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Interim Report

Phase One

64-2

ATTITUDES OF TROOPS IN THE TROPICS

Volume One

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ROWLAND AND COMPANY, INC.
P. O. Box 61
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R&C Report No. 63-29
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SUMMARY

The purpose of Phase One of the present study was to develop ways and means to identify and quantify attitudes. A theory of attitudes was developed, a model was constructed, and several basic assumptions were identified which influenced the subsequent selection and development of the following data collection techniques which were analyzed independently and comparatively:

1. Objective questionnaires which employ Likert-type and Osgood-type scales;
2. Sentence completion items;
3. Listing items;
4. Projective picture items which elicit verbal (written) responses;
5. Projective picture items which elicit non-verbal responses;
6. Completely unstructured items in which the subjects are allowed free expression; and
7. Lowery-Lucier Reasoning Test Combination.

Content matter of the items pertain to items of Quartermaster issue as they are used in a tropical environment, and some general conditions such as entertainment, officer-enlisted man relationships, health, etc.

Two pilot studies were conducted during the development of the several techniques, one in Panama and one at Fort Lee. The pilot studies aided in the development and refinement of the instruments which were employed during the major data collection in Panama. The major data collection phase was conducted with 200 Airborne Infantry troops as subjects. The data were analyzed and some conclusions reached in regard to the several techniques employed. The Osgood-

type of questionnaire appeared to be superior to the Likert-type. The projective methods of obtaining attitude information seem to be promising, but specific comments must await further consideration of available data. Some techniques which were devised in order to discriminate between respondents who are yielding "valid" data and those who are contributing "invalid" data appear to be successful.

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Special appreciation is hereby expressed...

...to Dr. David R. Peryam, Chief, Food Acceptance Branch, Armed Forces Food and Container Institute, U. S. Army Quartermaster Research and Engineering Command, Chicago, Illinois. Dr. Peryam's sustained interest, counsel, and advice concerning content matter and item construction, and his cooperation in expediting the job contributed heavily toward the success of this project. Every research contract would prosper handsomely if it were equipped with a Technical Monitor of Dr. Peryam's qualities.

...to Dr. Ralph Dusek, Chief Psychologist, Psychology Branch, Quartermaster Research and Engineering Center, Headquarters, QMR&E Command, Natick, Massachusetts, for his confident willingness to explore new concepts with untested techniques and for his many contributions, both administrative and technical, which made this study possible.

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INTRODUCTION

SECTION ONE - READERS' GUIDE

This research job is directed toward exploration and exploitation of new concepts in human attitude measurement. The job has two phases. Phase One is exploratory and is reported herein. Phase Two hopes to exploit some new concepts, is just being started, and will be reported upon at the conclusion of the second year.

The Phase One report is divided into two volumes. Volume One contains the text describing the research. Volume Two contains copies of the actual data collection instruments used in the study. Combination of all the material into one volume would have resulted in a book of unmanageable size.

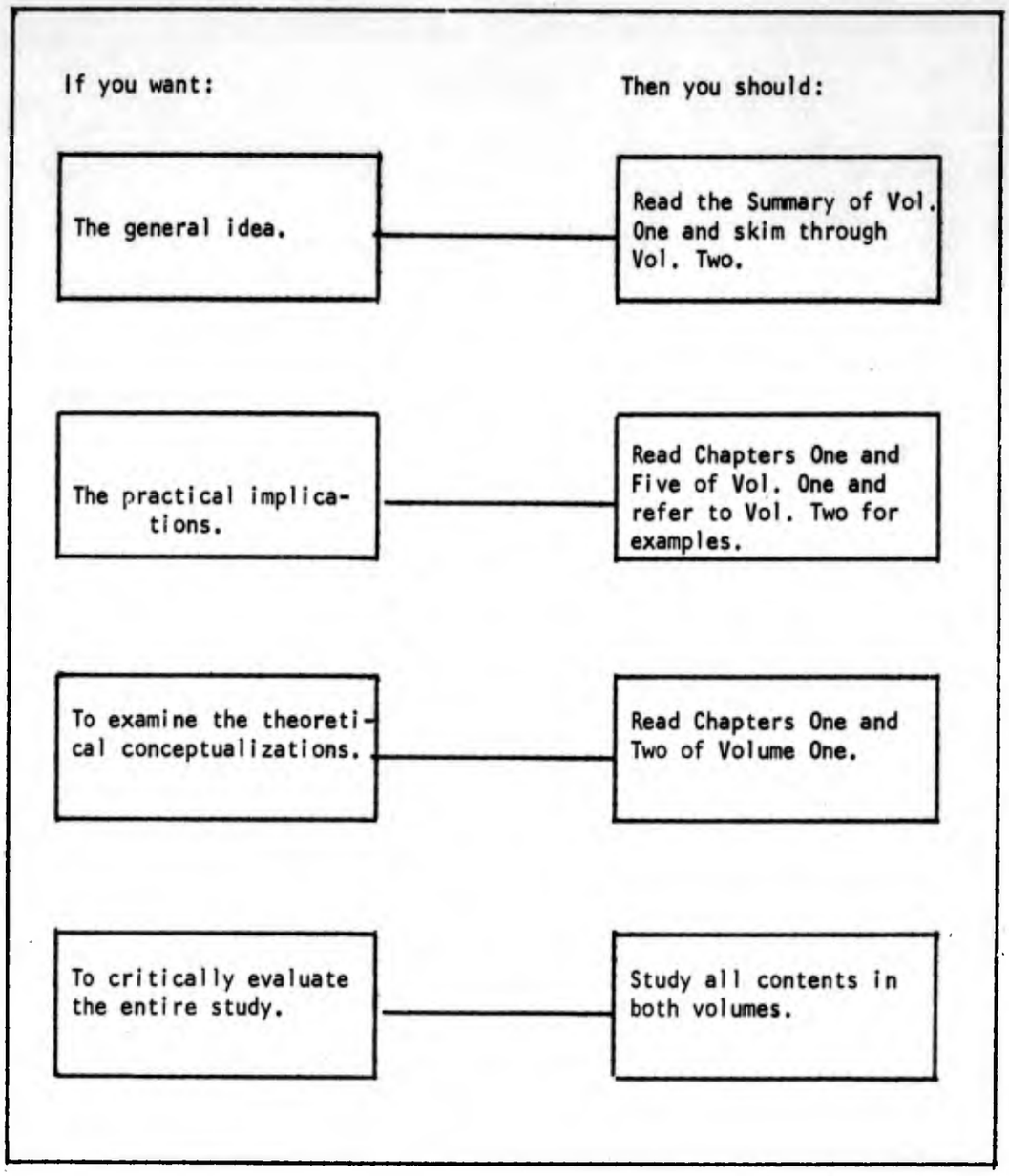


Figure One

Readers' Guide

SECTION TWO - BACKGROUND OF THE PROBLEM

Over the last few decades man has made technological discoveries which have enabled environmental manipulation and control of a magnitude difficult to comprehend. Hardware development, originally intended to extend man's sensory or physical capabilities to assist him in his conquest of nature, has evolved into the construction of complex systems whose functions transcend original intents. Systems are conceived and developed in terms of their overall missions rather than to merely extend one of man's senses. Hence, the human organism has come to be viewed as a complex component of man-machine systems; a component whose effectiveness must be evaluated in much the same manner as the hardware components.

As system effectiveness has been recognized to be dependent upon human reliability as well as upon hardware reliability, the study of human performance has taken on new meaning. Concerted efforts in the study of the human organism have led to the conclusions that, compared to hardware technology, the control and prediction of human behavior is hardly understood.

Behavioral scientists have developed many constructs which represent phenomena related to human performance; among these constructs are intelligence, interest, emotions, personality, attitudes, etc. Furthermore, it has often been demonstrated that the contribution to system performance by the individual is a measurable product of such constructs. It follows then, that just as it is necessary to understand the physical laws which pertain to the materials, processes, and forces involved in propulsion, guidance, etc., to be able to control and direct weapon systems, so

is it also important to master the dynamics involved in predicting and controlling human behavior because people are an integral component of such systems. For example, a great deal of progress has been made in the field of intelligence testing. Psychologists have developed relatively straightforward techniques which reliably and reasonably easily detect individual differences with respect to intellectual skills and abilities. This allows a rather sophisticated level of prediction as to eventual individual and group performance on the job. Great practical value has resulted from this application of psychometric capability.

However, the ability to measure intelligence is only one of the dimensions needed to accurately predict and control human behavior. It is commonly acknowledged that "attitudes," the ways in which people believe and feel about things, are also major contributors to human performance. Based upon this principle, industry spends millions of dollars each year on advertising to form and change attitudes such that people will behave in some desired manner with respect to their product or service. It is upon the same principle that governments have enlisted active support from their people in times of emergency. The quick mobilization, intense dedication, and sacrificing spirit of the people of the United States during World War II was very different from the somewhat apathetic behavior exhibited during the "police action" in Korea. It is possible that the different behaviors might in part be attributed to the way in which the two encounters were dealt with in the news media; for example, "police action" vs. "war" made a significant difference in "attitudes," which in turn was reflected in behavior. Similarly, it is reasonable to hypothesize that a soldier who has negative attitudes toward such things as his articles of personal equipment,

his organization equipment, or military life will sustain some degree of impairment in his motivation or even his unconscious willingness to endure viscissitudes or expose himself to risks. Thus soldier attitude can, and probably does, profoundly influence human behavior characteristics of military significance all the way from original enlistment, acceptance of equipment items, combat effectiveness, and on to re-enlistment or "early - out." While the influences of attitudes may well be small and unobtrusive, these influences are apparently cumulative and thus are eventually of great significance in the lives of all of us. Control of a phenomenon demands the ability to measure it. Therefore, if one is to succeed in deliberately manipulating the creation, change, or concealment of attitudes, one must be able to measure them in order to evaluate the efficacy of his controlling activities.

Based on the premises that human performance is a determining factor in the success or failure of man-machine systems, and human behavior is affected significantly by "attitudes," the criticality of the study of formation, change, and control of attitudes on a deliberate basis becomes quite evident. If optimal performance is to be obtained from the "people part" of the systems by shaping and changing attitudes in the proper manners, accurate determination of their attitudes must be made. While the ability to make precise measurement of attitudes is mandatory, the state of the art of attitude measurement is questionable, to say the least. Recognition of the general inadequacy of attitude measurement techniques constitutes the rationale for undertaking the present research.

SECTION THREE - STATEMENT OF THE PROBLEM

The objectives of this two-phased research are to:

1. Explore and devise ways and means to measure attitudes;
2. To systematically test the methods derived;
3. To use the successful techniques to obtain, summarize, and suggest uses for normative information on such attitudes in order to bring about more effective military operations.

The present report, which culminates Phase One, presents an account of the execution of a Research Plan which has accomplished much progress toward Objectives One and Two of the problem stated above. Phase Two will deal with the remainder of Objective Two and Objective Three.

The attitude measurement field is so broad that boundaries must be established to avoid dilution and dissipation of effort. Therefore, in order to stay within a practical scope, this study has been almost completely limited to consideration of attitudes of troops in the tropics with regard to items of Quartermaster issue. However, the attempt has been made throughout to develop theoretical and methodological approaches which would be applicable to practically any attitude measurement situation.

CHAPTER TWO

ATTITUDE THEORY

SECTION ONE - GENERAL CONDITIONS

I. Introduction

Perhaps the most important single concept in social psychology today is the concept of "attitude." While research in the area of attitudes has sometimes been conducted solely for purposes of advancing our knowledge of human behavior, it has also frequently sought to make contributions of direct application in worldly affairs. There appears to be more research and more publications concerning attitudes than any other topic in the field of social psychology, at least in terms of quantity. Gordon Allport [1954, p. 45] states that "... the term itself (attitude) may not be indispensable, but what it stands for is."

Unfortunately, while reviewing the literature for the present study, it has been found that there is much to be desired in the field of attitude conceptualization, attitude theory, and attitude research. Increased volume of publication has not necessarily been accompanied by increased clarity of subject matter. In fact, in the present instance almost the opposite appears to be true; increased volume seems to have been accompanied by decreased clarity. The concept of attitude seems to be in a confused state, and the confusion appears to be mounting. While some researchers use the term "attitude" to mean one thing, other researchers use the term differently. Other investigators somewhat blandly assume that everyone agrees as to the nature and development of attitudes and therefore seemingly feel no necessity

to define their terms and explicitly state their assumptions. Some writers use the term "attitudes," "beliefs," and "opinions" as synonymous, while others make sharp distinctions between these constructs. An example of this is Abelson [1959, p. 102], who has this to say about "Opinions and Attitudes:"

> "Unlike some others who have used these terms, we are using them interchangeably in the report. There is no consensus among social scientists about what these words mean."

Consider also the following conflicting positions: some researchers hold that an attitude is a response, while others maintain that it is a readiness to respond. Some employ the term both as a response and as a readiness to respond, apparently not recognizing the differences between readiness for response and overt behavior. Some state that an attitude is composed of pure affect, others hold that both affect and cognition enter into attitudes, and still others do not even bother to state their positions regarding these two aspects. Thus attitudes have been construed as both event and process, static and dynamic, affect and cognition or affect alone, future tendencies and past performances, and various combinations of these and other dimensions. A brief review of the literature should convince the reader of the chaotic state in the conceptualization of attitude. It should be noted at this point that this research team has not attempted to produce a comprehensive review. The reader is referred to the article by McNemar [1946] and Moscovici [1963] for more comprehensive study.

II. Brief Overview of Classical Conceptions

The accompanying diagram [Figure 2] has been submitted to assist the reader through the labyrinth of theories and near-theories of attitude discussed in the review of the literature. It is not a simple figure, but then neither is the concept it attempts to accommodate.

In Figure 2 the various basic assumptions and relationships which different "schools" of behavioral scientists appear to follow in their work with attitudes have been outlined. Using theories of attitudes as the starting point, one immediately encounters a division into two separate camps: those who hold that attitudes are responses (following Route A), and those who maintain that attitudes are predispositions to respond (following Route B). The response theorists soon divide into two groups; those who believe that responses (attitudinal) are pure affect (Fork A_2), and those who believe that such responses are combinations of cognition and affect (Fork A_1).

The predisposition theorists divide into similar camps; the ones postulating pure affect take Fork B_2, and those maintaining both cognition and affect as parts of attitudes taking Fork B_1. Those who take the "pure affect" Forks A_2 and B_2, automatically assume that "evaluation" is pure affect (Route C). Meanwhile, the "cognition-affect" theorists divide into two separate groups: 1) the "mixture theorists" who hold that attitudes are combinations of affect plus cognition, following Fork D_1, and 2) the "compound theorists" who maintain that attitudes have inseparable aspects of cognition and affect, taking Route D_2. The mixture theorists follow D_1 to its logical conclusion; i.e. belief in the fractionation of attitudes into separable components of affect and cognition. On the other hand, the compound theorists follow D_2 to its logical conclusion, that of regarding attitudes as representing

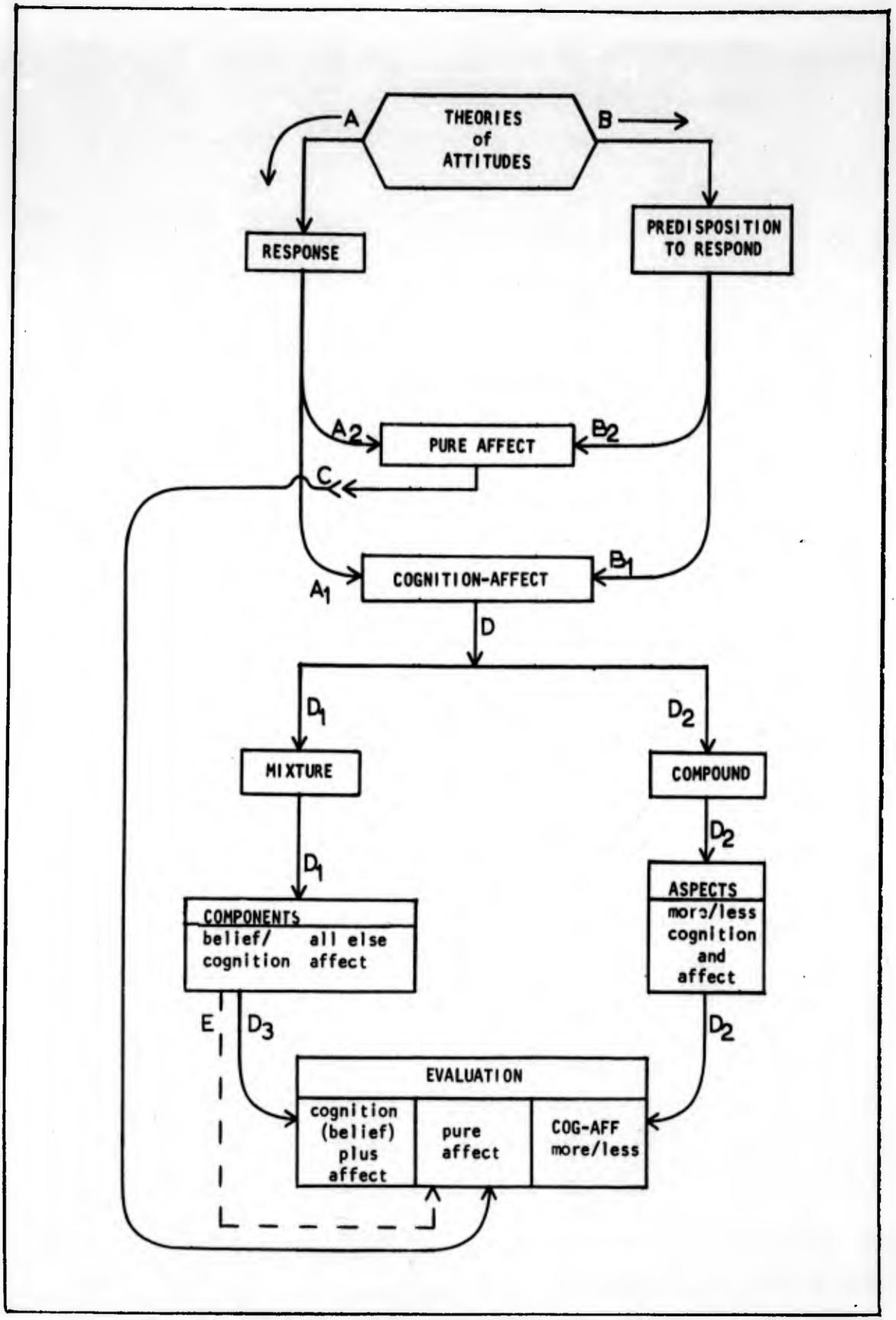


Figure 2. A diagram of the various basic assumptions and relationships which different "schools" of behavioral scientists appear to follow in their work with attitudes.

indivisible totalities of affect and cognition. The mixture theorists also follow D_3 to evaluation, wherein evaluation is considered as being divisible into components of affect and cognition; while the compound theorists follow Route D_2 to evaluation, wherein evaluation is considered as having indivisible aspects of affect and cognition. It appears as if some of the mixture theorists believe that evaluation is pure affect, although clear-cut statements from these mixture theorists have not been located. Thus the route some mixture theorists appear to follow, Route E, is drawn with a dashed line.

Obviously, even though the presentation above has been greatly oversimplified, the conceptualization of attitude has proven difficult to theorists. Perhaps attitude is such an elusive or comprehensive concept that great differences in meaning are to be expected. According to Gordon Allport [1954, p. 43]:

> "Since an attitude may combine both instinct and habit in any proportion, it avoids the extreme commitments of both the instinct theory and environmentalism. The term likewise is elastic enough to apply either to the disposition of single isolated individuals or to broad patterns of cultures ...."

III. Attitude: Which is it -- Tendency to Respond or Response?

Klineberg [1962] provides two definitions for attitude prefering the latter; the first is related to values, the second is a disposition to react. Allport [1954, p.43] says that: "Attitude connotes a neuropsychic state of readiness for mental and physical activity." Morgan [1956, p. 626] similarly defines attitude as: "A tendency to respond either positively (favorably) or negatively (unfavorably) toward certain persons, objects, or

situations." Osgood, Suci, and Tannenbaum [1957, p. 189] seem to follow the general pattern so far discussed in their view that attitudes are: "... predispositions to respond, but are distinguished from other such states of readiness in that they predispose toward an evaluative response." Therefore, it can be seen that these authors hold that attitude falls into the category of a "tendency" or readiness or predisposition to respond to a psychological object. Since a tendency or predisposition or readiness indicates a potential for some reaction in the future, it would appear that in most instances the "tendency" relates to classes of objects rather than to specific objects. A response, on the other hand, implies a reaction to a specific object in the present or past, and hence must be differentiated from a "tendency" to respond. Green [1954, p. 336] has summed up in a review of definitions of attitude:

> "It is apparent that the concept of attitude implies a consistency or predictability of responses. An attitude governs, or mediates, or predicts, or is evidenced by a variety of responses to some specified set of social objects or situations."

According to this view, when an attitude (tendency) has been actuated into some specific behavior towards a psychological object, the behavior is labelled a "response." One no longer has a tendency to respond (something which has a probability loading of happening in a certain way in the future) and instead one has something called a response or reaction which is happening in the immediate present or has happened in the past.

Logically, a "tendency to respond" and a "response" cannot be one and the same thing, thus they should not be classified under an identical label. No small portion of the confusion in the research on attitudes may arise from

the fact that some authors use the term attitude to mean a "tendency to respond," while others use this term to mean the "response" or "action." For example, Helen Peak [1959] states that: "This term (attitude) is used to refer to an affective or evaluative reaction which is organized around some situation or some object." Axelord [1959] states that M. Rosenberg, E. Carlson, and Helen Peak express a common theory of attitude structure which he sums up in the following way: "... an individual's attitude, defined as an evaluative response to an attitude object...." and then he proceeds to accept this theory as his own. Das and Nanda [1963] introduce their article on attitudes with the statement that: "Attitudes are evaluative verbal responses ...."

On the other hand, Thistlethwaite, Moltz, Kamenetzky, and de Haan [1955] who indicate a preference for Route A of Figure 2, hold that the distinction between "disposition to respond" and "response" is inconsequential. They sum up their stand in a single paragraph:

> " 'Attitude' may be conceived as a dispositional concept reducible to specified observations of behavior. The behavior in terms of which attitudes are specified in this report is the preferential behavior of the respondent in making choices as to which alternatives in a series of multiple-choice questionnaire items he prefers, or agrees with most nearly. This preferential behavior may be taken as an indicant of some unobservable attitude or sentiment, or it may be treated as if it constitutes the full meaning of the term 'attitude'. Pragmatically, it makes little difference which of these positions is adopted."

Other authors explicitly distinguish between attitude as a tendency to respond, and a response which is associated with an attitude. Cameron and Margaret [1951, p. 64] point up this difference clearly:

> "The attitude is the widespread, diffuse, behavioral background which prepares for, supports, and prolongs certain responses and not others. A response, on the other hand, is the more specific,

> localized aspect of a reaction which emerges from and is supported by the attitude.... Responses and their supporting attitudes are constituents of the unitary, temporal organizations we call reactions."

At this point the writers wish to bring attention to something which is, at least to them, incredible. In spite of clear warnings, there seems to have been a major strategic failure in attitude research.

From the account in the pages above, it can be seen that there is no concensus regarding whether attitudes are responses or tendencies to responses. This theoretical controversy would be acceptable as such for such is the stuff of science. Astonishingly enough however, it has been observed that the vast majority of writers seem to accept the view that <u>responses to survey items</u> used in their studies are <u>direct measures of attitudes</u>! Some authors draw their support for this action from Osgood, et al [1957], Kjeldergaard [1961], Fishbein and Raven [1959], and Manis [1961].

There have been alarms sounded from mental measurement oriented specialists that this cannot be done. Jahoda, Deutsch, and Cook [1951, p. 112 - 113], conscious of measurement, stress the difference from their frame of reference:

> "Many of the methods of social psychology are directed toward obtaining measures of behavior in specific situations under conditions which permit <u>inferences</u> about attitudes. Measurement of the characteristics of an attitude is always indirect. Unfortunately, in practice the inferential nature of the measurement of attitudes is frequently glossed over."

Newcomb [1950, p. 154] speaks as follows:

> "Attitudes ... are not themselves responses but states of readiness to respond. Hence, they can be measured only indirectly. More precisely, they are inferred from responses, various dimensions of which are measured. We shall thus use the term 'attitude response' to refer to behavior (mainly of the verbal nature) from which attitudes are inferred."

Green [1954, p. 335], also viewing the field from a measurement orientation says: "The concept of attitude does not refer to any one specific act or response, but an abstraction from a large number of related acts or responses." He defines an attitude as a disposition to react favorably or unfavorably to a class of objects, and then adds: "This disposition may, of course, be inferred from a variety of observable responses made by the individual when he is confronted by a member of the class of objects toward which he has an attitude."

In spite of these warnings, it is painfully apparent that the majority of attitude research regards item responses as direct measures of attitude and reifies these responses as facts. Even worse, this viewpoint is seemingly adopted thoughtlessly, practically as an article of blind faith. Apparently, all the admonishments of experimental psychologists about commission of the stimulus error have not reached the working level in social psychology.

As will be seen later, data from the present study clearly reveal this view of what one gets as answers to his survey items to be at variance with the facts. Indeed, to the present writers, it would appear that execution of even casual observation by professional psychologists would result in observations regarding man's general perfidy which would be sufficient to cast extreme doubt upon such a naive view. Surely, even laymen are fully aware that what people "say" and what people "do" are two entirely different things at times. Laymen also know that what people "think" and what people "say" are often different. Moreover, in this day and time, it is often found that even a lay person will appreciate the fact that unconscious levels of mental behavior may produce responses whose sources are unrecognizable to the

individual. How a large number of trained research persons with previous measurement experience could possibly believe that "if you ask them, people will give you their attitudes" is simply incomprehensible. Sophomore after sophomore has given his professor "what the old man wants to hear" or has simply checked one or another objective alternative when neither one really fitted his own case, but it finished the job and allowed the class to leave early. Soldiers hold an "official" attitude toward their officers as well as a private one - and the two are often 180° apart. In short, people lie. Psychologists should not be surprised at this, but they should be prepared to get past this kind of behavior to another level.

How is it that attitude theorists can battle each other tooth and nail over whether attitudes are "responses" or "tendencies" and then so cozily snuggle into the same bed, and agree that these differences in viewpoint are really inconsequential because in either case the check marks in the survey form are actually measures regardless of theoretical predilections of the surveyor? No wonder there is an increasing demand for logicians these days.

IV. Attitude: Cognition - Affect or Pure Affect?

As was mentioned earlier, some behavioral scientists consider attitudes to be purely affective, while others postulate that various mixtures or compounds of cognition and affect are part and parcel of an attitude.

Rosenberg [1960] points up the issue of the two approaches, affect only and cognition-affect, thusly:

> "Most, though be no means all, definitions of the attitude concept have been restricted to the emotional 'Einstellung': when some object regularly and dependably elicits an affective evaluative set that can be characterized as either 'pro' or 'con', 'positive' or 'negative', the individual is said to hold an attitude.... a concern with both the affective and

cognitive components of attitudes leads to a useful clarification of their structured properties and to a useful formulation of the attitude-change process."

A. Cognition-Affect

The "cognition and affect" theorists were divided into two general classes: those who employ a "mixture" concept and those who employ a "compound" concept. The "mixture" theorists generally segment cognition and affect of an attitude into separate components, in which the cognitive component is a belief, and the affective component of an attitude is all that remains after belief has been removed. The "compound" theorists generally hold that attitudes have aspects of both cognition and affect in varying proportions.

1. The mixture theory

The distinction between the "mixture" theorists and the "compound" theorists is generally sharp and clear. Adherents of each approach usually employ vocabularies which indicate their respective theories, although this is not always the case. The "mixture" theorists, following D_1 of Figure 2 postulate attitudes as consisting of two virtually independent but interacting components -- cognition and affect. These two components are separable into pure elements: belief is the cognitive element, affect is the emotional (feeling) element. Belief is "operationally defined" by some authors as a probability function (expressed in terms such as true, false, correct, incorrect), while Osgood et al [1957, p. 190] define belief as a judgmental function (expressed as scalable in polar terms of fast-slow, stable-changeable, heavy-light, etc.). Affect is the emotional dimension (expressed by such terms as good-bad, right-wrong, pro-con, positive-negative)

or in Osgood et al [1957, p. 193] as scales of fair-unfair, valuable-worthless, pleasant-unpleasant, clean-dirty, good-bad. The point to be emphasized here is that cognition and affect are assumed to be two discrete components separable into pure elemental forms, each without trace of the other.

One of the adherents of the mixture theory is Katz [1960]. He concludes that "attitudes include both the affective, or feeling core of liking or disliking, and the cognitive, or belief, elements which describe the object of the attitude, its characteristics, and its relations to other objects." Rosenberg [1960] delineates a similar view when he conceives of an attitude as "... consisting of a cognitive as well as an affective component." Krech, Crutchfield, and Ballachey [1962, p. 140], while concurring with Katz and Rosenberg on the components of an attitude, add "action tendency" as they proclaim: "The cognitive component of an attitude consists of the beliefs of the individual about the object .... The feeling component of an attitude refers to the emotions connected with the object." And P. T. Young [1961, p. 521], adding his contribution to the mixture theory, is one of the few who uses the terms "aspects" and "components" interchangeably. He says, "It is generally agreed that an attitude has two main aspects -- cognitive and affective. The cognitive component is defined as the set of beliefs (held by a person) about the value-attaining and value-blocking powers of the attitude object viewed as an instrument agency .... The affective component is defined as the pattern of feeling regularly aroused by the presence of the psychological object."

2. The compound theory

The "compound theorists," while postulating cognition and affect as contributing vectors in their definition of attitude as measured or as a theoretical construct, specifically state or imply that cognition and affect are integrated in the totality of the individual in such a manner that they are <u>not</u> separable. These authors have followed Route D_2 of Figure 2. According to their theory there are <u>aspects</u> of cognition and affect which indicate that these two concepts are inseparable. There are proportions of cognition and affect involved in attitude: that is, there are instances where an evaluation may be predominantly cognitive (with concomitant smaller proportion of affect). To state it another way, all evaluations have significant proportions of affect <u>and</u> cognition.

The "compound theorists" seem as definite in their stand as do the "mixture theorists," although some with one orientation may have shifted to another orientation through time. Thurstone in at least one instance [1959, p.216] held that: "The concept 'attitude' will be used here to denote the total sum of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic. Thus a man's attitude about pacifism means here all that he feels and thinks about peace and war." This appears to be in opposition to the quotation credited to Thurstone by Edwards, mentioned later. Hartley and Hartley, [1958, pp. 655 - 656] write that:

> "... since percepts with which attitudes are connected grow out of contact with the perceived object, attitudes have a cognitive base. However, because the individual does not easily separate that which he cognizes, experiences, or perceives from the effect such experiences have on him, the

cognitive aspects of attitudes are integrated with the individual's emotional responses to the objects of his attitudes."

Crockett [1957] succinctly relates his views:

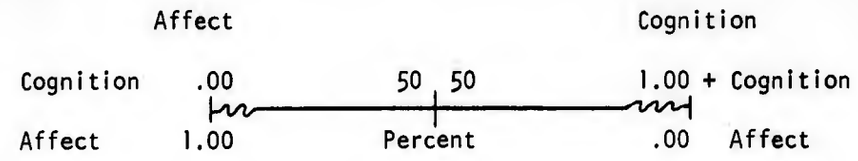
"The term attitude is used here to denote a more or less enduring cognitive-affective tendency to respond to some object .... Although the affective and cognitive components of attitudes are discussed separately, it should be emphasized that the two sets of processes operate jointly and interdependently for any particular person."

3. Comparison of mixture and compound theories

An example of the approach which might be employed by adherents to the two theories (mixture and compound) should help to clarify the differences. Take the instance of an attitude toward capital punishment, an issue which is both controversial and frequently used in attitude study. It will be first considered from the point of view of the mixture theory. An overall evaluation on the "good-bad" scale is pure affect according to the latter theory. The expression of "approval" or "disapproval" is also one of pure affect. Some beliefs about capital punishment are: 1) that it exists in some parts of the United States, Fishbein and Raven [1959], and 2) that it has "value attaining or value-blocking powers," P. T. Young [1961, p. 521], Rosenberg, [1960]. These beliefs are pure cognition and the previously stated "affects" are pure affect, each independent of the other, but these beliefs and affects are correlated with each other to some degree.

According to the "compound theory", the evaluation of capital punishment in terms of "good" or "bad" is based upon certain beliefs about capital punishment. These beliefs, such as "it is value-attaining" (will deter murder) are to some extent in turn based upon affect (perhaps deter even my own murder), etc. There is an integration of affect and cognition to

the point where they are inseparable, one from another. The evaluation of capital punishment as "good" or "bad", "approved" or "disapproved" is scalable in proportions of affect and cognition as follows:



The wavy line at each end of continuum indicates unlikelihood of extreme positions. The scale represents proportions of the inseparable aspects of cognition and affect.

In the mixture theory mention has been made of "components" and "elements" of cognition and affect; in the compound theory, mention has been made of "aspects" of cognition and affect. The selection of these terms in relation to respective theories has not been fortuitous. The label "component" implies a conceptual framework as does the label "aspect." A careful regard of the literature has shown that, except for rare cases, these combinations (mixture theory with components and elements; compound theory with aspects) have been used together by authors. Thus the combination of labels appear not only to be functionally descriptive, but also to have had natural attractions as coherent wholes.

B. Pure Affect

Helen Peak [1958], representing the "pure affect" theorists, says that, "The feeling about an object or the evaluation of it are, then, the affective responses or the properties of a concept which constitute an attitude." Jahoda, Deutsch, and Cook [1951, p. 112] define attitudes as a

"disposition to respond affectively toward a specified entity." Edwards [1957, p. 2] takes a similar stand as follows: "We shall, following Thurstone (1946), define an attitude as the degree of positive or negative affect associated with some psychological object." (Please note that the present authors quoted a different Thurstone reference earlier.)

C. Comparison of Positions

One method to further examine the practical consequences of the "affect only" and "cognition-affect" theoretical positions is to review their relative positions with respect to the concept of "evaluation."

The terms "evaluation" and "evaluate" are so frequently employed in connection with attitude that they must be carefully considered. While "evaluate" and "evaluation" are key words, they appear to represent totally different concepts to different authorities. These differences in use are largely centered around the users' viewpoint on the "Affect -- Cognition-Affect" controversy. To Helen Peak, the process of "evaluating" apparently is purely affective. For example, she asserts that: "The term (attitude) is used to refer to an affective or evaluative reaction ...." [1959], or again, "The feeling about an object or the evaluation of it are, then, the affective responses to or the properties of a concept which constitute an attitude." [1958]. Helen Peak seems to follow Route A, A_2, and C directly through its course. It is difficult to determine whether Osgood intends "evaluate" to indicate pure affect, or a mixture of affect and cognition, or a compound of affect and cognition. It seems that it means one approach to him at one time, and another at a different time. In Measurement of Meaning, Osgood et al, [1957] appear to be using "evaluate" primarily to refer to pure affect,

yet one could hardly construe use of "evaluation" to mean pure affect in the fourth chapter of the same book entitled, "The Evaluation of the Semantic Differential." Yet some of his followers seem to believe that Osgood does intend "evaluate" to imply pure affect and are guided accordingly. For example, Fishbein and Raven [1959] report that:

> "Stemming from Osgood's analysis of attitude through his semantic differential, a scale was developed which permits an operational distinction between belief and attitude. Attitude is defined as the evaluative dimension of a concept, belief as the probability dimension. ...generally, cognitive aspects have been attributed to 'beliefs' and affective or motivational aspects to 'attitudes'. It seemed likely that pressures could be exerted upon the subject's belief in ESP - 'What is the probability that such a phenomenon does exist? Is it existant or non-existant?' or upon his evaluation of ESP - 'Is ESP "good" or "bad"?' The latter, consistent with Osgood (1952, 1958), Doob (1947) and Rhine (1958) can be seen as the evaluative dimensions of a concept, or more specifically as an attitude.... The first step then was to find a means for separately measuring the components."

While there are authorities who hold that "evaluation" is purely affective, thus following Route C to "Evaluation - Pure Affect" from Route A_2 or B_2 of Figure 2, there are also those who maintain that both "cognition" and "affect" are aspects of an evaluation. In their introductory chapter entitled "A General Statement" of Toward A General Theory of Action, Parsons and Shils as editors [1951, p. 11] with the other seven co-authors appear to have concurred on the basis of a concept of "evaluation" as follows: "The process of deciding alternatives, of assessing them in the light of their ramified consequences, is called evaluation." Florence Kluckholm [1961, p. 7]

presents her notion this way: "Value orientations are complex, but definitely patterned (rank-ordered) principles, resulting in the transactional interplay of three analytically distinguishable elements of the evaluative process -- the cognitive, the affective, and directive elements."

Frequently one is able to comprehend the meaning a writer intends for a term by the way he uses it rather than by the way he defines it. This seems to apply to the use of the term "evaluate" by "compound theorists." Rokeach [1960, p. 63] says that:

> "To evaluate information on its own merits is necessarily to be oriented with both feet in the here and now. At the same time, this evaluative process implies a disciplined concern with the immediate, foreseeable future. For we continually make predictions and plans on the basis of information, and the way these predictions and plans turn out helps along the evaluative process. Similarly with postdiction, which implies a realistic evaluation or re-evaluation of our past in terms of present."

One observation could be made in summary at this point. If attitudes are pure affect, how is it that so little has been done to measure attitude by resorting to projective techniques or non-verbal techniques? If affect is the basis, then attitudes may be simply unavailable to cognitive (and thereby verbal) levels of response. Relatively little has been achieved in this area. The present writers will provide further discussion elsewhere herein. Suffice it to say that at this point the "Affect versus Cognition-Affect" argument does not seem to us to be undergoing particularly rigorous experimental study these days. Furthermore, the writers doubt that it would come under genuine test so long as investigators persist in sticking to objective, written surveys.

V. Attitudes, Opinions, Beliefs

The terms "attitudes," "opinions," and "beliefs" are employed by some authorities to be separate and individual (even though often overlapping) concepts. Some authors hold that "attitudes" and "beliefs" are synonymous, or that "attitudes" and "opinions" are synonyms, or that "beliefs" and "opinions" mean the same thing -- and some even lump "attitudes," "beliefs," and "opinions" into one basket as being interchangeable.

The practice of using the above three terms interchangeably, thus losing distinctive characteristics of each, has become so widespread that careful documentation would be exceptionally time consuming and therefore appears to be unwarranted for the present report. There are some authorities, such as Thurstone [1959] and Morgan [1956] who have explicitly defined each term as a separate concept so that three distinct concepts are differentiated instead of having three terms for one diffuse concept. In constructing their own attitude model the present investigators found it necessary to utilize three separate concepts for the terms "attitude," "opinion," and "belief" to aid in satisfactorily communicating with each other and to their readers. They also found that they were required to index terms to indicate differentiated meanings for individual terms. These terms are defined in the section discussing the model.

VI Summary

That there are major differences between theoretical foundations of attitudes held by different research social scientists seems beyond question. In most of the recent literature about attitudes investigators do not frequently explicitly state their theories and basic assumptions. The reader of

research reports, articles, and books on attitudes is left largely on his own to reconstruct theory and assumptions from statements within the specific text. A surprisingly large number of authors seem to proceed without any clear theory or explicit assumptions, fortifying their positions by assertive statements as needed. Writers in the field of attitudes seem to have neglected theory in the last ten or fifteen years. Moscovici [1963] in his recent survey of the field has this to say:

> "No outstanding technical progress marked the last decade. The surveys have merely taken, in their over-all conception, both a more anthropological.., and a more experimental direction.... This methodological stability results from the predominant role of experimentation, and the lack of a major theoretical drive toward a new approach to the understanding of reality...a common, or basic, theoretical concern is not seen to emerge from the obtained results."

von Bertalanffy [1962] sees a tendency to neglect theory in our scientific endeavors in general:

> "Science of the past (and partly still the present) was dominated by one-sided empiricism. Only collection of data and experiments were considered as being 'scientific' in biology (and psychology); 'theory' was equated with 'speculation' or 'philosophy,' forgetting that a mere collection of data, although steadily piling up, does not make a 'science'. Lack of necessary theoretical framework and unfavorable influence on experimental research itself (which largely becomes an at-random, hit-or-miss endeavor) was the consequence."

Another major factor contributing toward some of the chaotic results in attitude study has been the tendency of many researchers to reify the concept of attitude. The reification process in many cases has been carried to its logical conclusion. From concretizing the basic concept of attitude, many theorists have followed through by concretizing "elements" within the "attitude." The literature indicates that many of the attitude theorists and researchers

are unaware that differences exist between theories, that some are aware of differences but consider such matters inconsequential, while still others who are aware of the differences, appear disturbed by those differences, but do nothing substantial in a research program which would allay their apparent disturbances.

Three basic theoretical models implicit in the literature seem to account for the various approaches used by researchers in the attitude area today. They are: 1) attitude as purely affective, (Route A, A_2, C, or Route B, B_2, C, Figure 1); 2) attitude as a mixture of two components, affect and cognition, (Route B, B_1, D_1, D_3, or E, Figure 2); and 3) attitude as a compound with two aspects, cognitive and affective, (Route B, B_1, D_2, Figure 2). The present authors have found theories and research approaches relating to attitudes to be in such a state of confusion that they felt forced to state their theoretical foundations and to build their own Attitude Model, which follows in the next section. They follow the route of the compound theorists, B, B_1, D_2.

Lack of consideration of theory and basic assumptions seem to have contributed heavily to confusion and even outright chaos in research on attitudes. There has been a conspicuous lack of success at making functionally useful measurements of attitude in order to further the everyday application of knowledge to practical affairs of the working world. Perhaps the attempt to "apply" attitude data is falling down because our technology has such poor theoretical and methodological foundations.

SECTION TWO - ATTITUDE MODEL

I. Introduction

Unlike present day "hardware" technology which has complex, specific languages and terminology of its own, the behavioral sciences deal with subject matter and language which have been applicable through the ages. Man has long been cognizant of particular phenomena within himself. He has made observations that there are certain consistencies in himself which he has come to depend upon. As one man has dealt with another he has generally found it beneficial to become aware of the things the other person likes or dislikes, accepts or rejects, is for or against. He has expected these dispositions to be relatively stable and has operated on the assumptions, conscious or unconscious, that they would be. Many of these observations and assumptions contain degrees of face validity. From a pragmatic standpoint the assumption of stability with some phenomena has received support.

Many areas of theory building, attitude measurement, and application of attitude findings would profit from having a comprehensive and accurate model available. A model would serve as a map of the territory, like other maps, and would encourage and support many different endeavors therein. The writers, after examination of much of the work of others, have found no adequate model for the attitude area. Accordingly, the model described later herein was devised. The model was constructed with two major aims in mind: first, to incorporate into the present research program the latest relevant information available at this date; and second, to describe and relate this information in such a way as to effect optimization of operational terms and definitions. Since this present model is conceived of as being in an early stage

of development, it is reasonable to expect changes in the model with added data, experience, etc. Still the model has been found to have value to the authors in its present form. In any case, it is believed to be an improvement upon the pre-existing models.

II. Definitions

In the construction of a model, definitions are required in order that reasonably unambiguous communications are made possible, otherwise there may be misunderstanding and misinterpretation by the reader as to what is meant by the writer. Without the guideposts of definitions, even the writer himself may "lose his way" in his own development. This is particularly true in a field such as attitude theory and research where basic terms appear to have variant meanings for different authorities. Therefore, some basic definitions are provided at this point.

Terms used in the model are briefly defined at the outset, and these terms are amplified in the context of the explanation of the model. The terms "attitude," "opinion," and "belief" are used to describe a specific concept. Other concepts used in the model, which are defined in the following sections are Belief Systems, Belief-Value Matrices (B-VM's), evaluation, and cathexis.

A. Attitude

The term "attitude," perhaps the most important single concept in this area, has a primary meaning for purposes of the present model. Other more specific, secondary, and limited meanings of the term "attitude" are used and defined in context. An attitude in its primary meaning is herein considered to be a second order hypothetical construct which implies an

individual's predisposition, tendency, or readiness to respond to a psychological object. It is a second order construct in that it represents other constructs such as predisposition, tendency, or readiness to respond, etc; which in turn represent the "real" world. Hence, the construct attitude is two levels or orders from the actual phenomena.

B. Belief and Belief-Value Matrix

The concept of a belief is very difficult to communicate. Rokeach [1960, pp. 31-32] says about "belief:"

> "What is a belief? To answer this question we can do no better than first to quote from Truebiood, a philosopher of religion. He writes: 'We have beliefs about history, beliefs about the structure of material aggregates, beliefs about the future, beliefs about God, beliefs about what is beautiful, or what we ought to do. Most of these beliefs we state categorically. We say, 'Columbus landed in the West Indies,' 'Water is composed of hydrogen and oxygen,' 'Rain is falling today,' 'There will be a snowstorm tomorrow,' 'God knows each individual,' 'Greek temples are more beautiful than Egyptian temples,' 'I ought to work rather than play tennis today.' Each of these statements similar to thousands we make every day, is elliptical in that the preliminary statement is omitted. We might reasonably preface each of these propositions by the words, 'I believe,' or 'There seems to be good evidence that.' Every proposition becomes in fact a judgment, and man is a creature greatly concerned with his own judgment. We take our judgments seriously and, foolish as we are, we are deeply interested in the correctness of our judgments.
>
> To all this let us add that every person also has countless other beliefs that he cannot verbalize. We infer them from his behavior...."

The present authors define a belief as a hypothesis about the world, self-included, and a value as an internal standard. It should be stressed here that it is our understanding that beliefs and values are not separate entities. Following Tolman, beliefs and values are interrelated in matrix form, such that we have Belief-Value Matrices (B-VM's). In

describing one example of a B-VM, Tolman [1951, p. 290] says: "The belief-value-matrix chosen for representation...is constituted by the cognitive categorizations, beliefs, and values...."

Although "value" has been given a brief definition, the concept of value does not truly lend itself to a brief description. Whole chapters and entire books have been devoted to this subject. However, a paragraph from a chapter on "Values and Value-Orientations" by Clyde Kluckholm [1951, p. 432] should provide sufficient orientation for immediate purposes.

> Values and beliefs. Values differ from ideas and beliefs by the feeling which attaches to values and by the commitment to action in situations involving possible alternatives. If you are committed to act on a belief, then there is a value element involved. The following crude schematization is suggestive. (1) This is real or possible (belief); (2) This concerns me or us (interest); (3) This is good for me or us, this is better than something else that is possible (value). Belief refers primarily to the categories, 'true' and 'false'; 'correct' and 'incorrect.' Values refer primarily to 'good' and 'bad'; 'right' and 'wrong.'

C. Belief System

It is postulated that every individual has a Belief System which, in Rokeach's words [1960, p. 32] is "an organization of verbal and nonverbal, implicit and explicit beliefs, sets, or expectancies." System and organization are employed in the present context in the conceptual framework of von Bertalanffy [1956, 1962] where the "parts" are B-VM's, the system is the Belief System, and the organization consists of the interrelations of the B-VM's.

D. Opinion

Opinions are defined as subjects' verbalizations. For purposes of this model, they are assumed to reflect segments of an individual's

attitudes. "Verbalization" in the present context is broadly interpreted; for example, checking a multiple-choice questionnaire, a direct written answer to an open question or a spoken response to an interviewer can all be considered as "verbalizing."

E. Evaluations

Evaluations are defined as an individual's directed consideration of any psychological object to which he responds. It is a weighing process in which an individual assigns an overall judgment in terms of value according to some standard or set of standards which he carries internally. In evaluating, an organism employs a compound of cognitive and affective energies rather than the use of one aspect to the exclusion of the other. These compounds vary in proportion of cognitive to affective energies with significant amounts of both in every evaluation.

F. Cathexis

A cathexis is considered to be any energy in the human organism originating from physiological sources which produces, independent of learning, vectors towards behavior. These forces can be inborn, or develop as a natural concomitant of organismic maturation. They will thus include drives, urges, needs, fears, etc. The recent research of Walk and Gibson [1961] has demonstrated experimentally that at least one kind of fear, the fear of depth, occurs without necessity of previous experience (learning). Although most fears appear to be learned, if fear of depth can develop without experience, there is no assurance how many other fears and similar action-propelling energy potentials can evolve likewise. Such possible sources of energy potential must be considered in conjunction with attitudes. It would seem

that the cavalier position held by some authorities, attitudes are learned, and only learned, is untenable. As for our own position, Maslow [1948] has said it well when he says that: "The current fashion is to treat attitudes, tastes, interests, and indeed values of any kind as if they had no determinant other than associative learning, i.e. as if they were determined wholly by arbitrary extra-organismic forces. It is also necessary to invoke intrinsic requiredness."

III. Discussion of Model

In the discussion of this portion of the report, reference will be made to Figure 3, Belief System Process. Please refer to this figure as necessary without further specific reference.

Regarding human behavior, there seem to be numerous phenomena which are relatively stable, thus making prediction possible. One of these phenomena is the characteristic tendency of a specific individual to respond in a relatively consistent manner to a particular class of stimuli. This tendency toward response consistency has been referred to by many names, but has recently been called "attitude" and has been the topic of consideration by both laymen and scientists. One of the descriptions of this phenomenon of response consistency popular with many social psychologists was made by Allport [1935] nearly thirty years ago: "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations with which it is related."

Attitudes, as predispositions to respond to psychological objects, are seen as hypothetical constructs, artifacts abstracted out of personality

systems in order to simplify conceptualization of some complex segments of human behavior and enhance communication about those segments. Thus "attitude" becomes a handy label permitting communication about a concept without the necessity of a descriptive discourse each time one wishes to refer to that concept. Yet an attitude is not an attempt to represent "something real" in the sense of tangibility.

Belief Systems and B-VM's are also seen as hypothetical constructs, but they are believed to represent some behavioral dynamics in the "real world," to describe macroscopically certain processes in individual organisms. Attitudes as hypothetical constructs, being based upon some aspects of the hypothetical constructs of Belief Systems and B-VM's, are thus constructs of constructs, or second order constructs. The equating of these two levels, Belief Systems and Attitudes, constitutes a mixing of dimensions, and thus leads to confusion. Communication about attitudes is possible so long as the communicants agree as to what is meant by "attitude" in the discussion immediately at hand.

Attitudes, as hypothetical constructs of predispositions to respond, are potentials, with potential direction and potential intensity. But as second order hypothetical constructs, attitudes are neither static nor dynamic. Yet if most recent organismic theories are accepted, man is a dynamic organism functioning in a dynamic environment, which is the approach accepted for this model. To place the artifact "attitude" back into its real-life setting, and thus relate dynamic processes to a processless concept, the Belief System of an individual, with its B-VM's is conceived as constituting the "real-life" dynamic forces which underlie an attitude and give force, direction, and change to an "attitude." The Belief System of an individual provides

the potential, with dimensions of direction and intensity, for possible reaction at some future time. The dynamics visualized are described later.

The Belief System is thought of as being an organization of interrelated B-VM's which change through time, although changes are usually slow. While there is change in B-VM's and in the Belief System, there is generally a relative consistency of both through short time periods. Each B-VM is a multivectorial resultant of many forces, hence change is not a fortuitous matter, but rather comes about as the resultant of changes in the many vectors which make up a B-VM. The vectors which produce a resultant B-VM have varied origins: Some vectors may be predominantly affective, others may be predominantly cognitive; some vectors may be the result of learning, others may be more biologically determined. Significant change in any one of the vectors may cause a significant change in a B-VM.

For purposes of this discussion the biologically determined vectors involved in attitude are being called "cathexes." Cathexes may in many cases be altered by learning, but at least some traces of cathexes remain in B-VM's, and therefore contribute toward the Belief System. Thus, a Belief System is hypothesized as being the "real-life" counterpart of a major portion of the hypothetical construct referred to as an "attitude." The present authors maintain that biologically determined vectors, whether defined as needs, drives, or instincts are part of the attitude complex. This view is contrary to the strong stand taken by numerous social psychologists that "attitudes are learned" [Hartley and Hartley, 1958; Kimball Young, 1956; P. T. Young, 1961].

As an overview, this research team visualizes the development of a Belief System as follows: An organism has certain constitutional endowments and potentials for growth. As the organism develops in interaction with its environment, it has many experiences, and learning takes place. The growth, development, experiences, learning, and the like constitute the individual's history. As Stevens [1935] has so succinctly and aptly put it: "... the simplest phenomenological observation is really a complex response of an organism with a long history, and is therefore itself a construct." An individual's history also includes his drives, needs, urges, etc. Beliefs and values are generated within the historical framework. Beliefs, values, memories, etc. are stored, and the accumulated storage is called the "apperceptive mass." Beliefs and values form into separate B-VM's, but only as the result of many vectors (cognitive forces, affective forces, biological forces, and others).

As the organism lives, information comes to him in various ways. In interpreting this information, an individual's B-VM's form constellations which provide directional and intensity dimensions of certain reactions and not others. The interpretations and the reactions themselves alter the B-VM's by a feed-back process. This process will be reinterpreted later in terms of set and hypothesis theories. B-VM's have degrees of consistency through time which frequently approach stability, at least for short periods. When an individual's B-VM's have been sufficiently stabilized that his responses to specific types of information (e.g. "psychological object A") become predictable to a high degree, it can be inferred that the individual "has an

attitude toward object A." It is believed that this is what Tolman [1951, p. 358] meant when he wrote that:

> "A chapter on attitudes would, from my point of view, be nothing more or less than a descriptive study of beliefs and resultant positive and/or negative values in belief-value matrices in specified populations of individuals."

Even the paradigm presented so far is too sketchy to enable one to visualize an individual and "his attitude." Therefore, it behooves us even in the face of demands for brevity, to put some more substance into the account. First, consider the use of "information" in place of the more usual term "stimulus."* A stimulus implies that some source of energy sets an inert organism into activity, something similar to the pushing of a predetermined series of buttons which starts an electronic computer. Even "stimulus energy" does not appear to be appropriately descriptive. Information on the other hand, implies that an active organism carrying within him an apperceptive mass, interprets configurations in his environment. Woodworth [1947] expressed a significant fact when he said that: "It is impossible to look without trying to see or to listen without trying to hear."

With respect to the difference between "information" and "stimulus" consider the following example: To the average American driving an automobile, a small red light, or a large red light, a red colored octagonal sign, or a policeman facing you with outstretched arms, if properly placed, all provide the same information -- STOP. To a Hottentot recently

*The desirability of using this terminology was first called to our attention by Dr. Crawford Clark.

arrived in the United States sitting alongside the driver, this same "stimulus" (small red light, large red light, policeman with outstretched arms, or red colored octagonal sign) may well not provide the same information, (or even ANY information) -- if he had not accumulated the appropriate interrelationships in his apperceptive mass. Obviously, "information" is a more appropriate term than either "stimulus" or "stimulus energy" in the present context. In the next paragraphs which follow, the relationship between B-VM's and Belief Systems to information will be more thoroughly examined.

The Belief System, with its B-VM's, while serving as a base upon which to build the attitude hypothetical construct, still does not provide the necessary concepts to account, even superficially, for translation of B-VM's into dynamic processes of behavior relating to the present topic. In order to effect this translation, Floyd Allport's [1951] integration of the Bruner and Postman hypothesis theory with set theory has been adopted. The individual theories and Allport's integrations are too complex to report in any detail in the present report, therefore an abstracted version is attempted.

According to hypothesis theory, individuals do not perceive objects from a void, but rather develop expectancies based upon past experiences about what they will perceive in the future. The expectancies evolve into hypotheses about the world, self included, which each individual carries around in his organism, usually on an unconscious level. Individuals also have sets "that are long established through perceiving activity and may be already almost at the point of full operations when (they) enter a situation. ... such sets ... serve to select, organize, and transform 'information' that comes to them (the organism) via the sensory input from the environment." [Allport, 1955, p. 381]. In other words, hypotheses tend to structure sensory

input (information) into composites of organized, meaningful wholes. Hypothesis theory takes into consideration the cognitive and affective aspects relating to perceiving, and set theory adds physiological preparatory and sustaining mechanisms of perceiving. Allport [1955, p. 412] emphasizes that "... we have 'hypotheses' not merely to see or hear, but to do; sets for some kind of action not merely for drawing conclusions."

Appropriate hypotheses are evoked by information (stimulus energy input), and these hypotheses and sets combine to structure the outside information field. The activated hypotheses and sets become an internal ("inside") information field which interacts with the "outside" information field in a feedback cycle. The structuring of the outside information field leads to a restructuring of the inside information field and a checking of hypotheses and sets followed by confirmation or rejections of hypotheses, calling up of new, more appropriate hypotheses where indicated, modification of hypotheses, and eventual action. The degree to which a perception is veridical to the information as stimulus energies depends upon a number of factors which have been spelled out as laws by Bruner and Postman, and have been amplified by Floyd Allport and reinterpreted in concepts of his structural theory. Our interest here is primarily in the contributions of the concepts of hypotheses and sets to the inner information field and how they relate to the Belief System and the B-VM's.

Both sets and hypotheses as used in the Allport version of the modified integrated set and hypothesis theories seem to the present authors to be the products of belief vectors and value vectors as well as previous experiences. Each hypothesis which an organism maintains would seem to have

vectors of beliefs, of values, of experiences, and of cathexes, as well as other vectors. The same would appear to hold for sets. Thus Belief Systems and B-VM's become active parts of the inside information field during behaviors labeled as perceiving, thinking or acting.

IV. Example of Hypothetical Application of Model

Now for a more specific description of the Lucier, Hart & Rowland Attitude Model. This can best be done by analyzing a typical hypothetical case. Take $Smith_1$ -- a soldier with the rank of private first class in the United States Army. $Smith_1$ is twenty-three years old, born and reared in Mississippi, has been in the Infantry for two years, has been on his assigned post at Fort Davis, Canal Zone, for six months, is unmarried. $Smith_1$ has a Belief System at time T_0, represented by Section One, Figure 3, which comprises the organization of his B-VM ($B\text{-}VM_a$, $B\text{-}VM_b$, $B\text{-}VM_n$) at time T_0. $Smith_1$ is one of fifty soldiers who have been assigned by the Captain to "answer some questionnaire that has been brought down here by another bunch of head-shrinkers from the States." All fifty are sitting in groups of four and five at tables in the mess hall on a rainy, humid, hot afternoon in October, waiting for the start of the scheduled ordeal. $Smith_1$ is sitting in a group of five, of which $Smith_2$, through $Smith_5$ are friends of $Smith_1$, of similar ages, ranks, and backgrounds. Thus at time T_1 (Section II, Figure 3) $Smith_1$ is about to be exposed to an "attitude survey" to be administered to selected soldiers at his military post. Some of $Smith_1$'s B-VM's have probably been altered during the interval between T_0 and T_1. The number of B-VM's altered and the degree of change is dependent in part upon the duration of the interval and what transpired therein.

At the appointed time, someone enters the mess hall, orally delivers some information and instructions concerning the data collection which is shortly to follow, and then passes out forms which are to be filled in by the soldiers. These forms contain questions which provide stimuli which activates the soldiers to respond. The responses which each soldier makes are his opinions about the specific objects named. They must be, as this is the way the surveyor designed his project to evolve and besides, what else can $Smith_1$ do except check one or another of a few categories which is reasonably descriptive of his attitude.

If the surveyor is truly naive, he believes things to be as neat and direct as just described. Chances are that he realizes that life situations are not really as clear, neat, and direct as stated above. However, if the situation only were that orderly, it would accommodate the theoretical beliefs of the surveyor that the troops responded as they were asked to respond. "I asked them, they told me, therefore I measured their attitudes." If the results of the present research are any guides, it is doubtful that most attitude surveyors realize the awesome disparity between their descriptions of what takes place and what actually happens in real life situations.

Let us now consider specifically the surveyor and $Smith_1$. The surveyor in this case assumes that each question on the form in turn is "the stimulus" for each of $Smith_1$'s written responses. Let us say that $Smith_1$ responds by checking a space in each of a series of alternates to multi-choice objective questions about his "attitudes" towards specific objects. The surveyor assumes that the questions on the page "are the stimuli" to $Smith_1$ in selecting each alternative either because that is the way he, the

surveyor, would probably behave or because that is the way $Smith_1$ is expected (ordered, motivated, invited, ...) to regard them. But let us try to look at the situation from $Smith_1$'s point of view. Section Two of Figure 3 represents some aspects of his dynamics at the instant he is slecting an alternative to question X. The outside information field for $Smith_1$ at the instant X is being checked is represented by the blob labeled "outside information" in Section Two. $Smith_1$'s outside information field contains the carefully prepared questions printed on the form provided by the surveyor, but this field also includes much additional "information." The afternoon is hot and humid, $Smith_1$'s four friends can probably see how he is checking his item, the surveyor is present in the room, etc. All of the information is outside $Smith_1$'s skin, but this "outside information field" becomes "information" to $Smith_1$ through the functioning of his own organism. He structures the outside information field by his own nervous system, which includes his Belief Systems, his B-VM's, etc. The "outside information field" in turn restructures the "inside information field." The outside information field calls forth constellations of relevant B-VM's which organize into subsystems of short duration which become part of the "inside information field." One thus obtains reverberating feedback circuits between outside information fields, and inside information fields. This "inside - outside" problem is extremely complex, as has been so well stated by Floyd Allport [1955]:

> "Every act of behavior has both its 'inside' and its 'outside' characteristics. The principle, in fact, probably applies in some way to every phenomenon studied by scientists .... Two points of view are thus always presented to the observer. He can take either the inside view of the aggregate (at any level concerned) or he can take the outside view .... How these two views can be reconciled, how the inner and outer aspects or relationships of the phenomenon can be simultaneously dealt with without dislocation or gap and explained in one consistent theory, is one of the most pervasive, difficult and important tasks of science.... We have called it the

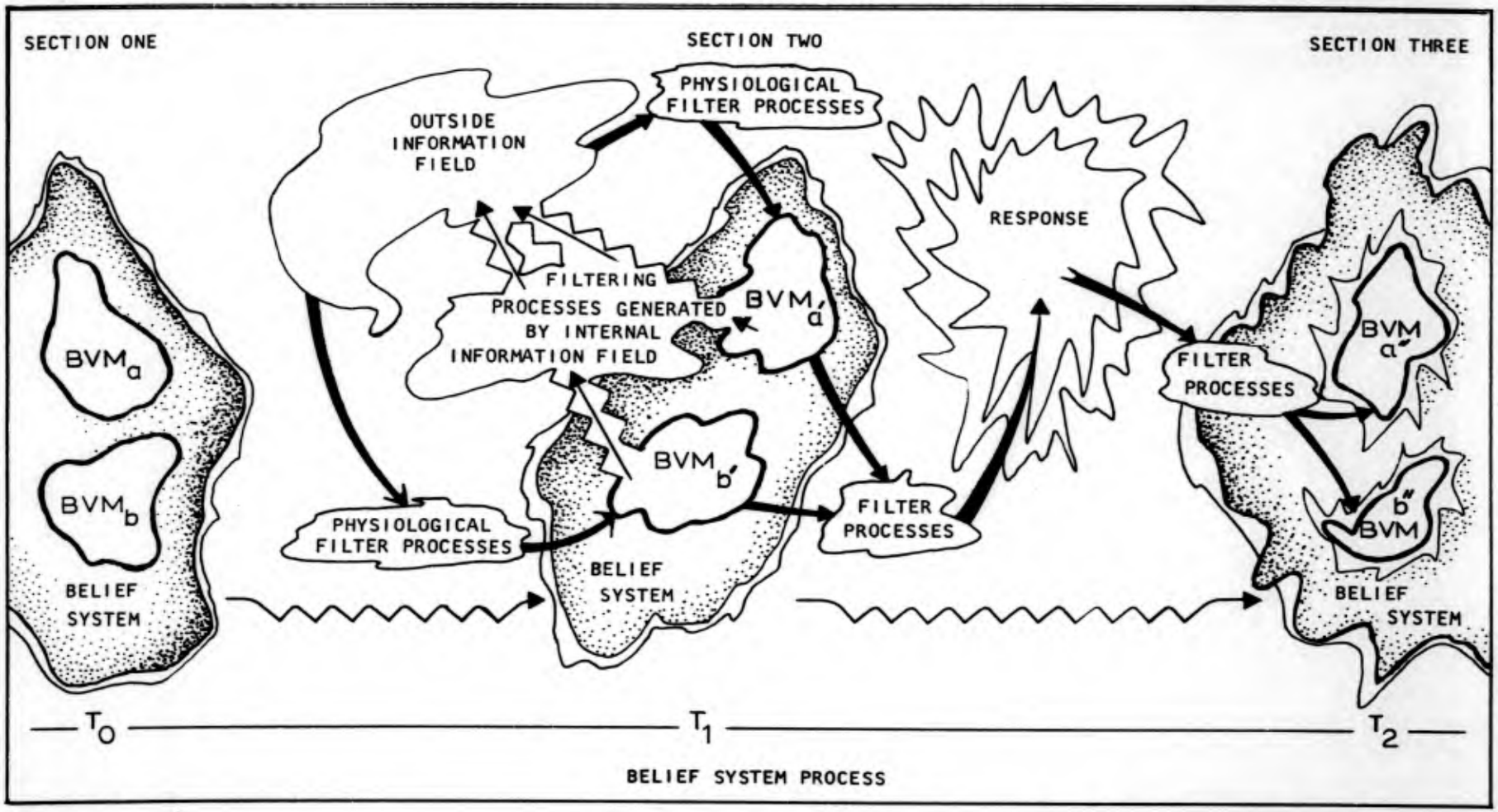


Figure 3. Belief System Process

> 'inside - outside' problem (pp. 110-111).... What goes on inside the individual physiologically must have a great deal to do with his perception and his outer behavior.... For example, though we know that demand-characters of objects spring from states internal to the organism, we can depict them as plus or minus 'valences' possessed by goal-objects lying in certain external regions.... The inside - outside problem has been a stumbling block for physical field-theory as well as for psychological (p. 157). Perceptual order and stability can be regarded not merely as a matter of the appraisal of cues, but also as a more dynamic relationship between the organsim and the environment (p. 271)."

The present authors concurring with Allport in the difficulty as well as the importance of the "inside - outside" problem, have no illusions that they can solve it. But though they cannot solve it, neither can they ignore it. The "inside - outside" aspects of the problem of attitude assessment are so germane to research on attitudes that they must be taken into account, no matter how gross the state of the art at this time. Issues evolving out of both $Smith_1$'s "inside" and "outside" worlds have such important implications for research design that omission of either one of them would extensively debilitate any attempt to grasp the explanation of the etiology and mechanism of attitudes.

$Smith_1$ may have any number of B-VM's such as the examples which follow:

1. B-VM Constellation L

   "They take advantage of weak people (and I am weak in the authority hierarachy), they look down on people who are not of equal or superior level, they are prejudiced, etc."

2. B-VM Constellation M

   "Headshrinkers" (and the surveyor now in the room demonstrating his authority by requiring $Smith_{1-50}$ to answer this stupid damned form is a Headshrinker) -- "They are all a 'bunch of nuts,' they use tricks to find out about what you're thinking, they learn personal things about you that no outsider has any business knowing, etc."

3. B-VM Constellation N

> $Smith_1$ and his four friends, now grouped together at a table responding to the surveyors questionnaires, had heard about the survey from some other Smiths who had it yesterday, and those Smiths had a "bull session" the previous evening. Some plans of action were agreed upon: "Let's not cooperate with this guy. Be careful what you say; some of these guys tip off 'the brass.' Let's foul this guy up; we'll deliberately give him wrong answers, etc."

Constellations L, M, and N, become a subsystem, called "Subsystem X," all of which becomes a vector with direction and intensity toward a response (checking one of the alternatives to Item X of the questionnaire). The general approach taken towards responding will also be dependent upon other vectors interacting with the vector emanating from Subsystem X. One of these vectors will be influenced by the configuration which the surveyor established by his manner, what he says, what he does, etc. Another vector will be the environmental press of the general military situation. "Will my superiors learn what I am doing here? If they do, what will this mean? etc." These combined vectors up to this point concern the issue of the general approach $Smith_1$ will take in responding to the questionnaire (as well as behaviors he will exhibit at this time such as interactions with the surveyor, interactions with $Smith_{2-5}$, etc.), and may even determine his response approach. That is, he may at this point decide to check item alternatives in a random manner without regard to question content.

$Smith_1$'s behavior should be examined a little more closely. The Outside Information Field is brought in to the nervous system of $Smith_1$ through various filtering processes. The Outside Information Field as modified first by physiological filter interacts with the Inside Information

Field and stimulates various salient, pertinent B-VM's which form subsystems and act as filters. $Smith_1$ then projects his new Inside Information Field out to the Outside Information Field, again through filtering processes, and restructures the Outside Information Field. As Frank [1939] says: "...stimuli are functions of the field created by the individual interacting with the situation." This reverbatory feedback loop sets up continuous restructuring of both the inside and the outside fields until a momentary stability is reached. $Smith_1$, having reached a state of instantaneous stability, reacts to the major segment of his outside information field -- in this case, the Attitude Questionnaire. His reaction is termed a response (Section Two, Figure 3). This response, R, is registered in $Smith_1$'s nervous system and has a feed forward effect, as indicated by changes in B-VM's A and B in Section Three. That is, the changes in B-VM's A and B will influence to some degree $Smith_1$'s reaction pattern in the future. If the primary vector influencing $Smith_1$'s response patterns in checking the attitude questionnaire derives from Subsystem X (Anti-Authoritarian B-VM Constellation, Anti-Headshrinker B-VM Constellation, and Fear B-VM Constellation), he will probably check alternatives at random or use some other ruse to attempt to invalidate his responses. If he does this, his data is not only worse than useless, it is downright misleading. If the surveyor wants to learn about attitudes toward objects, he would be well advised to eliminate the data collected from $Smith_1$ and others like him. On the other hand, if the objective is to learn some specific things about attitudes themselves, he might be well advised to focus attention on data collected from $Smith_1$ and others of his type.

If $Smith_2$, in spite of many personal and situational similarities to $Smith_1$, decides, at the instant of responding to the Attitude Questionnaire, to cooperate by seriously studying the individual items and answering them as sincerely and honestly as he can, one has many different questions to consider. As $Smith_2$ checks an alternative to an item, to what extent is he reacting to the named "object" as his psychological object, and to what extent is he reacting to other forces deriving within his Belief System (for example: "Since the Army is no damned good then it must be true that everything they issue is no damned good either.") To what extent is environmental pressure influencing his response? Has hostility towards the instrument itself developed, and if so, to what degree? These are merely samples of problems with which the social scientist must grope if he is going to cope with attitudes realistically. These samples can be subsumed under the label of the "stimulus problem." Social scientists working in the attitude fields will be plagued continuously with the stimulus problem. The stimulus problem encompasses Floyd Allport's "inside - outside problem" and carries with it additional aspects. Stevens [1951, pp. 31-32] briefly discusses it:

> "The reason for equating psychology to the problem of defining stimuli can be stated thus: The complete definition of the stimulus to a given response involves the specification of all the transformations of the environment, both internal and external, that leave the response invariant. This specification of the conditions of invariance would entail, of course, a complete understanding of the factors that produce and that alter responses. It is easy enough, of course, to decide upon arbitrary definitions of 'stimulus objects' (e.g. a given pattern of lines, a quantity of luminous flux, acoustic waveform, etc.), but the question is what properties of these objects do the stimulating? Viewed in this fashion, it is evident that for no response have we yet given a complete definition of the stimulus. At best we have only partially determined the conditions and limits of the invariance."

The problem of defining the stimulus in Social Psychology sometimes seems insurmountable. Certainly, it has bothered this team a great deal. Yet, practicing scientists must stop somewhere in their efforts to define the stimulus, or they will never do any practicing; no research would ever be started if someone did not eventually make the break and commence with whatever definitions he may have at the moment, no matter how crude. It does appear from close observation of the literature, however, that many researchers define the stimulus poorly, if at all. Many of them settle for an artificially oversimplified and unrealistic stimulus, select one of the "outside" or the "inside" aspects, and neglect all the others. Such an approach frequently results in deficiencies in design of techniques, administrative procedures, or analytic procedures, or deficiencies in all three. The present attempt is aimed at considering both the inside and the outside aspects in the model. The model described above has been used as a reference for constructing the techniques, evolving the administrative procedures, and selecting the analytic procedures in the research reported herein. It is hoped that by judicious pragmatic decisions as to stopping points in the infinite regress faced in the stimulus problem, that the consideration of "both sides of the coin" has resulted in improved coverage of important problems. That is, it is hoped that the model includes sufficient coverage of both the "inside" and "outside" aspects of the stimulus problem to permit a small step forward in attitude research without carrying either side to unnecessary detail. It is also modestly believed that at the same time these aspects of the model have been so constructed as to beneficially influence the techniques, the administrative procedures, and the analytic procedures of this research. Discussion and commentary and improvements on this model will be gratefully received.

CHAPTER THREE

DEVELOPMENT AND ADMINISTRATION OF TECHNIQUES

SECTION ONE - INTRODUCTION

Sections One and Two of this chapter contain a chronological narrative account of the considerations, events, and general evolution of this study from its inception up to the completion of Phase One data collection in Panama. Some basic assumptions derived from the theory and model development [Chapter Two], are listed in Section Three and are discussed in terms of their effect upon subsequent instrument design and construction in Section Four. Section Five concludes the chapter with a presentation of the methodology employed and a description of the sample population.

The project momentum and direction were initiated via several conferences in which representatives of the sponsor and ROWLAND AND COMPANY were present. Some of the accomplishments of the conferences were:

1. Specification of research objectives;
2. Establishment of lines of communications;
3. Coordination of pertinent phases of separate projects;
4. Data collection sites considered, Panama tentatively selected.

A survey of the attitude research literature resulted in confirmation of the conclusion that much of the attitude research recently performed had been based on untested assumptions. Furthermore, in many instances attitude assessment techniques had been developed without consideration of the assumptions and hypotheses upon which they were constructed. Consequently, the next action undertaken subsequent to the literature search in this project was

the development of a theory and a model which made explicit the primary assumptions upon which the development of attitude assessment techniques for the present project were to be based. The theoretical approach taken at the outset of the project did in fact play, and continues to play, a major role in the development of the assessment techniques, the administration procedures, and the analyses of the data.

SECTION TWO - DATA COLLECTION EFFORTS

1. Field Orientation and Pilot Study Number One

Concurrent with theory building and model construction, attention was devoted to the selection of a data collection site and its related issues. The sponsor provided advance information regarding several tropical sites. After studying all aspects of each site, two representatives of the research team made a field orientation trip to the Canal Zone, Panama. The purpose of the trip was to scout the research characteristics of the site and to explore the possible attitude subject matter which could be investigated and evaluate the probable suitability of measurement techniques which could be used. The general research situation was studied; potential pools of appropriate subjects were located; administrative personnel were briefed about the forthcoming data collection; and data were collected from a sample of one hundred soldiers for a pilot study. Analysis of the experiences of the field orientation resulted in the following conclusions:

1. Panama appeared to provide conditions appropriate for study of attitudes of troops in the tropics within a reasonable travel limit;

2. The term "tropics" encompasses many different climatic and terrain environments (hot, dry, barren, vs. hot, wet, rain, forest, etc.) and that most of the varying conditions were available within short distances of the Canal Zone;

3. There were suitable quantities of trained subjects in operational units, many of whom had completed the Jungle Warfare Training Course, or had tropical combat experience;

4. The Army Research and Development Office and local troop commanders would cooperate in and support any future data collection.

Conclusions drawn from the pilot study itself need to be considered separately in that they have broad implications. Obviously, there were a finite number of Quartermaster items and conditions that could be considered in this study. One of the purposes for data collection on the orientation trip to Panama was to identify the critical "attitudinal objects" and their salient dimensions about which survey items could be constructed. The three items shown below ere extracted from one of the instruments employed in the first pilot study. They exemplify the approach taken to collect the initial exploratory data:

1. Describe how you feel about wearing your combat boots in the tropics. What are their good and bad points and why do you consider them good or bad?

2. For each of the following words, write a statement or statements which describes how you feel about wearing your fatigues in the tropics.

   Appearance:

   Protection:

   Quality:

   Effectiveness:

3. What changes could be made which would improve the effectiveness and morale of the troops in the tropics?

Note that in keeping with the theory presently held by the writers, items one and two are written to have a multidimensional approach and item three is constructed so as to elicit responses general enough to encompass any areas the soldiers themselves feel to be important.

Analysis of the pilot study data indicated that specific, appropriate attitude information was being elicited. For example, many respondents stated

that they preferred the combat boots over the jungle boots for use in the tropics if grip devices were applied to the soles of the combat boots. A large percentage of the soldiers stated that fatigues wore out at a much faster rate in the tropics than they do in the temperate zones. Reporting that they do not receive extra clothing allowance for tropical duty, the troops expressed a strong negative attitude in regard to fatigues in the tropics. The examples cited above are used to indicate the concrete nature of some of the results.

The information obtained from the pilot study empirically supported the inclusion of some of the "attitudinal objects" (topics) and dimensions which had been selected on á priori bases. The use of some topics and dimensions were not supported by the data and were deemed questionable. The data suggested some new topics and dimensions to be included in the instruments.

The results of the data analysis, and the theory which had been formulated both were major contributing factors to the development of the instruments. New techniques were developed, items were constructed, and materials were prepared, all of which were to be tested in Pilot Study Number Two.

II. Pilot Study Number Two

Due to the developmental nature of the techniques which were employed for collecting data in Panama, the investigators planned a second pilot study which was conducted at Fort Lee before the trip to Panama. The purposes of the trip were two fold: 1) to provide the investigators with information and prior experience concerning the administration of the battery

of assessment techniques; and 2) provide a last opportunity to detect and correct any major problems which might have been caused by the instrument or procedures as they then existed. The investigators collected data from a sample of forty-eight Quartermaster soldiers at Fort Lee. Analysis of the data resulted in the following conclusions:

1. The objective type questionnaires were generally effective in that most of the items were understood and appeared to be discriminative. Some simplification in language was required for some of the items;

2. Trends were noted which justified further consideration of the techniques used to identify certain kinds of invalid data;

3. The written projective technique elicited a good range of responses, but there were too many items and some of the items required simplification;

4. The projective pictures seemed to be practical, but there were too many.

III. Major Data Collection

Once the pilot studies were completed the instruments were refined and prepared for the major data collection. The techniques which were used are discussed in Section Four of Chapter Three. Two members of the research team traveled to Panama to collect data during a two-week period. The bulk of the data was collected during the first week with one member of the team remaining in Panama to perform interviews during the second week. Data were collected from two hundred subjects, sixteen of whom were extensively interviewed during the second week. This brought to a conclusion the data collection of the first phase of the contract.

SECTION THREE - BASIC ASSUMPTIONS

Shortly after the orientation trip to Panama, a representative of the sponsor met with ROWLAND AND COMPANY personnel to discuss the implications of the data acquired in Panama. Partial analysis of the data as well as the theory and model served as a guide upon which the assessment techniques were designed.

Some of the assumptions which evolved out of the theoretical conceptualizations are as follows:

1. Attitudes may change through time, but if changes occur they are generally relatively slow and progressive rather than sudden, large, and abrupt. Thus attitudes do not oscillate from moment to moment and therefore have sufficient stability to permit measurement and prediction.

2. Opinions, though but distorted abstractions from "true" attitudes, can be elicited so as to make possible useful inferences about attitudes.

3. Opinions will be dependent upon a) attitudes, b) techniques used to elicit opinions, and c) the environmental complex at the time the subject is responding.

4. Correspondence between attitude and opinions will vary inversely with environmental pressure. That is to say, the greater the reduction in environmental press, the more a subject will tend to express his "true" attitude in the form of an opinion. If the environmental press can be reduced to near phenomenological zero, an individual will be likely to express his true attitude in so far as the instruments and his own limitations permit.

5. While "environmental press" is an individual matter, steps can generally be taken which tend to reduce the press to manageable proportions for most people.

6. The ways in which an individual deals with his environment (which also can be considered in terms of personality theory) affect the manner in which his attitudes alter his behavior.

For example, if an individual is dogmatic and predominantly affective in dealing with his environment, it is assumed that he will respond in a relatively rigid affective and simple manner to objects about which opinions are solicited.

7. Subjects can be categorized into sub-populations (or categories) from data gathered by appropriate techniques in attitude studies. Sub-populations derived from attitude data can be useful in types of research discussed in Eight below.

8. The type of study being made will determine the sub-populations which are to be studied. For example, if one is studying present attitudes towards an object, the researcher would want to use his entire sample. If he were interested in changing behaviors of appropriate subjects from stereotyped, negative, or rigid reaction patterns to considered, weighted judgments through some therapeutic educational program, he would probably want to study a specific portion of his sample. If on the other hand, the researcher wanted to use "attitude information" as part of his data for reaching decisions as to whether or not certain objects should be changed, he would probably want a different sub-population than he would want for the "educational program."

9. A significant portion of the respondents will yield misrepresentative information for one reason or another. Awareness of this assumption may lead to more accurate data collection techniques as well as more valid data analyses.

10. Data collection techniques relying upon verbal responses are not adequate to collect some affective data which are not available to intellectual expression.

11. Open-ended projective techniques allow respondents to supply salient information surveyors didn't recognize as such, and also allow respondents an opportunity for cathartic expressions.

Obviously these eleven assumptions are not all-inclusive. They are explicitly stated because they have been major influences in the development of the instruments.

SECTION FOUR - INSTRUMENT DEVELOPMENT

This Section presents some of the psychometric considerations which were dealt with in the present study. It presents in detail the attitude assessment techniques and supporting sources of information which received the greatest degree of exploration and which were developed to the administrative stages. The techniques are discussed in the following order in this section:

I. Attitude Assessment Techniques

- A. Objective Questionnaires (Likert-type scales & Osgood-type scales)
- B. Written Projective (Listing and incomplete sentences)
- C. Projective Pictures (Written responses and color responses)
- D. Personal Interviews

II. Supportive Data Collection Techniques

- A. The Lowry-Lucier Reasoning Test Combination
- B. Biographical Data from Service Records
- C. Biographical Information from Respondents

Complete copies of the final instruments are contained in Volume Two for the readers' reference.

I. Attitude Assessment Techniques

The label "Assessment Techniques" is used in preference to "Measurement" in that it connotes a meaning more closely aligned with the conceptualizations discussed in Chapter Two. Attitudes are inferred and their directions and intensities can only be estimated when using information derived

from scaled responses. Although even physical measurements require some estimates, the standards or criteria are more definite than they are for most psychological phenomena.

This study is based primarily on the development of some attitude assessment techniques so it has been necessary to consider some basic measurement problems. The utility of most measurement procedures hinges upon the concepts of validity, reliability, objectivity, and standardization. Validity refers to the extent to which the technique (test) measures that which it purports to measure. Reliability is a measure of the internal consistency of the test, i.e., the degree to which a test will yield similar results for a particular population. Objectivity has to do with the mechanics of test administration, response, and scoring. Standardization of a technique means deriving norms based on the population for whom the test has been designed; this procedure provides comparative standards for data interpretation.

Since validity and standardization involve efforts of a magnitude beyond the scope of the present phase of this project they are not dealt with extensively herein. However, the developmental phase of this project of necessity must include consideration of objectivity and reliability. Consideration of these two problems largely affected the selection and development of the techniques discussed herein.

(Objectivity)

The more objectivity characterizes assessment techniques, the more the responses to items reflect the respondents' variance rather than the variance between surveyors. Two major factors contribute to the objectivity

of assessment techniques: 1) the method of presenting the individual items and 2) the manner of responding. Techniques identified as objective techniques usually have highly structured administrative procedures and highly structured manners of responding. Two examples of these are true-false and multiple choice type items, which allow comparitively less opportunity for surveyor bias when collecting the data. Some so called non-objective psychological devices are those which are more or less unstructured in nature, particularly with respect to manners of responding. Some specific examples of these are:

1. "Open-ended" (or incomplete sentences);
2. Pictures or "cartoons" with empty balloons;
3. "Fill-in-the-blank" surveys or tests;
4. Essay Questions;
5. "Role-playing," "play" tests;
6. Critical incidents;
7. Analysis of autobiographical materials (letters, themes, etc.).

Highly "structured" techniques (objective) lend themselves to easier, bias-free scoring procedures. However, they restrict the respondents to an artificial limit of responses which have been prescribed by the surveyor. On the other hand, "unstructured" (projective) techniques are far more difficult to score but allow the subjects more freedom of response. The "unstructured" techniques are often the only methods which will work in certain situations, for example:

1. Situations in which one wishes to discover something regarding attitudes from the respondent without providing cues to the respondent as to what the examiner is really interested in.
2. Situations in which explicitly naming the alternatives from which the respondent is to select his answer would "give away" the answer.

3. Situations in which the surveyor is desirous of obtaining information concerning saliency and doesn't wish to establish sets in the respondents.

4. Situations which are unavailable to verbal transmissions.

While objective techniques are comparatively economical in that they allow large group administrations and machine scoring of responses, they are geared primarily to the cognitive aspects of attitudes. Projective techniques, although plagued with problems pertaining to procedures for content analysis, provide pertinent information with respect to "how it is said" rather than just "what was said." Therefore the projective techniques tap the affective aspects of attitudes more directly.

(Reliability)

The generally accepted notion of reliability is test centered, i.e., if a test doesn't yield consistent responses from a subject using one of the "internal consistency" measures, (test-retest method, equivalent-form test, the split-half method) the test items are assumed to be at fault. The present research team accept this view of reliability to account for but half the problem. Quite likely a good measure of the inconsistency in test results is due to those subjects who are being inconsistent irrespective of the test item. In this research, reliability is viewed as two aspects rather than one and should be separated insofar as possible. They are:

1. Instrument Reliability
2. Respondent Reliability

Consequently, assessment techniques and procedures were developed in this study which would allow examination of both kinds of reliability.

The present study includes consideration of a number of techniques ranging from highly structured (machine scorable responses) to highly unstructured (little or no structure in directions or manner of responding). Such a diverse approach to the subject of attitude assessment provides a systematic way of studying the relationships of structured vs. non-structured techniques by individuals. This procedure allows optimal use of the advantages of both "structured" and "unstructured" techniques, and intensive evaluation of Respondent and Test Reliability.

A. Objective Questionnaires

1. Scaling rationale

Structural differences between objective questionnaires for gathering opinion data are due primarily to the different types of scaling procedures employed. A large factor in the selection of the scaling procedure is the apparent effectiveness of a particular scale-type in the past. The Likert-type scale was considered at the outset for this study because it had undergone a number of years of research and seemed to offer an optimal solution to the scale construction problems. Development and adaption of the Likert-type scale to the content of the present study resulted in consideration of some forms of the Osgood-type scale. Both Likert and Osgood-type scales are dealt with in the following discussion because both were used for data collection.

In the present study, the Likert-type questionnaire consists of statements which are presented to the subject with instructions that he is to indicate his level of agreement or disagreement with them. He does so by

marking one of seven places on a vertical scale ranging from "I agree completely" to "I disagree completely." For example:

610. In this area my combat boots are completely unsatisfactory.

I agree completely ----- ( )
I agree quite a bit ----- ( )
I agree slightly ----- ( )
I neither agree nor disagree ----- ( )
I disagree slightly ----- ( )
I disagree quite a bit ----- ( )
I disagree completely ----- ( )

Items developed for the Osgood-type questionnaire are composed of two-part statements, the first part of which contains substantive elements, and the second (evaluative) part is represented by polar adjectives or descriptive phrases on a seven point vertical scale. For example:

210. In this area my combat boots are completely:

Unsatisfactory ----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
Satisfactory ----- ( )

Note that the subject rates a referent between polar concepts. The polar concepts are usually represented by single adjectives (satisfactory and unsatisfactory) for each concept, although occasionally descriptive phrases are used. Note also that each of the items above is designed to elicit attitude data on the same subject, but with different scale theory.

Careful consideration of the two scaling procedures raises an issue which might have very serious theoretical implications; namely, the possibility that the Osgood-type scales might be more valid than the Likert-type scales. In order to systematically consider this possibility, two separate booklets were constructed such that a one group - two condition experimental design could be implemented. One booklet consists of items with Likert-type scales for responses, whereas the other booklet contains the same items but with Osgood-type scales for responses. All two hundred soldiers (One Group) were administered both booklets (two conditions) such that any differences between responses to booklets could be attributed to the difference in scaling techniques.

There are at least two logical explanations why the Osgood-type item should be superior to the Likert-type item in collecting data for attitude research. The two explanations will be referred to as the "semantic leap," and the 'whip antenna" effect.

a. The Semantic Leap Assumption

Suppose one takes as his first example Item 510 of the Likert-type questionnaire used in this study.

	I agree completely -----	( )
	I agree quite a bit -----	( )
	I agree slightly -----	( )
510. The food served in the mess hall here is excellent.	I neither agree nor disagree -----	( )
	I disagree slightly -----	( )
	I disagree quite a bit -----	( )
	I disagree completely -----	( )

In this item it is assumed that the scale expresses seven degrees of attitude from acceptance to rejection. This is a typical item for a conventional military attitude survey. Unidimensionality is assumed on each Likert item so that "disagree" for a positive item is interpreted implicitly (by the item construction) as the opposite end of the basic concept stated in the item. If the respondent agrees with the statement, one is probably safe in assuming that the respondent believes the referent "food" to have a relative degree of merit corresponding to the positive choice he makes. But what is the referent when the respondent checks the extreme negative of this item? Is it not possible that he has reacted something like the following: "The food here is <u>not excellent</u>, it is only <u>fair</u>, therefore this statement is wrong. Therefore, I will check that I disagree completely with the statement that the food is excellent." It is not possible to tell from the subject's response when he is evaluating <u>a referent</u> (which may be a referent only to the experimentor), and when he is evaluating <u>a statement</u> as a statement. It is highly probable that in many instances the respondent himself is not conscious of whether he is responding to a Likert-type statement as a statement, or whether he is responding to the referent so readily accepted by the surveyor. In the Likert-type items the surveyor makes the "semantic leap" that the respondent is responding to the surveyor's <u>referent</u> as his own referent, a leap which probably is frequently not justified.

Now consider Item 110 which is the Osgood-type counterpart of Item 510, and reads as follows:

Excellent ----- ( )

----- ( )

----- ( )

110. The food served here in the mess hall is: ----- ( )

----- ( )

----- ( )

Lousy ----- ( )

In this instance the referent (food) is explicitly pointed out, and the task of assigning a value ranging between two extremes is also explicitly indicated. This research team respectfully suggests that there is considerably less likelihood that the respondent is responding to the statement as a statement in this approach than in the Likert approach described earlier. In all probability, there is greater likelihood that he is responding to the referent "food" which is also the referent of the surveyor. There will always be a difference between a response to the word "food" and the edible objects which are placed before the respondents in the mess hall, but at least the surveyor has eliminated one possible uncontrolled level of abstraction from his referent by use of the Osgood-type approach.

b. The "Whip Antenna" Effect

Consider the Likert-type item: "Officers here are industrious" with the choice of seven alternates between "I agree completely" and "I disagree completely." Again one is reasonably safe in assuming the respondent's meaning if he checks the positive alternative. But what does he mean if he chooses a negative alternative? For this discussion, it is assumed that the respondent has successfully made the semantic leap and that he is responding to the concept

of "industriousness" of officers. Does his negative response mean that he believes that referent officers work hard but are unproductive, or does it mean that they do not exert themselves - in other words, that they are lazy? Or does he have still some other interpretation in mind as he enters a negative evaluation? One has here an item which is anchored on one end ("industrious") but has no anchor at the other end. Thus the item corresponds conceptually to the mechanics of a whip antenna on an automobile radio, where one end of an antenna is anchored to the automobile and the other end is free and indeterminant. The Osgood approach of using the phrase "Officers here are..." with officers to be rated in seven degrees between "industrious" and "lazy" anchors both ends of the continuum, thus achieving unidimensionality to the degree that the polar concepts are unidimensional.

If the reader thinks the above illustrations are exceptional, let him ponder the following Likert-type items on a five point scale, which was designed as follows: "1) strongly agree, 2) agree, 3) undecided, 4) disagree, 5) strongly disagree " [E. E. Cureton, 1960].

a) My supervisor's orders and instructions are almost always clear to me.

b) My supervisor puts the welfare of his men ahead of his desire to please his supervisors.

c) Considering its mission, my unit has just about the right number of men in it.

d) It is easy for me to do things the Air Force way.

e) My present job suits me better than any other job I know of in the Air Force.

f) Sometimes the pressure of my job is more than I can bear.

g) In general, I feel that I have gotten a square deal from the Air Force.

h) The Air Force program of medical care for dependents is very good.

If one wishes to ponder further the meaning of responses, let him consider the middle choice category (undecided) of possible responses to these items. What does "undecided" mean in each instance of the Likert-type item listed above? For example, in Item "g" above, does a check of "undecided" mean that the subject cannot make up his mind as to whether or not he has "gotten a square deal from the Air Force" or does it mean that sometimes he has "gotten a square deal from the Air Force" or does it mean that sometimes he has "gotten a square deal" and other times not, so that he reaches a mean position on this item?

2. Description

The detailed description of the many aspects of the Objective Questionnaires which follows may be enhanced by referring to Volume Two. Inasmuch as some of the aspects which have been included in the Questionnaires are somewhat novel, the authors have included supporting rationales. The different aspects are presented in the following order: numbering system, topics, dimensional approach, "your comments" card, respondent-reliability indicators, scoring techniques, and demographic items.

a. Numbering system

The final instrument included two booklets of objective items (Osgood, Likert) which were administered to each subject. Each booklet contains 125 items. Each item in the Osgood booklet has a "matching" item in the Likert booklet in that they have a common referent. The matched items differ with respect to the type of scale used as discussed previously in this chapter.

Items in the Osgood booklet are numbered from 110 to 441, and corresponding items in the Likert booklet are numbered from 510 to 841. The first digit of an item number designates the section and booklet in which it appears. The second digit designates the Topic block, and the third digit identifies the item within the block. For example, the first item of section two, which pertains to the degree of satisfaction of combat boots, appears in the Osgood booklet at 210. The corresponding item in the Likert booklet is numbered 610.

b. Topics

Items are grouped into blocks of either ten or five items each. The items of a block are intended to study different dimensions of a single topic. There are eight 10-item blocks and nine 5-item blocks covering seventeen topics. Inclusion of these topics was based on information acquired from the pilot studies in conjunction with information provided by representatives of the sponsor. The seventeen topics are listed according to the number of items used for each.

Ten-item Blocks	Five-item Blocks
Food (mess hall)	Family
Food (field rations)	Health
Officers	Weather
Boots (combat)	Insects and Bugs
Pack	Poncho
Fatigues	Snakes
Entertainment	Raincoat
Boots (jungle)	Shelter Half
	Drinking Water

c. Dimensional approach

As mentioned earlier, items referring to the same topic are arranged in a constellation or block. A dimensional approach is employed because it seems highly questionable that single items permit inferences concerning all aspects of complex attitudes. It is likely that attitudes are resultants of several lesser sub-attitudes which may themselves be in conflict. One item might be an indicant of how the subjects feel about the object or condition but it would leave unanswered the pragmatic question - why? The dimensional approach seems necessary in order that the responses may more closely reflect the actual status of the objects and/or conditions in question. Approaching each topic from more than one dimension allows object assessment as well as opinion assessment. Consequently, if opinions of troops are sought concerning combat boots, then items should be constructed which could tap several dimensions of the soldier's opinion about boots if he does indeed have more than one view on that subject. For this reason, each of the items within a block was constructed with the intent of assessing a specific dimension of the topic. For example, the topic dealt with in block 53 of the Likert booklet is "officers." The ten items 530 to 539 deal with capability, intelligence, honesty, leadership, etc. each of which is thought to be a different dimension of the topic "officers."

d. Your comments cards

Each block of associated items has an open-ended item at the end which was included to test its benefits to respondent and surveyor. The open-ended item which consists of a blank page entitled "Your Comments", provides the subjects with an opportunity to express themselves in their own way. It is believed that this procedure improves rapport with the subjects. It provides

for release of tension resulting from the constraints imposed upon them by the fixed alternatives as stated in the Likert scale. Four "Your Comments" cards are included in each booklet.

The importance of providing the subjects with ample opportunity for free expression was carefully documented by Rensis Likert [1951]. He maintained that even college students, usually sophomore psychology majors, who were highly motivated to participate as subjects in scientific endeavors such as attitude scale development, frequently objected to being restricted to the question alternatives as stated. They insisted that none of the alternatives gave them an opportunity to express their attitudes correctly.

It would seem then, that populations which are less captive than college students would react very unfavorably to survey conditions which restrict free expression. If restrictive techniques have an effect upon the respondents, then rapport becomes questionable and a potentially uncontrolled variable. This issue is discussed because it has been demonstrated repeatedly that rapport plays an essential role in behavioral science experiments. In part rapport is important because it affects Respondent Reliability, and Respondent Reliability was previously discussed to be a contributing factor to the reliability of the entire testing situation. The present investigators believe that provisions which allow free expression are manditory for the establishment of rapport in lengthy, and sometimes tedious situations, like answering long opinion questionnaires. This necessity is likely to be particularly important in dealing with intelligent, motivated respondents.

In addition to the important role open-ended items may play in regard to rapport, there is another contribution which "Your Comments" cards

can make. The almost unlimited conditions which may affect attitudes coupled with the fact that experimentors are not omniscient creates a need for continuous instrument updating. The open-ended items add the advantage of providing an additional source of information to assist in updating the instrument. The importance of this contribution is supported by the principle of feedback in an open system.

e. Respondent reliability indicators

One of the basic assumptions upon which the present research has proceeded is that all people do not respond to attitude surveys with the same degree of veracity. In fact, there seems to be those respondents who make every effort to confound the surveyor. Certainly there are respondents who do not participate with the same ability and interest that the surveyor would command were he to be the respondent; and yet, most surveyors either are not cognizant of these problems or they purposely ignore them.

The techniques discussed in this section were developed in order to estimate Respondent Reliability. Data which are used to estimate Respondent Reliability may be classed into two major categories: Abnormally Inconsistent Data and Abnormally Consistent Data.

(1) Abnormally Inconsistent Data

It appears reasonable to assume that attitudes have a certain amount of stability. It follows then, that, if valid and reliable assessment techniques are employed, identical items will elicit similar responses from the same respondent. On the other hand, if the items were not understood by the respondents and/or respondents were not cooperating, similar responses to

identical items could be expected only by chance. Based on this premise, Internal Consistency Checks were included in both the Osgood and Likert-type booklets. Internal Consistency Checks are comprised of two items which are identical except that their directions are reversed; that is, the scale values of the items are reversed the second time the item appears in the booklet. For example, Item 212:

212. In the terrain we have here my combat boots provide:

Poor Traction ----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
Excellent Traction ----- ( )

appears later in the booklet as Item 219:

219. In the terrain we have here my combat boots provide:

Excellent Traction ----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
----- ( )
Poor Traction ----- ( )

An Internal Consistency Check which yields responses whose scale values differ by three or more is considered an Inconsistent Response. Three or more Inconsistent Responses out of a possible sixteen is the Respondent Reliability Rejection Criterion. Choice of this criterion is arbitrary but

seems reasonably stringent and appropriate. Inasmuch as Internal Consistency Checks are included in both the Osgood-type booklet and the Likert-type booklet, any combination of three Inconsistent Responses was sufficient to surpass the Rejection Criterion.

Each ten-item block contains an Internal Consistency Check. The item first occurs within the first three items of the block and is always presented in its reversed condition as the last item of the same block. The Internal Consistency Checks are sixteen in number and are located by the following item numbers:

Osgood-type Booklet		Likert-type Booklet	
112	119	512	519
121	129	521	529
130	139	530	539
212	219	612	619
221	229	621	629
230	239	630	639
312	319	712	719
430	439	830	839

(2) Abnormally Consistent Data

While considering the Respondent Reliability Rejection Criterion of three Inconsistent Responses, it became obvious that this technique is not sensitive to the respondent who checks the mean across all his answers. Yet the information provided by the data of a respondent who marks across the hypothetical mean on blocks of items also appears to be questionable. Consequently, an additional Respondent Reliability Rejection Criterion has been

established which will be referred to as an Undifferentiated Profile. That is, consistent use of mean scores across a block. Three or more ten-item blocks with Undifferentiated Profiles, four or more five-item blocks, or any combination of five and ten-item blocks with Undifferentiated Profiles would cause data to be rejected as unreliable information.

f. Scoring Technique

Response to items were made on Mark Sense automatic data processing cards. Four data cards were required per questionnaire in order to allow responses to the 125 items. These cards were placed strategically in the booklets and were (in most cases) accompanied by a "Your Comments" card. Both types of cards could be "popped in" and "popped out" such that the booklets themselves were made reusable. Both types of cards were precoded in such a way that they could be matched with the respondents and with the administration scheme they followed.

g. Demographic Items

The seventeen items appearing in the front of some of the Osgood-type booklets and the Likert-type booklets pertain merely to biographical information. A discussion of these items follows in the Supportive Data Section.

B. Written Projectives

1. Listing

a. Description

Written projective items are classified into two sub-categories: listing and sentence completion. The listing technique consists of items

which request the respondents to list three characteristics, attributes, items, conditions, etc. which they like, dislike, want, etc. concerning some object or condition. For example:

Three pieces of equipment that are not waterproof enough are:

1. _____
2. _____
3. _____

b. Rationale

This approach to attitude inference combines some of the advantages of both the structured and the unstructured techniques. It makes it possible to obtain data which the surveyor postulates were relevant to the respondents and at the same time to obtain data which the subjects considered were relevant but which the surveyor had not perceived as such. The listing technique also provides data from which inferences may be made concerning saliency of objects.

2. Sentence Completion

a. Description

Each item consists of a word or phrase of a partial sentence which the subject is asked to complete. The sentence stems vary in structure to the degree selected by the investigator. It is possible to construct the sentence stems such that they will partially determine the content of the sentence completion leaving emotional value or tone unstructured; determine the tone of the sentence completion leaving content unstructured; or leave both content and tone unstructured. The following items exemplify these three alternatives respectively:

My jungle boots _____

_____

_____

The miserable _____

_____

_____

Since I've been in the tropics _____

_____

_____

For data collection in Panama two "equivalent" forms of written projectives, Forms A and B, were constructed, each of which were composed of sixteen listing items, and thirty-seven sentence completion items. Many of the equivalent items had been written so as to use different language and yet bring out the same discussion topic. The most effective items were to be selected for continued use. Half of the sample population were administered Form A and the other half was administered Form B.

b. Rationale

Although scoring sentence completion items is a difficult task, the kind and quality of data which the investigators have collected through this means on other occasions appears to justify the additional effort. New information and saliency of objects are two kinds of information obtained from written projectives. But perhaps more important is the way in which the data are obtained. Written projective techniques, in keeping with "projective" theory, offer relatively unstructured materials to respondents which they

structure. That is, the individual literally "projects" his attitudes into the perceptual organization, not merely checks from a predetermined repertoire of response possibilities.

C. Projective Pictures

Following the logic of the projective approach which affords the respondent an opportunity to project his "feelings," to verbalize (or otherwise express himself) by "structuring" unstructured materials, two additional techniques were developed. These projective techniques are thematic in nature but differ from one another with respect to type of responses elicited.

1. Written Response

a. Description

Scenes which depict life in the tropics both from a military and an off-duty point of view are presented to the respondents. The content of most of the scenes was selected so as to correspond with the topical content of the objective scaling techniques. In each scene one or more individuals are engaged in some kind of activity such as talking, walking, or just sitting, (thinking). Empty cartoon-like balloons are provided for the respondents to write what they think the individuals might be saying or thinking. In some of the pictures the stimuli are provided by the scene depicted in conjunction with a comment by one or more figures, and in some cases this is augmented by other written material. In other cases there are no comments, hence the initiating stimuli are produced by the scenes alone.

Eighteen pictures were used in the pilot study, each of which was found to differ in its effectiveness. The investigators were hesitant to

eliminate any pictures on the basis of their "effectiveness" due to the fact that the pictures were designed for use with troops in a tropical environment, while the respondents being used in the pre-test were stationed in the United States. The conditions for which the instrument was to be designed, i.e. for "troops in the tropics" were obviously not met in the pilot study, but this was not avoidable. However, the emphasis of the first trial was exploratory in nature and the investigators were primarily interested in what modes or ways the respondents would respond rather than what their actual responses were. Due to the fact that the administration took longer than seemed desirable, three pictures were arbitrarily eliminated, leaving a total of fifteen in the final Phase One instrument.

b. Rationale

The psychological mechanisms involved in this technique allow the respondent to ascribe verbalizations to "other" persons represented in the scenes without fear of reproach. The degree of insight can range from almost complete awareness to total lack of awareness of the self-referential nature of the responses. It was hypothesized that this method would be a significant step forward in eliciting frank, sincere attitudes by practically eliminating environmental press and subjective evaluation of response by the respondent.

2. Color Response

a. Description

Pictures similar to the ones discussed above are presented to the respondents. Some of the same pictures employed in the Written Response approach are included, as well as others which are different. Two major differences

exist between this method and the written response projective pictures:

1. None of the pictures contain writing or balloons, and
2. Each subject is given a box of ordinary wax crayons containing eight colors and is asked to color the scenes in anyway he desires.

b. Rationale

This technique is employed to explore methods of obtaining expressions of attitudes other than by verbal means. If attitudes are composed of cognitive and affective aspects in various proportions as the present theory asserts, it seems likely that suitable techniques would have to be developed for the different proportions of cognition-affect. Techniques which elicit verbal responses appear to tap predominantly cognitive portions of cognition-affect. It seems to follow that techniques which elicit non-verbal responses would more successfully tap the predominantly affective portions of cognition-affect. The importance of trying to develop such a technique becomes apparent when one considers the fact that there are no techniques known to exist at the present which have been designed to assess attitudes in this way.

It is the investigator's intent to consider possible color correlates of attitudes and to build a theory of color as an attitudinal referrant, based upon direct meaning and application of color. By application, the authors mean such behaviors as heavy strokes, going outside boundaries, seemingly meaningless scribbles, etc., all of which are possible ways that non-verbal expressions of attitudes might be made.

D. Personal Interviews

1. Description

Sixteen of the sample of two hundred respondents were selected for personal interviews. They were selected on the basis of their behavior during the administration. The administrators, based on their observations during administration, attempted to select some individuals from each of the following classifications: Fast-Cooperative, Fast-Uncooperative, Slow-Cooperative, Slow-Uncooperative. The mean time for the sixteen interviews was one hour. During the course of each interview the respondent was given an opportunity to explain how he felt about each of the techniques and in what manner he had responded to them (insofar as he could introspect). The initial portion of the interview was spent establishing rapport with the intent that the respondent would feel free to respond frankly and sincerely. The interviewer explained some of the purposes of methodological research such as the present one, that it was important for the investigators to know why the respondents were responding as they did, so that changes and adjustments could be made in order to provide a more interesting and useful instrument.

At the conclusion of each interview the respondent was asked to rate himself with respect to his level of effort to cooperate throughout the test battery. He was to rate himself on a scale from one to ten with ten representing maximum level of effort. Almost without exception, the respondents gave ratings of themselves which appeared to be in accord with other criteria, (surveyor's rating, performance on the instruments, etc.). Those respondents who gave themselves ratings of less than ten were asked to explain their reasons for so doing. In a few cases it was not until this point that they

took the interviewer into their confidence and revealed their "true" mode of operation as they understood it.

2. Rationale

The primary purpose for the use of the technique was to determine why the subjects responded to the several techniques in the way they did, i.e. what mode of operation did they incorporate? Did they try hard to cooperate? If they did, was there any point at which they didn't try hard, and if so, why? If they didn't read the items, why didn't they? Did they understand the items or was the language too diffucult? And what types of response bias were operative? Answers to these questions provided one more consistency check on the individual, and served further as a basis for validating the other instruments.

II. Supportive Data Collection Techniques

Supportive data consists of data pertaining to the 200 respondents which describes them in non-attitudinal dimensions; that is, data such as intelligence scores, age, rank, etc. These data are useful for comparing with categories of "attitudinal" responses in order to identify trends and possible correlates of "attitudes." The Supportive Data Collection Techniques which were selected during this phase of the research were:

1. The Lowry-Lucier Reasoning Test Combination;
2. Biographical data from respondents; and
3. Biographical data from service records.

A. The Lowry-Lucier Reasoning Test Combination

1. Description

The Lowry-Lucier Reasoning Test Combination is administered in two parts, the Lowry-Lucier Reasoning Test (A) and the Lowry-Lucier Reasoning Test (B).

The Lowry-Lucier Reasoning Test (A) requires the subject to solve various problems presented in verbal form; on the other hand, the Lowry-Lucier Reasoning Test (B) calls for the solution of problems presented in the form of spatial relations. Both forms incorportate the progressive difficulty techniques, e.g. in each test the earlier problems are so simple that a child can solve them, while the concluding problems are so difficult that sophisticated adults find them challenging. Both tests are timed, fifteen minutes are allowed for the Lowry-Lucier Reasoning Test (A) and twenty minutes for the Lowry-Lucier Reasoning Test (B).

2. Rationale

The investigators hypothesized a relationship between Inconsistent Responses on the Osgood and Likert-type scales and intelligence. The Lowry-Lucier Reasoning Combination was included as a criterion measure because of the apparent success achieved by that instrument estimating reasoning abilities (intelligence) which are independent of learning experiences beyond those attained during early childhood.

B. Biographical Data from Respondents

1. Description

The demographic items which appear in the front of the Osgood and Likert booklets deal with biographical information such as age, education, father's education, marital staus, dependents, type of home town, rank, service time, branch of service, time in combat, battle stars received, time in jungle training areas, number of times completed Jungle Warfare Training Center course, quarters, and type of eating facilities most frequently used, and "attitudes toward the Army." The last mentioned item describes four general orientations a soldier might have towards being in the Army, which range from strong positive

to strong negative. The respondents are asked to check the orientation that best describes the situation as they see it.

2. Rationale

Since Phase One is developmental in nature, every source or kind of information that is obtainable pertaining to the respondents becomes helpful in evaluating their responses. Biographical data are useful for comparing with categories of "attitudinal" responses in order to identify trends.

The final item of the demographic section is not considered biographical information. It is an item on "attitude toward the Army" in general and was included in the instrument for comparative purposes. The notion is held by some theorists that there are residual effects upon specific attitudes toward a class of objects which results from a general attitude of orientation. In this case the general orientation is "attitude toward the Army" and the specific attitudes are toward objects associated with the Army.

C. Personnel Records

1. Description

Information such as number and kind of awards received, time lost, etc., was obtained from the Files. Biographical information which duplicated some of the information given by the respondents on the Demographic section of the Objective Questionnaires was obtained from Personnel Records Form DA-20. General Technical Scores (GT) were obtained from Personnel Records Form DA-20 by adding the arithmetic scores to the verbal scores of the General Classification Test Battery, and dividing by two.

2. Rationale

The duplicate biographical information was obtained as a furthe external criterion check of Respondent Reliability.

General Technical Scores (GT) were considered potential correla of Inconsistent Responses. GT scores appear to be largely affected by ve skills whereas the Lowry-Lucier Reasoning Test Combination is not; conseq they appear to measure different aspects of "intelligence." Examination distributions of respondents by Inconsistent Responses vs. scores obtaine the Lowry-Lucier Reasoning Test Combination and the General Technical app to be a fruitful approach.

SECTION FIVE - METHODOLOGY

1. Sampling Plan

The sampling plan called for two hundred soldiers as subjects. Due to the developmental nature of this phase of the study, the comparison and evaluation of techniques was the primary concern. In order to provide comparisons which would account for possible differential transfer, four counterbalanced conditions were established. Included among the comparisons to be made were:

1. Osgood Booklet vs. Likert Booklet
2. Written Projective Form A vs. Written Projective Form B
3. Objective Booklets with "Your Comments" cards vs. Osgood and Likert Booklets without cards.
4. Written Projectives administered before Objective Booklets vs. Written Projectives administered after Objective Booklets.

The two hundred subjects were divided into four groups of fifty each. Each group was given a different order of presentation of techniques. To control biases introduced by one or the other of the two administrators, each of the four groups was divided into sub-groups of twenty-five each. Consequently, both sub-groups of each group (or condition) were tested under the same conditions except with different administrators. Technically then, there were eight conditions rather than four when different administrators are considered in the counterbalancing. These eight conditions are depicted in Table 1.

TABLE 1

SAMPLING PLAN

Administrator A			Administrator B		
Group	N	Order of Presentation	Group	N	Order of Presentation
1A	25	Demographic Likert-Type Booklet Written Proj. (Form A) Osgood-Type Booklet	1B	25	Demographic Likert-Type Booklet Written Proj. (Form B) Osgood-Type Booklet
2A	25	Demographic Osgood-Type Booklet Written Proj. (Form B) Likert-Type Booklet	2B	25	Demographic Osgood-Type Booklet Written Proj. (Form A) Likert-Type Booklet
3A	25	Written Proj. (Form B) Demographic Osgood-Type Booklet Likert-Type Booklet	3B	25	Written Proj. (Form A) Demographic Osgood-Type Booklet Likert-Type Booklet
4A	25	Demographic Likert-Type Booklet Written Proj. (Form A) Osgood-Type Booklet	4B	25	Demographic Likert-Type Booklet Written Proj. (Form B) Osgood-Type Booklet

Note. - The entire sample of two hundred subjects were tested under one of the presentations described above. Four of the groups (2A, 3A, 1B, and 2B) returned for a second testing session to take the Lowry-Lucier Reasoning Test Combination, the Projective Pictures (Written Response), and the Projective Pictures (Color Response) in that order.

Groups 4A and 4B did not receive "Your Comments" cards in their Objective Booklets.

II. Population Description

Two hundred soldiers from the Third Battalion, 508th Airborne Infantry were selected as subjects for this study. The particular unit was selected because of availability.

The model characteristics of the sample were as follows:

Age	20 - 24 years
Education	High School Graduates
Grade	PFC
Service Time	12 - 18 months
Army Attitude	3

The reader who is interested in a closer examination of the way in which the demographic characteristics are distributed may refer to Table 2.

It should be noted that the subjects were members of a group whose services were in demand due to their special skills and geographic location near several potential hot spots in Central and South America. As a result the men were on alert a majority of the time.

TABLE 2

Sample Population Description

Descriptors	Valid Data Sample (N=140)	Invalid Data Sample (N=60)	Sample Population (N=200)
Age in Years:			
35 and over	4	0	4
30 - 34	6	2	8
25 - 29	9	4	13
20 - 24	65	23	88
Less than 20	52	30	82
No Response	4	1	5
Formal Education[a]:			
College	1	1	2
Some College	13	4	17
Secondary School	58	28	86
Some Secondary School	49	18	67
Grade School	6	5	11
Some Grade School	1	1	2
None	1	0	1
No Response	11	3	14

[a] Highest level completed

(Table continued on next page)

TABLE 2, Continued

Descriptors	Valid Data Sample (N=140)	Invalid Data Sample (N=60)	Sample Population (N=200)
Rank:			
Master Sergeant	0	0	0
Sergeant First Class	0	0	0
Staff Sergeant	5	1	6
Sergeant	20	8	28
Corporal	16	5	21
Private First Class	90	43	133
Private	7	1	8
No Response	2	2	4
Time In Service (in months):			
37 and over	33	12	45
19 - 36	12	2	14
13 - 18	50	24	74
7 - 12	39	20	59
6 or less	3	1	4
No Response	3	1	4
Attitude Toward Army[b]:			
4	45	16	61
3	54	16	70
2	30	16	46
1	3	7	10
No Response	8	5	13

[b] A score of 4 is a most favorable response, while 1 is a most unfavorable one.

CHAPTER FOUR

ANALYSIS OF DATA

SECTION ONE - INTRODUCTION

This research project has produced such a quantity of data and the time since completion of data collection has been so short that it has not been possible to completely process and evaluate all the available data prior to the deadline for the Phase One report. Broadly speaking, the data from the objective techniques has been reasonably completely studied while the data from the projective materials has been only generally overviewed. However, sufficient analytic work has been accomplished to warrant publication in incomplete form. (A first action of Phase Two will be completion of the analysis prior to undertaking further survey work.)

Keeping in mind that the prime purpose of the research is to investigate methodological aspects of attitude measurement practices and, if possible, to compare the relative effectiveness of competing strategies, one finds that the major focus of the results is a cross-comparison between techniques. Such a cross-comparison can only be valid after demonstration that each technique was applied to an essentially similar survey population. Accordingly, some discussion is provided to demonstrate the equivalence of the survey groups. Finally, to the extent that such data is available at this early stage, concrete attitudinal information has been extracted from the study and is presented for consideration by the using agency.

SECTION TWO - OBJECTIVE QUESTIONNAIRE DATA

I. Data Classification

A. Valid and Invalid Data Samples

The investigators postulated that all respondents do not display with the same degree of effort, ability, interest, veracity, and cooperation. This notion constituted a major influence in the development of the data collection instruments and procedures. This same postulate affected the data analysis portion of the study by virtue of the fact that the data were classified as "valid" or "invalid," according to the validity criteria (discussed in Chapter Three), and then were analyzed independently and comparatively.

The data from 140 respondents of the sample population survived the initial hurdles of the "valid data" criteria and were placed in the Valid Data Sample. The data from the remaining sixty respondents were placed in the Invalid Data Sample. The criteria which were used to categorize data as valid or invalid were based on "measures" of Respondent Reliability which are referred to as Respondent Reliability Indicators. The Respondent Reliability Indicators, which are discussed in detail in Chapter Three, are: Inconsistent Responses, Undifferentiated Profiles, and Incomplete Data. Table 3 provides the number of respondents whose data were rejected as invalid by group and by Respondent Reliability Indicators. The investigators deliberately chose to set up relatively severe criteria for valid data since it seems preferable to err on the side of setting up too severe a test than too liberal a standard. Except for that portion of the analyses which involves comparisons of the Valid Data Sample and Invalid Data Sample the data are based on data from the Valid Data Sample only.

TABLE 3

Rejection Information by Groups

	Number of Inconsistent Responses (IR)			Number of Respondents Rejected by Respondent Reliability Indicators			
Group	LIK.	OSG.	TOT.	IR	Undifferentiated Profile	Incomplete Information	TOT.
1	56	19	75	12	4[a]	2[b]	16
2	42	28	70	11	3[a]	2[b]	14
3	39	36	75	10	1	1[b]	11
4	52	29	81	14	5	0	19
Total	189	112	301	47	13	5	60

[a] - One undifferentiated profile elimination was also eliminated by IR score.

[b] - One incomplete data was also eliminated by IR score.

B. The Five Basic Topics

Although seventeen topics were used for data collection in the objective questionnaires, only five topics: 1) Food, 2) Officers, 3) Combat Boots, 4) Health, and 5) Snakes were selected for intensive study. These topics were considered to be the most crucial to soldiers in the tropics, and thus would most likely provide the most meaningful data. The utilization of pertinent data is particularly crucial to analysis and conclusions relating to decisions of choice between the two questionnaire methods -- the Likert and the Osgood. The selection of these particular topics was made on the basis of observations and discussions with tropic-experienced Army personnel and is therefore essentially on a priori bases. These topics are referred to as the "Five Basic Topics."

II. Osgood and Likert Data Comparisons

To test some notions concerning theoretical scaling differences [Chapter Three] between Osgood-type scales and Likert-type scales, a one group-two condition experimental design was implemented in this study. All two hundred soldiers (one group) were administered both booklets (two condition). Any differences between responses to booklets should be attributed to the differences in scaling techniques. It was anticipated that responses to corresponding items in the Osgood and Likert questionnaires would be found to correlate favorably and yet at the same time reflect some significant differences. Similarities in responses were expected because each comparison involved one subject's two responses to two items of presumably identical content. Dissimilarities were expected to be reflected in the data as a result of the differences in scaling techniques. The remainder of this section is a consideration of these similarities and differences as actually found in the data.

A. Data Similarities

1. Between Groups Comparisons

Although the experimental design is defined as "one group" in that all respondents were administered both questionnaires, it was necessary to divide the "one group" into four sub-groups for counterbalancing purposes. Each group received a different order of presentation [Table 1] such that any progressive errors due to order of presentation would be controlled.

An analysis of variance of the four groups was made on the Five Basic Topics for both Osgood and Likert-type items. Of the sixty ratios computed, two between-group variance ratios were significant beyond the .05 level; they were on the Osgood Food Topic between Group One and Group Two, and between Group One and Group Three. Corresponding mean differences were also significant at the .05 level. Means for Groups Two and Three tend to run higher than comparative means for Groups One and Four on both Likert and Osgood questionnaires, but other than the two just mentioned, there are no significant differences between groups. Correlations between Osgood and Likert means for the Five Basic Topics for each of the four groups and for the total population are contained in Table 4. Correlations do not appear to be affected by order of presentation of instruments.

2. Mean and Standard Deviation Comparisons

Table 5 provides means and standard deviations of responses to Likert and Osgood items for the Five Basic Topics by groups and by total population. Of the twenty pairs of Likert and Osgood means for the same topic resulting from Topics times Groups shown in Table 5, eighteen have slightly higher Osgood means than Likert means, one has a reversal of this trend (with Group Four,

TABLE 4

Correlations Between Likert and Osgood Means for the Five Basic Topics by Group and Total Population of the Valid Data Sample

Group	N	Food	Officers	Combat Boots	Health	Snakes
1	(34)	.91	.74	.81	.86	.69
2	(36)	.88	.85	.77	.60	.76
3	(39)	.75	.91	.84	.86	.76
4	(31)	.88	.88	.66	.64	.60
Total Pop.	(140)	.86	.85	.77	.77	.70

Note. - All correlations are significant beyond the .01 level.

TABLE 5

Means and Standard Deviations for Osgood and Likert Responses to the Five Basic Topics

Group	Number		Food		Officers		Combat Boots		Health		Snakes	
			OSG.	LIK.	OSG.	LIK.	OSG.	LIK.	OSG.	LIK.	OSG.	LIK.
1	(34)	M	4.36	4.08	4.62	4.35	3.13	3.01	2.99	2.90	3.89	3.79
		SD	1.62	1.49	1.30	1.06	1.08	0.90	1.35	1.34	1.26	0.99
2	(36)	M	5.07	4.83	5.17	4.56	3.19	3.01	2.95	2.95	4.06	4.04
		SD	1.13	1.09	1.24	1.33	1.04	0.93	1.10	1.05	0.83	0.91
3	(39)	M	5.03	4.74	4.99	4.67	3.21	3.18	3.17	3.09	4.14	4.13
		SD	1.12	1.31	1.40	1.64	1.03	1.11	1.28	1.35	1.15	1.12
4	(31)	M	4.61	4.59	4.16	4.18	2.82	2.72	3.06	2.86	4.05	3.88
		SD	1.38	1.20	1.69	1.47	1.29	0.89	1.10	1.09	1.06	1.05
Total		M	4.78	4.57	4.76	4.46	3.10	2.99	3.04	2.96	4.04	3.97
(140)		SD	1.35	1.31	1.46	1.41	1.12	0.98	1.22	1.22	1.09	1.03

Note. - These data represent the Valid Data Population

Officers, having a Likert mean of 4.18 to an Osgood mean of 4.16), and in one instance (Group One, Health) the means are the same. Thus there is a small but consistent difference between Osgood and Likert means, with the Osgood mean being slightly greater (toward the favorable end of the continuum). These trends, for the most part, are not significant statistically, and they are numerically small. However, the practically unidirectional trend of the Five Basic Topics would indicate the existence of consistent, if not statistically significant, differences. What are statistically significant however, are the correlations between Osgood and Likert Means for the Five Basic Topics. The data represented by Table 4 indicate very strong relationships between the Osgood and Likert assessments.

3. Item By Item Comparisons

The Five Basic Topics were analyzed dimensionally. Food, Officers, and Combat Boots each have nine different dimensions and an Internal Consistency Check item. Health, and Snakes have five different dimensions each, but no Internal Consistency Check item. Table 6 lists the means and standard deviations for each item of the Five Basic Topics for both Osgood and Likert by identification number, thus permitting ready reference to the item as written in the instrument. Figures 4 through 7, which amplify Table 6, illustrate in graphic form the relations between Osgood and Likert means on an item by item basis. They are graphical comparisons of mean responses to Likert and Osgood questionnaires for each item of the Five Basic Topics subdivided by topic.

Each item is described by a key word or phrase so that the content may be identified and the variations from dimension to dimension comprehended. A base line of four (the hypothetical mean of an ambivalent item) is drawn on

TABLE 6

Means, Standard Deviations, and Number of Subjects for Each Item of the Five Basic Topics for Likert and Osgood Booklets

FOOD

Osgood					Likert			
Item No.	N	M	SD	Descriptive Term	Item No.	N	M	SD
110	137	4.0	1.9	Excellence	510	139	3.9	1.9
111	140	6.0	1.5	Fresh Milk	511	138	5.5	1.8
112	139	4.3	2.1	Preparation	512	140	4.2	2.0
113	138	5.1	2.1	Quantity	513	139	4.7	2.1
114	139	4.8	2.0	Fresh Fruits	514	140	4.5	2.0
115	136	4.8	2.1	Fruit Juice	515	139	4.4	2.2
116	135	5.3	2.1	Fresh Vegetables	516	139	5.1	1.8
117	139	4.4	1.8	Grease	517	139	4.7	1.7
118	136	4.4	1.9	Taste	518	136	4.1	1.9
119	132	4.4	2.1	Preparation	519	137	4.5	2.1

OFFICERS

Osgood					Likert			
Item No.	N	M	SD	Descriptive Term	Item No.	N	M	SD
130	138	4.5	2.0	Capability	530	138	4.3	1.8
131	139	4.9	1.8	Intelligence	531	140	4.9	1.8
132	138	4.5	1.8	Excellence	532	138	3.7	1.9
133	138	5.6	1.7	Honesty	533	139	5.3	1.7
134	139	4.8	1.9	Leadership	534	139	4.4	1.9
135	136	4.5	2.0	Industry	535	140	4.4	1.9
136	132	4.2	2.2	Understanding	536	139	3.7	2.0
137	139	4.6	1.8	Strength	537	136	4.7	1.8
138	138	5.1	2.0	Friendliness	538	135	4.6	1.9
139	132	4.8	1.9	Capability	539	135	4.6	1.8

(Table continued on next page)

TABLE 6, Continued

COMBAT BOOTS

Osgood Item No.	N	M	SD	Descriptive Term	Likert Item No.	N	M	SD
210	140	3.9	2.1	Satisfaction	610	139	3.7	2.0
211	139	2.3	1.6	Drainage	611	139	2.3	1.5
212	140	2.4	1.8	Traction	612	140	2.5	1.7
213	132	2.4	2.0	Ventilation	613	135	2.5	1.8
214	139	3.4	1.9	Drying	614	139	3.7	1.8
215	137	3.1	1.9	Cracking	615	139	2.7	1.6
216	135	4.6	2.0	Snake-protection	616	136	4.5	1.8
217	139	2.1	1.4	Waterproof	617	136	1.6	1.1
218	138	3.7	2.1	Rotting	618	137	3.7	2.0
219	136	2.4	1.8	Traction	619	136	2.4	1.6

HEALTH

Osgood Item No.	N	M	SD	Descriptive Term	Likert Item No.	N	M	SD
330	140	3.5	2.0	Area Health	730	138	3.0	1.8
331	139	3.7	1.7	Sores Heal	731	138	3.7	1.7
332	137	2.2	1.5	Disease	732	138	2.6	1.7
333	137	2.9	1.6	Sickness	733	137	3.1	1.6
334	139	2.9	2.0	Cleanliness	734	139	2.5	1.7

SNAKES

Osgood Item No.	N	M	SD	Descriptive Term	Likert Item No.	N	M	SD
420	139	2.8	1.8	Dangerous	820	137	2.7	1.6
421	135	2.9	1.9	Quantity	821	140	2.7	1.7
422	137	5.5	1.8	Attacks	822	139	5.0	1.5
423	136	5.0	1.8	Beauty	823	138	4.6	1.7
424	136	4.1	1.8	Problem	824	139	4.8	1.7

each dimensional graph to assist in understanding the general reaction of the subjects to the dimensions as indicated by their checked responses. Examination of Figures 4 through 7 indicates that the Likert and Osgood direction of attitudinal dimensions follow each other closely. Means for most dimensions for both Food and Officers in Figures 4 and 5 respectively, are well above the hypothetical mean of 4.0. Means for Health in Figure 7 are all below the base line of 4.0, as they are also for all dimensions of Combat Boots except for "Protection Against Snakes" (items 216 and 616). The "Snakes" topic has the first four items split between means above the base line and means below the base line, with the last item (Problem), being of an integrative nature, acting as a resultant item. Distributions of responses (as indicated by responses by subjects on the scales of one to seven) for all dimensions of the Five Basic Topics on both Likert and Osgood-type questionnaires indicated similar patterns on both, and no unusual distribution patterns on either. This analysis provides further evidence that the Likert-type questionnaires and the Osgood-type questionnaires seem to be measuring the same thing insofar as the "Valid Data Sample" are concerned. Apparently, however, respondents make more use of the ends of the scales in Osgood scales and thereby the dimensionality aspect is better treated with Osgood scales.

B. Data Dissimilarities

The analyses of the Valid Data Sample from all approaches applied to the present data indicated that the Likert-type questionnaire and Osgood-type questionnaire lead to parallel conclusions, with results so similar as to be almost indistinguishable. But the analyses of the "Valid Data Sample" alone does not tell the entire story. A look to other factors which may be

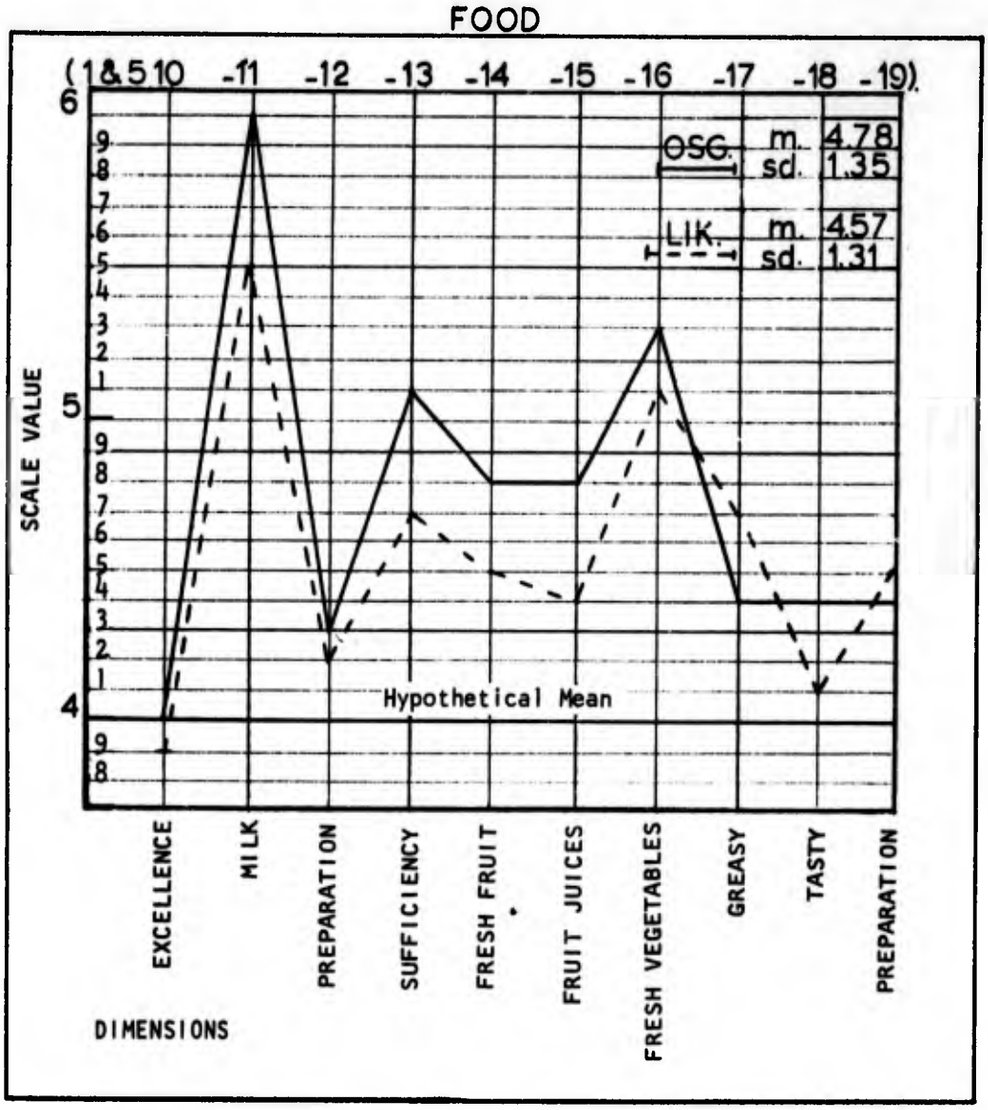


Figure 4. Means of the "Valid Data Sample" responses for the nine dimensions pertaining to the Basic Topic of "Food."

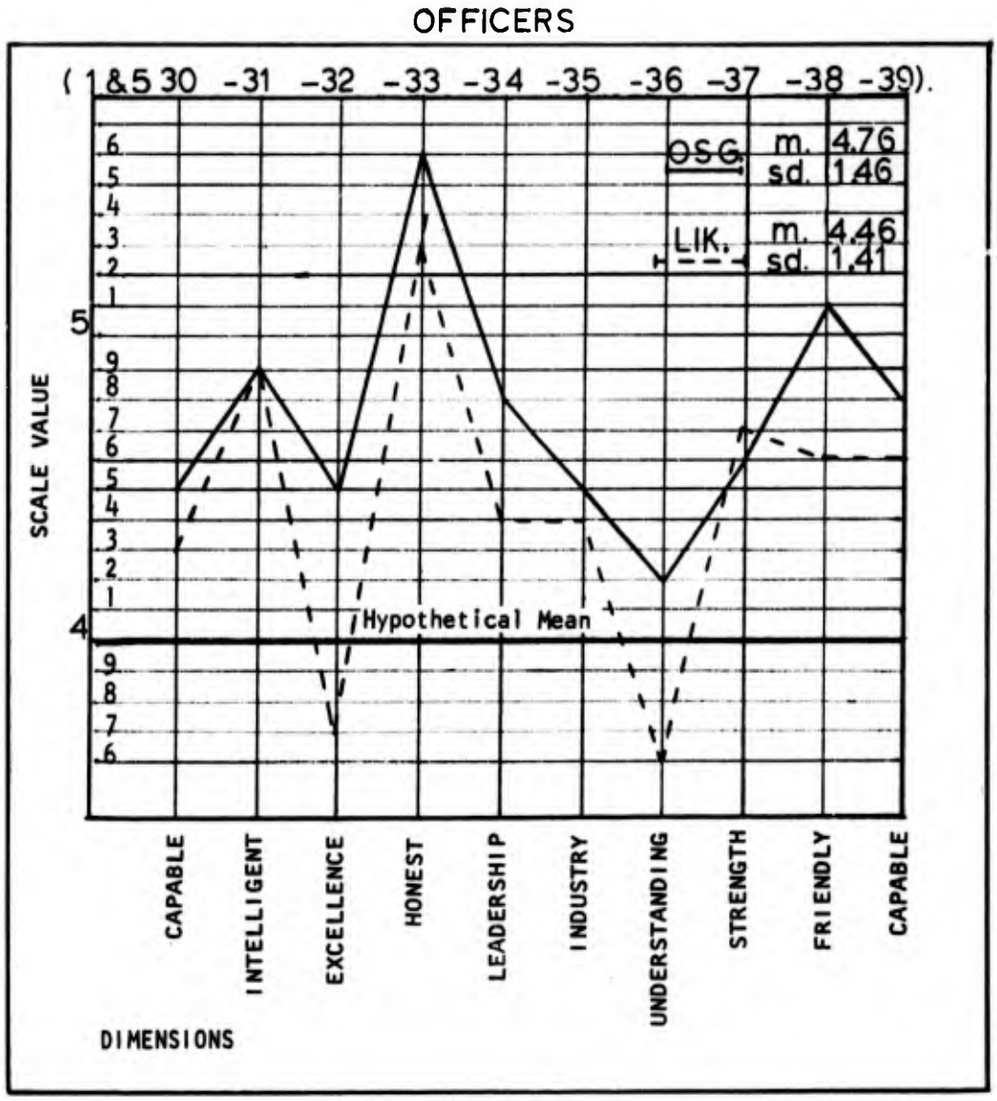


Figure 5. Means of the "Valid Data Sample" responses for the nine dimensions pertaining to the Basic Topic of "Officers."

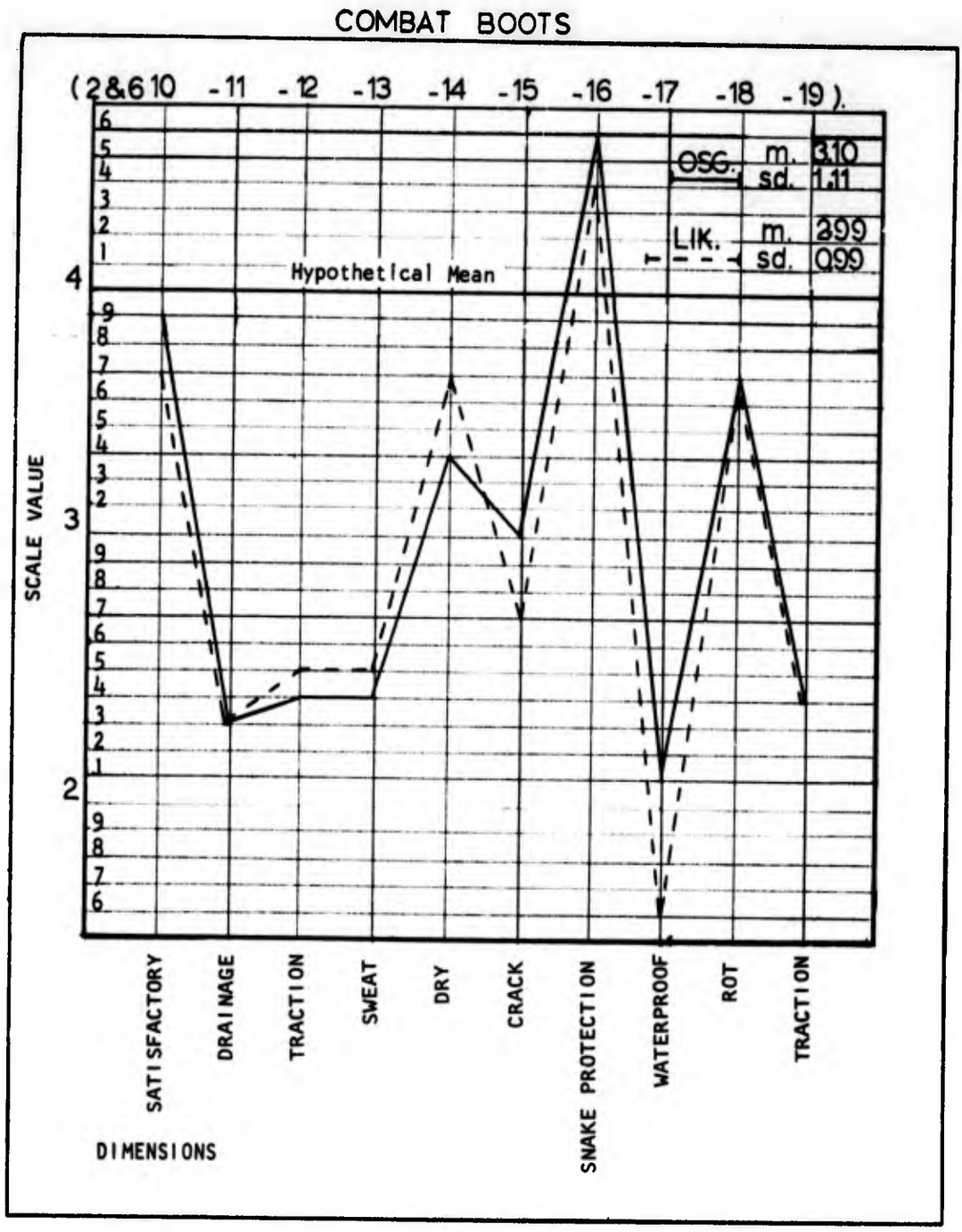


Figure 6. Means of the "Valid Data Sample" responses for the nine dimensions pertaining to the Basic Topic of "Combat Boots."

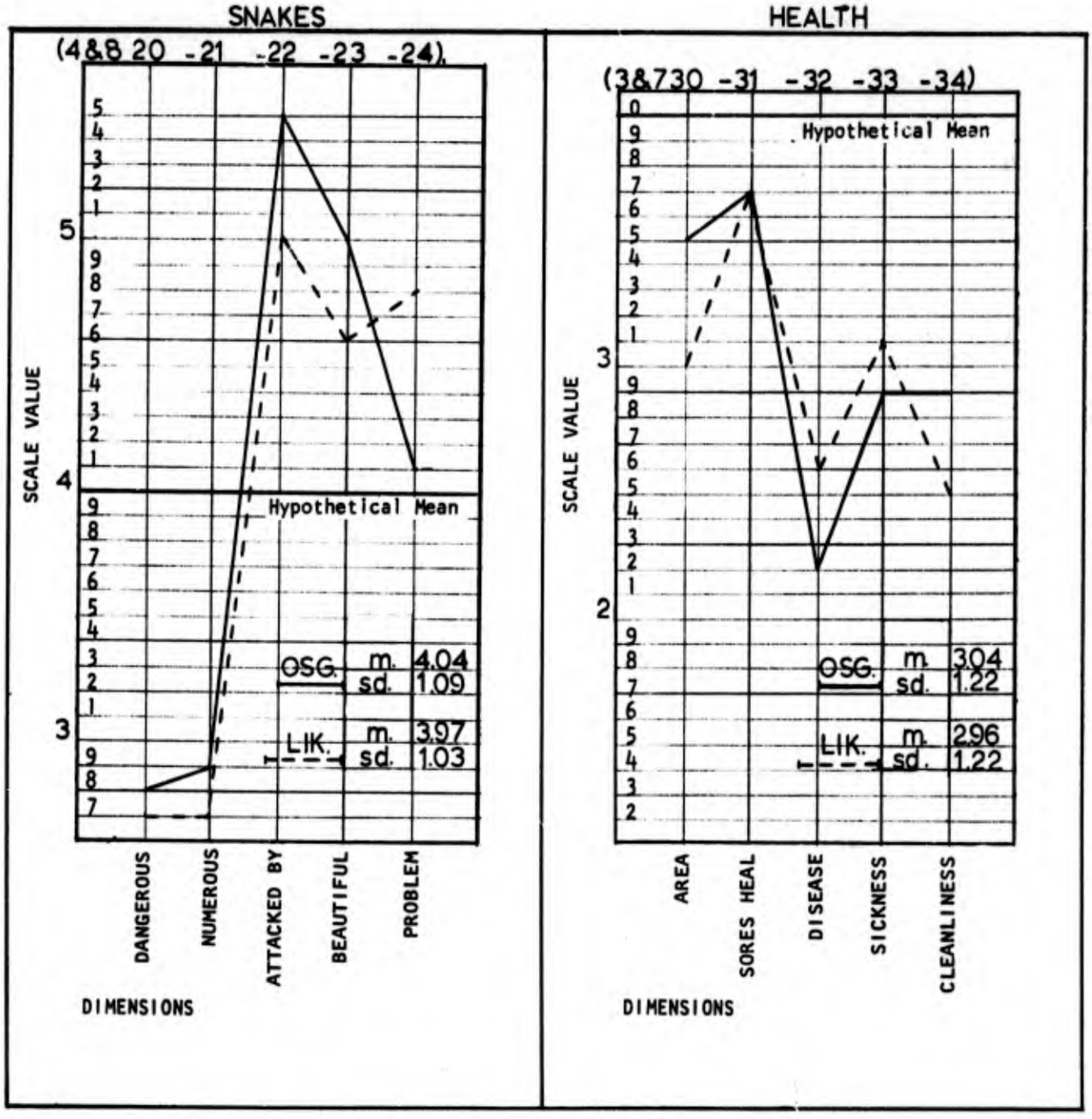


Figure 7. Means of the "Valid Data Sample" responses for the five dimensions pertaining to each of the Basic Topics "Health" and "Snakes."

contributing to the entire picture is in order. Response behaviors in relation to the portion of the "Invalid Data Sample" which has been analyzed to date must also be considered.

1. Respondents' Preferences

At the conclusion of each groups' administration the respondents were asked to indicate which of the two objective questionnaires they preferred. Of the 159 subjects who answered the question, 98 (62%) preferred the Likert, 53 (33%) preferred the Osgood, and 8 (5%) stated "either" or "neither." The preference is nearly two to one in favor of the Likert over the Osgood.

2. Inconsistent Response (IR) Comparisons

The fact that the respondents reported that they favored the Likert-type questionnaire by a two to one ratio might indicate that they found it easier to understand, more interesting, or any one of a number of things any one of which could possibly lead to more reliable responses. However, when Inconsistent Responses (IR) are considered the opposite influence seems appropriate, that is, the Osgood-type questionnaire elicited more reliable responses.

Of the 301 IR's made, 189 (63%) were made on Likert blocks of items, while 112 (37%) were made on Osgood blocks of items. Of the sixty respondents who were placed in the Invalid Data Sample, forty-three were placed there due to IR's alone, and the majority of the contribution for these errors came from the Likert questionnaire. It appears that there is something about the Likert-type questionnaire which contributes more to commission of error than does the Osgood-type questionnaire.

3. Inconsistent Response and Intelligence Score Relationship Comparisons

a. General Technical Scores (GT)

There appears to be a direct relationship between GT scores obtained from the personnel records and Inconsistent Responses. The median GT scores for the 195 subjects on whom such scores were available is 96.5. Of the forty-five who were rejected on the basis of IR's and for whom GT scores are available, twenty-nine are below the median and sixteen are above the median. This distribution is statistically significant beyond the .05 level. In the lowest quarter of the total sample (forty-nine subjects), with a GT score of eighty-seven or below, twenty-one were rejectees. In the highest quarter, with a GT score of 106 or above, only eight were rejectees. Twenty-nine subjects had GT scores of 113 or above; none of these were IR Rejectees.

Of the twenty-nine subjects who were rejected wholly or predominantly by Likert IR's (two or more Likert IR's and one or no Osgood IR's), eleven had three or more Likert IR's and no Osgood IR's. On the other hand, of the sixteen subjects who made two or more Osgood IR's, only one had no Likert IR's. This provides additional support to the conclusion that Likert-type items contribute the major portion of error leading to rejection as unsuitable data. The magnitude of this phenomenon opens a new aspect of attitude research.

Another piece of evidence contained in the data adds weight to the conclusion that the Likert scales contributes disproportionately to rejection at low GT scores. Of the five subjects who scored less than seventy on the GT, all but one had three or more Likert IR's and that one had two Likert IR's. On the other hand, all but one of these five had one or zero Osgood IR's, and the remaining individual had two Osgood IR's and two Likert IR's. Thus there

is numerical support for the conclusion that subjects who make low GT scores can handle Osgood scales more successfully than they can handle Likert scales.

The Invalid Data Sample of sixty subjects should be more thoroughly studied than it has, but time did not permit this prior to writing the present report. It is hoped that these data can be more carefully studied in the near future.

b. Lowry-Lucier Reasoning Test Combination Scores (LLRC)

One hundred subjects took the Lowry-Lucier Reasoning Test Combination (LLRC). Of these one hundred subjects, twenty-one were IR rejectees. There was no relationahip between LLRC scores and IR rejections. Ten of the IR rejectees scored below the median on LLRC and eleven above the median. As the GT is heavily loaded with language and the LLRC is not, one could infer that rejection by IR is heavily influenced by language ability, at least as far as the present sample is concerned.

III. Correlations and Intercorrelations of Topic and Demographic Variables

Correlational studies often yield data which assist in the confirmation or denouncement of suspected relationships between variables, and help discover new relationships. Assuming that attitudes are somewhat consistent in nature and are available to assessment, "valid" assessment techniques will yield data which are consistent. Therefore, a rather large number of correlations have been run and they have been carefully studied for consistencies and trends.

Intercorrelations between the seventeen Osgood Topic means (Set B variables) and the five demographic variables: age, education, grade, time in

service, and the item "Attitudes toward the Army" (Set A variables) were calculated, resulting in a 22 X 22 matrix. All correlations discussed in the remainder of this report are for the 140 subjects in the Valid Data Sample. The Five Basic Topics were also intercorrelated on Likert means, resulting in a 27 X 27 matrix, but the latter are not considered in the present report.

There are numerous significant correlations between Set B variables. There are also numerous significant correlations between Set A variables, but there are only a few significant correlations between Set A variables and Set B variables.

A. Between Set Correlations

A factor contributing to low correlations between Set A variables and Set B variables was the homogeniety of the population as indicated by the Demographic data. Of the 140 subjects in the Valid Data Population, 117 were between the ages of seventeen and twenty-four; 107 either had finished some high school or were high school graduates; ninety were PFC's and ninety-two had been in the service less than eighteen months. Similar trends hold for the entire sample.

With an N of 140, correlations of 0.165 are significant at the .05 level, correlations of 0.216 are significant at the .01 level. Age has the greatest number of significant correlations with the seventeen Topics, being six. Age correlates 0.26 with Food, 0.20 with Snakes, and 0.39 with Field Rations, 0.24 with Family, 0.22 with Bugs, and 0.17 with Fatigues. All correlations are positive, indicating a more favorable response pattern with increased age. Education correlates significantly only with Pack of the Set A variables,

and this one just barely reaches the .05 level at 0.17. Grade correlates 0.25 with Food, 0.17 with Snakes, 0.34 with Field Rations, and negative (-) 0.17 with Raincoat. Time in Service correlates only with Raincoat, and then at a negative (-) 0.18. "Attitude toward the Army" (AA) correlates 0.18 with Health and 0.24 with Entertainment.

"Attitudes toward the Army" was a single item measure, and as such seemed to follow the observation of McNemar (1946) that single item opinion techniques lack stability.

B. Within Set Correlations

1. Set "A" Intercorrelations

From Table 7 one can observe that Age has a high correlation with Grade and Time in Service (0.68 and 0.56), which is to be expected. Age has significant but low correlations with Education (0.26) and with Attitude toward the Army (0.33). Education has low significant correlations with Grade and Time in Service as well as Age, but does not correlate significantly with "Attitude toward the Army" (AA). Looking at AA, we find it correlates significantly with Grade, Time in Service, and Age (0.44, 0.38, and 0.33) in that order. There do not appear to be any relationships in this Set of variables which call for concern.

2. Set "B" Intercorrelations

Means, standard deviations, and intercorrelations for the seventeen topics for 140 subjects comprising the Valid Data Group using the Osgood-type questionnaire are shown in Table 8.

TABLE 7

Intercorrelations Between Age, Education, Grade, Time in Service and Attitudes Toward the Army (Valid Data Population, N = 140)

	Age	Education	Grade	Time	AA
Age	---	.26	.68	.56	.33
Education	.26	---	.24	.25	.16
Grade	.68	.24	---	.68	.44
Time in Service	.56	.25	.68	---	.38
Army Attitudes	.33	.16	.44	.38	---

Note. - All correlations are significant beyond the .01 level except that between Education and Attitudes Toward the Army.

One interesting feature of Table 8 is that with 136 individual entries, there is not a single negative correlation, even with the lowest and thus statistically non-significant, correlation. This would indicate that there is some factor which contributes to all interrelationships of the seventeen topics. The following rationale is submitted. If a soldier has a negative outlook when he enters the service, it is probable that all his responses such as those elicited by the Osgood-type questions would tend to be somewhat depressed. On the other hand, if a soldier's outlook were generally in the positive direction, this too would be reflected at least to some extent in responses to those questions. There appears to be an attitude residual which penetrates all responses to questions on the seventeen topics. While this theory of attitude residual is inferential, the fact that all 136 correlations were positive is far beyond the chance level and calls for some explanation.

Interrelationships between Topics are shown in another manner in Table 12 which lists the statistically significant correlations which each Topic has with every other Topic, and places the correlations in order of magnitude, starting with the highest first.

A glance at Table 12 shows that four Topics correlate significantly with each of the other sixteen topics. They are: 1) Field Rations, 2) Bugs, 3) Fatigues, and 4) Raincoat. The Officer Topic and Snake Topic have the lowest number of significant relationships with other topics, being ten each. A study of the various orders and magnitudes of correlations indicates the existence of order. The lists of correlation by Topics were arranged in what appeared to be some kind of relationships. As a check on the concept of ordered relationships, Figure 8 was drawn to represent graphically all relationships

TABLE 8

Means, Standard Deviations, and Intercorrelations for the Seventeen Topics in the Osgood-Type Booklet (Valid Data Population, N = 140)

	Topic	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Food	4.78	1.35	---	.20	.28	.43	.14	.71	.23	.25	.36	.26	.24	.35	.44	.22	.18	.22	.15
2.	Officers	4.76	1.46	.20	---	.14	.13	.12	.24	.21	.20	.17	.20	.13	.31	.22	.06	.08	.19	.17
3.	Combat Boots	3.10	1.12	.28	.14	---	.35	.17	.27	.15	.40	.40	.36	.36	.57	.29	.24	.42	.38	.37
4.	Health	3.04	1.22	.43	.13	.35	---	.37	.49	.43	.49	.49	.33	.22	.33	.41	.23	.13	.34	.20
5.	Snakes	4.04	1.09	.14	.12	.17	.37	---	.22	.12	.32	.40	.24	.31	.16	.09	.32	.21	.22	.10
6.	Field rations	4.30	1.20	.71	.24	.27	.49	.22	---	.31	.36	.38	.42	.34	.39	.41	.27	.20	.23	.25
7.	Family	3.52	1.20	.23	.21	.15	.43	.12	.31	---	.36	.24	.21	.23	.25	.29	.31	.19	.27	.31
8.	Weather	3.01	1.21	.25	.20	.40	.49	.32	.36	.36	---	.49	.41	.18	.45	.33	.17	.18	.30	.10
9.	Bugs	2.37	0.98	.36	.17	.40	.49	.40	.38	.24	.49	---	.30	.18	.48	.28	.25	.31	.25	.18
10.	Water	3.42	1.35	.26	.20	.36	.33	.24	.42	.21	.41	.30	---	.14	.37	.28	.18	.13	.27	.07
11.	Pack	4.26	1.10	.24	.13	.36	.22	.31	.34	.23	.18	.18	.14	---	.27	.27	.36	.32	.30	.41
12.	Fatigues	3.45	1.04	.35	.31	.57	.33	.16	.39	.25	.45	.48	.37	.27	---	.34	.28	.33	.33	.30
13.	Entertainment	3.91	1.14	.44	.22	.29	.41	.09	.41	.29	.33	.28	.28	.27	.34	---	.22	.25	.29	.32
14.	Jungle Boots	4.09	1.30	.22	.06	.24	.23	.32	.27	.31	.17	.25	.18	.36	.28	.22	---	.40	.32	.33
15.	Poncho	3.31	1.17	.18	.08	.42	.13	.21	.20	.19	.18	.31	.13	.32	.33	.25	.40	---	.47	.45
16.	Raincoat	3.38	1.17	.22	.19	.38	.34	.22	.23	.27	.30	.25	.27	.30	.33	.29	.32	.47	---	.44
17.	Shelter Half	3.54	1.35	.15	.17	.37	.20	.11	.25	.31	.10	.18	.07	.41	.30	.32	.33	.45	.44	---

Note. - 0.165 significant at .05 level. 0.216 significant at .01 level.

with correlations of 0.40 or greater. All Topics except Officers have at least one correlation of 0.40 or greater; most have many more than one of this magnitude. In rank order by numbers of correlations of 0.40 and over, Health has six; Bugs and Weather have five each; Field Rations, Combat Boots, and Poncho have four each; Food, Entertainment, Fatigues, and Shelter Half have three each; Water and Raincoat have two each; and Family, Snakes, Jungle Boots, and Pack only have one each.

The resultant structure seems to have some inherent logic. Health, with its six correlations of a magnitude of 0.40 or greater appears to be the nucleus of two constellations (A and B) of relationships and to have one lone satellite (Family). Shown on the left hand side of the diagram is Constellation A consisting of Field Rations, Entertainment, and Food, all "tied" to each other and all "tied" to Health. Directly to the right of the Health Topic we have Constellation B consisting of four topics "tied" together. They are Weather, Combat Boots, Bugs, and Fatigues. Constellation B is joined to Health by Weather and Bugs. Bugs has Snakes as a lone satellite. Water is a connecting link between Constellation A and B. Constellation C consists of Poncho, Shelter Half, and Raincoat, with Pack being "tied" to Shelter Half and Jungle Boots being "tied" to Poncho. Constellation C is joined to Constellation B by correlation with Combat Boots. When the magnitude requirement was lowered to 0.35 there was little or no change in structure. More units of Constellation C "tie" to Combat Boots with the lowering to 0.35, otherwise Constellation C remains unrelated to other parts of the System. Cross relationship between Constellation A and B begin to show up, but the picture becomes complicated without providing added information.

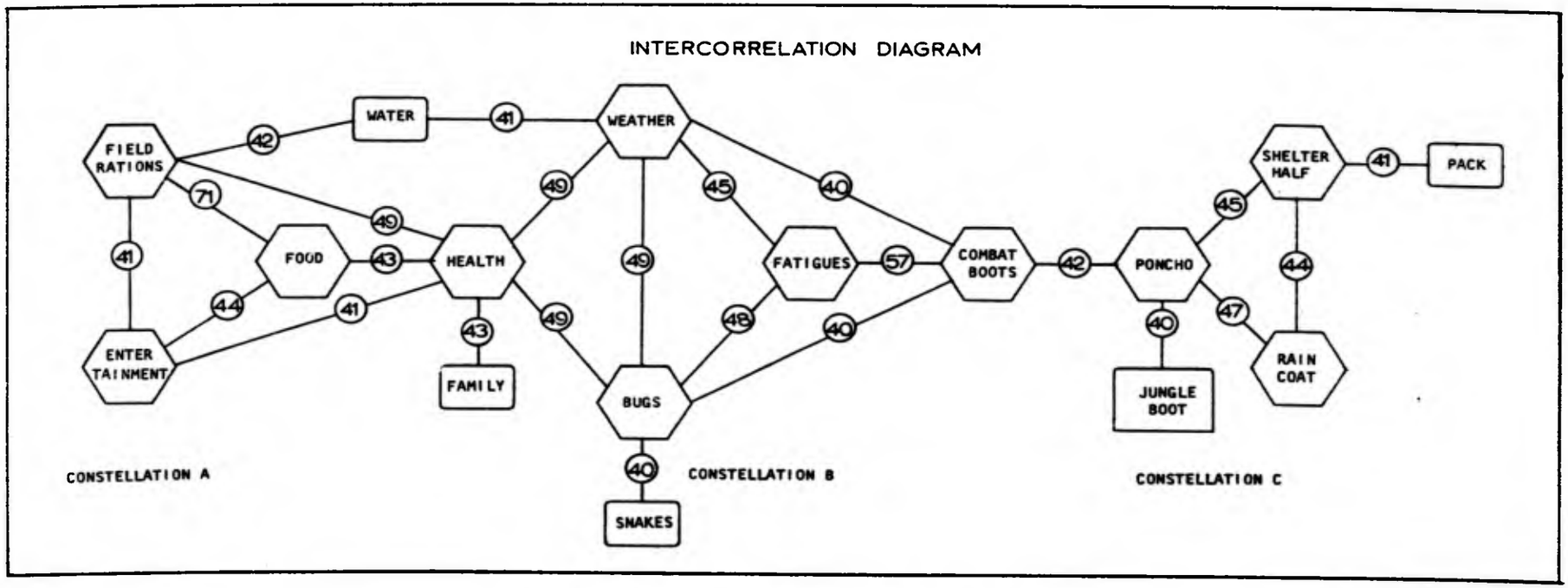


Figure 8. Topic Intercorrelation Diagram. All correlation 0.40 and over for 140 subjects using the Osgood Booklet.

The logic following the structure is as follows: Health is either directly of indirectly related to all Topics in Constellations A and B. Field Rations and Food are directly related to each other and to one's concept of Health. Entertainment might be considered as related to Food and Field Rations, particularly where entertainment is extremely limited, as these respondents appeared to feel was the case. Clothing (as represented by Fatigues and Combat Boots) are definitely related to Weather and Bugs in the real world, and these in turn relate directly to Health. Snakes seem to be somewhat outside the Constellation but related to it through it phenomenological cousin, Bugs. Constellation C Topics are interrelated in that they are rarely or not at all used. The Pack is used only for training purposes, and if one accepts the word of the soldiers, is left in the barracks whenever possible. The Raincoat and Poncho both appear to be disliked and used only infrequently. The Shelter Half was reported as not being used at all by these troops. The Jungle Boots seemed to be a desired item by a large percentage of the subjects, but an item which had not been issued to them. Constellation C seems to consist of items which were in the periphery of experience of most of the subjects. Thus the structure of the relationships of Topics as developed graphically from reasonably high correlations within the correlation matrix seems to have a logical basis. That is, all of the pieces seem to fit together, except the Topic of Officers. At first glance one might assume that Officers was an unstable measure. But this was not the case. The Osgood and Likert means for Officers correlated at 0.85, one of the two highest of the Five Basic Topics. Another explanation is that the Topic of Officers is relatively independent of the other Topics, and is related to them primarily by the attitude residual. This possibly accounts for the significant correlations which do exist between Officers and

the other Topics, and could also account for the fact that those correlations were low even though statistically significant. Topics could be designed which would probably correlate highly with Officers, but that was not the purpose of the present study.

Intercorrelations between the Five Basic Topics for both Likert and Osgood means are included in Table 9. Intercorrelations for Osgood means are above the diagonal and those for Likert means are below the diagonal. The data indicate that the correlations for Likert and Osgood means on similar Topics are very close. The highest intercorrelation is between Health and Food, 0.43 for both Likert and Osgood, and the lowest is between Snakes and Officers, 0.12 for the the Osgood and 0.07 for the Likert.

Analysis of the data with respect to correlations and intercorrelations indicates some strong trends and consistencies. These consistencies appear often enough to support the notion that some "valid" assessments have been made.

IV. Dimensional Approach

In this study the investigators have assumed that: 1) single items do not permit inferences concerning all aspects of complex attitudes; 2) "attitudes" per se, are resultants of several lesser sub- attitudes which may themselves be in conflict; and 3) in order to obtain information about the psychological objects in question, items are necessary which pertain to the several dimensions of that object (if there are several). These assumptions were the basis for the construction and administration of several items (different dimensions) per topic.

TABLE 9

Intercorrelations Among the Five Basic Topics for Osgood and Likert Means (Valid Data Population, N = 140)

(Correlations for Osgood Means appear above the diagonal, and those for Likert Means appear below the diagonal.)

	Food	Officers	Combat Boots	Health	Snakes
Food	----	0.20	0.28	0.43	0.14
Officers	0.20	----	0.14	0.13	0.12
Combat Boots	0.23	0.16	----	0.35	0.17
Health	0.43	0.20	0.38	----	0.37
Snakes	0.13	0.07	0.10	0.30	----

Note. - 0.165 significant beyond .05 level.
0.216 significant beyond .01 level.

The graphs in Figures 4 through 7 not only provide ready comparison of responses to Likert and Osgood items by dimensions, but they also provide a dimensional comprehension of how the subjects responded to a specific topic. For example, one could infer from the graph on "Combat Boots" that the subjects were generally dissatisfied with this issue item for use in the tropics; that the one dimension of acceptance is "Protection Against Snakes," and that they find the dimensions of "Drainage," "Traction," "Sweating," "Cracking," and "Waterproofing" unacceptable. Other graphs could be employed as reference dimensions against which to plot responses made by individuals for purposes of analyzing individual response patterns. Similar graphs could be drawn for any or all of the twelve additional Topics.

Figures 4 through 7 tend to support the assumptions of the dimensional approach. What better way could information be obtained such as is given in Figure 6 concerning Combat Boots? Though they are generally unacceptable they are adequate insofar as protection against snakes. Figure 7 entitled "Health" and "Snakes," indicates that snakes are considered to be numerous and dangerous, yet attacks by them are infrequent, and they are considered to be somewhat pretty creatures. These different dimensions appear to be in conflict with one another. The final item, which pertains to the problem magnitude created by snakes, is nearly an average of the other items. Logically speaking this outcome is a reasonable one. If snakes are considered to be dangerous and numerous, it follows that they would also be considered a very big problem to deal with in the jungle. However, if it was known (or believed) that attacks by snakes were very infrequent then the problem would not assume such large proportions.

V. "Your Comments" Cards

In Chapter Three a rationale for the use of "Your Comments" cards was presented. Essentially, it consisted of the hypothesis that rapport would be improved by allowing some free expression of the respondents, which in effect means that the techniques would elicit more interest and cooperation from the respondents than if they were not allowed the opportunity for free expression.

To test the hypothesis, three of the four groups were provided an opportunity to express their reactions in their own way to topics in the Likert and Osgood questionnaires by strategic placement of four "Your Comments" cards in each booklet. Subjects in Group Four (See Table 1) were not provided this opportunity. Note the following observations pertaining to the hypothesis stated above. Group Four had the largest number of total individuals placed in the Invalid Data Sample, the largest number of rejects due to Inconsistent Responses (IR's) (14) and the largest number of rejects due to "Undifferentiated Profiles" (5).

Further support of the hypothesis that rapport is increased with more free expression allowed the respondents is provided when the following data are examined.

Group Three, which was administered the Written Projective (which allows relatively free expression) before either the Osgood or Likert and which was also provided "Your Comments" cards, had the smallest number of total rejections (11), smallest number of IR rejections (10), and smallest number of Undifferentiated Profile rejections (1). It appears as if the order of presentation of the Written Projective affected the elimination rates by groups.

Group Three had the least number of spontaneous responses on the "Your Comments" cards of the three groups who were provided the cards.

Some statements on the "Your Comments" cards are quoted below as examples of responses. These comments were unsolicited other than having "Your Comments" cards strategically placed throughout the booklets and a verbal request from the surveyor at the completion of the second of the two booklets to state preferences between the Osgood and Likert questionnaires. While no systematic study of these data has been conducted yet, a general appraisal indicates that there is considerable useful information in the cards, and that most of it is codable and can be analyzed by statistical procedures. The following examples quoted verbatim with spelling errors intact are for illustrative purposes only.

Expressions concerning the Likert and Osgood Booklets:

a) "Program good for saying what you think."

b) "Questions were suitable for getting information about men and equipment. Tests didn't miss anything."

c) "Views not fully expressed because equipment mentioned has not been issued. Army doesn't give men enough freedom to express themselves."

d) "Good to boost moral of men and increase their general ability to function."

e) "I didn't think the question were stupid if you wanted to know anything about our equipment or the people and I don't think that you missed anything."

f) "Had the comment cards not been here I would have made some comments on a sheet of paper."

g) You can't give you true opinion in either book. But still I favor the Red Book a little more than this one." (Red = Likert, "This One" = Osgood.)

h) "To many questiones all meaning the same thing."

i) "I don't like either one because there is no room for one to express himself. All answers are those of someone else."

j) "The same questions are asked to often. This test could be made a lot shorter an a lot less boring."

k) "The officers here are something personnel. Sometime they are for you all the way, then when they see you need help they 'get hot,'. They are to gun-hole." (sic)

l) "There isn't very much entertainment on post. The only things on post are the show, service club, beach, pool, Enlisted Man's Club, and the snack bar."

SECTION THREE - "PROJECTIVE TECHNIQUES" DATA

The following Projective Techniques were employed in the present study: Written Projective (Listing and Incomplete Sentence), Projective Pictures (Written Response), and Projective Pictures (Color Response). Time has not permitted a thorough systematic study of the data gathered by the Projective Techniques prior to the writing of the present report. However, the data from the projective materials has been generally overviewed and forms the base upon which the remainder of this Chapter was written.

I. Written Projectives

A. Listing

This technique was included primarily to assess topic saliency. It affords the surveyors the opportunity to obtain information from which they can evaluate their choice of topics and topic dimensions for which both objective and projective items have been written.

Some kinds of information which may be derived from listing items are presented in Table 10. The Table presents some summary data on three items from the Written Projective form. Some general observations may be noted. For each of the three items the total number of Topics listed increases from the first to the third choice categories whereas the agreement of rank order decreases. This suggests that there is a strong consensus with respect to salient Topics. The data for item eight indicates that there is far more agreement as to the things which cause discomfort in field exercises than there is about things disliked about the current tour of duty; with agreement on best

TABLE 10

The Five Most Often Selected Topics for Items
Four, Eight, and Twelve of the Written Projective Form
Arranged by Choice Category

Item Four

Choice	First		Second		Third	
Topics Most Often Selected	chicken	(34)	steak	(26)	pork	(16)
	steak	(29)	chicken	(17)	chicken	(13)
	potatoes	(16)	roast beef	(16)	potatoes	(13)
	pork	(13)	pork	(12)	steak	(9)
	ham	(10)	potatoes	(12)	ham	(8)
	spaghetti	(10)			roast beef	(8)
	eggs	(10)			salads	(8)
Number of Topics Listed	39		45		49	

Item Eight

Choice	First		Second		Third	
Topics Most Often Selected	heat	(45)	heat	(22)	heat	(20)
	insects	(24)	insects	(20)	lack of water	(18)
	helmet	(14)	helmet	(14)	equipment	(10)
	pack	(13)	lack of water	(13)	insects	(10)
	weather	(10)	pack	(8)	terrain	(9)
			rain	(8)		
			equipment	(8)		
			jungle	(8)		
Number of Topics Listed	34		47		47	

(Table continued on next page)

TABLE 10, Continued

Item Twelve

Choice	First		Second		Third	
Topics Most Often Selected	too many alerts	(20)	too many alerts	(15)	too many alerts	(18)
	no time off	(18)	jungle	(13)	recreation	(8)
	heat	(14)	no time off	(10)	too far from home	(7)
	Panama	(14)	heat	(7)	no time off	(7)
	jungle	(11)	climate	(6)	harrassment	(7)
Number of Topics Listed	48		56		62	

liked foods somewhere in the middle of the other two. In each case the two or three most salient topics about a general attitudinal statement are easily selected.

The information concerning topic saliency which is obtained from the listing technique provides an excellent method for assessing the content validity of the surveyor's instrument which serves as feedback information in updating his instrument. These data are difficult, if not impossible to obtain through strict application of objective techniques.

B. Sentence Completion

New information and saliency characterize the Sentence Completion technique as well as the Listing technique just described. In marked contrast however, the Sentence Completion technique is less structured and allows the respondents to do their own "structuring" of the material.

In the present study the responses to most of the Sentence Completion items appear to be amenable to classification by emotional tone and content. For example, the responses to item 19 of the Written Projective form which pertains to "Recreation" in the Army, was analyzed in the following manner. The majority of the responses fell into two content categories, "quantity of recreation" and "quality of recreation." Some of the responses were inappropriate to either category and so a third category was established for the miscellaneous responses. Once a response was placed into one of the three "content" categories it then had to be judged with respect to emotional tone value. Three tonal categories were established: negative, neutral and positive. Table 11 indicates the manner in which the responses of the sample population were distributed. Note that there is no consensus with respect to

TABLE 11

Classification of Sample Population Responses to Item 19 (Written Projective Form) by Content and Tone

Content	Tone		Number of Responses
Quality	Negative		35
	Neutral		39
	Positive		40
		Total	114
Quantity	Negative		38
	Neutral		1
	Positive		7
		Total	46
Miscellaneous	Negative		0
	Neutral		4
	Positive		4
	Irrelevant		12
	Pornographic		2
		Total	22
Two Responses			13
No Response			31

quality of recreation but that the troops whose responses are quantity oriented definitely feel there is insufficient recreation.

After the responses to Written Projective item 19 were categorized with respect to content and tone they were correlated with subjects' responses to objective items 310 and 312. Item 310 had been constructed to elicit "quality" responses whereas item 312 was to elicit "quantity" responses. A .35 coefficient of correlation was calculated between Objective and Written Projective responses. It is hoped that this procedure of external validation or one similar to it may be followed for all of the Projective items and techniques. It is also expected that a more rigorously controlled method of judging responses will result in a higher coefficient of correlation.

II. Projective Pictures

Although the data aquired by way of the Projective Pictures (Written Response) and Projective Pictures (Color Response) have not been processed and evaluated due to the large mass of data collected in Phase I, there are some general observations which have been made.

From time to time there are persons who are unfamiliar with the techniques who question as to the suitability of using the cartoon-like techniques to gather data which are of a serious nature. Even more questionable, even to this research staff, was the attempt to use the color-response technique which requires hardened, "rough and ready" soldiers to sit down with a box of crayons and participate in activities which are commonly identified as kid stuff. The surveyors must admit that this spectacle offered a very interesting sight to behold. The situation is best appreciated by visualizing

the common, stereotyped rough and gruff sergeant sitting at a desk with crayons in hand, selecting, stroking, blending, and generally coloring as if he really enjoyed it. It really happened! In both cases, the written response and the color response Projective Pictures, the men were extraordinarily cooperative and enthusiastic. In fact, the administrators observed that the men seemed more interested, tired less quickly, and "put more into it" when working on the Projective Pictures than on any of the other techniques.

A. Written Response

The Projective Pictures (Written Response) may be dealt with in much the same manner as the Written Projective responses, i.e., the responses are categorized according to content and emotional tone. Most of the responses appeared to be relevant to the objectives, although some were apparently irrelevant insofar as attitudes toward objects and conditions of the present study were concerned; however, the latter class of responses could very well be used for other aspects of personality assessment of respondents. The pictures with the most structure, such as those containing a statement by one of the characters in the picture, seemed to elicit the most directly relevant responses. Those pictures with only empty balloons seemed to be more conducive to irrelevant responses.

B. Color Response

The color responses seem to offer a variety of ways in which the data can be evaluated. Quantity of colors used, colors selected, objects selected for coloring, types of strokes, and other aspects of expressive behavior appear to be potential evaluative factors relevant to attitudinal assessment.

Once the color response data have been classed and coded it will be ready for cross-comparison with the data from the other techniques. The cross-comparisons will allow attitude information correlates of color to be identified.

SECTION FOUR - THE INTERVIEWS

The primary purpose of the interviews was to investigate the respondents' reactions to the techniques employed in the study. A secondary purpose was to provide an additional consistency check with respect to both Respondent and Instrument Reliability.

I. Respondents' Reactions

A. Objective Techniques

Those respondents who preferred the Likert-type scales over the Osgood-type scales reported that they did so primarily because it was "easier," by which they meant it was more structured. Those respondents who expressed preference for the Osgood-type items stated that it was easier to understand and allowed more direct expression.

B. Listing Technique

Of all the techniques, the majority of the interviewees selected Listing as their most preferred. The respondents reported that they knew exactly how to answer Listing items because the instructions were so straightforward. The nature of the items resulted in a clearly defined task, while at the same time they had a considerable amount of response freedom.

C. Sentence Completion

Sentence Completion items were generally preferred over the Objective items because they allowed more free expression. However, some of the respondents seemed somewhat uneasy due to the fact that there was too much

freedom, or too little structure. For the most part, those who expressed dissatisfaction with the sentence completion items were unable to verbalize their reasons for feeling that way.

D. Projective Pictures

Both of the Projective Picture techniques were viewed as irrelevant. Some of the subjects reported that they used the situation to "cut-up." When interviewed concerning the Projective Pictures most of the respondents indicated that they didn't particularly care for the techniques but didn't exactly know why. They avoided discussing the self-referential nature of the techniques, but appeared to be concerned about the fact that the "headshrinkers" would find out things about them that were none of their business. One subject reported that on the color response Projective Pictures he tried to color everything exactly opposite what it was in reality.

II. Additional Consistency Check

Based on information obtained from the interview and the written projective techniques the interviewer subjectively judged each interviewee and classified him into the Valid Data Group or the Invalid Data Group.

Of the sixteen respondents who were interviewed, the interviewer judged that five of them would be rejected due to the Inconsistent Response scores they attained on the objective questionnaires. Subsequent analysis of the Objective Data has indicated that of the eleven respondents judged to belong to the Valid Data Sample, all of them did in fact belong to it. Of the five who were judged to be "rejects" on the basis of their behavior during the interview, three in fact were rejected. Note that there are but two false

negatives and no false positives. One of the false negatives had two Inconsistent Responses, just missing the criterion for rejection. These results were quite consistent considering the subjective nature of the judgments and contribute one more dimension in which the data collection techniques can be evaluated.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

SECTION ONE - SUMMARY

The purpose of the study, which is the First Phase of a Two-Phased Project, was the development of techniques and methods for collection, processing, and analyzing data concerning attitudes of troops toward items of Quartermaster issue for use in the tropics. A survey of the state of the art of attitude research was conducted, which led the surveyors to specify their theory and build their own model. Assumptions were derived from the theory and model which provided guide lines for the progress of the study.

Two pilot studies were conducted in conjunction with the development of instruments, procedures, and analytic methods. The final stage consisted of administering Likert and Osgood-type opinion questionnaires, written projective techniques, and two novel projective picture techniques to 200 soldiers serving in the tropical area of Panama, and collecting other data concerning these troops. The data were partially analyzed, with analytic focus on the opinion questionnaires. Considerably more in the way of analyses is indicated to obtain full return from the valuable data obtained. Conclusions and recommendations derived from analyses of the data follow in Sections Two and Three. The report concludes with a listing of some possible hypotheses to be considered in Phase Two.

SECTION TWO - CONCLUSIONS

I. Assessment Techniques

A. Objective Instruments

Conclusion One

The general assumption that all respondents are capable of understanding opinion questionnaires and are willing to cooperate in responding to them in the way the surveyor intends and desires is unwarranted. The literature warns against this assumption, and the results of the present study are in accord with the literature. Yet most of the attitude research conducted for the military recently is based upon the assumption of capable and willing performance on the part of each and every respondent. While this assumption is not explicitly stated, it is so implied if all responses are treated equally and all data from a survey is included in the analysis. Conclusion: Wherever practicable in attitude studies, steps should be taken to 1) assess opinion data for Respondent Consistency (see text), and 2) to categorize and treat the data in accordance with its consistency.

Conclusion Two

Some types of opinion questionnaires are amenable to the inclusion of mechanisms for the detection of consistency of responses. One such type of instrument is the multi-dimensional objective type questionnaire discussed in Chapter Three which incorporates an Internal Consistency Check system.

Conclusion Three

The use of the Dimensional approach (that is, having a number of different dimensions for each topic tapped by separate items) seems preferable for many types of attitude studies than the use of a single global question for a topic. The use of the dimensional approach probably is far superior to the single question approach both in cases where the data are to be employed in the study of objects as objects as well as the opinions of the respondents as individuals. An exception to this might be a case where the taste of an item were in issue, when the single question hedonic scale would possibly be more appropriate.

Conclusion Four

Scales constructed with Likert and Osgood-type items appear equally effective as regards their dimensional approach in the sense that both appear to measure essentially the same things. (This is not to say they are interchangeable, nor are they equally suitable for attitude measurement. See below.)

Conclusion Five

Responses to Osgood-type scales are likely to correspond more closely to the surveyor's referents than are responses to Likert-type scales due to at least two factors:

1. "Semantic Leap" -- the assumption that the subject may be reacting to his, the surveyor's, intended referent when in fact the subject may be reacting to the statement of the items; and

2. The "whip antenna effect" (anchoring of only one end of the scale with the other end free and indeterminant). [The vulnerability of Likert scales to both of these factors is described in Chapter Three.]

Conclusion Six

Responses are significantly more consistent when elicited by way of an Osgood-type scale than by a Likert-type scale.

Conclusion Seven

Responses on Osgood-type scales appear to be less related to language ability of the respondent or the surveyor than are similar Likert-type scales. Thus, individuals with all levels of language abilities are better able to respond to Osgood-type measuring instruments than they are to Likert-type instruments. Use of Osgood based scales should reduce language ability contamination of opinion measures.

Conclusion Eight

When respondents are provided the opportunity to express their opinions in their own words, rapport is improved and survey cooperation is generally improved.

Conclusion Nine

Provisions for subjects to express their own opinions as they respond to multiple choice opinion items frequently provides surveyors with information not available to them or recognized by them at the time of the design of their instruments. The individual statements which respondents make also frequently apprize surveyors of changes in conditions and situations which have taken place between the design and administration of his instruments, thus serving to make updating of instruments a possibility.

B. Projective Instruments

Conclusion Ten

Projective instruments, whether of the "Your Comments" type used with the objective questionnaires, the listing type, the Sentence Completion type, or the Projective Picture (Written Response type) provide information which can be used for: 1) Test and Respondent Reliability evaluation; 2) Topic and dimension saliency evaluation of present instruments; and 3) Construction of new items pertaining to topics and/or dimensions which appear to be important to the respondents, but which the surveyor had overlooked.

Conclusion Eleven

Although the unstructured nature of the technique is conducive to production of a certain amount of irrelevant data, a large amount of useful data can be obtained from soldier respondents with the use of Projective Pictures (Written Response). The advantages of such data both as original data in its own right and as corroboration of objective measurement items makes the technique worthwhile.

Conclusion Twelve

The written responses to Projective Pictures correlate closely with other types of responses for respondents who are capable of handling the material of other techniques and who are cooperating.

Conclusion Thirteen

Soldier respondents will cooperate (at least overtly) to such unorthodox procedures for collecting attitudinal data as the Projective Pictures (Color Response). Preliminary analysis indicates that responses to such material can be of value in assessing the emotional value attached to attitudinal material.

Conclusion Fourteen

Responses to projective pictures are less inhibited than are so-called objective responses; they tap a deeper level (perhaps more emotional level) than do objective response instruments.

Conclusion Fifteen

The coloring responses to projective pictures indicate individual differences which should be amenable to categorization. Classification of these responses and correlation with other attitudinal material shows promise of creating a new technique of attitude measurement.

Conclusion Sixteen

The interview provides a means to validate responses obtained with objective and projective techniques. Further, it allows the investigator to determine some of the causes of inconsistent responses.

II. Topical Conclusions

Conclusion Seventeen

Snakes do not appear to be a major problem to seasoned troops in the Panama area.

Conclusion Eighteen

Jungle boots had not been issued to troops in the sample population. They have but little definitive information upon which to formulate an opinion regarding the item.

Conclusion Nineteen

The shelter-half, tents, raincoats, ponchos, and packs are rarely used by the sample population in the Panama area. This might be a function of the specific role these troops are called upon to play (Airborne Infantry) and may not apply to other types, such as Infantry or Mechanized troops.

Conclusion Twenty

The sample population are not generally issued water-purification tablets and would not drink untreated water. A majority consider water in the jungle as particularly dangerous and do not seem interested in trying water purification by tablets to be carried individually. A small but sizeable minority seem to desire to have them issued to be carried as part of their standard stock.

Conclusion Twenty-One

The combat boot is considered unacceptable as a jungle item by the sample population.

Conclusion Twenty-Two

"Health" is a topic of considerable concern to the sample population. Whether this is based upon a reasonable

amount of evidence, or whether it is based predominantly on rumor is not known. Venereal diseases contribute heavily to the concern about health, but there are also other factors which contribute heavily.

Conclusion Twenty-Three

Most of the discomfort experienced by the men when they were on field exercises was attributed to the heat and to insects in that order.

Conclusion Twenty-Four

Two interdependent factors, "too many alerts" and "no time off" account for the majority of the complaints made concerning duty in Panama.

SECTION THREE - RECOMMENDATIONS

I. Objective Instruments

Recommendation One

Mechanisms for the assessment of response consistency should be designed into all opinion collection instruments whenever practicable in attitude research.

Recommendation Two

The dimensional approach to topics should be employed wherever practicable.

Recommendation Three

Osgood-scale items should replace Likert-scale items, particularly where the focus of an attitude study is upon objects as objects.

Recommendation Four

Subjects should be provided with means to express themselves in their own way in conjunction with objective opinion questionnaires, and that they be encouraged to make use of the self-expression opportunity. The choice of using or not actually using such material lies with each experimentor at the appropriate decision moment.

II. Projective Instruments

Recommendation Five

Written response techniques should be administered simultaneously with objective techniques in attitude studies to provide new

information to the surveyor, to provide information to up date objective instruments, to point up blind spots in the experimentors' assumptions and to provide cross-comparison data for Test and Respondent Reliability evaluation.

Recommendation Six

It is recommended that further analyses and further study be conducted with the data gathered from written responses to projective pictures in order to come to a better understanding of their value both as cross-comparison checks and as assessment techniques in their own right.

Recommendation Seven

Further study should be conducted with coloring responses to projective pictures. Such studies could be aimed toward the development of a comprehensive theory of color-emotion interrelationships. After a heuristic theory is developed, a procedure for meaningful categorization should be developed followed by development of analytic procedures.

SECTION FOUR - HYPOTHESES

The purpose of Phase One has been to develop and design data collection techniques which could be used to measure soldiers' attitudes in tropical environments. During Phase One data have been collected, analyses have been made, and some conclusions have been drawn, all of which have contributed to the formulation of some hypotheses pertaining to the measurement of attitudes of troops in the tropics which may be tested in Phase Two. Some hypotheses are stated which pertain to the instruments themselves, and some are stated which pertain to the topics about which items were written.

I. Assessment Techniques

Hypothesis One

A statistically significant portion of each sample of troops used for "attitude" data collection will yield inconsistent responses to the extent that their data should be classified as unuseable and removed from consideration in study of troop attitude.

Hypothesis Two

Invalid data sub-groups, as determined by the Respondent Reliability Indicators (Inconsistent Response and Undifferentiated Profile), will differ significantly from the valid data sub-groups in regards to responses to the projective techniques.

Hypothesis Three

More Inconsistent Responses will be made on the Likert-type questionnaire than on the Osgood-type questionnaire.

Hypothesis Four

Responses to dimensional items on the Osgood-type questionnaire will correlate significantly with responses pertaining to the same topics which are elicited with projective materials.

Hypothesis Five

Likert-type items will indicate a stronger relationship with language abilities than Osgood-type items.

Hypothesis Six

Subjects who are allowed some opportunities for free expression during the administration of highly structured questionnaires, such as the Likert and Osgood-type techniques, will score fewer inconsistent responses than those who are not allowed some free expression.

Hypothesis Seven

Responses to projective techniques will elicit less inhibited and more emotionally laden responses than the more structured objective techniques.

II. Topics

Hypothesis Eight

Some dimensions of certain items of Quartermaster issue will manifest common trends of acceptance or rejection which vary independently of types of troops or types of assignments.

Hypothesis Nine

When used in the jungle, combat boots will be unacceptable (yield responses which are on the negative side of the mean attitude score) in dimensions which include traction, drainage, and ventilation.

Hypothesis Ten

Steel helmets and packs will yield mean scores which are below the hypothetical mean of 4.0.

Hypothesis Eleven

Topics which pertain to objects other than Quartermaster issue items, such as food, officers, and entertainment will vary significantly with factors associated with geographical area of troop assignment.

Hypothesis Twelve

The topics of food, officers, and entertainment will yield mean scores which are lower for troops stationed on the Atlantic side of the Canal Zone than for troops stationed on the Pacific side.

Hypothesis Thirteen

Topic saliency will vary with the combat/non-combat state of the area in which the troops are stationed.

Hypothesis Fourteen

Topics pertaining to personal comfort such as food, entertainment, insects, climate, and the like will elicit a larger percentage of unsolicited suggestions from troops stationed in Panama than from troops stationed in Viet Nam.

Hypothesis Fifteen

Topics pertaining to items of Quartermaster issue such as boots, fatigues, packs, and weapons, etc. will elicit a larger percentage of unsolicited suggestions from troops stationed in Viet Nam than from troops in Panama.

TABLE 12

Lists of Significant Correlations Between Each Topic and the Sixteen Other Topics

By Order of Magnitude for Osgood-type Means (Valid Data Population, N = 140)

Officers		Entertainment		Food		Field Rations		Water		Health	
Fatigues	0.31	Food	0.44	Field Rations	0.71	Food	0.71	Field Rations	0.42	Weather	0.49
Field Rations	0.24	Health	0.41	Entertainment	0.44	Health	0.49	Weather	0.41	Bugs	0.49
Entertainment	0.22	Field Rations	0.41	Health	0.43	Water	0.42	Fatigues	0.37	Field Rations	0.49
Family	0.21	Fatigues	0.34	Bugs	0.36	Entertainment	0.41	Combat Boots	0.36	Food	0.43
Weather	0.20	Weather	0.33	Fatigues	0.35	Fatigues	0.39	Health	0.33	Family	0.43
Water	0.20	Shelter Half	0.32	Combat Boots	0.28	Bugs	0.38	Bugs	0.30	Entertainment	0.41
Food	0.20	Family	0.29	Water	0.26	Weather	0.36	Entertainment	0.28	Snakes	0.37
Raincoat	0.19	Combat Boots	0.29	Weather	0.25	Pack	0.34	Raincoat	0.27	Combat Boots	0.35
Bugs	0.17	Raincoat	0.29	Pack	0.24	Family	0.31	Food	0.26	Raincoat	0.34
Shelter Half	0.17	Bugs	0.28	Family	0.23	Combat Boots	0.27	Snakes	0.24	Water	0.33
		Water	0.28	Jungle Boots	0.22	Jungle Boots	0.27	Family	0.21	Fatigues	0.33
		Pack	0.27	Raincoat	0.22	Shelter Half	0.25	Officers	0.20	Jungle Boots	0.23
		Poncho	0.25	Officers	0.20	Officers	0.24	Jungle Boots	0.18	Pack	0.22
		Jungle Boots	0.22	Poncho	0.18	Raincoat	0.23			Shelter Half	0.20
		Officers	0.22			Snakes	0.22				
						Poncho	0.20				

(Table continued on next page)

TABLE 12, Continued

Family		Weather		Bugs		Snakes		Fatigues		Combat Boots	
Health	0.43	Health	0.49	Health	0.49	Bugs	0.40	Combat Boots	0.57	Fatigues	0.57
Weather	0.36	Bugs	0.49	Weather	0.49	Health	0.37	Bugs	0.48	Poncho	0.42
Jungle Boots	0.31	Fatigues	0.45	Fatigues	0.48	Weather	0.32	Weather	0.45	Weather	0.40
Field Rations	0.31	Water	0.41	Snakes	0.40	Jungle Boots	0.32	Field Rations	0.39	Bugs	0.40
Shelter Half	0.31	Combat Boots	0.40	Combat Boots	0.40	Pack	0.31	Water	0.37	Raincoat	0.38
Entertainment	0.29	Field Rations	0.36	Field Rations	0.38	Water	0.24	Food	0.35	Shelter Half	0.37
Raincoat	0.27	Family	0.36	Food	0.36	Raincoat	0.22	Entertainment	0.34	Water	0.36
Fatigues	0.25	Entertainment	0.33	Poncho	0.31	Field Rations	0.22	Poncho	0.33	Pack	0.36
Bugs	0.24	Snakes	0.32	Water	0.30	Poncho	0.21	Raincoat	0.33	Health	0.35
Pack	0.23	Raincoat	0.30	Entertainment	0.28	Combat Boots	0.17	Health	0.33	Entertainment	0.29
Food	0.23	Food	0.25	Raincoat	0.25			Officers	0.31	Field Rations	0.27
Officers	0.21	Officers	0.20	Jungle Boots	0.25			Shelter Half	0.30	Jungle Boots	0.24
Water	0.21	Poncho	0.18	Family	0.24			Jungle Boots	0.28		
Poncho	0.19	Pack	0.18	Pack	0.18			Pack	0.27		
		Jungle Boots	0.17	Shelter Half	0.18			Family	0.25		
				Officers	0.17						

(Table continued on next page)

TABLE 12, Continued

Poncho	
Raincoat	0.47
Shelter Half	0.45
Combat Boots	0.42
Jungle Boots	0.40
Fatigues	0.33
Pack	0.32
Bugs	0.31
Entertainment	0.25
Snakes	0.21
Field Rations	0.20
Family	0.19
Food	0.18
Weather	0.18

Raincoat	
Poncho	0.47
Shelter Half	0.44
Combat Boots	0.38
Health	0.34
Fatigues	0.33
Jungle Boots	0.32
Pack	0.30
Weather	0.30
Entertainment	0.29
Water	0.27
Family	0.27
Bugs	0.25
Field Rations	0.23
Food	0.22
Snakes	0.22
Officers	0.19

Shelter Half	
Poncho	0.45
Raincoat	0.44
Pack	0.41
Combat Boots	0.37
Jungle Boots	0.33
Entertainment	0.32
Family	0.31
Fatigues	0.30
Field Rations	0.25
Health	0.20
Bugs	0.18
Officers	0.17

Pack	
Shelter Half	0.41
Combat Boots	0.36
Jungle Boots	0.36
Field Rations	0.34
Poncho	0.32
Snakes	0.31
Raincoat	0.30
Fatigues	0.27
Entertainment	0.27
Food	0.24
Family	0.23
Health	0.22
Weather	0.18
Bugs	0.18

Jungle Boots	
Poncho	0.40
Pack	0.36
Shelter Half	0.33
Raincoat	0.32
Snakes	0.32
Family	0.31
Fatigues	0.28
Field Rations	0.27
Bugs	0.25
Combat Boots	0.24
Health	0.23
Food	0.22
Entertainment	0.22
Water	0.18
Weather	0.17

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