.138	.140	1.51	.22	.13	.13
C1D	.0000001	.0633	.0633	.0002	.99	.10	.10
S1-A	.0005	.2546	.2551	.19	.66	.18	.17
S1-E	.00005	.1805	.1806	.03	.87	.12	.12
LS1-A	0.00	.05	.05	0.00	1.00	.04	.04
LC1-A	.001	.075	.077	1.78	.19	.07	.06
LS1-E	.009	.187	.197	4.78*	.03	.15	.17
LC1-E	.004	.282	.287	1.48	.23	.15	.16
IPR	.003	.184	.188	1.76	.19	.16	.15
ICE	.0001	.0079	.0081	1.78	.19	.009	.011
IT	.0007	.1082	.1089	.58	.45	.11	.12
IR	.002	.054	.055	2.76	.10	.05	.04
SPR	.0001	.0504	.0505	.26	.61	.03	.02
S-S	.00002	.0684	.0685	.02	.88	.03	.03
G-O	.001	.211	.212	.46	.50	.14	.13
ART	.003	.172	.175	1.81	.18	.14	.13
PREP	.0005	.1971	.1976	.25	.62	.17	.16
OTH	.008	.234	.241	3.17	.08	.22	.20

TOT-2	7657.9	218596.2	226254.1	3.36	.07	151.9	169.6
TOT-3	7700.6	147608.5	155309.1	5.01*	.03	123.6	141.3
NC1	.0004	.0368	.0372	1.15	.29	.03	.02
COMP	.0003	.0168	.0171	1.54	.22	.02	.02
ACTC1	.002	.120	.122	1.27	.26	.19	.18
IC1	.0005	.1502	.1507	.33	.57	.22	.21
SC1	.0006	.0733	.0739	.77	.38	.04	.03
TC1	.00004	.12554	.12558	.03	.86	.15	.15
RC1	.0032	.0583	.0616	5.28*	.02	.06	.05
Cl	.005	.170	.175	2.74	.10	.27	.25
AFF	.003	.288	.291	1.08	.30	.28	.27
EFF	.012	.426	.438	2.65	.11	.46	.48
L	.007	.441	.448	1.46	.23	.45	.46
S1	.0002	.2122	.2124	1.10	.7t	.30	.30
ClPA	.0003	.0222	.0226	1.67	.20	.02	.02
ClPR	.0002	.0840	.0842	.79	.66	.06	.06
ClFU	.0004	.0558	.0562	.72	.40	.03	.03
PRIM	.028	.546	.574	4.85*	.03	.31	.28
DEFD	.007	.139	.146	4.86*	.03	.24	.26
PC1	.002	.122	.125	1.76	.19	.23	.22

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Vocabulary Skills; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{HiVoc}	\bar{X}_{LoVoc}
TOT-1	28407.5	395689.4	424096.9	6.89*	.01	243.3	209.2
SLP	.003	.243	.246	1.05	.31	.14	.15
SLD	0.00	.136	.136	0.00	.99	.15	.15
CLP	.002	.137	.140	1.61	.21	.13	.14
CLD	.0004	.0629	.0633	.57	.45	.10	.09
SL-A	.029	.226	.255	12.41*	.001	.16	.19
SL-E	.007	.173	.181	3.96*	.05	.13	.11
LS1-A	.0003	.0467	.0469	.52	.47	.04	.03
LC1-A	0.00	.077	.077	0.00	.99	.06	.06
LS1-E	.007	.189	.197	3.64	.06	.17	.15
LC1-E	.001	.285	.287	.49	.49	.16	.15
IPR	.001	.186	.188	.71	.40	.15	.16
ICE	.0002	.0079	.0081	1.85	.18	.01	.01
IT	.001	.108	.109	1.28	.26	.11	.12
IR	.002	.053	.055	4.23*	.04	.05	.04
SPR	.0004	.0501	.0505	.77	.38	.02	.03
S-S	.0007	.0678	.0685	1.01	.32	.03	.03
G-O	.018	.194	.212	8.90*	.004	.12	.15
ART	.00003	.17514	.17517	.01	.91	.13	.13
PREP	.011	.186	.198	6.00*	.02	.18	.16
OTH	.0008	.2406	.2414	.32	.58	.20	.21

TOT-2	13629.4	212624.7	226254.1	6.15*	.02	171.9	148.3
TOT-3	8259.6	147049.5	155309.1	5.39*	.02	141.1	122.7
NC1	.0003	.0369	.0372	.82	.37	.02	.03
COMP	.001	.016	.017	6.59*	.01	.015	.022
ACTC1	.00006	.12181	.12188	.05	.83	.18	.18
IC1	.0005	.1501	.1507	.35	.56	.21	.22
SC1	.0007	.0731	.0739	.95	.33	.03	.04
TC1	.003	.123	.126	2.16	.15	.14	.15
RC1	.002	.059	.062	3.62	.06	.06	.05
CI	.005	.170	.175	2.82	.10	.25	.27
AFF	.023	.268	.291	8.29*	.005	.26	.29
EFF	.026	.412	.438	5.96*	.02	.49	.45
L	.009	.439	.448	1.96	.17	.46	.44
SI	.002	.210	.212	1.07	.30	.29	.30
CI PA	.0003	.0223	.0226	1.11	.29	.016	.019
CI PR	.002	.083	.084	1.89	.17	.056	.065
CI FU	.001	.055	.056	1.68	.20	.033	.026
PRIM	.01	.56	.57	2.48	.12	.28	.31
DEFD	.001	.145	.146	.40	.53	.26	.25
PCI	.001	.124	.125	.63	.43	.22	.23

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Spatial Errors; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{HiSpa} Errors	\bar{X}_{LoSpa} Errors
A-I	.34	67.05	67.39	.49	.49	3.21	3.10
TOT-1	9548.6	414548.3	424096.9	2.21	.14	235.5	215.6
SLP	.01	.24	.25	2.36	.13	.16	.14
SID	.002	.134	.136	1.69	.20	.15	.14
CLP	.01	.13	.14	5.05*	.03	.14	.12
CLD	.001	.062	.063	1.52	.22	.09	.10
SL-A	.004	.252	.255	1.38	.24	.18	.17
SL-S	.003	.177	.181	1.70	.20	.12	.11
LS1-A	.00001	.4692	.04692	.02	.90	.04	.04
LC1-A	.004	.072	.077	5.94*	.04	.06	.07
LS1-E	.001	.195	.197	.55	.46	.16	.16
LC1-E	.01	.28	.29	3.02	.09	.15	.17
IPR	.005	.183	.188	2.54	.11	.16	.15
ICE	.0005	.0076	.0081	6.26*	.01	.012	.007
IT	.002	.106	.109	2.22	.14	.12	.11
IR	.001	.054	.055	2.51	.12	.04	.05
SPR	.00002	.05049	.05051	.04	.83	.03	.03
S-S	.0001	.0684	.0685	.13	.72	.03	.03
G-O	.001	.211	.212	.57	.45	.14	.13
ART	.000005	.175163	.175168	.002	.96	.13	.13
PREP	.01	.18	.20	7.76*	.006	.16	.18
OTH	.0003	.2411	.2414	.11	.74	.21	.21

TOT-2	5477.4	220776.7	226254.1	2.38	.13	167.0	151.9
TOT-3	4059.7	151249.4	155309.1	2.58	.11	137.8	124.8
NCI	.00004	.03718	.03722	.11	.74	.02	.03
COMP	.001	.016	.017	8.90*	.004	.02	.01
ACTC1	.00005	.12183	.12187	.04	.85	.18	.18
IC1	.003	.147	.151	2.20	.14	.22	.21
SC1	.001	.073	.074	1.64	.20	.03	.04
TC1	.001	.124	.126	1.12	.29	.15	.14
RC1	.003	.059	.062	4.72*	.03	.05	.06
CI	.004	.171	.175	2.05	.16	.26	.25
AFF	.00004	.29076	.29080	.01	.91	.28	.28
EFF	.002	.435	.438	.50	.48	.47	.48
L	.03	.42	.45	6.98*	.01	.44	.47
SI	.02	.20	.21	8.24*	.005	.31	.28
CI PA	.00004	.02251	.02256	.18	.67	.02	.02
CI PR	.0001	.0841	.0842	.17	.69	.06	.06
CI FU	.001	.055	.056	2.01	.16	.027	.033
PRIM	.03	.55	.57	4.73*	.03	.31	.27
DEFD	.0001	.1456	.1457	.07	.80	.25	.25
PCI	.003	.122	.125	2.20	.14	.23	.22

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Vocabulary Errors; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{HiVoc} Errors	\bar{X}_{LoVoc} Errors
TOT-1	4140.5	419956.4	424096.9	.95	.33	220.5	233.5
SLP	.001	.245	.246	.49	.49	.15	.15
S1D	.001	.136	.136	.44	.51	.15	.14
CLP	.0002	.1396	.1398	.14	.71	.13	.13
C1D	.001	.062	.063	1.32	.25	.09	.10
S1-A	.004	.251	.255	1.52	.22	.18	.17
S1-E	.01	.17	.18	3.41	.07	.11	.13
LS1-A	.00662	.04690	.64692	.05	.82	.04	.04
LC1-A	.001	.076	.077	1.00	.32	.06	.07
LS1-E	.001	.195	.197	.63	.43	.16	.16
LC1-E	.0002	.2865	.2867	.07	.79	.15	.16
IPR	.003	.185	.188	1.40	.24	.16	.15
ICE	.00002	.0080	.0081	.26	.61	.01	.01
IT	.0004	.1086	.1089	.33	.57	.11	.11
IR	.0003	.0550	.0554	.60	.44	.05	.04
SPR	.0001	.0504	.0505	.25	.62	.02	.03
S-s	.001	.068	.068	1.32	.25	.03	.03
G-O	.003	.209	.212	1.55	.22	.14	.13
ART	.011	.164	.175	6.36*	.01	.12	.14
PREP	.0002	.1974	.1976	.10	.76	.17	.17
OTH	.007	.234	.241	.299	.09	.22	.20

TOT-2	2149.8	224104.3	226254.1	.92	.34	155.8	165.2
TOT-3	1800.0	153509.1	155309.1	1.13	.29	128.0	136.6
NC1	.001	.036	.037	1.99	.16	.03	.02
COMP	.0001	.0170	.0171	.42	.52	.02	.02
ACTC1	.001	.121	.122	.63	.43	.18	.19
IC1	.001	.150	.151	.71	.40	.22	.21
SC1	.001	.073	.074	.88	.35	.03	.04
TC1	.00004	.12554	.12558	.03	.86	.15	.15
RC1	.000003	.061548	.061551	.01	.94	.05	.05
C1	.00004	.17462	.17466	.02	.89	.26	.26
AFF	.002	.289	.291	.69	.41	.28	.27
EFF	.004	.434	.438	.83	.36	.46	.48
L	.00001	.44808	.44809	.002	.97	.45	.45
S1	.0001	.2124	.2124	.03	.87	.30	.30
CI PA	.0001	.0225	.0226	.26	.61	.02	.02
CI PR	.00001	.08421	.08422	.01	.92	.06	.06
CI FU	.002	.054	.056	3.36	.07	.025	.034
PRIM	.00000004	.57375249	.57375253	.00001	.99	.29	.29
DEFD	.00001	.14566	.14567	.004	.96	.25	.25
PC1	.0002	.1243	.1245	.18	.67	.22	.23

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Spatial Abilities; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{HiSpa}	\bar{X}_{LoSpa}
TOT-1	19348.3	404748.7	424096.9	4.59*	.04	212.9	241.0
SLP	.001	.245	.246	.50	.48	.15	.15
SLD	.000002	.13624	.13625	.001	.97	.15	.15
CLP	.00000001	.13976690	.13976691	.00001	.99	.13	.13
CLD	.0001	.0631	.0633	.18	.67	.09	.10
SL-A	.003	.252	.255	1.01	.32	.18	.17
SL-E	.001	.179	.181	.60	.44	.11	.12
LS1-A	.00006	.04687	.04692	.12	.73	.04	.04
LC1-A	.000006	.076675	.076681	.01	.93	.06	.06
LS1-E	.006	.191	.197	2.82	.10	.15	.17
CL1-E	.002	.284	.287	.81	.37	.15	.16
IPR	.00001	.18785	.18786	.005	.95	.16	.16
ICE	.00001	.00805	.00806	.14	.71	.01	.01
IT	.000001	.108945	.108946	.001	.98	.11	.11
IR	.001	.054	.055	1.71	.19	.04	.05
SPR	.000001	.050574	.050516	.003	.96	.03	.03
S-S	.0001	.0683	.0685	.17	.68	.03	.03
G-O	.01	.20	.21	3.52	.06	.14	.12
ART	.00001	.17516	.17517	.004	.95	.13	.13
PREP	.001	.197	.198	.49	.49	.16	.17
OTH	.01	.23	.24	5.73*	.02	.22	.20

TOT-2	10762.5	215491.6	226254.1	4.79*	.03	150.1	171.0
TOT-3	9054.7	146254.4	155309.1	5.94*	.02	122.6	141.9
NCI	.002	.036	.037	4.64*	.03	.03	.02
COMP	.00001	.01708	.01709	.08	.78	.02	.02
ACLC1	.001	.121	.122	.80	.37	.18	.19
IC1	.00002	.15067	.15068	.01	.92	.21	.21
SC1	.0005	.0735	.0739	.62	.43	.04	.03
TC1	.0003	.1253	.1256	.20	.65	.15	.15
RC1	.001	.061	.062	1.25	.27	.05	.06
Cl	.002	.173	.175	1.09	.30	.26	.25
AFF	.002	.288	.291	.82	.37	.28	.27
EFF	.009	.429	.438	1.92	.17	.46	.48
L	.004	.444	.448	.92	.34	.45	.46
Sl	.001	.211	.212	.55	.46	.30	.29
ClPA	.00001	.02255	.02256	.03	.86	.17	.18
ClPR	.001	.083	.084	1.13	.29	.064	.058
ClFU	.0003	.0560	.0562	.44	.51	.03	.03
PRIM	.004	.570	.574	.60	.44	.30	.29
DGFD	.00004	.14563	.14567	.03	.88	.25	.25
PCI	.0001	.1244	.1245	.10	.75	.22	.23

*Significant at $p < .01$.

TABLE B-3.--Continued [Independent Variable: Attitude Direction; df = 2/95].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{Agree}	$\bar{X}_{\text{Disagree}}$	$\bar{X}_{\text{Undecided}}$
TOT-1	987.5	423109.4	424096.9	.11	.90	224.5	233.6	227.1
SLP	.018	.227	.246	3.83*	.03	.15	.17	.13
SLD	.01	.13	.14	2.45	.09	.14	.14	.16
CLP	.004	.135	.140	1.58	.21	.13	.15	.13
CID	.001	.062	.063	.58	.56	.10	.10	.09
SL-A	.02	.24	.26	3.64*	.03	.17	.21	.17
SL-E	.003	.178	.181	.81	.45	.12	.11	.12
LS1-A	.0004	.0465	.0469	.43	.66	.038	.032	.037
LC1-A	.002	.075	.077	1.07	.35	.067	.055	.062
LS1-E	.004	.193	.197	.97	.38	.16	.15	.17
LC1-E	.01	.28	.29	.97	.38	.153	.145	.166
IPR	.004	.184	.188	1.08	.34	.16	.17	.15
ICE	.001	.007	.008	6.89*	.002	.008	.017	.009
IT	.003	.106	.109	1.25	.29	.115	.120	.106
IR	.00001	.0553	.0554	.06	.94	.04	.05	.05
SPR	.00001	.05050	.05052	.01	.99	.03	.03	.03
S-S	.002	.067	.068	1.31	.28	.03	.04	.02
G-O	.004	.208	.212	.84	.44	.13	.14	.14
ART	.000003	.175165	.1751619	.0007	.99	.13	.13	.13
PREP	.01	.19	.20	3.19*	.05	.17	.14	.17
OTH	.01	.23	.24	1.31	.27	.22	.20	.20

TOT-2	762.6	225491.6	226254.1	.16	.85	159.3	166.9	159.4
TOT-3	1260.3	154048.8	155309.1	.38	.68	129.0	139.3	133.1
NC1	.0005	.0367	.0372	.62	.54	.03	.03	.03
COMP	.001	.016	.017	4.21*	.02	.02	.03	.03
ACTC1	.004	.118	.122	1.49	.23	.18	.19	.18
IC1	.01	.14	.15	2.94	.06	.22	.23	.20
SC1	.00002	.07390	.07393	.02	.99	.04	.04	.04
TC1	.004	.121	.126	1.76	.18	.15	.16	.14
RC1	.00002	.06153	.06155	.02	.98	.05	.05	.05
Cl	.01	.17	.17	1.91	.15	.26	.28	.25
AFF	.01	.28	.29	1.38	.26	.28	.29	.27
EFF	.03	.40	.44	4.07*	.02	.46	.44	.49
L	.03	.42	.45	3.11*	.05	.45	.42	.47
Sl	.01	.21	.21	1.47	.24	.29	.31	.29
ClPA	.001	.022	.023	1.99	.14	.020	.018	.014
ClPR	.001	.083	.084	.44	.65	.06	.06	.06
ClFU	.0003	.0560	.0562	.23	.79	.03	.03	.03
PRIM	.04	.53	.57	3.64*	.03	.30	.33	.27
DEFD	.003	.143	.146	.83	.44	.25	.25	.26
PC1	.006	.118	.125	2.53	.09	.30	.33	.27

*Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Age; df = 1/96].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_{17}	\bar{X}_{18}	\bar{X}_{19}	\bar{X}_{20+}
TOT-1	3060.07	421036.83	424096.91	.23	.88	230.64	224.90	220.90	237.33
SIP	.002	.244	.246	.21	.89	.16	.15	.15	.15
SID	.008	.128	.136	1.91	.13	.12	.15	.15	.15
CIP	.001	.139	.139	.20	.89	.13	.13	.12	.13
CID	.0004	.063	.063	.18	.91	.09	.10	.10	.09
S1-A	.0005	.255	.255	.06	.98	.17	.18	.18	.17
S1-E	.002	.179	.180	.32	.81	.11	.12	.11	.12
LS1-A	.002	.645	.046	1.17	.32	.04	.04	.04	.03
LC1-A	.0004	.0763	.0767	.17	.92	.07	.06	.06	.06
LS1-E	.003	.194	.197	.47	.71	.15	.16	.17	.15
LC1-E	.005	.281	.287	.60	.62	.17	.15	.17	.15
IPR	.0008	.188	.189	.13	.94	.16	.16	.16	.16
ICE	.0002	.008	.008	.89	.45	.01	.01	.01	.01
IT	.004	.104	.108	1.35	.26	.10	.11	.11	.13
IR	.001	.054	.055	.70	.56	.05	.05	.04	.04
SPR	.002	.049	.051	1.01	.39	.03	.03	.02	.02
S-S	.003	.065	.068	1.62	.19	.02	.03	.04	.03
G-O	.0006	.211	.212	.09	.96	.13	.13	.13	.13
ART	.006	.170	.175	1.11	.35	.15	.14	.13	.12
PREP	.005	.192	.197	.87	.46	.16	.17	.18	.16
OTH	.0006	.241	.241	.07	.97	.20	.21	.21	.21

TOT-2	2411.1	223842.2	226254.1	.34	.80	163.9	158.8	155	169.6
TOT-3	1209.3	154099.8	155309.1	.25	.86	133.6	130.9	128.7	139.1
NCL	.0006	.037	.037	.55	.65	.03	.02	.02	.03
COMP	.0008	.016	.017	1.64	.19	.03	.02	.02	.02
ACTCL	.0006	.121	.122	.16	.92	.17	.18	.18	.18
ICL	.001	.150	.151	.21	.89	.21	.21	.21	.21
SCI	.001	.073	.074	.59	.62	.04	.04	.04	.03
TCL	.005	.121	.126	1.20	.32	.14	.14	.14	.16
RCL	.002	.060	.062	1.07	.37	.06	.06	.05	.04
CI	.007	.168	.175	1.25	.30	.27	.26	.24	.26
AFF	.002	.289	.291	.22	.89	.28	.28	.28	.27
EFF	.001	.436	.438	.08	.97	.46	.47	.47	.47
L	.003	.445	.448	.19	.91	.46	.45	.46	.44
SI	.003	.210	.212	.38	.77	.29	.30	.30	.30
CLPA	.001	.021	.023	1.93	.13	.01	.02	.01	.02
CLPR	.003	.081	.084	1.30	.28	.07	.06	.05	.06
CLFU	.0005	.056	.056	.29	.83	.03	.03	.03	.03
PRIM	.005	.569	.574	.28	.84	.31	.29	.28	.30
DEFD	.007	.139	.46	1.48	.22	.23	.25	.26	.26
PCI	.0006	.124	.125	.16	.92	.23	.23	.22	.22

Significant at $p < .05$.

TABLE B-3.--Continued [Independent Variable: Attitude Intensity; df = 3/94].

Depend. Var.	Between SS	Within SS	Total SS	F	F Sig Level	\bar{X}_1	\bar{X}_2	\bar{X}_3	\bar{X}_4
TOT-1	6072.0	418025.0	424096.9	.46	.71	216.7	219.0	221.5	236.4
SLP	.01	.24	.25	1.08	.36	.17	.16	.14	.15
SLD	.0003	.1359	.1362	.07	.98	.14	.15	.15	.14
CLP	.002	.137	.140	.53	.67	.15	.13	.12	.13
CLD	.002	.062	.063	.80	.50	.11	.10	.10	.09
SL-A	.004	.251	.255	.46	.71	.17	.18	.18	.17
SL-E	.001	.180	.181	.14	.93	.12	.12	.11	.12
LS1-A	.001	.046	.047	.42	.74	.03	.03	.04	.04
LC1-A	.002	.075	.077	.82	.48	.07	.06	.07	.06
LS1-E	.004	.192	.197	.72	.54	.14	.15	.16	.17
LC1-E	.001	.286	.287	.11	.95	.14	.15	.15	.16
IPR	.001	.187	.188	.21	.89	.16	.16	.16	.15
ICE	.0001	.0079	.0081	.50	.68	.004	.010	.011	.010
IT	.001	.108	.109	.20	.90	.11	.11	.12	.11
IR	.0004	.0550	.0554	.23	.88	.04	.05	.04	.04
SPR	.004	.046	.051	2.79*	.05	.06	.03	.02	.02
S-S	.001	.067	.068	.60	.62	.03	.03	.02	.03
G-O	.01	.20	.21	1.39	.25	.17	.13	.14	.12
ART	.004	.171	.175	.78	.51	.11	.12	.14	.14
PREP	.002	.195	.198	.36	.78	.14	.17	.17	.17
OTH	.02	.23	.24	2.13	.10	.16	.21	.22	.20

TOT-2	3512.4	222741.7	226254.1	.49	.69	160.7	153.1	156.7	167.6
TOT-3	3796.4	151512.7	155309.1	.79	.51	134.7	129.2	125.8	139.5
NC1	.001	.036	.037	.84	.48	.02	.03	.03	.02
COMP	.0003	.0167	.0171	.65	.59	.02	.02	.02	.02
ACTC1	.003	.119	.122	.78	.51	.20	.19	.18	.18
IC1	.004	.147	.151	.81	.49	.20	.22	.22	.21
SC1	.01	.07	.07	2.51	.06	.07	.04	.03	.04
TC1	.001	.124	.126	.32	.81	.15	.15	.15	.14
RC1	.001	.061	.062	.43	.73	.07	.05	.05	.05
Cl	.003	.171	.175	.60	.62	.27	.26	.26	.25
AFF	.004	.287	.291	.42	.74	.27	.27	.28	.27
EFF	.01	.43	.44	.58	.63	.43	.46	.47	.48
L	.01	.43	.45	1.06	.37	.42	.43	.46	.46
Sl	.01	.21	.21	.93	.43	.31	.31	.29	.30
ClPA	.001	.022	.023	1.23	.30	.01	.01	.02	.02
ClPR	.001	.083	.084	.40	.75	.07	.07	.06	.06
ClFU	.0004	.0558	.0562	.23	.88	.04	.03	.03	.03
PRIM	.02	.56	.57	.95	.42	.33	.31	.28	.29
DEFD	.003	.142	.146	.77	.51	.25	.25	.26	.25
PC1	.003	.121	.125	.84	.47	.26	.23	.22	.22

*Significant at $p < .05$.

APPENDIX C

QUESTIONNAIRES

APPENDIX C

Do Not Write
In This Space

Subject No. _____

Group No. _____

Project No. _____

Test 1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

Michigan State University

East Lansing, Michigan

PUBLIC OPINION SURVEY (College-University)

Name _____ Age _____
(years)

Sex ^M
F Social Security or
Student Number _____

Year in _____ Freshman
College _____ Sophomore
_____ Junior College attending _____
_____ Senior

Date _____

Michigan State University's College of Communication Arts is conducting an exploratory study on personal and social opinions. This test booklet has several short blocks or groups of questions which are essential in the carrying out of this project.

Please remember there are no right or wrong answers. You are asked to give your frank and honest opinions at this time. The school in which this test is being conducted is not sponsoring this survey, and neither the school, its administration, the instructor or anyone associated with the school will have usage of this information. We ask for your name, et. al., for identifying purposes only. Your anonymity is guaranteed. At a later date, a Michigan State University staff member will return to answer any questions you might have about the project.

Please do not open this booklet until you have received appropriate instructions from the project leader. Thank you for your cooperation.

We are interested now in what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3, or -1, -2, -3, depending on how you feel in each case.

+1: I AGREE A LITTLE

-1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE

-2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH

-3: I DISAGREE VERY MUCH

Please write both the number and the sign in the margin left of each statement.

_____ The United States and Russia have just about nothing in common.

_____ It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.

_____ Man on his own is a helpless and miserable creature

_____ In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.

_____ I'd like it if I could find someone who would tell me how to solve my personal problems.

_____ The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.

_____ While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.

Continue marking your answers in this manner:

+1: I AGREE A LITTLE

-1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE

-2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH

-3: I DISAGREE VERY MUCH

_____ The present is all too often full of unhappiness. It is only the future that counts.

_____ To compromise with our political opponents is dangerous because it usually leads to betrayal of our own side.

_____ It is only when a person devotes himself to an ideal or cause that life becomes meaningful.

_____ Most people just don't give a "damn" for others.

_____ The main thing in life is for a person to want to do something important.

_____ Most people just don't know what's good for them.

_____ Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.

_____ In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

_____ Most of the ideas which get printed nowadays aren't worth the paper they are printed on.

_____ It is better to be a dead hero than to be a live coward.

_____ My blood boils whenever a person stubbornly refuses to admit he's wrong.

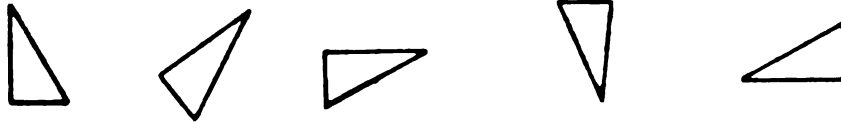
_____ There are two kinds of people in this world: those who are for the truth and those who are against the truth.

_____ Of all the different philosophies which exist in this world there is probably only one which is correct.

Name: _____

CARD ROTATIONS TEST — S-1

This is a test of your ability to see differences in figures. Look at the 5 triangle-shaped cards drawn below.



All of these drawings are of the same card, which has been slid around into different positions on the page.

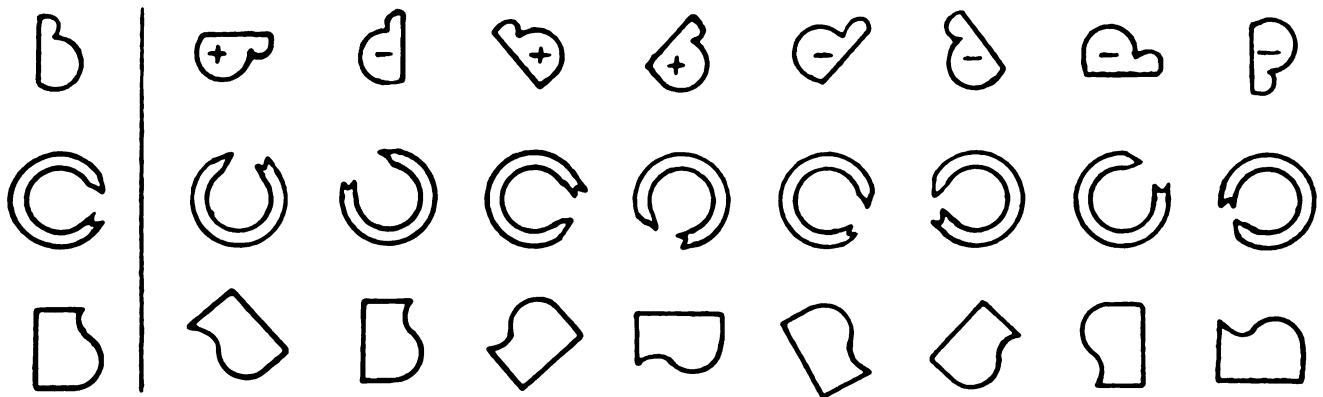
Now look at the 2 cards below:



These two cards are not alike. The first cannot be made to look like the second by sliding it around on the page. It would have to be flipped over or made differently.

Each problem in this test consists of one card on the left of a vertical line and eight cards on the right. You are to decide whether each of the eight cards on the right is the same as or different from the card at the left. Put a plus (+) or cross (X) on the card, if it is the same as the one at the beginning of the row. Put a minus (-) on the card, if it is different from the one at the beginning of the row.

Practice on the following rows. The first row has been correctly marked for you.

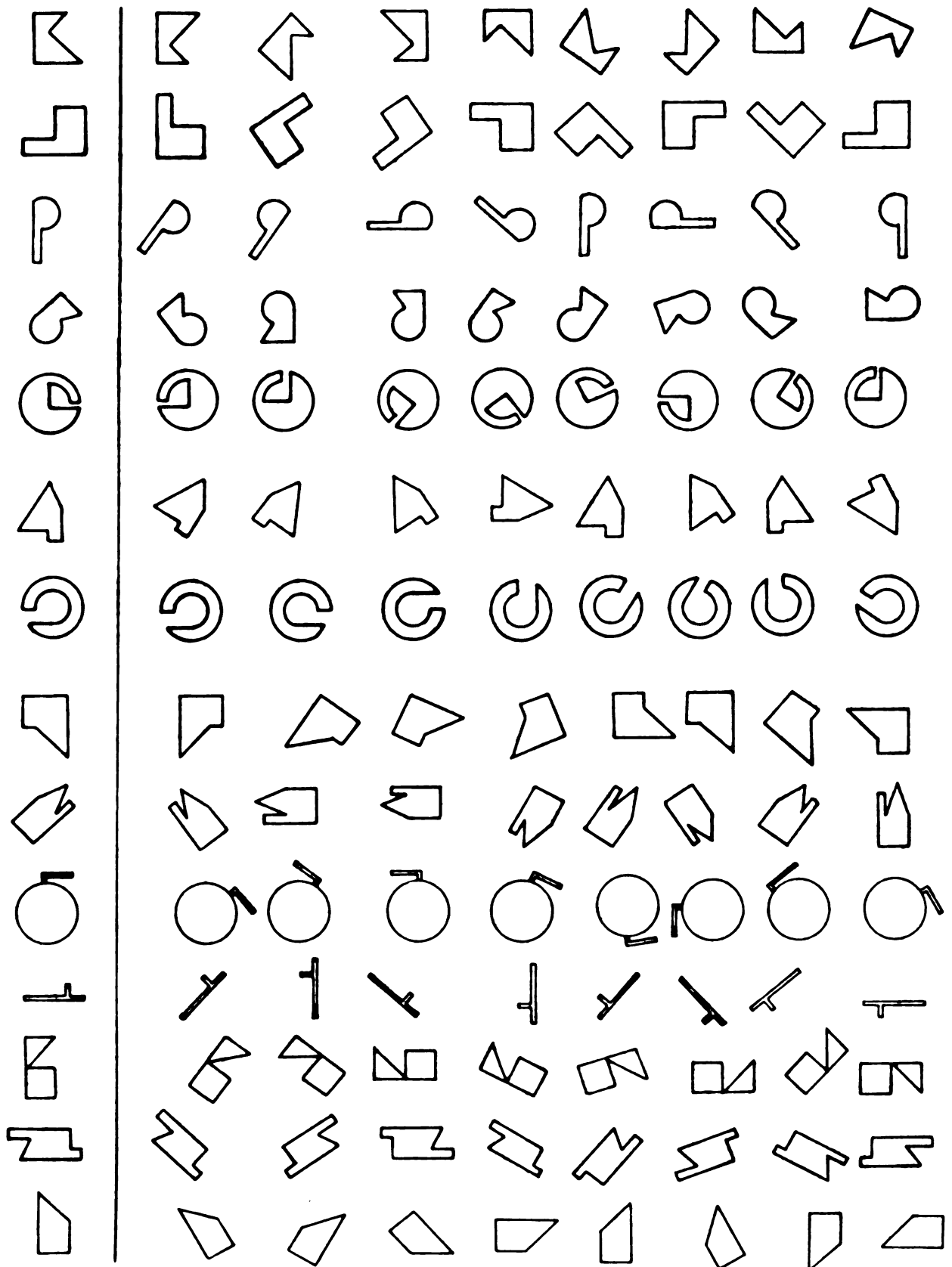


Your score on this test will be the number of cards marked correctly minus the number marked incorrectly. Therefore, it will not be to your advantage to guess, unless you have some idea whether the card is the same or different. Work as quickly as you can without sacrificing accuracy.

You will have 4 minutes for each of the two parts of this test. Each part has 1 page. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

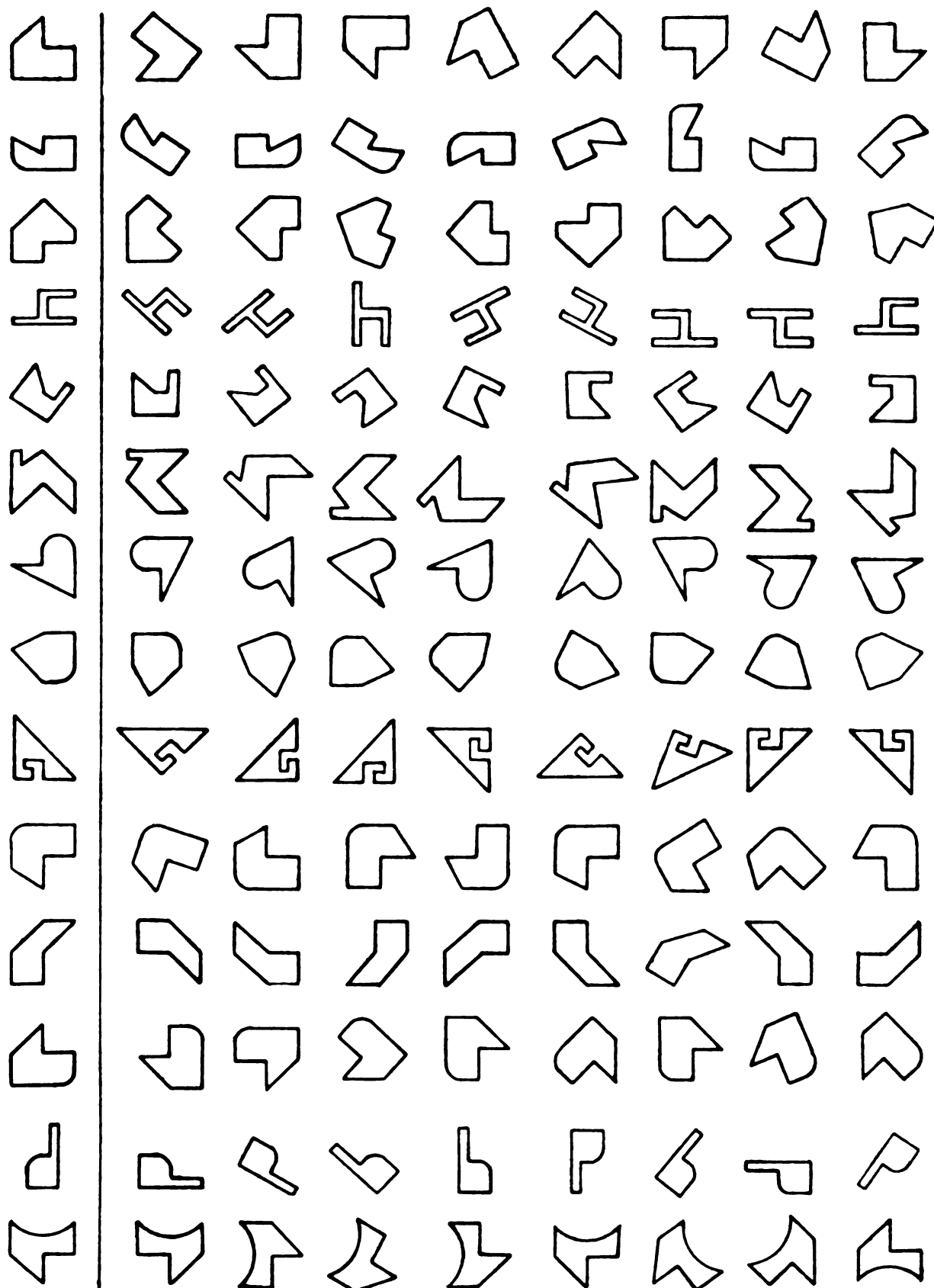
DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO.

Part 1 (4 minutes)



DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO.

STOP.

Part 2 (4 minutes)

DO NOT GO BACK TO PART 1 AND
DO NOT GO ON TO ANY OTHER TEST UNTIL ASKED TO DO SO.

STOP.

This section of the survey seeks to determine your own personal opinion on certain topics. You will be asked your opinion on five statements, stating whether you agree, disagree, or are undecided, and then you will be asked to state how strongly you feel about your position. For example:

Do you believe a college education is worthwhile?

☒ Agree
☐ Disagree
☐ Undecided

How strongly do you feel about this?

☐ Not at all strongly
☐ Not so strongly
☒ Fairly strongly
☐ Very strongly

Thus, in the above question, the X mark denotes you agree a college education is worthwhile, and that you feel fairly strongly about your belief.

Now proceed with the following five statements, giving your own personal opinion. Please answer every question, with one answer only.

Do you believe the United States should withdraw all military troop assistance to South Viet Nam?

☐ Agree
☐ Disagree
☐ Undecided

How strongly do you feel about this?

☐ Not at all strongly
☐ Not so strongly
☐ Fairly strongly
☐ Very strongly

Do you believe Sen. Edward M. Kennedy's recent involvement in the fatal accident disqualifies him for President of the United States?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

- ☐ Not at all strongly
- ☐ Not so strongly
- ☐ Fairly strongly
- ☐ Very strongly

Do you believe churches in general are too involved in politics?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

- ☐ Not at all strongly
- ☐ Not so strongly
- ☐ Fairly strongly
- ☐ Very strongly

Do you believe public aid to non-public schools should be prohibited?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

_____ Not at all strongly

_____ Not so strongly

_____ Fairly strongly

_____ Very strongly

Do you believe the current college student protests are justified?

_____ Agree

_____ Disagree

_____ Undecided

How strongly do you feel about this?

_____ Not at all strongly

_____ Not so strongly

_____ Fairly strongly

_____ Very strongly

Name: _____

WIDE RANGE VOCABULARY TEST — V-3

This is a test of your knowledge of word meanings. Look at the sample below. One of the five numbered words has the same meaning or nearly the same meaning as the word above the numbered words. Mark your answer by putting an X through the number in front of the word that you select.

jovial

1-refreshing

2-scare

3-thickset

4-wise

☒ 5-jolly

The answer to the sample item is number 5; therefore, an X has been put through number 5.

Your score will be the number marked correctly minus a fraction of the number marked incorrectly. Therefore, it will not be to your advantage to guess unless you are able to eliminate one or more of the answer choices as wrong.

You will have 6 minutes for each of the two parts of this test. Each part has one page. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO.

Part 1 (6 minutes)

cottontail	7. evoke	13. placate	19. curtailment
1-squirrel	1-wake up	1-rehabilitate	1-expenditure
2-poplar	2-surrender	2-plagiarize	2-abandonment
3-boar	3-reconnoiter	3-depredate	3-abridgment
4-marshy plant	4-transcend	4-apprise	4-improvement
5-rabbit	5-call forth	5-conciliate	5-forgery
marketable	8. unobtrusive	14. surcease	20. perversity
1-partisan	1-unintelligent	1-enlightenment	1-adversity
2-jocular	2-epileptic	2-cacation	2-perviousness
3-marriageable	3-illogical	3-inattention	3-travesty
4-salable	4-lineal	4-censor	4-waywardness
5-essential	5-modest	5-substitution	5-gentility
boggy	9. terrain	15. apathetic	21. calumnious
1-afraid	1-ice cream	1-wandering	1-complimentary
2-false	2-final test	2-impressive	2-analogous
3-marshy	3-tractor	3-hateful	3-slenderous
4-dense	4-area of ground	4-prophetic	4-tempestuous
5-black	5-weight	5-overflowing	5-magnanimous
gruesomeness	10. capriciousness	16. paternoster	22. illiberality
1-blackness	1-stubbornness	1-paternalism	1-bigotry
2-falseness	2-courage	2-patricide	2-imbecility
3-vindictiveness	3-whimsicality	3-malediction	3-illegibility
4-drunkenness	4-amazement	4-benediction	4-cautery
5-ghastliness	5-greediness	5-prayer	5-immaturity
loathing	11. maelstrom	17. opalescence	23. clabber
1-diffidence	1-slander	1-opulence	1-rejoice
2-laziness	2-whirlpool	2-senescence	2-gossip
3-abhorrence	3-enmity	3-bankruptcy	3-curdle
4-cleverness	4-armor	4-iridescence	4-crow
5-comfort	5-majolica	5-assiduity	5-hobble
bantam	12. tentative	18. lush	24. sedulousness
1-fowl	1-critical	1-stupid	1-diligence
2-ridicule	2-conclusive	2-luxurious	2-credulousness
3-cripple	3-authentic	3-hazy	3-seduction
4-vegetable	4-provisional	4-putrid	4-perilousness
5-ensign	5-apprehensive	5-languishing	5-frankness

DO NOT TURN THE PAGE UNTIL ASKED TO DO SO.

STOP.

Part 2 (6 minutes)

- | | | | |
|---|---|--|---|
| <p>shortcake</p> <p>1-condiment
2-pastry
3-fruit
4-sweetmeat
5-vegetable</p> | <p>31. demoniacal</p> <p>1-alloof
2-mythical
3-thoughtful
4-fiendish
5-eccentric</p> | <p>37. corroboratory</p> <p>1-plausible
2-anticipatory
3-confirmatory
4-explanatory
5-esoteric</p> | <p>43. aggrandizement</p> <p>1-theft
2-impeachment
3-derision
4-amazement
5-enlargement</p> |
| <p>hardtack</p> <p>1-nail
2-textile
3-weapon
4-wood
5-biscuit</p> | <p>32. highroad</p> <p>1-mountain road
2-right of way
3-main road
4-roadbed
5-concrete road</p> | <p>38. figurine</p> <p>1-metaphor
2-wine
3-poem
4-organ
5-statquette</p> | <p>44. effulgence</p> <p>1-prominence
2-outline
3-change
4-radiance
5-energy</p> |
| <p>commendable</p> <p>1-pleasurable
2-charitable
3-lucrative
4-proscriptive
5-laudable</p> | <p>33. befog</p> <p>1-dampen
2-forget
3-whip
4-mystify
5-belittle</p> | <p>39. rancorous</p> <p>1-malignant
2-jubilant
3-abashed
4-inglorious
5-careless</p> | <p>45. aphasia</p> <p>1-loss of speech
2-drunkenness
3-anemia
4-loss of memory
5-rash</p> |
| <p>nonchalant</p> <p>1-sarcastic
2-discourteous
3-noble
4-unconcerned
5-unsophisticated</p> | <p>34. platoon</p> <p>1-tableland
2-bridge of boats
3-body of soldiers
4-commonplace remark
5-frigate</p> | <p>40. inveteracy</p> <p>1-habitualness
2-migration
3-bravery
4-covering
5-hatefulness</p> | <p>46. panoplied</p> <p>1-philosophical
2-dressed in armor
3-panting
4-frenzied
5-atavistic</p> |
| <p>coloration</p> <p>1-pigmentation
2-alternation
3-configuration
4-prevention
5-taint</p> | <p>35. dullard</p> <p>1-peon
2-duck
3-braggart
4-thief
5-dunce</p> | <p>41. choler</p> <p>1-anger
2-chorister
3-guard
4-saliva
5-refrigerator</p> | <p>47. sacrosanct</p> <p>1-sacrificial
2-dormant
3-inviolable
4-superficial
5-gullible</p> |
| <p>aridity</p> <p>1-bitterness
2-surface
3-sonority
4-dryness
5-torridity</p> | <p>36. momentarily</p> <p>1-frivolously
2-moderately
3-weightily
4-momentarily
5-modishly</p> | <p>42. vacillation</p> <p>1-purification
2-wavering
3-expulsion
4-tempting
5-foolishness</p> | <p>48. prurience</p> <p>1-modesty
2-sapience
3-provender
4-lust
5-security</p> |

DO NOT GO BACK TO PART 1 AND

DO NOT GO ON TO ANY OTHER TEST UNTIL ASKED TO DO SO.

STOP.

This instrument is composed of 20 statements regarding feelings about communicating with other people.

Indicate the degree to which the statements apply to you by marking whether you (1) strongly agree, (2) agree, (3) are undecided, (4) disagree, or (5) strongly disagree with each statement. Work quickly, just record your first impression.

Do not mark on this page. Please use the answer sheet provided.

- | | 1 | 2 | 3 | 4 | 5 |
|---|----|---|---|---|----|
| 1. I look forward to an opportunity to speak in public. | SA | A | U | D | SD |
| 2. My hands tremble when I try to handle objects on the platform. | SA | A | U | D | SD |
| 3. I dislike to use my body and voice expressively. | SA | A | U | D | SD |
| 4. My thoughts become confused and jumbled when I speak before an audience. | SA | A | U | D | SD |
| 5. I have no fear of facing an audience. | SA | A | U | D | SD |
| 6. Although I am nervous just before getting up, I soon forget my fears and enjoy the experience. | SA | A | U | D | SD |
| 7. I face the prospect of making a speech with complete confidence. | SA | A | U | D | SD |
| 8. Although I talk fluently with friends I am at a loss for words on the platform. | SA | A | U | D | SD |
| 9. I feel relaxed and comfortable while speaking. | SA | A | U | D | SD |
| 10. I always avoid speaking in public if possible. | SA | A | U | D | SD |
| 11. I enjoy preparing a talk. | SA | A | U | D | SD |
| 12. My posture feels strained and unnatural. | SA | A | U | D | SD |
| 13. I am fearful and tense all the while I am speaking before a group of people. | SA | A | U | D | SD |
| 14. I find the prospect of speaking mildly pleasant. | SA | A | U | D | SD |

PLEASE TURN OVER!

- | | |
|---|-------------|
| 15. I look forward to expressing my opinion at meetings. | SA A U D SD |
| 16. While participating in a conversation with a new acquaintance I feel very nervous. | SA A U D SD |
| 17. Conversing with people who hold positions of authority causes me to be fearful and tense. | SA A U D SD |
| 18. I would enjoy presenting a speech on a local television show. | SA A U D SD |
| 19. I feel that I am more fluent when talking to people than most other people are. | SA A U D SD |
| 20. I am tense and nervous while participating in group discussions. | SA A U D SD |

NAME _____

STUDENT OR SOCIAL SECURITY NUMBER _____

Michigan State University's College of Communication Arts is conducting an exploratory study on personal and social opinions. The school in which this test is being conducted is not sponsoring this survey, and neither the school, its administration, the instructor or anyone associated with the school will have usage of this information. We ask for your name, et. al., for identifying purposes only. Your anonymity is guaranteed. After you have completed this exercise, a Michigan State University staff member will answer any questions you might have about the project.

This survey seeks to determine public opinion on certain topics. You are being asked your opinion on three statements stating whether you agree, disagree, or are undecided, and then you will be asked to state how strongly you feel about your position. For example.

Do you believe Richard Nixon is a good President?

☒ Agree
☐ Disagree
☐ Undecided

How strongly do you feel about this?

☐ Not at all strongly
☐ Not so strongly
☒ Fairly strongly
☐ Very strongly

Thus, in the above example, the x mark denote you agree Nixon is a good president, and that you feel fairly strongly about your belief. Now proceed with the following three statements.

Do you believe Sen. Edward M. Kennedy's recent involvement in the fatal accident disqualifies him for President of the United States?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

- ☐ Not at all strongly
- ☐ Not so strongly
- ☐ Fairly strongly
- ☐ Very strongly

Do you believe churches in general are too involved in politics?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

- ☐ Not at all strongly
- ☐ Not so strongly
- ☐ Fairly strongly
- ☐ Very strongly

Do you believe public aid to non-public schools should be prohibited?

- ☐ Agree
- ☐ Disagree
- ☐ Undecided

How strongly do you feel about this?

- _____ Not at all strongly
- _____ Not so strongly
- _____ Fairly strongly
- _____ Very strongly

Write the most persuasive speech on the following topic, taking the position you favor most. You have 20 minutes to write. Write as though you were to give this speech before an audience that has many different positions on the topic.

PUBLIC AID TO NON-PUBLIC SCHOOLS

[