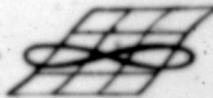


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U. S. Army Natick Laboratories
Natick, Massachusetts

Contract No. DA19-129-QM-2076(N)
Project No. 7X95-01-001

Final Report
Phase Two

ATTITUDES OF TROOPS IN THE TROPICS

Volume One

Equipment and Situational Evaluations

161-P

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R&C Report No. 64-19
12 October 1964

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SUMMARY

The study of U. S. troops in the tropics reported herein had two principal objectives: (1) to develop new and more effective means for measuring attitudes and (2) to apply these techniques to the measurement of tropical troops' attitudes towards selected items of Quartermaster issue. These dual objectives were pursued in a two-year research effort.

At the first increment of the project, an exhaustive survey of the literature on the theory and practice of attitude measurement was carried out. Awareness of a striking degree of theoretical incoherence resulted from this effort and prompted the development of a new theoretical model for attitudes. Implications of this model guided the execution of the remainder of the project. Attitudes were characterized as multidimensional constructs and behavioral predispositions. The principal theoretical mandate which emerged from the model was that the measurement of attitudes had to be approached phenomenologically. Therefore, the research team was constrained to identify salient attitudinal topics and situational variables, as a first step in the measurement process. Concurrent with this process the research team undertook the systematic comparison of the efficacy of alternate attitude measurement systems.

These dual objectives were accomplished by means of three data collection trips during the first year of the project. Three hundred U. S. troops stationed in Panama and fifty U. S. troops at Fort Lee, Virginia participated in this phase.

Phase I data analysis indicated the superiority of attitude measurement scales of the Osgood type over the Likert type. Also, a clear-cut requirement for

the incorporation of minimally structured projective techniques in the battery emerged. These projective techniques had a threefold purpose: (1) to assess the saliency of items included in each generation of questionnaire; (2) to identify salient items not previously recognized as such by the experimenters; and (3) to aid in interpreting the objective data findings.

Based on these Phase I results and further interviews with troops recently returned from tropical service, a final instrument was developed during the early part of the second year. This instrument was administered to 2160 U. S. troops stationed in Panama, Hawaii, and Okinawa.

Three types of information resulted from analysis of this data. First, attitudes towards specific items of Quartermaster issue such as the poncho, jungle boots and canteen resulted and are reported herein in Volume One. Interaction effects among population elements and situational variables are also detailed. This data is presented in such a manner as to be of guidance value to equipment designers. The second type of information, also reported in this volume, pertains to attitude change. Attitudes of approximately 100 Mechanized Infantry troops were measured before and after combat conditions were imposed upon them, and considerable change was observed. The third type of information, reported in Volume Two, is methodological in nature. The experimental results of comparisons among the methodologies and self-checking features of the final instrument are fully explored. Recommendations of guidance value to future attitude researchers and numerous suggestions for preparation of attitude studies are systematically presented. Volume Three displays the psychometric instruments comprising the Attitude Assessment Battery developed and used by the research team in this project.

READERS' GUIDE

This report has been divided into three volumes in order to facilitate the acquisition of specific types of information by readers with differing interests. It is envisioned that there will be at least three principal classes of readers: (1) those interested in the specific attitudinal findings and the methodological developments of the research program; (2) those interested only in the attitudinal findings; and (3) those interested only in the methodological developments. By making Volume I and Volume II each focus on one of these areas and by making them independent of one another, the reader with a circumscribed area of interest will be able to find the information he is interested in with a minimum of effort.

It is believed that this approach is congruent with the Army's general policy of stimulating the scientific community at large by making available data resulting from unclassified research projects. In particular, there will very probably be considerable interest in the methodological aspects of this research program among academic circles. Such users will, however, have no particular interest in the specific content of such items as the way troops feel about combat boots in the jungle. Therefore, copies of Volumes II and III will suffice for such readers.

It is recognized that the three-volume approach with Volumes I and II being independent of one another, necessitates some repetition. This repetition is necessary to make the two volumes independent and will be beneficial to the reader who is not interested in both kinds of data. The

annoyance value of the repeated information to the careful reader should be nominal since all such information will be introductory in nature and will be easily recognized for what it is.

A brief schematic presentation of the best way to derive various types of information from the report is set forth on the following page.

If you want:

Then you should:

The general idea

**Read the summaries of
Volume I and Volume II
and skim Volume III**

**To understand how the
troops feel about items
of QM issue**

**Read Volume I in its
entirety - Chapter IV
contains hard core
results and recom-
mendations**

**To examine theoretical
conceptualizations**

**Read Volume II in its
entirety and skim Vol-
ume III for examples**

**To critically evaluate
the entire study**

**Carefully examine the
contents of all three
volumes**

Figure 1. Readers' Guide

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ACKNOWLEDGEMENTS

Research designed to measure the attitudes of troops in the tropics towards items of Quartermaster issue has been carried out under the sponsorship and technical direction of the U. S. Army Natick Laboratories. While many of the techniques employed in this study have been generated within ROWLAND & COMPANY, a great deal of sound technical guidance and assistance has been offered by Natick scientists. Further, previous attitudinal research conducted by Natick has proved valuable to ROWLAND & COMPANY in both the development of methodologies and in the making of choices concerning the mechanical execution of the program. Special appreciation is expressed to the following Natick personnel for their assistance in this program:

Dr. John Kobrick

Dr. David R. Peryam

Dr. E. Ralph Dusek

Major James M. Chaffin

Mr. John L. McCoy

In addition to the overall guidance furnished by Natick personnel, other persons and organizations contributing significantly to the successful execution of this project included:

Col. Robert D. Larson
Commanding Officer
U. S. Army Research and Development Office
Fort Clayton, Canal Zone

Dr. D. A. Dobbins
Behavioral Sciences Coordinator
U. S. Army Research and Development Office
Fort Clayton, Canal Zone

Howard W. Hembree
Scientific Director
Field Evaluation Agency
Quartermaster Research & Development Command
Fort Lee, Virginia

Administration personnel at USARPAC Headquarters

Without the aid rendered by the foregoing persons and organizations,
the data collection phases of this project could not have been accomplished.
For this aid, ROMLAND & COMPANY expresses its thanks to them.

RECOMMENDATIONS

During the research conducted in Phase I and Phase II of the present project a series of hypotheses, both general and specific, have been tested. A series of conclusions have been drawn and some recommendations have been made pertaining to the cumulative research of both phases of the project.

The following recommendations are those which have design implications and their derivations are contained within the text of this volume.

RECOMMENDATIONS

Recommendation 1

Improve the durability of the new jungle boot, particularly with respect to the inhibition of cracking and rotting.

Recommendation 2

Develop a government issue tiger suit for use as a fatigue uniform in the jungle.

Recommendation 3

Develop a short-sleeved fatigue uniform for use in garrison by tropical troops.

Recommendation 4

Develop either a better ventilated, longer poncho or a loose-fitting rainsuit for rain protection. If the latter alternative should be elected, a general purpose covering made out of the present poncho's material should also be furnished the troops.

Recommendation 5

Discontinue the use of combat boots in the jungle.

Recommendation 6

Continue the development of the new bladder-type canteen. Improve the durability and ease of filling.

Recommendation 7

Explore ways and means to improve the "Comfort" of the pack. The "Capacity," "Fit," and freedom of "Movement" possible when wearing the pack should also be re-evaluated.

Recommendation 8

The quantity of food furnished tropical mess halls should be studied for adequacy.

Recommendation 9

Cooking practices which would improve the taste and reduce the greasiness of food served to troops in tropics should be instituted.

Recommendation 10

Examine means to reduce the external size of the rucksack without sacrificing its many desirable features.

Recommendation 11

Expand issue of the poncho liner since it is very highly regarded by those troops in the sample who had used it.

Recommendation 12

Examine ways to reduce the bulkiness and visibility of the new jungle hammock. Also explore possible ways to make the ease of exit greater.

Recommendation 13

Develop a means of water purification which does not render the taste of water unpalatable.

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CHAPTER ONE

INTRODUCTION

A. PHASE I REVIEW

1. PHASE I OBJECTIVES

This report is the Phase II (final) report on Contract No. DA19-129-QM-2076(N), Attitudes of Troops in the Tropics. It will set forth the attitudinal results of this study in Volume I and the methodological findings in Volume II. Since this research program has been conducted and reported in two phases, the reader is herein provided with a summary account of the objectives, research procedures and principal findings of Phase I. If a more detailed understanding of Phase I is desired, ROWLAND & COMPANY Report No. 63-29, Attitudes of Troops in the Tropics, dated 12 July 1963, is available.

The objectives of the overall program were as follows:

- a. Explore and devise ways and means to measure attitudes;
- b. To systematically test the methods derived;
- c. 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.

Essentially, Phase I focused on the execution of objective a. and part of objective b. The balance of the research has been completed in Phase II. A chronological presentation of the Phase I research program follows.

2. REVIEW OF THE LITERATURE

At the inception of the project, ROWLAND & COMPANY research personnel immediately began to systematically go through the literature to become abreast of the most current theory and practice in the field of attitude measurement. As time passed, a substantial annotated bibliography was amassed concerning both attitudinal theory and attitude assessment techniques.

The assumption had been made that such a study of the literature would serve to identify alternative techniques suitable for use in assessing the attitudes of troops in the tropics towards items of Quartermaster issue. Also, it was assumed that diligent study would disclose a more or less unified theoretical model justifying at least some of the currently practiced attitude assessment techniques. The deeper into the literature the research team dug, the more apparent it became that this second assumption was unfounded. While it was possible to identify techniques which allegedly "measured attitudes," it was not possible to find a unifying theoretical explanation of why these techniques worked. Indeed, it was found that there was not even consensus on the meaning of the concept attitude or on many related concepts such as belief, value, opinion, etc.

Another insight gained by this careful look at the literature was that most attitude assessment techniques were developed using college sophomores as subjects. While this is not a problem in and of itself, the fact that investigators working with other sorts of populations seemed to have uncritically accepted these techniques as valid, did bother the research team. This was a reasonable concern since the differences between college sophomores and Special

Forces personnel sweating it out in the jungles of Viet Nam would appear to be considerable, at least from a phenomenological viewpoint.

Therefore, since prevailing attitude assessment techniques appeared to have weak or non-existent theoretical foundations, and also since available techniques were of questionable validity for use on a military population, it was decided to start from scratch and develop some sort of unifying theoretical model. Once this was accomplished, it would be possible to examine available assessment techniques and develop new techniques in a technically sound manner.

3. ATTITUDINAL MODEL CONSTRUCTION

The description of the process of model construction is difficult in that there was no prescribed procedure to follow. The approach of the ROWLAND & COMPANY research team was to intensify the survey of the literature so that assurance would be gained that all prevailing viewpoints and theoretical formulations would be considered. Once this was accomplished, it was necessary to selectively draw together all the theoretical propositions which seemed useful and give them coherence in the framework of the model.

Obviously, great hazards exist in the selection process since no one is either omniscient or bias free. Though every effort was made to evaluate all theories on their relative merits, it is only fair to warn the reader that some bias towards a phenomenological viewpoint may be present in the model since most of the research team members share this common outlook.

Essentially, the model relates attitudes to belief-value matrices and the subjects' informational fields in a time domain context. A detailed

understanding of this model can best be gained by reading Chapter Two of the Phase I, ROWLAND & COMPANY report, Report No. 63-29.

4. ASSESSMENT TECHNIQUES DEVELOPMENT

Concurrent with the later stages of model development, a portion of the research team turned its attention to the development of tentative instruments for assessing the attitudes of troops towards items of Quartermaster issue. This effort was cyclic in that first a tentative instrument was developed, then administered and then refined and readministered. This evolutionary research procedure will be more fully treated in the subsequent text.

a. Site Selection and Salient Topic Identification

The first step in the instrument development process actually involved the solution of two problems. First, sites or locations where U. S. troops served under tropical conditions and where troops would be available for testing had to be identified. Also, since it is obvious that all items of Quartermaster equipment could not be probed by the study, a means of identifying the topics which are most important (salient) to the troops had to be devised. Therefore, the first ROWLAND & COMPANY measuring instrument was designed with the objective of obtaining saliency data and getting a practical "feel" for the way U. S. troops would react to various psychometric devices when used on an exploratory basis.

In coping with the first problem area, ROWLAND & COMPANY was advised that American troops stationed in Panama experienced all the many characteristics of the jungle within a closely circumscribed geographical

area and that samples of these troops could be made available to ROWLAND & COMPANY. Other areas did not meet those requirements at that time. Having tentatively found a suitable location, the research team focused its attention on the development of an instrument which would elicit information from the troops as to which items of Quartermaster issue were of greatest concern to troops serving in the tropics. A tentative instrument relying largely on open-ended questions was devised for this purpose.

While this instrument was being developed, arrangements were made to obtain access to the troops in Panama. This administration was considered as Pilot Study No. 1. It served as a good opportunity, not only to obtain the necessary data, but to get the lay of the land insofar as the suitability of Panama as a testing location went. Both objectives of Pilot Study 1 were fulfilled; Panama was deemed suitable as a site for subsequent extensive tropical troop attitude testing and specific items of Quartermaster issue were identifiable as being attitudinal objects of concern to these troops.

b. Development of Attitude Assessment Instrument

(1) Initial Consideration

As a result of Pilot Study No. 1 and the maturation of the theoretical model which was undergoing concurrent development, the ROWLAND & COMPANY research staff had available sufficient data to begin the construction of questionnaires designed to elicit information on the attitudes of tropical troops towards salient items of Quartermaster issue. Pilot Study No. 1 served to identify these salient topics. The influence of the theoretical model was felt in a requirement to also elicit information identifying the subjects'

perceptions of the military environment and, to a certain extent, the subjects' world view. Therefore, the development objective sought was the creation of assessment techniques which would probe specific attitudinal areas and those which would probe areas of fundamental outlook and world view. To these ends a variety of objective, written projective, and picture projective techniques were developed.

(2) Pilot Study No. 2

The new attitude assessment battery was tried out on a small sample at Fort Lee, Virginia. This administration, Pilot Study No. 2, had a dual purpose. First, to provide the investigators with information and prior experience concerning the administration of the battery of assessment techniques; and secondly to provide an opportunity to detect and correct any major problems which might have been caused by the instrument or procedures as they then existed.

Analysis of the data obtained in Pilot Study No. 2 yielded the following conclusions:

- a. 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;
- b. Trends were noted which justified further consideration of the techniques used to identify certain kinds of invalid data;
- c. The written projective technique elicited a good range of responses, but there were too many items and some of the items

required simplification;

- d. The projective pictures seemed practical, but there were too many.

Based on this and other information inferred from Pilot Study No. 2, refinements, additions, deletions and corrections were made to the assessment battery. Arrangements were made during this period for access to 200 U. S. troops stationed in Panama for the Phase I major data collection effort.

5. MAJOR DATA COLLECTION

a. Data Collection Procedure

The major data collection was carried out over a two-week period. The primary data were gathered in the first week by a two-man team. Supplemental interview information was obtained during the second week by one of these men.

b. Major Data Collection Objectives

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 made were:

1. Objective scaling concept - Osgood booklet vs. Likert booklet;
2. Projective scaling format - Written Projective Form A vs. Written Projective Form B;
3. Opportunity to volunteer comments - Object booklets with "Your Comments" cards vs. Osgood and Likert booklets without cards;

4. Order of administration - Written Projective administered before Objective booklets vs. Written Projective administered after Objective booklets.

The interviews conducted during the second week had two principal foci of concern. First, the researchers wanted to know the troops' reactions to the instrument. Ambiguities, unclear wording, irrelevancies, etc., all were to be identified by the subjects. It was also desired to identify the salient topics pertinent to U. S. troops stationed in the tropics. Both of the objectives were met and permitted the following primary conclusions to be reached at the conclusion of Phase I.

6. CONCLUSIONS

a. Methodological Conclusions

As has been previously indicated, the major emphasis in Phase I was on the development and comparison of alternative attitude assessment techniques. A complementary methodological concern was the development of a technique for the detection of valid and invalid data samples. A concomitant of the methodological goals of Phase I was the acquisition of further information on the troops' reactions to the saliency of various topics and data as to their attitudes towards the specific items probed in Phase I.

Without delving into the specifics of the data analysis, the following broad conclusions were reached.

1. The Osgood technique is superior to the Likert technique of attitude assessment;

2. Written projectives were found to be valuable in eliciting attitudinal saliency information as guides to item preparation, and generally aiding the interpretation of the objective responses;
3. There was not found to be a significant difference between Written Projective Forms A and B, however, individual items on both forms were identified which consistently elicited useful data;
4. Use of the 'Your Comments' cards was found to be valuable. Among other advantages, subjects who received 'Your Comments' cards had fewer inconsistent responses;
5. It was found advantageous to administer Written Projectives prior to the Objective booklets;
6. Whenever possible in attitudinal studies, steps should be taken to assess the data for response consistency and to categorize and treat the data in accordance with its consistency;
7. The dimensionalization of questions probing attitudinal objects of concern is more fruitful than merely asking global assessment questions under most circumstances;
8. A workable means of identifying inconsistent responses in objective attitude measuring techniques was developed;
9. Soldier respondents are willing to give at least overt cooperation when asked to participate in fairly bizarre assessment techniques;
10. Picture projectives seemed to have promise in the assessment of attitudes since they appeared to directly tap emotional responses.

b. Topical Conclusions

In addition to these methodological findings, the following topical conclusions were reached:

1. Snakes did not appear to be a major problem to seasoned troops in the Panama area;
2. Jungle boots had not been issued to troops in the sample population. They had but little definitive information upon which to formulate an opinion regarding the item;
3. The shelter-half, tents, raincoats, ponchos, and packs were rarely used by the sample population in the Panama area. This may have been attributable to the mission of the particular sample (Airborne Infantry) and may not be applicable to other types of troops;
4. The sample population was not generally issued water purification tablets and would not drink untreated water. A majority considered water in the jungle as particularly dangerous and did not seem interested in trying water purification by tablets to be carried individually. A small but sizeable minority seemed to desire to have them issued to be carried as part of their standard stock;
5. The combat boot was considered unacceptable as a jungle item by the sample population;
6. Health was a topic of considerable concern to the sample population;
7. Most of the discomfort experienced by the men when they were on field exercises was attributed to heat and to insects, in that order;

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

These conclusions, both methodological and topical, were used to sharpen and tighten the measuring instruments for Phase II. Problem areas were identified in a more definitive manner such that items could be written to ensure adequate coverage of critical topics and their dimensions. The measuring instruments and their inter-relationships were improved so as to provide a more valid approach to the collection of attitudinal data.

B. PHASE II OBJECTIVES

The present study was originally conceived and eventually supported by sponsors with different but compatible points of view. One view was hardware oriented and required an end product which could be used in equipment evaluation. The other view was more theoretical in nature and encouraged a rather heavy investment of time and effort in establishing methodological inroads which would improve the state of the art in general. Whereas Phase I (Report No. AD 417796) of this two-phased research stressed the development of attitudinal assessment techniques, Phase II has consisted largely of the collection, analysis, and interpretation of attitudinal data, as regards equipment evaluation. In addition, hypotheses formulated as a result of Phase I data were tested and additional information gathered relative to the methodological aspects of the study. Consequently, both phases have contained a methodological and attitudinal mix insofar as objectives have been concerned. The treatise herein relates to the primary objective of Phase II which has been to collect, analyze, and interpret attitudinal data.

1. ATTITUDINAL OBJECTIVES

Not unlike any other scientific inquiry only a finite number of objects could be considered in this study. The "objects" of the study are referred to as "topics" and were systematically selected as a result of the data gathered and analyzed during Phase I. There are two classes of "topics," equipment and situational. The equipment related topics investigated were: "Fatigues," "Poncho," "Poncho Liner," "Combat Boots," "Jungle Boots," "Canteen," "Meals," "Pack," "Rucksack," "Tiger Suit," and "Hammock." The situational topics included for study were: "Weather," "Water," "Insects," "Entertainment," "Family," and "Officers."

The primary objective of Phase II was to obtain an accurate assessment of the troops' attitudes toward the eleven equipment related topics. Inclusion of the six situational topics into the study was primarily to collect data which would expedite the analysis and interpretation of the equipment related data. It was also hoped that the study would provide attitudinal information as to why the respondents felt the way they appeared to feel about their equipment, and provide identification of any independent variables which are concomitants of attitudes.

The desired final product then, is one in which the attitudes of troops toward some Quartermaster issue items have been accurately assessed. Not only was determination to be made as regards the troops' feelings toward their equipment, but in addition, the reasons for their attitudes were to be identified.

2. METHODOLOGICAL OBJECTIVES

Several concepts were developed in Phase I which were employed for data collection and analysis in Phase II. The present authors propose that some of the concepts could very well have far reaching implications in the science of attitude measurement and possibly also have general applicability in the field of psychometrics. There are five of these major concepts and they are dealt with herein in the following order: Respondent Cooperation, Topic Dimensionality, Projective Techniques, Osgood-type Objective Scales, and Data Collection-Processing Techniques.

a. Respondent Cooperation

Attitudinal research has led to the development of a wide variety of techniques in an attempt to accurately assess attitudes. Although the psychometric instruments differ radically in some instances, the desired end product seems to be shared by all investigators; that is, that responses will be obtained which represent the subject's "actual" position on some specified psychological continuum. The present authors propose that a response which fulfills this requirement should be thought of as a valid response, and that the construct of "response validity" be utilized to represent this desired end product.

There is a subtle but significant distinction which should be made between the more commonly used constructs of item or test validity and the present authors' proposed construct, response validity. Although repeated reference is made to item validity, as if it were the ultimate objective of the investigator, in the present authors' opinions, item or test validity is merely a partial contributor to valid or invalid responses. On the other hand, response

validity is here suggested to be the ultimate objective in any psychometric instrument and is a function of not only item validity but of Respondent Cooperation as well.

For purposes of clarification, the constructs critical to the present discussion are defined below:

Response Validity

A valid response is one which represents the subjects' "actual" position on a psychological continuum where the continuum is one which is shared by respondent and investigator alike and means the same to each.

Item Validity

A valid item is one which, assuming cooperation from respondent, elicits evaluations of the referent prescribed by the investigator.

Respondent Cooperation

A cooperative respondent is one who, assuming item validity, attends to the referent prescribed by the investigator in the manner prescribed by the investigator.

In order to assess Respondent Cooperation, a measuring technique amenable to use with Objective Instruments such as the Osgood or Likert scaling techniques has been developed and has been included in this study. This technique is referred to as the Respondent Consistency Check.

Although a great deal of attention has been paid to item validity and a number of techniques developed to measure and insure it, the notion of Respondent

Cooperation appears to have been relatively unexplored. Some personality and interest inventories have included "lie scales" which have been inferential in nature, but for the most part respondent cooperation has been an assumption. A major objective of this research has been to demonstrate that a significant number of respondents yield inconsistent responses, which signifies a lack of cooperation, and that their data is sufficiently different from the data of the rest of the sample as to make the inclusion of their data suspect for certain applications.

b. Topic Dimensionality

Although a crude measure of soldier acceptance is obtained with the use of global items such as "do you or do you not like your fatigues," it has been recognized for some time that information derived in this manner is insufficient if remedial action is to be taken to correct equipment deficiencies. In an attempt to acquire information which answers questions about why the troops feel the way they do concerning their equipment the dimensional approach came into being. Salient features of equipment have been identified such as "Comfort," "Durability," and "Protection," and incorporated into the instruments thereby providing a dimensional approach to the measurement of attitudes.

The influence of the theoretical model developed by the authors during Phase I of this project prompted the recognition of levels of dimensions. When the various attitudinal parameters of a given topic are examined, it becomes apparent that there are levels of dimensions which are arranged in hierarchal order on a generality-specificity continuum. For example, attitudes relating to the topic of "Fatigues" may be evaluated in the following manner: level one, which is the most general in nature, deals with the soldiers'

over-all acceptance or rejection of 'Fatigues,' level two consists of dimensions such as 'Comfort,' 'Protection' and 'Durability;' and level three relates to dimensions subsumed by the dimensions within level two such as 'Rotting,' 'Tearing' and 'Stitching' relate to 'Durability,' or underbrush protection, insect protection and protection from the sun relate to the 'Protection' dimension.

it has been the authors' intent to explore the relationships among the different levels of dimensions thereby providing more accurate and definitive attitudinal assessments.

c. Projective Techniques

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. 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 transmission.
5. Situations in which the surveyor knows the topic of interest to himself but either cannot (or does not choose to) set up a suitable scale of responses, (usually because he does not know what or how to use his alternatives).

Several unstructured techniques were developed during Phase I and it was planned that at the conclusion of Phase II the utility of these approaches would be determined and identification made of the approaches most likely to succeed in the assessment of attitudes.

d. Objective Scales

Techniques defined as Objective techniques usually have highly structured administrative procedures and highly structured manners of responding. Structural differences between Objective questionnaires for gathering opinion data are due primarily to the different types of scaling procedures employed. A particular version of the method of summated ratings, herein referred to as the Likert scale, was considered at the outset for this study because it had undergone a number of years of both research and applied use and seemed to offer an optimal solution to scale construction problems. However, after this research group had accomplished considerable work with the Likert scale a few questionable characteristics were identified which raised some doubt as to its validity, which in turn led to the adoption and further development of a form of the Semantic Differential technique, referred to in subsequent discussion as the Osgood scale. A complete description of each of the two scales is found in Chapter Three, Section A, of this Volume.

At the conclusion of Phase I the data were interpreted to indicate the probability that the Osgood scale seemed to be a more valid approach to attitude assessment than the Likert technique. One of the objectives of Phase II was to provide the necessary data to substantiate or repudiate this notion.

e. Data Collection - Processing Techniques

Not unlike most research jobs the cost-accuracy tradeoff has been a practical and a necessary consideration, and consequently, has received special attention in the present study. Data collection techniques were designed which were expected to reduce over-all costs and increase accuracy by requiring a minimal amount of manual data handling. The "systems" approach employed in the instrument design forced design considerations of data processing techniques early in the developmental stages, which was to provide a much more compatible, efficient data-collection processing system.

During Phase I a system was developed which came close to accomplishing the desired ends through the incorporation of mark sense cards inserted in "pop in" and "pop out" pages of the test booklet. There were some rather serious flaws in the system, however, one of which was the inability of the mark sense reader to accommodate the data as it was necessarily displayed on the mark sense cards.

One of the objectives of Phase II was to implement the necessary changes which would allow the data-collection processing procedures to function properly.

3. EXPERIMENTAL OBJECTIVES

Unexpected events which transpired while the research team was collecting data in Panama provided the ingredients for a unique social-psychological experiment. One hundred twenty-nine respondents were administered the attitudinal assessment battery before the flag incident occurred on January 9. Although the research team was forced to discontinue data collection at that time due to the alert status upon which the troops were placed, it returned four months later to complete data collection.

It becomes apparent that the situation resulting from the flag incident had provided the following conditions of an excellent experimental design:

- 1) a pre-test, the 129 subjects who were tested prior to the flag incident,
- 2) a major intervening force which could alter attitudes considerably, e.g., the troops were placed on alert and were cognizant of the impending danger of being shot at in combat, and
- 3) a post-test, the subjects tested prior to the flag incident were re-tested using the same instruments administered in the pre-test.

The importance of this experimental design is better understood through a careful examination of the basic assumptions underlying this research project or, for that matter, any other equipment-related attitudinal studies in the Armed Services. The first major assumption is that soldier performance in combat has a causal relationship to soldier attitude. Secondly, it is assumed that attitudes of non-combatant troops compare favorably with attitudes of troops in combat. Hence, assessment of the attitudes of troops not engaged in combat, which is comparatively easy, will provide data which assists the prediction and control of soldier performance in the combat situation.

The objective of invoking the experimental design discussed in this section into the present research is to test the assumption that equipment related attitudes are not a function of the combat - non-combat situation.

CHAPTER TWO

DESCRIPTION OF SAMPLE

In any behavioral science research it is necessary to fully delineate the nature of the sample from which data is obtained before it is possible to establish the degree of generality which may be attached to the results. If a sample is either small or biased in some manner, it is obvious that conclusions based on such data must be narrowed in accordance with these considerations.

The primary objective of this project has been to study the attitudes of troops in the tropics towards items of Quartermaster issue. Early investigations indicated that Panama, Hawaii and Okinawa are the main tropical regions in which U. S. Army troops train. It was also recognized that Viet Nam provided an area in which Army personnel are actually engaged in combat under tropical conditions at the time this report was in preparation. The original experimental design proposed by the investigators suggested drawing subjects from Panama, Hawaii and Viet Nam. This design included two of the three major-non-combatant tropical areas in which Army personnel are trained, plus a combatant area. Policy considerations precluded the collection of data in Viet Nam so Okinawa was chosen instead. The non-combatant-combatant contrast was still possible since Okinawa is a major staging area for Viet Nam. Therefore it was possible to obtain data at Okinawa from large numbers of troops who had been to Viet Nam.

Having thus assured a wide enough data base from a geographical standpoint to permit generalizations concerning troops in the tropics,

arrangements were made for obtaining sufficient numbers of subjects in each location. These arrangements resulted in the administration of a total of 2160 attitude assessment batteries, with the following breakdown: 1130 in Panama, 560 in Hawaii and 470 in Okinawa. Also, prior to data collection, efforts were made to stratify the sample in accordance with the branch representation in each area.

In order to be able to characterize the sample adequately, each respondent was probed concerning 13 demographic variables. These variables were: age, formal education, marital status, dependents, rank, time in service, branch, time in combat, battle stars, time in jungle training area, reason for entering active duty, season most time spent in tropics, and region most time spent in tropics (answered only by those having been to Viet Nam). The percentage distributions of each major subpopulation as well as the total cooperative and uncooperative populations (see Chapter Four, Section A for a detailed treatment of this complex concept) for each response category to each of these questions are displayed in Table 1. The data derived from each of these demographic items is treated briefly in the following text.

A. DEMOGRAPHICAL ANALYSIS

Age

By far the greatest percentage of all respondents is in the 20 - 24 year age bracket. This bracket includes approximately one-half of the total sample. It is also observable that the Okinawa sample is more heavily weighted with personnel in the 30 and over (20.3 per cent) age category as contrasted with the populations from Hawaii (11.9 per cent) and Panama (16.1 per cent).

TABLE 1
 PERCENTAGE DISTRIBUTIONS OF DEMOGRAPHIC ITEMS FOR
 TOTAL RESPONDENT POPULATION

<u>Descriptors</u>	<u>Cooperative Population</u>				<u>Uncooperative Population</u>
	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>	<u>Total</u>	<u>Total</u>
Age in Years:					
35 and over	5.5	4.7	8.4	6.0	9.8
30 to 34	10.6	7.2	11.9	9.9	7.1
25 to 29	19.9	12.0	19.1	17.4	9.8
20 to 24	46.9	58.2	49.0	50.7	49.3
Less than 20	17.1	17.9	11.6	16.0	24.0
Formal Education Completed:					
College	3.9	2.1	3.4	3.3	2.2
Some College	18.0	14.0	28.0	19.3	11.4
All 12 grades	54.8	46.8	53.4	52.2	50.0
9 to 11	18.0	26.8	13.0	19.3	25.9
6 to 8	4.7	8.9	1.7	5.2	6.6
5 or less	0.3	0.6	0	0.3	1.7
None	0.3	0.8	0.5	0.4	2.2
Marital Status:					
Single	55.0	60.3	55.9	56.8	62.4
Married	39.6	37.3	38.7	38.7	33.2
Separated or Divorced	5.1	1.8	4.9	4.1	3.1
Widower	0.3	0.6	0.5	0.4	1.3

(Table continued on next page)

TABLE 1 (Continued)

<u>Descriptors</u>	<u>Cooperative Population</u>				<u>Uncooperative Population</u>
	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>	<u>Total</u>	<u>Total</u>
Dependents:					
4 or more	13.1	10.0	11.6	11.9	11.8
3	11.5	8.9	12.1	10.9	9.2
2	12.5	12.6	13.1	12.7	12.3
1	19.7	23.6	14.4	19.5	23.3
None	43.2	44.9	48.8	45.0	43.4
Rank:					
Commissioned Officer	3.1	2.1	4.9	3.2	0.9
Sgt. Major	0.4	0	0	0.2	0.9
M/Sgt.	1.4	0.2	2.0	1.2	0
SFC	2.6	1.0	8.3	3.6	2.7
SSG	6.4	4.8	10.7	7.0	8.0
Sgt.	11.0	10.8	21.5	13.5	12.9
Cpl.	22.8	22.4	17.6	21.4	23.1
PFC	39.6	36.3	26.9	35.6	38.2
Pvt.	12.7	22.4	8.1	14.3	13.3
Time in Service: (months)					
36 or more	35.0	26.3	45.4	35.0	34.2
18 to 35	27.8	27.8	28.1	27.9	24.9
12 to 17	15.7	13.3	12.9	14.4	18.2
6 to 11	17.6	21.3	12.4	17.4	17.4
Less than 6	3.9	11.3	1.2	5.3	5.3

(Table continued on next page)

TABLE 1 (Continued)

<u>Descriptors</u>	<u>Cooperative Population</u>				<u>Uncooperative Population</u>
	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>	<u>Total</u>	<u>Total</u>
Branch:					
Infantry	32.4	54.6	0.7	30.6	34.0
Airborne	17.5	1.3	42.2	19.2	23.7
Mechanized	14.9	12.5	0.7	10.6	9.3
Special Forces	11.3	1.1	35.6	14.6	11.6
Other	23.9	30.5	20.7	25.0	21.4
Time in Combat: (months)					
12 or more	7.6	6.1	17.0	9.4	10.0
6 to 11	3.9	2.3	8.8	4.7	8.7
1 to 5	2.5	4.6	2.2	3.1	3.1
Less than 1	6.1	0.8	2.2	3.6	5.2
None	79.9	86.2	69.8	79.2	73.0
Battle Stars Awarded:					
More than 3	3.7	3.5	8.2	4.7	6.7
3	2.7	1.5	2.3	2.3	2.2
2	1.6	1.9	1.5	1.7	3.8
1	1.8	1.9	2.5	2.0	0.9
None	90.2	91.2	85.5	89.3	86.4

(Table continued on next page)

TABLE 1 (Continued)

<u>Descriptors</u>	<u>Cooperative Population</u>				<u>Uncooperative Population</u>
	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>	<u>Total</u>	<u>Total</u>
Amount of Jungle Training: (months)					
24 or more	25.9	24.1	12.6	22.1	20.3
12 to 23	31.8	21.2	27.9	27.8	25.7
6 to 11	18.8	22.1	22.7	20.7	27.9
3 to 5	13.7	17.2	17.8	15.7	11.7
Less than 3	9.8	15.4	19.0	13.7	14.4
Reason for Entering Active Duty:					
Drafted	33.1	40.3	15.5	30.6	34.7
To avoid draft	19.9	16.6	22.2	19.6	17.6
Without concern of draft	37.7	36.4	55.5	41.9	39.2
Activated from Reserves	3.2	2.0	1.0	2.3	3.5
Other	6.1	4.7	5.8	5.6	5.0
Season Most Time Spent in Tropics:					
Rainy	25.9	28.0	16.1	24.1	25.6
Dry	4.5	2.7	12.6	5.9	6.7
Equally divided	69.6	69.3	71.2	70.0	67.7

(Table continued on next page)

TABLE 1 (Continued)

<u>Descriptors</u>	<u>Cooperative Population</u>			<u>Total</u>	<u>Uncooperative Population</u>
	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>		<u>Total</u>
Region Most Time Spent in Tropics:					
Delta	21.0	16.6	11.0	15.8	11.2
Plateau	16.2	5.9	17.3	13.5	18.3
Mountain	12.4	37.3	34.7	28.4	32.4
Equally divided	50.4	40.2	37.0	42.3	38.1

Formal Education

Apparently there is a hierarchy among the three populations with respect to amount of education. The Okinawa group ranks first in this respect, Panama second and Hawaii third. This conclusion is supported at both ends of the educational spectrum since in Okinawa 31.4 per cent, in Panama 21.9 per cent, and in Hawaii 16.1 per cent of the populations had some college or more while Hawaii had 10.3 per cent with eight or less grades completed, Panama 5.3 per cent and Okinawa only 2.2 per cent in this category.

Marital Status

Overall, it was found that about 60 per cent of the total population was single, 35 per cent married, 4 per cent separated or divorced and 1 per cent widowed. Hawaii was found to have more single personnel proportionately than the other two populations. This is congruent with the fact that the Hawaii group has younger troops than do the other locations. There is a slight reversal of this trend noticed between Panama and Okinawa. The Panama group has 64 per cent of its population 24 or less while Okinawa has 60.6 per cent in this category. However, slightly more troops from Okinawa (55.9 per cent) are single as contrasted with troops from Panama (55.0 per cent).

Another interesting feature of this data is that there seems to be a markedly lower ratio of separated or divorced to married in the Hawaii group than in either of the other populations. It is also interesting to note that a 5.6 per cent difference exists between the cooperative and uncooperative groups with respect to the proportion of single personnel in the population. The uncooperative group has the larger percentage. Likewise, a difference of 5.5 per cent in the marriage category favoring the cooperative respondents

seems to support the idea that married men, taken as a whole, are more responsible than are single men.

Dependents

It was found that U. S. troops in Panama had the greatest number of dependents, those in Hawaii being second and those in Okinawa third.

Rank

The sample from U. S. troops in Okinawa has a strikingly larger percentage of higher ranking enlisted personnel. 21.0 per cent of the Okinawa sample, 10.8 per cent of the Panama sample and 6.0 per cent of the Hawaii sample held grades E-6 through E-9. At the other end of the enlisted rank continuum, 58.7 per cent were Privates and PFC's in Hawaii, 52.3 per cent in Panama and 35 per cent in Okinawa.

Time in Service

As might be predicated on the basis of the data on rank, groups in Okinawa have more experienced personnel than do Panama and Hawaii. 45.4 per cent of the Okinawa population has been in the service for three years or more as contrasted with 35.0 per cent and 26.3 per cent for Panama and Hawaii, respectively. In the eleven months or less of service category the percentages of the populations for Hawaii, Panama, and Okinawa are 32.6 per cent, 21.5 per cent and 13.6 per cent respectively.

Branch

Though the investigators attempted to arrange for a rigorously stratified sample with respect to branch of service, the complexities of field research are such that compromises had to be made. As it turned out, a fairly

good representation of U. S. Army branches found in the tropics was obtained. As can be seen from Table 1, groups in Panama and Hawaii were largely made up of infantry and "other" personnel. The "other" category being comprised of relatively small groups with the following specialties: missile, medics, artillery, support and aviation. Airborne and Special Forces were the largest groups on Okinawa.

Time in Combat

Seventeen per cent of the U. S. troop sample taken on Okinawa has had a year or more of combat experience in contrast with less than half that percentage for each of the other populations. It is interesting to note that a difference of 6.2 per cent between the cooperative and the uncooperative groups existed relative to combat experience with the uncooperative group having the greater percentage. Nearly 80 per cent of the total sample had no time in combat, however.

Battle Stars

Due to the fact that the Okinawa population had much more combat experience than did the other two populations, there were more battle stars possessed by Okinawa troops than by any other group. 14.5 per cent of the Okinawa troops as opposed to 9.8 per cent of the Panama troops and 8.8 per cent of the Hawaii troops had earned battle stars. Also, a difference of 2.9 per cent exists between the cooperative and uncooperative groups with respect to battle stars won, favoring the uncooperative groups. Though this difference is not great it suggests the possibility that perhaps some of the uncooperative subjects may have been uncooperative to the extent of falsifying some demographic data.

Time in Jungle Training Area

The question regarding time in jungle training area was intended to ascertain the total amount of jungle training and/or jungle combat experience possessed by each subject. In retrospect it was realized by the item writers that the wording of the question was such that the subjects might differentiate between jungle training and actual jungle combat. Apparently, this was done since the troops in Okinawa who had the greatest amount of combat experience had the lowest percentage of personnel with a year or more of time in a jungle training area, 40.5 per cent, as contrasted with 57.7 per cent for the troops in Panama and 45.3 per cent for the troops in Hawaii. Similarly, 19 per cent of the Okinawa population, 15.4 per cent of the Hawaii population and 9.8 per cent of the Panama population had less than three months in a jungle training area. Although the item was intended to assess the amount of jungle experience obtained by the troops, it becomes obvious that the amount of time spent in a jungle training area does not necessarily reflect this. For example, it would seem that the Special Forces who lived for six months, 24 hours a day, in the jungle in Viet Nam received a great deal more jungle experience than the soldiers in Panama who went out in the field once a week; and yet the item used certainly does not indicate this.

Reason for Entering Active Duty

In both Panama and Hawaii a larger number of persons entered active duty either because they were drafted or to avoid being drafted than for any other reason. On Okinawa, this was not true since 37.7 per cent of this population was either drafted or motivated to join up by the draft in contrast to 55.5 per cent who joined without concern of the draft. This fact seems to be

congruent with the general picture which emerges of the Okinawa group as older, higher ranking personnel with more combat experience. In short it appears that there are more professional, career soldiers on Okinawa than in either of the other two locations.

Season Most Time Spent in Tropics

It was recognized by the researchers that evaluations of certain items of Quartermaster equipment might vary as a function of the tropical season in which the item had been most used by the respondents. The data shows that 70.0 per cent of the respondents had spent equal time in the rainy and dry seasons. The remaining portion of the population was split between those who had spent the majority of their time in the rainy and dry seasons. Taken as a whole, it would appear that the population is familiar enough with both seasons to be able to identify any deficiencies of Quartermaster issue equipment which are peculiar to one or the other season.

Region Most Time Spent in Tropics (Viet Nam)

Since, at the time of this report, Viet Nam is the only tropical area in which the United States is involved in conflict, it was deemed useful to find out both how many respondents had been to Viet Nam and, for those who had been there, what geographical regions or region had they served in. The geographical question was included as a result of some interviews conducted at Fort Bragg during Phase I. The interviewees indicated that there were three clearly defined geographical locations which varied a great deal with respect to topographical conditions. Consequently, the item was included so that this particular variable could be accounted for if, in fact, it seemed to be related to

attitudes. A total of 405 respondents had been to Viet Nam or roughly 19 per cent of the total sample. Of these personnel approximately 40 per cent had their time equally divided among delta, plateau and mountain regions. Troops from Hawaii and Okinawa had also spent a lot of time in the mountain regions while the troops from Panama who did not have equally divided time in the various regions had spent more time in the delta region. Overall, a good representation of troops experienced in all of the geographical regions was available.

B. POPULATION COMPARISONS

The foregoing analysis has been based on gross differences in response frequencies observed among the five population classifications displayed in Table 1. Five of the demographic variables which were viewed by the analysts as being most salient in defining the characteristics of the population to whom the battery was administered were selected for more intensive analysis. The variables chosen were: age, education, rank, time in Army and combat experience. A contingency calculation (chi-square) was run between the total cooperative and total uncooperative populations, between the Panama and Hawaii, Panama and Okinawa and Hawaii and Okinawa cooperative populations on each of these variables.

The significance levels achieved by these comparisons are shown in Table 2.

1. COOPERATIVE VS. UNCOOPERATIVE COMPARISONS

For the cooperative vs. uncooperative populations age and education were found to be significant variables. For age it was found that the

TABLE 2
 CHI-SQUARE SIGNIFICANCE LEVELS BETWEEN POPULATIONS FOR
 SELECTED DEMOGRAPHIC VARIABLES

<u>Demographic Variables</u>	<u>Consistent vs Inconsistent</u>	<u>Populations</u>		
		<u>Panama vs Hawaii</u>	<u>Panama vs Okinawa</u>	<u>Hawaii vs Okinawa</u>
Age	.001	.001	.05	.001
Education	.001	.001	.001	.001
Rank	Not significant	.001	.001	.001
Time in Army	Not significant	.001	.001	.001
Combat Experience	Not significant	.001	.001	.001

cooperative respondents tended to be clustered in the middle age brackets (20 - 34) whereas the uncooperative respondents were found more often in the extreme age categories of less than 20 and more than 35. Examination of the cells in the contingency table showed that the cooperative respondents are better educated than the uncooperative respondents. There are more observed than expected subjects in the "finished 12 grades" and above cells for the cooperative respondents and less observed than expected in all lower cells. For the uncooperative population, exactly the opposite is true, with observed frequencies exceeding expected frequencies for all cells less than "finished 12 grades," and expected frequencies exceeding observed frequencies for all higher educational categories. Though it is recognized that there is not necessarily a linear, positive relationship between education and intelligence, this data tends to support the idea that one of the major factors causing poor respondent cooperation is simply lack of ability. It is obvious that some linguistic proficiency is required before a subject can successfully cope with the objective instrument. Evidently, some of the subjects did not reach this ability threshold.

2. PANAMA VS. HAWAII COMPARISONS

The chi-square values computed for all five variables; age, education, rank, time in Army and combat experience were all significant at the .001 level. Therefore, there are very clear cut differences between the two populations with regard to the variables probed. The Panamanian population is older, better educated (i.e. those completing 12 grades and more), higher ranking (more E-6 - E-9 proportionately), has more time in the Army and more combat experience. Therefore a well defined difference between populations exists showing the Panama group to be more experienced, older, better educated, and

higher ranking personnel.

3. PANAMA VS. OKINAWA COMPARISONS

The Panama vs. Okinawa contingency calculations for the five selected variables were all significant at the .001 level except for age which was significant at the .05 level. As in the Panama versus Hawaii comparisons, there is a clear cut trend in the data showing the Okinawa troops to be older, better educated, higher ranking, and more experienced in military life than their counterparts from Panama.

4. HAWAII VS. OKINAWA COMPARISONS

As would be predicted from the results already reported, the Okinawa population was distinctly older, better educated, higher ranking, had greater time in the Army and had greater combat experience than did the Hawaii population.

C. OVERALL SAMPLE CHARACTERISTICS

Contrary to the investigators' expectations, the sample obtained in the three tropical regions studied do differ substantially in demographic characteristics. Though it is not altogether clear why this is so, there is a hierarchy among the three populations with respect to age, education, rank, time in Army and combat experience. The Okinawa population is first in this hierarchy with the oldest, best educated, etc., personnel, Panama is second and Hawaii third. There are no reversals in this trend so it is apparent that a bona-fide phenomenon exists.

The data discussed earlier on reason for entering the services and battle stars awarded both support the view that the Okinawa population is made up of a greater proportion of professional soldiers. Nearly twice as many battle stars have been awarded to the Okinawa troops than to either of the other populations. Also, far more soldiers on Okinawa initially entered active duty without concern for the draft than in either of the other populations. Though this phenomenon leaves the research team with some problems in assigning causality to attitudinal differences between populations, it does demonstrate that taken together, the total population is not biased with respect to the variables studied.

The items concerning duration of tropical services, seasonal experience in the tropics and geographical regions experienced in Viet Nam had distributions which indicated no heavy biases in the over-all population. There was also a reasonable distribution of branch specialties in the population. The items on marital status and number of dependents showed no useful trends.

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CHAPTER THREE
METHOD AND PROCEDURE

A. SAMPLE VALIDATION

1. COOPERATIVE VS. UNCOOPERATIVE RESPONDENTS

The present authors have proceeded on the assumption that all individuals of even supposedly homogeneous groups do not respond to questionnaires with the same degree of veracity, interest, and capability; that in many instances respondents will even deliberately attempt to confound the surveyor. While there is some evidence to support the notion of non-cooperation even among highly motivated, intelligent college students, it would seem that hostile, uncooperative (both deliberate and that due to inability) behavior would be even more prevalent in service personnel.

Respondent cooperation becomes a rather critical factor when attitudinal data are to be used for equipment evaluation and possible equipment design resulting therefrom. It would seem that data used for these purposes ought to be derived from respondents who are both interested and capable of indicating their attitudes via the investigators' data collection techniques. Consequently, based on the explicit assumptions that some respondents are more capable and willing to provide valid attitudinal data about themselves than are others, and that there are techniques which will allow differentiation between cooperative and uncooperative respondents, most of the results described herein represent that portion of the sampled population which was assessed to be cooperative.

2. RESPONDENT CONSISTENCY CHECK

A procedure called the Respondent Consistency Check (RCC) was developed to assess the consistency of a subject's responses. It is believed that the consistency measure provides sufficient information to allow inferences to be made concerning the cooperation or non-cooperation of respondents. The procedure followed was to have the subject respond twice to the same item, or basic item content, with reversed direction of the scales on the two response situations. If a respondent was inconsistent by three or more units it was considered a Respondent Consistency Error (RCE). Three or more RCE's out of a possible thirteen was considered a sufficient amount of inconsistency to warrant being classified as uncooperative. A more detailed treatment of the RCC technique and its theoretical aspects is found in Volume II.

B. TOPICS

The Army is interested in the possible effects of a tropical environment upon the equipment related attitudes of troops. Consequently, the investigators collected attitudinal data upon at least two major classes of dependent variables; namely, equipment related attitudes and situational related attitudes. One of the primary purposes of the study was to examine the relationship of the tropical environment upon the equipment related attitudes of troops. Rather than collect attitudinal data for all classes and kinds of Quartermaster equipment, only the most salient items of equipment and situational subjects were included in the final phase of this study. The saliency determination was made in Phase I.

Another reason for collecting attitudinal data pertaining to situational variables was to "calibrate" the respondents. Obviously, respondents who indicate undeviating negative or positive attitudes for situational variables and all items of equipment alike, seem to have world views somewhat different from those respondents who express preferences for some items of equipment as opposed to others, and who find some situational variables acceptable and not others.

Each piece of equipment such as fatigues, combat boots, etc., or situational variables such as weather, insects, etc., is referred to as a "topic." While there were eleven equipment topics and six situational topics, or seventeen in all, not all of these topics were treated by every respondent, and two of the equipment related topics were each treated as two topics. One of the complications of this study was the fact that the troops in each of the three locations tested were exposed to different kinds of equipment. This necessitated the establishment of three groups of topics (refer to Table 3): (1) Common Topics - there were nine topics which were treated in exactly the same way by the entire sample population; (2) Non-Combatant Topics - these were six topics included in the booklet administered to that part of the sample classed as non-combatant, or the troops in Panama and Hawaii; (3) Combatant Topics - four topics which related to equipment that only troops having recently been to Viet Nam would have had experience with were included in the booklet which was administered to the combatant population.

C. DIMENSIONS

Theoreticians are somewhat in agreement with the notion that a one item inquiry is very unreliable. If one item were to be used to assess the

TABLE 3

TOPICS CLASSIFIED BY TYPE AND BY POPULATION FOR WHICH THEY WERE USED

	<u>Type of Topic</u>	
	<u>Equipment</u>	<u>Situational</u>
Common to Non-Combatant and Combatant	Fatigues	Weather
	Poncho	Insects
	Jungle Boots	Water
	Combat Boots	
	Poncho	
	Canteen	
Non-Combatant	Meals	Officers
	Combat Boots (T)	Entertainment
	Pack	Family
Combatant	"Tiger Suit"	
	Hammock	
	Poncho Liner	
	Rucksack	

attitudes of troops toward a piece of equipment, what would be the nature of the item? In all probability it would have to be a general (global) sort of item in the "how well do you like your boots" category. Certainly information of this sort would only leave the Army a lot of room for speculation. If design changes were to be made as a result of global information of this sort, there is some question as to how the data could be used to determine what design changes should be made. For the very pragmatic reasons mentioned above and for reasons treated much more extensively in Volume II, dimensions and different levels of dimensions were identified whereby the various aspects of a piece of equipment could be examined in a systematic manner. Not every topic is represented by an equal number of levels of dimensions, and not every dimension within a level is treated similarly. This was not because they were not important enough but that the technique was somewhat developmental in nature and only a limited amount of time could be spent with this particular problem. However, some of the topics were broken down into several items, each item representing a particular dimension on a particular level. These items range from very general to quite specific and relate to one another in such a way as to permit one score to be calculated from all of the responses of a subject pertaining to a single topic. These scores are referred to herein as topic scores.

Tables 4, 5 and 6 list all of the topics and under each topic all of the dimensions are represented in the three different levels. Briefly, each cluster of lower level dimensions is supposed to represent the attitudes which summate to become the attitude represented by the appropriate dimension at the next higher dimension. Again, for a more exhaustive treatment of this problem the interested reader is referred to Volume II.

TABLE 4
 STRUCTURE OF TOPICS INTO LEVELS OF DIMENSIONS
 FOR THE NINE COMMON TOPICS

<u>Topic</u>	<u>Dimension</u>	<u>Level</u>
Fatigues	Global	1
	Comfort	2
	Durability	2
	Protection	2
	Camouflage	3
	Insects	3
	Underbrush	3
Poncho (S)	Global	1
	Durability	2
	Protection	2
	Comfort	2
Jungle Boots	Global	1
	Comfort	2
	Traction	2
	Durability	2
	Cracking	3
	Rotting	3
	Stitching	3
Combat Boots	Global	1
	Traction	2
	Protection	2
	Durability	2
	Cracking	3
	Rotting	3
	Stitching	3

TABLE 4 (Continued)

<u>Topic</u>	<u>Dimension</u>	<u>Level</u>
Canteen	Global	1
	Portability	2
	Durability	2
	Capacity	2
Poncho (T)	Global	1
	Durability	2
	Protection	2
	Comfort	2
	Fit	3
	Movement	3
	Temperature	3
Weather	Global	1
	Temperature	2
	Humidity	2
	Rainfall	2
Insects	Global	1
	Quantity	2
	Danger	2
	Annoyance	2
Water	Global	1
	Availability	2
	Healthfulness	2
	Taste	2

TABLE 5
 STRUCTURE OF TOPICS INTO LEVELS OF DIMENSIONS
 FOR THE SIX NON-COMBATANT SPECIFIC TOPICS

<u>Topic</u>	<u>Dimension</u>	<u>Level</u>
Meals	Global	1
	Variety	2
	Quantity	2
	Quality	2
	Taste	3
	Greasiness	3
	Preparation	3
Combat Boots	Global	1
	Traction	2
	Protection	2
	Durability	2
	Cracking	3
	Rotting	3
	Stitching	3
Pack	Global	1
	Durability	2
	Capacity	2
	Comfort	2
	Weight	3
	Fit	3
	Movement	3

TABLE 5 (Continued)

STRUCTURE OF TOPICS INTO LEVELS OF DIMENSIONS
FOR THE SIX NON-COMBATANT SPECIFIC TOPICS

<u>Topic</u>	<u>Dimension</u>	<u>Level</u>
Officers	Global	1
	Experience	2
	Common sense	2
	Understanding	2
Entertainment	Global	1
	Quantity	2
	On-base	2
	Off-base	2
Family	Global	1
	Authorization	2
	Quarters	2
	Acclimation	2

TABLE 6

STRUCTURE OF TOPICS INTO LEVELS OF DIMENSIONS
FOR THE FOUR COMBATANT SPECIFIC TOPICS

<u>Topic</u>	<u>Dimension</u>	<u>Level</u>
Tiger Suit	Global	1
	Comfort	2
	Durability	2
	Protection	2
	Camouflage	3
	Insects	3
	Underbrush	3
Hammock	Global	1
	Portability	2
	Protection	2
	Durability	2
Poncho Liner	Global	1
	Portability	2
	Durability	2
	Protection	2
Rucksack	Global	1
	Durability	2
	Capacity	2
	Comfort	2
	Weight	3
	Fit	3
	Movement	3

D. DATA COLLECTION INSTRUMENTS

A rationale and some supporting data are presented in Volume II for the use of a multi-technique data collection instrument. The purpose of this section is not to defend but merely to briefly describe the procedures and techniques whereby the attitudinal data were collected.

Several techniques were used, ranging from a highly structured "Objective" questionnaire in which the subjects were forced to select one of seven positions on a scale, to a completely unstructured "Subjective" technique in which the respondents were provided blank cards with the words "Your Comments" at the top. Some of the techniques were mostly exploratory in nature and their effectiveness is described in Volume II. The techniques from which the bulk of the attitudinal data described herein were drawn, are derived from three main sources: (1) the Osgood questionnaire, (2) a Sentence Completion and Listing booklet, and (3) "Your Comments" cards.

1. OSGOOD QUESTIONNAIRE

The Osgood questionnaire contains 93 items in the non-combatant booklet and 84 items in the combatant booklet. The items were constructed using a modified Semantic Differential scaling technique. Each item is composed of a two-part statement, the first part containing a substantive element and the second (evaluative) part is represented by polar adjectives or descriptive phrases on a seven point vertical scale.

For example:

10. For this climate and terrain
jungle boots are:

Very poor ----- ()
----- ()
----- ()
----- ()
----- ()
----- ()
----- ()
Excellent ----- ()

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.

2. SENTENCE COMPLETION AND LISTING

The Sentence Completion booklet contains 22 items covering 20 different topics. Each item consists of a word or phrase of a partial sentence which the respondent is asked to complete. For example:

My jungle boots _____

This particular technique may be used to structure either content or tone leaving the respondent a greater or lesser degree of freedom. The example above illustrates the case where content is partially structured, i.e., the topic of jungle boots to which a subject is asked to address himself has been specified, and tone is unstructured in that he may choose any tone he desires in responding. The subject may choose to respond in terms of a specific dimension or dimensions of the topic in question. Another case is one in which a tonal structure is provided and the respondent is expected to provide topical structure to the sentence.

Data reduction of Sentence Completion data must be characterized with the same care and precaution which characterizes the development of Objective items. The responses must be analyzed for both content and tone, and it must be done by experts who have been carefully trained to be as objective as the situation permits. Once a content area has been identified it is rated on a seven point scale for tone. Consequently, the tonal ratings of specific content or topical areas may be compared with the subject's responses to the same topic on the Objective questionnaire. The two major advantages of this technique are: (1) it increases the probability that the responses obtained reflect the kinds of attitudes which are most salient to the respondents, and (2) it provides a criterion measure upon which to validate the Objective measuring instrument.

The Listing technique is very straightforward. The respondent is asked either to list three dimensions he likes or dislikes about a certain topic, or he is asked to list three topics which are acceptable or unacceptable with respect to a particular dimension. This technique provides an excellent measure of saliency which allows the investigators the opportunity of determining whether the proper topics and dimensions of topics have been included in the rest of the assessment techniques.

3. "YOUR COMMENTS" CARDS

Three blank cards except for the words "Your Comments" at the top were inserted at strategic points within the Osgood questionnaire. The respondents were told that the investigators recognized that the questionnaire might not include items which represented all of the items of equipment and

their different dimensions which were important to them. Therefore, the blank cards were provided so that they could express in their own words their feelings about anything that had or had not been included in the questionnaire. The "Your Comments" responses were reduced and analyzed in the same manner as the Sentence Completion items.

The purposes for inclusion of this technique were two fold: (1) such a completely open ended technique as this, included in the middle of a completely structured technique as the Osgood, seems to offset the frustration experienced by some subjects when forced to choose alternatives not of their own making, resulting in better rapport, and (2) it provided another saliency measure.

E. BASELINE DATA

Two of the equipment topics were treated in such a way as to allow the troops to be their own control group. Obviously, if one of the primary interests of the project is to assess the effects of the tropical environment upon equipment related attitudes, then some data must be acquired from troops not located in the tropics. While neither time nor budget permitted the acquisition of data from a control group, and although the data collected will not be as reliable as it would be if collected from a bona fide control group in a temperate zone, the respondents were required to rate the same topic couched in two different time domains. For example, each item relating to poncho appeared in the questionnaire twice. One time the individual was to express his attitude toward the poncho in terms of its effectiveness in the tropics, and the other time he was to express his attitude toward the poncho in terms

of its effectiveness when he used it in the United States. Essentially, the items pertaining to poncho received two ratings which could be systematically compared, one for tropical use and one for use in a temperate climate. This comparison, in a very gross way, allowed some interpretations as to the effects of the tropics on the attitudes of troops. While this approach has the advantage of a one group - two condition experimental design and is therefore not subject to the "equal groups" assumption, there are other problems which perhaps are more serious. For example, the assumption is made that by phrasing the items in a Stateside context the subjects will respond as they would if they were in the States. Also, their attitudes about conditions as they used to exist back in the States might very well be affected by the "grass is greener" phenomenon. In short, the present investigators view this technique as rather limited, probably not as valid as actually testing groups in a temperate zone, but better than no control group at all.

The two topics used for the zonal control were "Poncho" and "Combat Boots." For "Poncho," both tropics and Stateside treatments are included in the nine common topics, such that all of the sample received both treatments. For "Combat Boots," only the Stateside treatment was included in the nine common topics and the tropics treatment appeared in the non-combatants booklet because the majority of the Viet Nam returnees had not worn combat boots at all while on their six months' tour. Hereafter the two treatments, "Stateside" and "Tropics" of the two topics shall be differentiated by the letters (S) for Stateside and (T) for tropics, appearing after the topic name.

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CHAPTER FOUR

RESULTS

Each of the seventeen topics is treated separately in this chapter. Although the situation related topics were included in the present study primarily to assist with the assessment of equipment related topics, they are also discussed independently in the latter portion of this chapter.

The results are discussed in terms of the total sample first, such that the attitudes which represent what the troops in general think about the effectiveness of their equipment as it is used in a tropical environment might be identified. Once the over-all picture is discussed the data is examined for possible relationships between tropical locations. Tables 14, 15 and 16 which contain the means and standard deviations of all topics for all of the sub-groups within each of the three tropical locations, are found in the Appendix.

In the final portion of this chapter the various implications suggested by the results are discussed in detail. The items of equipment and their characteristics which appear to be acceptable are identified, and those items of equipment and their characteristics which have been found to be unacceptable by the troops are discussed in terms of the possible alternatives available to correct the situation.

A. EQUIPMENT TOPICS

I. FATIGUES

a. Total Population Attitudes

Over-all, troops in the tropics may be characterized as being displeased with their fatigues. Though the over-all topic rating given fatigues is just below the Hypothetical Neutral on the seven-point attitude rating scale, there were a number of specifics focused upon in both the Objective and Projective data which indicate troop dissatisfaction with the fatigues in the tropics.

"Durability" and "Comfort" were both felt to be lacking in the standard issue fatigues. The men were uniformly convinced that the fatigues did not hold up under tropical conditions, particularly when subjected to launderings of unusually high frequency. When the respondents were asked to list the three items of equipment that wear out quickest in the jungle, fatigues were identified as being the least durable item of issue by a substantial margin. It was pointed out by some that this condition is accentuated by the rough treatment which seems to typify Army laundries.

Related to the requirement for repeated launderings is the fact that the current fatigues are too heavy. Therefore, the men sweat a great deal which in turn creates the need for frequent laundering. Though the Objective data portrayed in Figure 2 indicate a lesser degree of dissatisfaction with "Comfort" than with "Durability," the Your Comments cards data indicate that "Comfort" is probably at least as important and at least as lacking in the present fatigues as is "Durability." Over 140 respondents used the Your Comments cards to point out that the material used for fatigues is too heavy

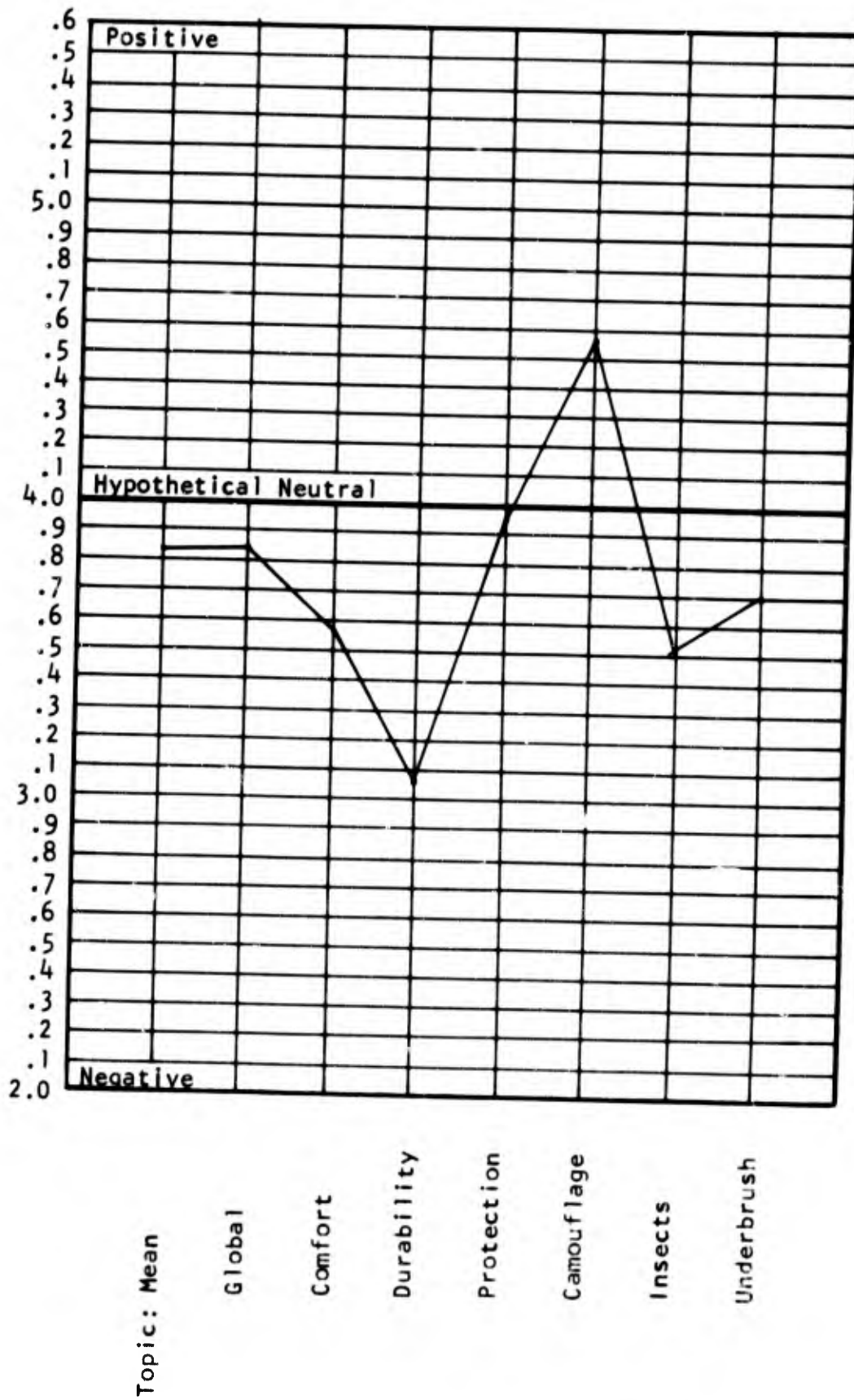


Fig. 2. Total Population Attitudes - Topic: Fatigues

and that they are too hot to wear in the tropics. A similar number of respondents made the completely unprompted suggestion that light weight, short sleeved fatigues be developed for garrison use. It was recognized by the troops that long sleeves are needed for use in the jungle, but a lighter weight material for the whole fatigue uniform was suggested. As a concomitant of the recommendation for short sleeved fatigue uniforms for garrison use, it was stated that the uniform would be made even more comfortable if the pants were not bloused.

The troops also used the Your Comments data to conclude that since the present fatigues are not durable and therefore require frequent replacement, that either their clothing allowances should be raised or more fatigues issued without cost to them.

The troops seemed to feel that the protective aspects of the present fatigue uniform are acceptable. The global response for "Protection" was right on the mean. The "Camouflage" protective characteristics of the uniform were highly regarded. The fatigues were believed to be somewhat more effective as protection against Underbrush than as protection against insects. In this latter regard, one respondent suggested that it might be wise to launder fatigues in some form of insect repellent.

b. Intra-Population Attitude Differences

Having portrayed the attitudes of troops in the tropics as a whole towards fatigues, it is useful to note the amount of relative agreement or disagreement among the various populations on the dimensions of fatigues which were studied. From a global standpoint the Panama group thought the fatigues

were less satisfactory than either the Okinawa troops or the Hawaii troops, in that order. This ordering was maintained for the objective responses on "Comfort" and "Insect Protection." The Hawaii group probably has a more positive attitude towards "Comfort" and "Insect Protection" because Hawaii has a more moderate climate and fewer insects than either of the other two locations.

For the "Durability" dimension, Panama maintains its position as having the most negative attitude, but Hawaii and Okinawa exchange places as holding the most positive attitude. This is also true for the broad dimension of "Protection" and the specific dimension of "Underbrush Protection." The Panama troops probably hold the most negative attitude on these dimensions because, insofar as limited observation permits, it seems that the Panama troops are more often exposed to the densest form of rain forests than the other two populations. Obviously, garment durability and protection are both functionally related to jungle density.

The remaining dimension treated by the Objective questionnaire, "Camouflage Protection," was rated very high relative to the other dimensions by both the Hawaii and Panama populations. However, in this instance the Okinawa group dissented and showed a markedly more negative attitude. This is interesting since the Okinawans have more combat experience, and specifically more experience in Viet Nam than do either of the other populations. Therefore, it appears possible that the judgment of the Okinawa troops is more salient on this issue even though the question was cast in terms of "Camouflage Protection" in the respondents' present location.

c. Summary

In summary, the troops in the tropics want a cooler, lighter weight and more durable fatigue uniform for use in the jungle. They believe the present uniform is deficient in these respects. Also, a large number of respondents feel that a short sleeved fatigue uniform for use in garrison is needed. By and large, the protective aspects of the present uniform are considered acceptable, but some improvements in insect and underbrush protection would be desirable.

2. PONCHO

a. Total Population Attitudes

Troops in the tropics were queried as to their attitudes towards the poncho both in the tropics and back in the States. This was done because data collected in the first phase of the project indicated that there appeared to be a substantial difference in the way the poncho was viewed in the States and in the tropics. The troops were asked the same broad dimensional question on "Durability," "Protection" and "Comfort," relative to the poncho in both locations. Also, the specific dimensions of "Fit," "Movement" and "Temperature," subsumed under "Comfort," were investigated.

Examination of Figure 3 shows a clear-cut difference between the attitude towards the poncho in the States and tropics. In every case, the attitudes are more positive towards the poncho in the more temperate region. "Comfort" is the only dimension for the population as a whole that falls below "Hypothetical Neutral" (4.0) for the poncho in the States. On the other hand, when viewed as an item of personal equipment to be used in the tropics, only

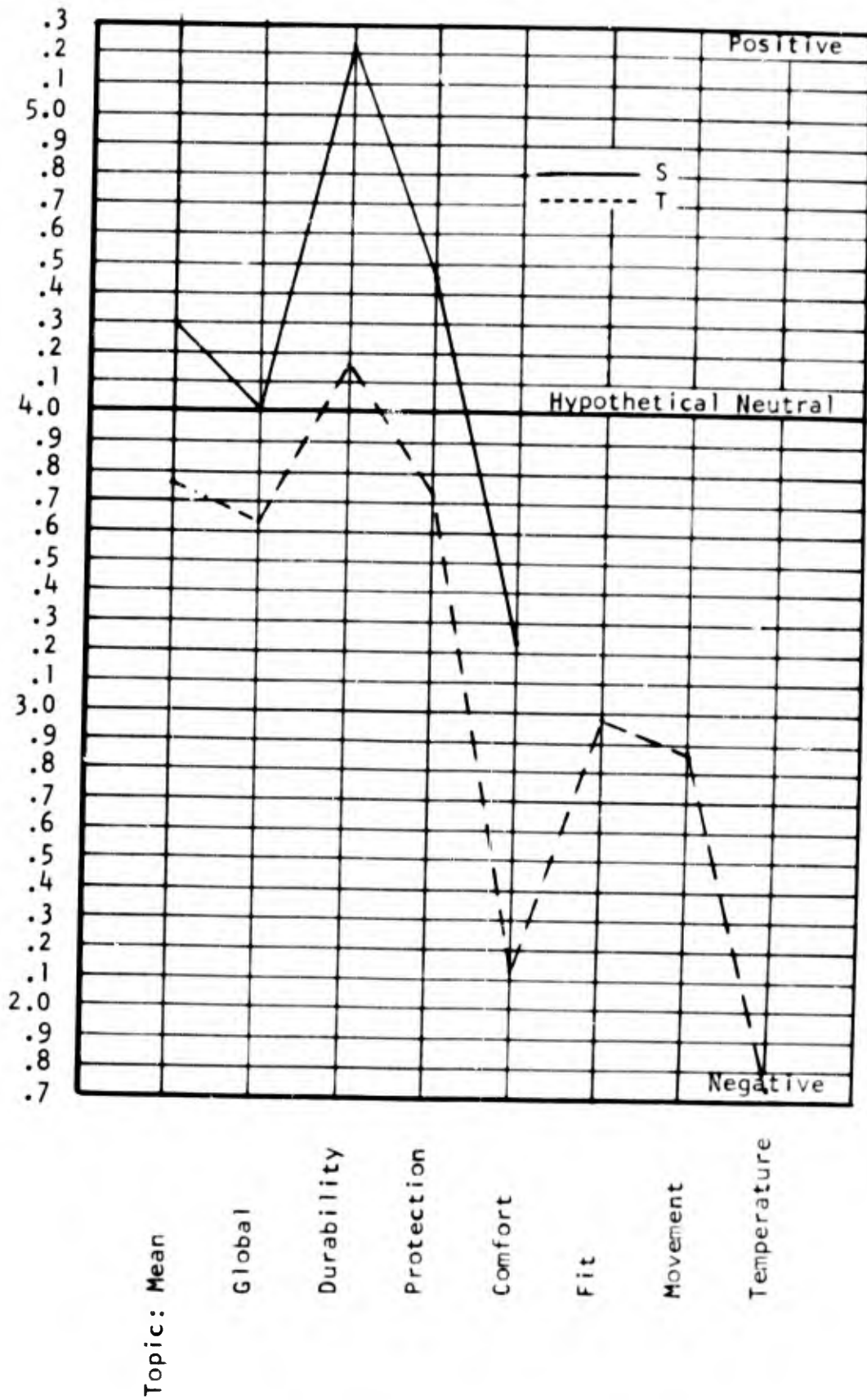


Fig. 3. Total Population Attitudes - Topic: Poncho

one dimension, that of "Durability" was above 4.0. For the three dimensions and the global mean that correspond on the two graphs, it can be seen that the curves follow one another very closely with an average difference of about 0.8 separating the curves.

The best liked feature of the poncho for both locations was its "Durability." Comments made on the Your Comments cards and Sentence Completion items concerning the poncho as an item of apparel in the jungle indicate that its desirability is diminished because of tearing on the underbrush. Evidently, this condition is not too acute since the poncho was ranked sixth by respondents asked to rank order the items that wear out most quickly in the jungle. It is evident from the data in Figure 3 that the Stateside "Durability" of the poncho is great.

The dimension "Protection" was felt to be somewhat more negative than that of "Durability." Responses elicited by the Projective techniques show the main area of dissatisfaction in that the legs and feet become wet very quickly due to its short length. Over-all, the "Protection" afforded by the poncho under Stateside conditions was deemed adequate while that offered under tropical conditions was deemed inadequate.

The evaluation of the responses to items on "Protection" is complicated by the fact that the protective aspects of the poncho are frequently exploited for non-apparel purposes. Two hundred two respondents used the Sentence Completion technique to comment on other uses of the poncho. The principal uses cited were as a shelter, sleeping wrap, ground cover and raft. There was a very strong positive attitude towards the poncho for these

non-apparel uses. Some respondents used the Your Comments cards to indicate that while the poncho was poor as a jungle garment, it was invaluable as a general purpose, protective device. Okinawa troops, in particular, tended to emphasize the utility of the poncho for just about everything in the jungle except a garment. The degree of utility of the poncho is still further emphasized by the fact that when asked to rank order the items of personal equipment of most value in the jungle the poncho was deemed the third most valuable of 22 items identified by the total population.

"Comfort" was categorically and strongly found to be unacceptable, both in the States and in the tropics. The three "Comfort" dimensions, "Fit," "Movement" and "Temperature," were all rated quite negatively but "Temperature" was by far the lowest of the three with an overall mean of 1.75. This Objective data is strongly supported by the Projective data in that 339 Sentence Completion responses focused on the "Comfort" of the poncho. Only two of these comments were positive. Likewise, the sweating induced by the poncho when worn as a garment was frequently mentioned in the Your Comments cards.

b. Intra-Population Attitude Comparisons

The Panama and Hawaii populations expressed more positive attitudes towards the poncho in a temperate zone (back in the States) than in the tropics. The Okinawa troops, however, gave the edge to the poncho in the tropics. Viewed as an item of personal equipment for use in the tropics the Okinawa troops had the most positive attitude, the Hawaii troops the second most positive attitude and the Panama troops the least positive attitude. Analyses of variance computed among the three populations comprising the sample show a

decisive (.01 level) difference in attitude toward the poncho both in the tropics and in the States. For use in the States, the Panama group viewed the poncho most favorably followed by the Okinawa and Hawaii groups.

It is interesting to note that the more militarily experienced troops on Okinawa who expressed the highest degree of acceptance for the poncho in the tropics, also used the Projective techniques to stress why they felt as they did about the poncho. They used the Your Comments cards to comment on the "other uses" of the poncho more than any other poncho dimension. Furthermore, they rated the poncho as the most valuable piece of personal equipment in the jungle.

The Hawaii group also rated the poncho as the most valuable piece of personal gear in the jungle, but did not stress its multi-purpose nature quite as much. The Panama troops were not quite so enthused about the poncho in the tropics as were the other two samples. When the fact that the Panama group gave the poncho the highest rating back in the States is coupled with the fact that they did not stress the "other uses" as much as did the other two samples, it seems reasonable to infer that the Panama group viewed the poncho more as a rain garment than as a general purpose protective covering. Even so, it is still possible to conclude that while the poncho is uncomfortable and does not afford optimal protection as a garment its durability and versatility make it a very desirable part of the tropical soldier's personal equipment.

c. Summary

In summary, it may be stated that the poncho is regarded favorably with respect to durability and protection in temperate regions. However, even under such conditions it is not comfortable as a garment. In the tropics the poncho is very poor as a garment because it causes excessive sweating. However, when viewed as a general purpose protective device its uses are manifold and the troops like it very much. Some troops went on to suggest that for rain protection in the jungle a loose fitting rain suit would be valuable.

It would seem that there are several possible ways to improve upon the undesirable aspects of the poncho and still retain its desirable features. One approach would be to provide the poncho with better ventilation for comfort and to lengthen it somewhat for protection of the lower legs as a rain garment. Another possibility would be to develop a light, loose fitting, well ventilated rain suit for weather protection and also furnish the troops with a general purpose protective cloth made out of the material which is currently used for ponchos.

3. JUNGLE BOOTS

a. Total Population Attitudes

The global attitudes as well as specific attitudes towards the "Comfort," "Traction" and "Durability" of the jungle boot were probed. Also, the broad dimension of "Durability" was further explored with respect to "Cracking," "Rotting" and "Stitching." Examination of Figure 4 clearly shows that the overall attitude of tropical troops towards jungle boots is favorable.

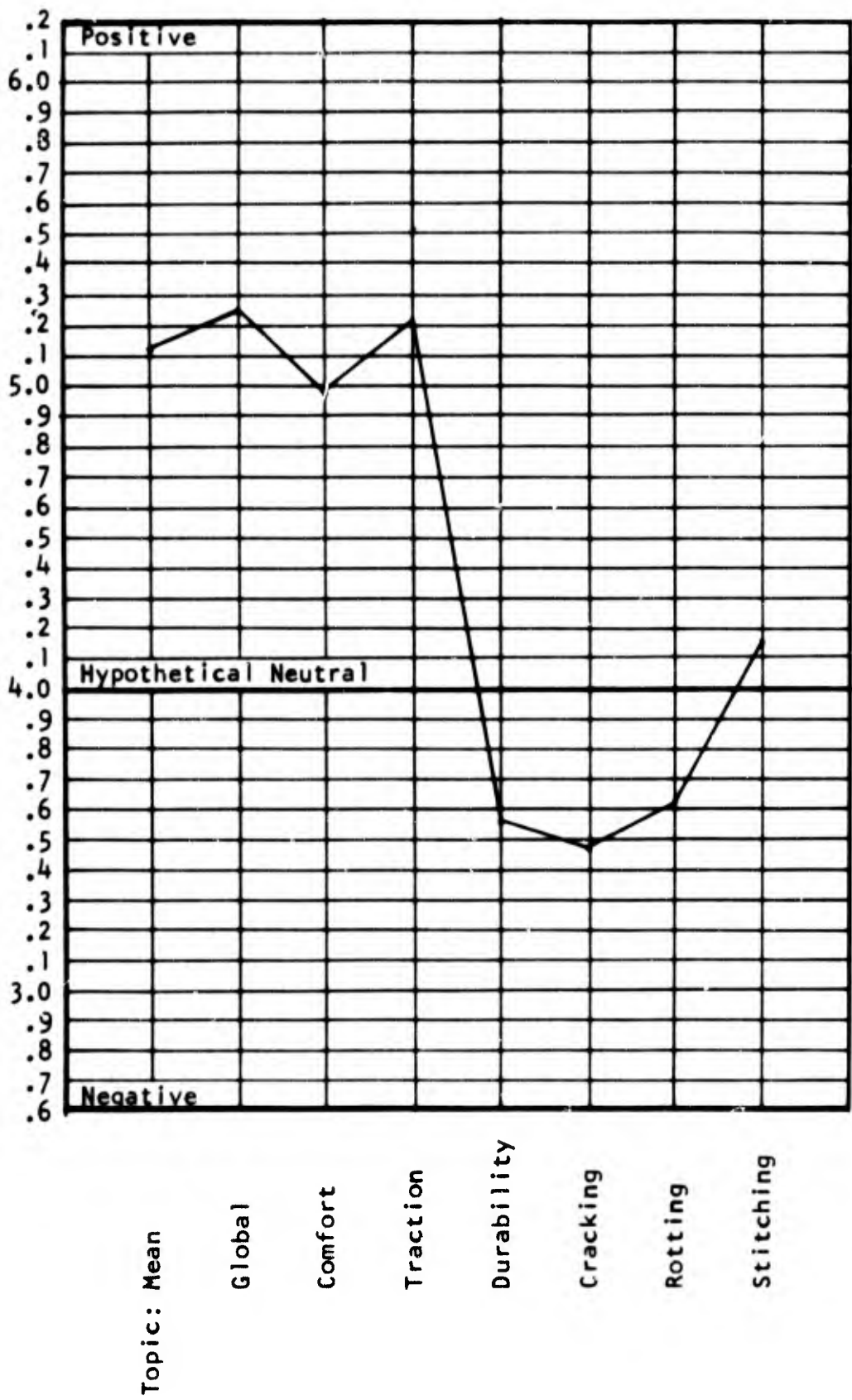


Fig. 4. Total Population Attitudes - Topic: Jungle Boots

That jungle boots achieved a topic score of 5.25 which is the second highest topic score for the non-combatant population and the third highest for the combatant population emphasizes the degree of acceptance of this item. It is obvious from Figure 4 that the "Comfort" and "Traction" of jungle boots are highly regarded. The functional utility of the jungle boot is also great since they were ranked fourth by the total population as the item of personal equipment of most value in the jungle. It is also evident that the jungle boot is deficient with respect to "Durability." "Cracking" is reported as the biggest durability problem followed closely by "Rotting." Though the over-all "Durability" of the jungle boot is viewed negatively, the specific aspect of "Stitching" is acceptable.

The simplicity and straightforwardness of these findings are confused somewhat by the fact that after the field data collection was begun, it was discovered that several generations of jungle boots were in use. The troops were asked to identify the type of jungle boots their ratings applied to on the Your Comments cards, but limited cooperation made it difficult to ascertain the distributions within populations for the different types of boots. As best the experimenters could tell, from the data obtained, the majority of the respondents who had used jungle boots expressed their attitudes in terms of the older type. The older type were characterized as having a buckle at the top of the boot rather than laces. Your Comments cards data indicated that while these older boots were a help in jungle terrain, they deteriorated rapidly. Sentence Completion responses relating to "Durability" focused on soles cracking and heels coming off. The consensus of the troops concerning the old jungle boot as set forth in the Your Comments cards

was that the design was acceptable but the materials used were not durable enough. Further light was shed on this matter by oral comments made by some respondents following the administration of the attitude battery. It was stated that part of the problem with the old jungle boot stemmed from the fact that they had been in storage for years in many cases and had experienced deterioration as a result of this storage.

Over-all, the jungle boots were deemed as a valuable asset to troops functioning in a jungle environment. The only major area of negative attitude was that the boots were not durable enough. Your Comments cards data indicate that the new jungle boots are somewhat more durable than the older variety but still lack sufficient durability. Indeed, several respondents indicated that two weeks of hard field use completely finished a pair of new jungle boots. Soles cracking and heels coming off still seem to be the major problems. Negative comments by troops having the older type boot without drain holes and the absence of complaints relative to drainage in the new boot indicate acceptance of this feature. Some troops felt the boots should offer better arch and ankle support and others stressed that better water repellency characteristics should be incorporated into the design of the boot.

b. Intra-Population Attitude Differences

Examination of the Objective questionnaire data furnished by the three populations shows a marked similarity between the Panama and Hawaii population attitudes towards the jungle boot. Both populations yielded an over-all topic score of approximately 5.05 which indicates a substantial

degree of acceptance. Both populations also expressed positive attitudes towards the "Comfort" and "Traction" of the boots, though in both cases "Comfort" was somewhat less highly regarded than "Traction." Over-all, "Durability" was unacceptable to both populations, but more so to the Panama troops than the Hawaii troops as represented by a difference of 0.4. The troops in Panama also were more negative with respect to all of the specific aspects of "Durability." Both groups viewed "Cracking" as the worst problem followed by "Rotting" and "Stitching." The only aspect of "Durability" receiving an attitude rating above the mean of 4.0 for either group was "Stitching." Evidently, it presents the least severe aspect of the "Durability" problem among the dimensions probed.

Therefore, there is a good deal of concordance between the two populations in their evaluations of the jungle boot. As previously explained, these ratings apply largely to the older type jungle boots.

The Okinawa sample, who had the greatest percentage of new jungle boots, expressed a more positive attitude towards nearly all aspects of the jungle boots. The Okinawa topic score of approximately 5.35 indicates that the troops really like the jungle boots. "Comfort" and "Traction" were rated higher by Okinawa troops than by either the Panama or Hawaii groups, which is a possible indication that improvements have been made in the design of the newer type boot. "Durability" is still rated below the mean but is less negative than for either of the other populations. "Cracking" and "Rotting" are viewed as problems of equal magnitude by the troops in Okinawa. "Cracking" is shown to be less of a problem, but "Rotting," while much better than in Panama, is lower than the Hawaii group rating. "Stitching" is rated as being

above 4.6 so it presents no problem at all in the new boots.

c. Summary

Over-all, the troops in the tropics view the jungle boot as one of their most valuable pieces of equipment when in the jungle. High topic scores for all three geographical regions, a preponderance of positive (328) to negative (73) global Sentence Completion responses, and high saliency as a Your Comment topic all support this conclusion. The only area of real dissatisfaction is with the durability of the boot. The data support the assertion that the new type jungle boots have been improved in this regard but still require further improvement.

4. COMBAT BOOTS

a. Tota' Population Attitudes

As in the case of the poncho, troops in the tropics were called upon to express their attitudes about wearing combat boots in the tropics and about wearing them back in the United States. However, only part of the entire sample was provided with the opportunity to respond to both kinds of items due to the fact that very few combatant troops wore combat boots in the tropics. In short, the non-combatant population responded to "Tropics" and to "States" items, whereas the combatant population responded just to items pertaining to the use of combat boots in the United States.

Figure 5 shows that combat boots used in the tropics are viewed a great deal differently than they are for use in the United States. All of the mean differences of the several dimensions are large, with a range of

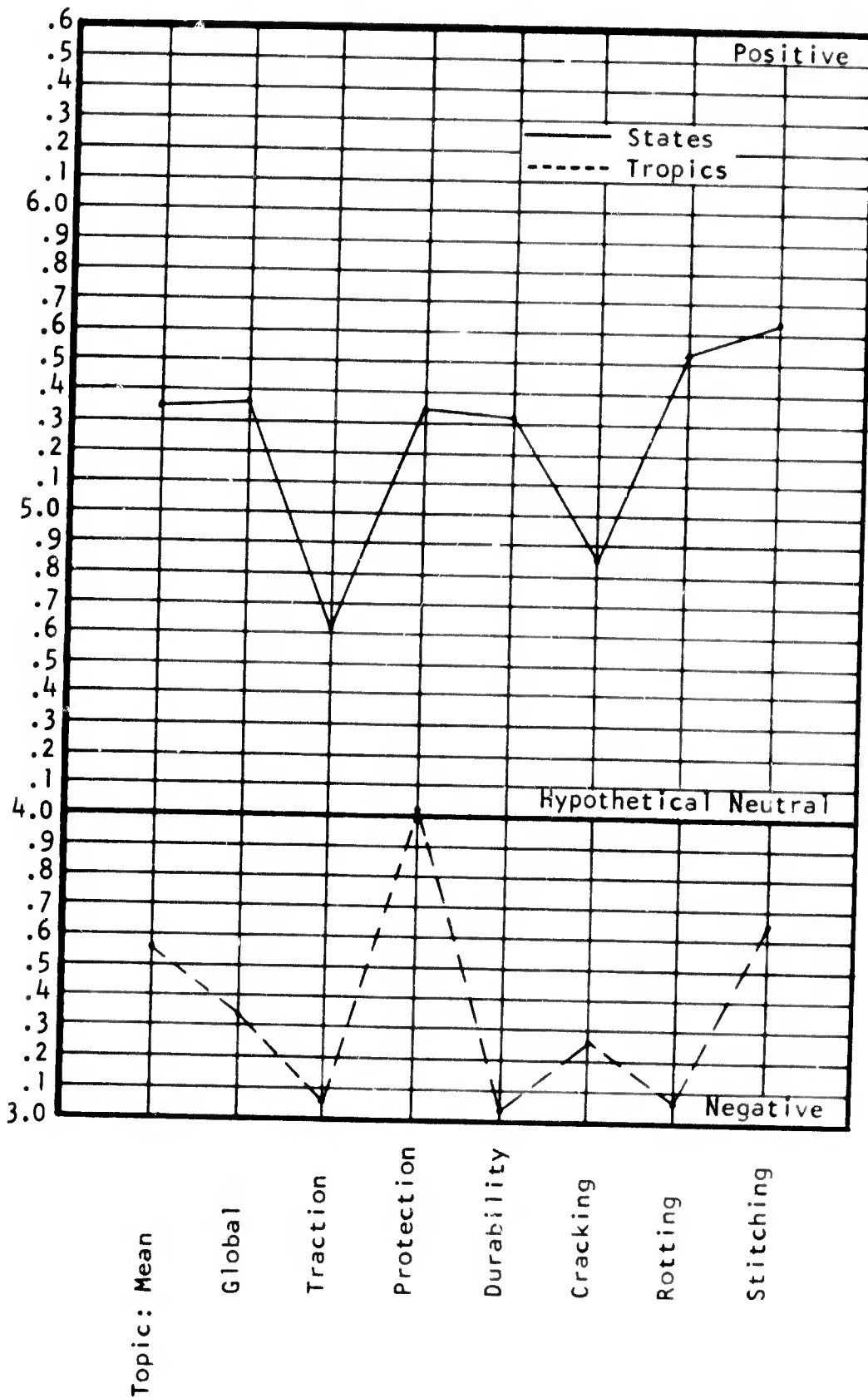


Fig. 5. Total Population (States) and Non-Combatant Population (Tropics) Attitudes - Topic: Combat Boots

differences from 1.3 to 2.4 and a mean of 1.8. All of the "States" dimension means are well on the positive side of Hypothetical Neutral. Except for "Protection" all of the "Tropics" means are clearly below Hypothetical Neutral. In short, the combat boots are quite acceptable for use in a temperate zone such as the United States, but are unacceptable for use in a tropical environment.

With a couple of exceptions the two curves vary together which indicates the inter-dimension relationships are somewhat the same for the tropics as for the States. In both cases "Traction" seems to be the least acceptable dimension and is considerably lower than the topic score. This data is supported by the data from the Listing technique which is displayed in Table 7. The respondents were asked to list three ways combat boots could be improved. The improvement for which there was by far the most agreement was "Traction."

While the combat boots provide adequate protection insofar as States use is concerned, the "Protection" dimension mean is no greater nor less than the topic or global mean. For tropics use "Protection" is the only dimension which is not viewed as negative by the population. Although the "Protection" mean is more neutral than positive, it is well above the topic mean or any of the other dimension means. The fact that on the Sentence Completion item only 23 comments, 16 of which were negative, were made about the "Protection" aspect of the combat boots seems to support the Objective data.

In both cases, States and tropics, "Durability" did not deviate far from its topic mean. In the United States "Cracking" was viewed as the least

TABLE 7

SALIENCY SCORES OF TOPICS IDENTIFIED BY
THE LISTING TECHNIQUENo. 25. Changes Which Would Make Combat Boots
Better For This Climate And Terrain

<u>Topic</u>	<u>Panama</u>				<u>Hawaii</u>		<u>Okinawa</u>	
	<u>Mech. Infantry</u>	<u>Airborne</u>	<u>Missiles</u>	<u>Special Forces</u>	<u>Infantry I</u>	<u>Infantry II</u>	<u>Special Forces</u>	<u>Total</u>
Sole - Traction	87	141	36	114	46	80	55	559
Vents, drainage and air circ.	52	37	29	53	44	39	58	312
Lighter weight	20	56	46	19	45	38	49	273
Waterproof	8	30	45	22	56	61	19	241
Better leather	31	20	20	23	27	22	12	155
Stronger sole and heel	29	26	10	12	32	12	16	137
Stronger Stitching	13	14	13	12	5	7	3	67
Zipper at side	12	1	3	1	2	10	25	54
Uppers - other material	3	6	3	10	10	12	7	51
Faster drying	-	5	-	9	7	10	12	43
Higher cut	2	1	13	6	6	4	9	41
Lower cut	5	1	13	2	4	12	3	40
Steel plate (sole)	-	-	-	9	7	5	14	35
Arch support	1	5	6	4	5	9	3	33
More flexible	-	10	-	2	4	3	11	30
Hard toe	-	-	6	6	10	5	1	28
Cushion innersole	3	1	1	3	5	5	4	22
Accessibility	-	2	1	7	6	2	2	20

positive sub-dimension of "Durability" while "Rotting" appears to be the greater factor in the tropics. In fact, Table 8 (Sentence Completion - Combat Boots) indicates that of the specific comments made about combat boots on the Sentence Completion item pertaining to combat boots, "Rotting" had the highest negative ratio. "Rotting" comments were made 53 times and every one of them was negative.

There were some other characteristics of combat boots which were not covered in the Objective instrument, but which the troops referred to in the less structured instruments. Three very salient dimensions which are represented in Tables 7 and 8 are "Ventilation," "Drainage," and "Weight." It was reported that combat boots are much too hot to wear in the tropics and need better ventilation. Also, once water gets into the boots (which is inevitable) there is no way for it to escape except when the boots are taken off. Another complaint of combat boots is their weight. The "Weight" dimension ranked third for saliency scores on the Listing technique and drew 53 negative to just three positive comments on the Sentence Completion item.

b. Intra-Population Comparisons

Generally speaking, there are few differences among the combat boot related attitudes of U. S. Troops stationed in Panama, Hawaii and Okinawa. Insofar as reporting upon the effectiveness of the combat boots when used in the United States, there was a slight difference between each of the groups, with the Okinawa group the least positive, the Panama group the most positive and the Hawaii group in between. It should be pointed out however, that even the least positive was above 5.0 which is a relatively high mean for a seven point scale. It is interesting to note that although the Okinawa group was

TABLE 8
 SENTENCE COMPLETION RESPONSES
 TOPIC: COMBAT BOOTS

<u>Topical Areas Identified</u>	<u>Responses</u>	
	<u>Positive</u>	<u>Negative</u>
I. Global*	453	169
II. Physical Characteristics		
Durability*	65	99
Rotting*	0	53
Soles	0	20
Heels	0	18
Waterproofing	2	32
III. Human Engineering Characteristics		
Weight	3	53
Support	3	17
Ventilation	4	49
Traction*	2	37
Protection*	7	16
Comfort	105	38
Fit	59	37
Too Hot	0	31
IV. Irrelevant		49

*Indicates inclusion of dimension in comparison of dimensions obtained from sentence completion analysis to dimensions included in the Objective questionnaire.

not called upon to respond to the Combat Boots (T) items the other two groups reversed their positions. The Panama group views the combat boots slightly more negatively than the Hawaii group. While the two groups have almost identical means for "Protection" and "Durability," the Panama group has noticeably lower means for the sub-dimensions of "Durability," "Cracking," "Rotting," and "Stitching." The fact that the two groups have similar means with respect to "Durability" and different means on the sub-dimensions might very well be explained by data collected from the more "unstructured" techniques and the situational topics.

The situational variable which seems to be most closely related to attitudes pertaining to the sub-dimension of "Durability" is "Weather." Examination of Table 9 clearly shows that the Hawaii group and Panama group differ significantly with topic means of 4.02 and 2.86 respectively. For the most part the troops stationed in Panama regard the weather there as wetter, hotter and more humid than do the troops in Hawaii. These attitudes appear to reflect actual conditions in Panama and Hawaii in that the mean temperatures are 80 degrees and 74 degrees respectively, and in Hawaii there is considerably less rainfall than in Panama. The conditions in Panama do seem to be more conducive to "Rotting," "Cracking" and "Stitching" problems than in Hawaii, which probably accounts for the lower sub-dimension means of the Panama group.

On the other hand, the means for "Durability" do not differ between the two groups, and based on the sub-dimension means the expectation is that the "Durability" mean for the Panama group would be considerably lower than the mean for Hawaii. A possible explanation of this might be the fact that

TABLE 9
 MEANS AND STANDARD DEVIATIONS OF THE NINE COMMON TOPICS
 FOR PANAMA, HAWAII AND OKINAWA

<u>Topic</u>		<u>Location</u>		
		<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>
Fatigues	Mean	3.58	4.21	4.00
	SD	1.60	1.66	1.53
	N	943	502	420
Poncho (S)	Mean	4.39	4.11	4.33
	SD	1.48	1.52	1.29
	N	941	499	419
Jungle Boots	Mean	5.04	5.07	5.35
	SD	1.46	1.47	1.17
	N	923	494	389
Combat Boots (S)	Mean	5.47	5.27	5.19
	SD	1.20	1.34	1.19
	N	941	495	419
Canteen	Mean	4.90	5.19	4.85
	SD	1.46	1.34	1.28
	N	941	502	420
Poncho (T)	Mean	3.55	3.80	4.20
	SD	1.57	1.59	1.34
	N	943	502	420
Weather	Mean	2.87	4.05	3.23
	SD	1.52	1.44	1.34
	N	942	501	420
Insects	Mean	2.12	3.21	2.72
	SD	1.15	1.54	1.33
	N	941	501	420
Water	Mean	4.64	5.50	3.88
	SD	1.50	1.30	1.40
	N	942	502	420

(S) Stateside
 (T) Tropics

the troops located in Hawaii occasionally trained in volcanic areas, and they reported that combat boots were torn to pieces by the volcanic rock. While a sub-dimension of this sort was not included in the Objective instrument it would appear this aspect of durability influenced responses to the "Durability" item.

c. Summary

It is apparent that the combat boots are regarded as quite acceptable in temperate zones such as the United States, and not acceptable for use in tropical environments. In the tropics, which has been the primary interest of this study, combat boots are unacceptable. Inasmuch as the troops are neutral with respect to the protective qualities of combat boots, the overall topic effects must be attributable to "Traction" and "Durability." In wet, humid, tropic rain forests the terrain provides a series of hilly, slippery obstacles which require soles designed for the maximum in "Traction." Many of the troops reported that they had soles with special treads put on their boots, but that while they were rather effective they came off too easily.

Combat boots are impossible to keep dry in the tropical rain forests due to the large amounts of rain and high humidity. These conditions led to a great amount of rotting not usually characteristic of combat boots, which greatly decreased the life of a pair of combat boots.

It would seem that the troops in the tropics are looking for a boot made of durable, light weight, rapid drying material with holes strategically placed to provide air circulation and water drainage, and which has durable soles and heels designed for maximum traction. Interestingly enough these

"desirable" characteristics appear to be found in the jungle boot issued by the Quartermaster and troops in the tropics find them to be quite acceptable. This fact supports the results obtained in the Combat Boots topic.

5. CANTEEN

a. Total Population Attitudes

One of the nine common topics was Canteen. The dimensions other than general acceptability which were investigated were "Portability," "Durability" and "Capacity." It will be noted from Figure 6 that every mean is positive with the topic mean slightly less than 5.0. The over-all acceptability of the canteen is further demonstrated by the fact that when all of the Topic Score means are rank ordered from most acceptable to least acceptable, Canteen is third out of fifteen possibilities for the non-combatant population and fourth out of thirteen for the combatant population.

Insofar as inter-dimension relationships are concerned, "Portability" is most positive and above the Topic Score and Global means, while "Durability" and "Capacity" are less positive in that order, and are both below the Topic Score and Global means. According to this data it would appear that troops in the tropics characterize the canteen as relatively easy to carry, acceptably durable and having a capacity which is just barely acceptable for use in jungle environment. Certainly Table 10, which portrays the canteen as second only to the machete insofar as important personal equipment used in the jungle, is strong supporting evidence of the acceptance of the canteen.

Although the frequency with which Canteen responses were made on the Your Comments cards was somewhat less than the most frequently mentioned

TABLE 10

SALIENCY SCORES OF TOPICS IDENTIFIED BY
THE LISTING TECHNIQUENo. 26. Pieces Of Personal Equipment Found To
Be Most Useful In The Jungle

<u>Topic</u>	<u>Panama</u>				<u>Hawaii</u>			<u>Total</u>
	<u>Mech. Infantry</u>	<u>Airborne</u>	<u>Missiles</u>	<u>Special Forces</u>	<u>Infantry I</u>	<u>Infantry II</u>	<u>Special Forces</u>	
Machete	80	90	86	92	50	83	32	513
Canteen & Cup	79	120	46	69	58	73	54	499
Poncho	13	24	43	102	66	86	81	415
Jungle Boots	54	48	27	16	31	13	24	213
Knife	31	22	14	33	28	18	32	178
Insect Bar	19	40	23	16	34	14	11	157
Hammock	-	-	-	66	-	-	60	126
Weapon	24	8	13	2	12	19	16	94
Compass	6	7	14	29	5	8	8	77
Pistol Belt	13	19	16	3	6	17	3	77
Soft Cap	17	23	5	10	1	4	9	69
Insect Repel.	2	10	18	2	12	8	-	52
Clean/dry clothes	-	3	19	3	11	8	5	49
Rope	15	2	6	7	6	5	3	44
Poncho Liner	-	-	-	-	-	-	42	42
Lt.Wt. Fatigues	4	-	-	4	2	-	28	38
Ent. Tool	3	9	7	1	7	3	6	36
Shelter Half	2	3	9	-	-	11	8	33
Bayonet	4	2	-	-	11	14	-	31
Rucksack	-	-	-	1	1	-	28	30

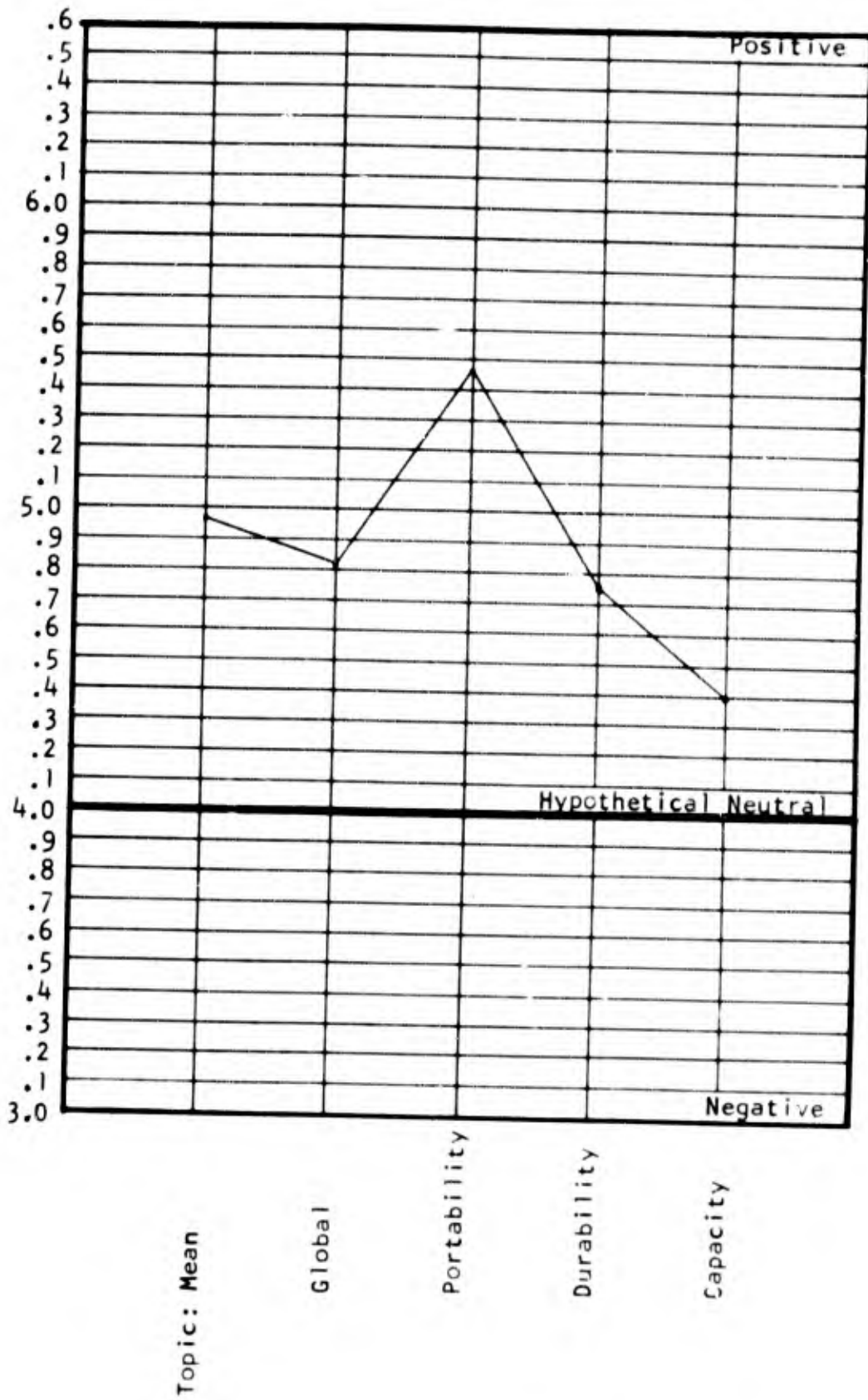


Fig. 6. Total Population Attitudes - Topic: Canteen

topics (Table 11) some commonly held notions were identified which the Objective technique precluded. For example, the attachment chain rattles and impairs safety, the metal corrodes too quickly, the stoppers are lost too quickly. While the Objective items did not differentiate between the metal and bladder type canteens, enough responses were made on the Your Comments cards to allow the general observations that: 1) capacity is even more acceptable than that for the metal canteen; 2) the water tastes better; 3) they snag and tear on bushes too easily; and 4) they are too difficult to fill.

b. Intra-Population Comparisons

For the most part, dimension acceptability of the canteen does not seem to be a function of tropical location. All of the dimension means for all three groups are above Hypothetical Neutral, and the inter-dimension relationships are practically the same for each of the three groups.

c. Summary

In summary, the canteen is a highly regarded item of equipment. It is easy to carry, quite durable, and generally holds a sufficient amount of water. Some suggested improvements are: the method of cap attachment should be improved so as to eliminate the noise caused by a rattling chain; the material of which the canteen is made should be changed in order to prevent metal corrosion and also to improve the taste of the water.

TABLE 11
 FREQUENCY OF "YOUR COMMENTS" CARDS RESPONSES BY POPULATION TO
 FOURTEEN SELECTED TOPICS

<u>Rank Order</u>	<u>Panama</u>	<u>Hawaii</u>	<u>Okinawa</u>
1	Fatigues	Fatigues	Jungle boots
2	Poncho	Poncho	Poncho
3	Army life	Meals	Fatigues
4	Meals	Army life	Canteen
5	Entertainment	Entertainment	Rucksack
6	Jungle boots	Jungle boots	Tiger suit
7	Officers	Combat boots	Army life
8	Canteen	Family	Combat boots
9	Combat boots	Officers	NCO's
10	Pack	Canteen	Meals
11	Family	Pack	Officers
12	NCO's	NCO's	Family
13	Rucksack	Rucksack	Entertainment
14	Tiger suit	Tiger suit	Pack

6. PACK

a. Non-Combatant Population Attitudes

The attitude of a sample of non-combatant, tropical U. S. troops stationed in Panama and Hawaii toward the pack were assessed relative to the broad dimensional areas of "Durability," "Capacity" and "Comfort." Specific sub-dimensions of "Comfort" were also probed. Those investigated were "Weight," "Fit" and "Movement."

Figure 7 indicates that, by and large, the troops found the pack acceptable relative to "Durability," slightly unacceptable relative to "Capacity" and highly unacceptable with regard to "Comfort." Examination of the Sentence Completion data confounds these rather obvious conclusions drawn from the Objective data since generally they contradict these inferences. There are, however, a substantially greater amount of negative than positive "Global" responses. (170 negative versus 92 positive) to the Sentence Completion items. Some of these unspecified negatives may account for a portion of the apparent contradictions. The three specific dimensions of "Comfort" displayed in Figure 7 are deemed more acceptable than "Comfort" itself. Therefore, it is concluded that there must be other salient aspects of "Comfort" which were not identified in the instrument, and which are viewed more negatively by the subjects than those which were rated.

By far the most favorably regarded aspect of the pack is its weight. This is supported by both the Objective and Sentence Completion data. There were some subjects who demurred via the Your Comments cards, but over-all the pack's weight was quite acceptable to the troops. "Fit" was found to be marginally unacceptable and "Movement" slightly more unacceptable. Sentence

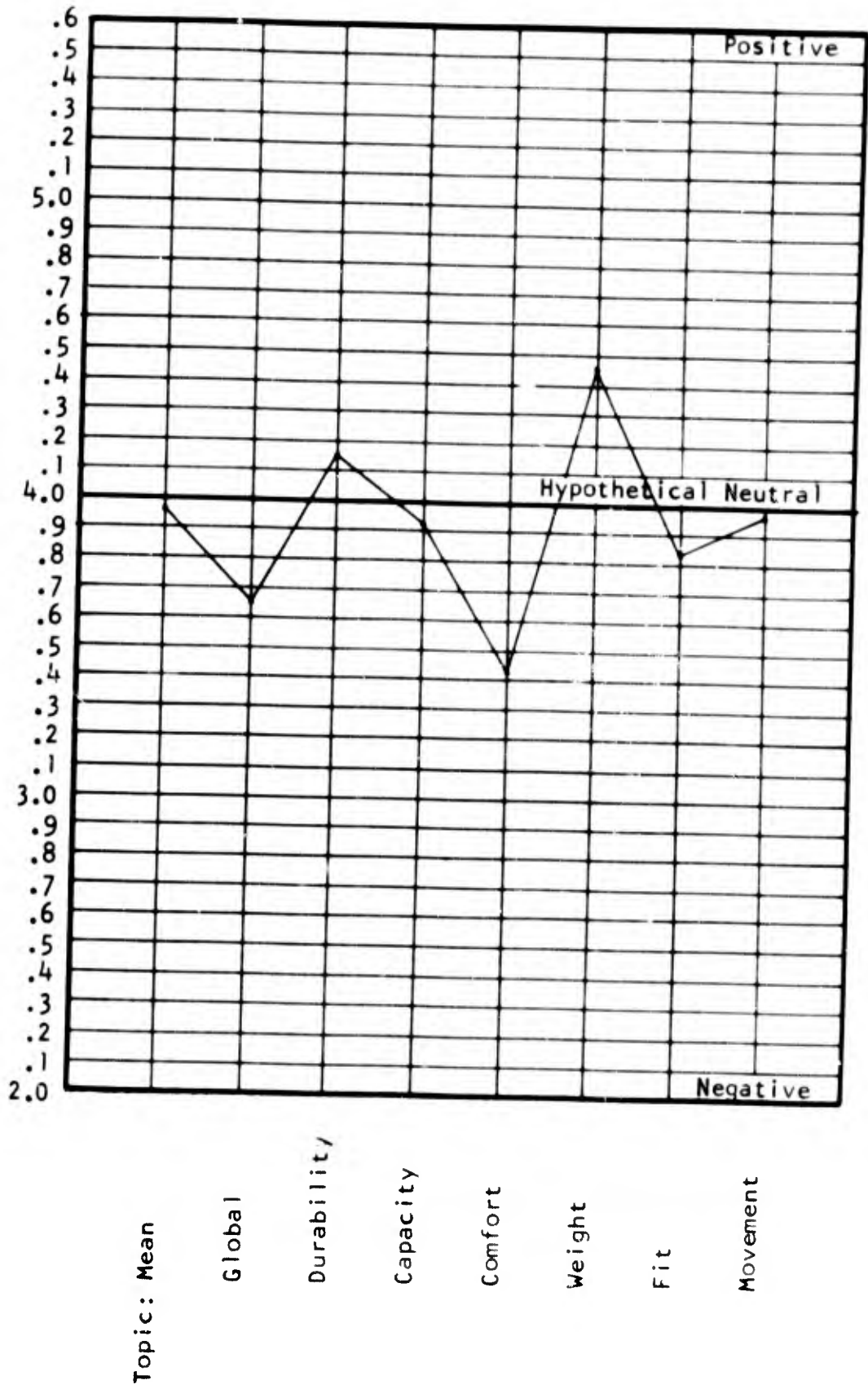


Fig. 7. Non-Combatant Population Attitudes - Topic: Pack

Completion responses on the dimension 'Movement' did not coincide (128 positive, 23 negative) with the Objective data. The extent of this disparity is great enough to introduce suspicion that perhaps some subjects' responses pertained to the rucksack rather than the pack. Though 'Movement' was one of the least positive dimensions of the topic 'Rucksack,' the fact that it had a mean of 4.32 implies a great enough degree of acceptance that if there was confusion in the minds of some persons whether the word 'Pack' was to be interpreted specifically or generically, some of the divergence between techniques might be accounted for by this confusion.

b. Intra-Population Comparisons

For the broad dimensional areas probed, 'Durability,' 'Capacity' and 'Comfort,' the U. S. troops stationed in Panama expressed more positive attitudes than did those stationed in Hawaii. Evaluation of the specific attitudinal dimensions of 'Comfort,' i.e., 'Weight,' 'Fit' and 'Movement' is mixed with the Hawaii troops being more positive with respect to 'Weight' and 'Movement' while the Panama troops regard 'Fit' more favorably than do the Hawaii troops. Over-all, it would appear the U. S. troops stationed in Panama find the pack more acceptable than do the Hawaii troops. The Topic Score for the Panama sample was slightly above Hypothetical Neutral while the Hawaii sample was slightly below this level. Global means for both populations are equivalent and indicate a lesser degree of acceptance (3.66) than do the Topic Scores.

c. Summary

Over-all, the pack is viewed by non-combatant tropical troops as being a borderline case relative to acceptability. Some contradictions in the data elicited by the various techniques complicates the interpretation of how the troops feel about this topic.

On the whole, it appears that the dimensions probed are marginally unacceptable excepting "Durability" and "Weight" which are acceptable and "Comfort" which is quite unacceptable. The fact that the Global mean for the non-combatant population is lower than all dimensions other than "Comfort" indicates that this dimension is of the greatest saliency to the troops. Therefore, it would appear that the most important improvement which could be made in the pack is to make it more comfortable to wear.

7. MEALS

a. Non-Combatant Population Attitudes

Attitudes of non-combatant troops towards meals were assessed by questioning the subjects with respect to the broad dimensional areas of "Variety," "Quantity," and "Quality" of food used in their mess halls. Specific dimensions of "Quality" which were also probed were: "Taste," "Greasiness" and "Preparation." These dimensions focused on the end product meal rather than the basic foodstuffs. Figure 8 shows that, on the whole, the broad areas probed are viewed positively, though marginally so, by the troops. It is also strikingly evident that there is a substantial disparity between the rating given the broad dimensional area "Quality" and the specific dimensions relating to "Quality," i.e., "Taste," "Greasiness" and

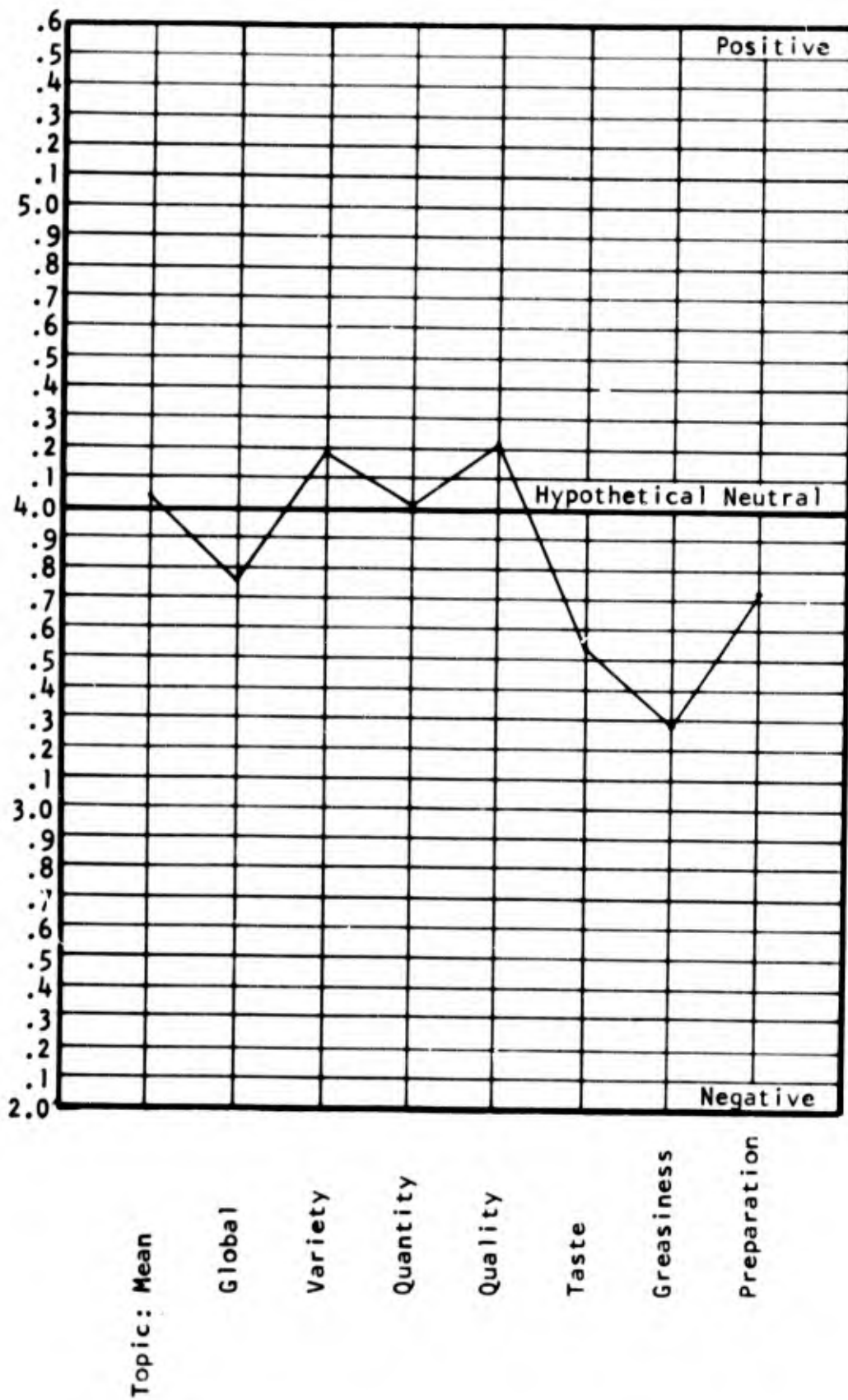


Fig. 8. Non-Combatant Population Attitudes - Topic: Meals

"Preparation." The reason for this disparity is that over-all, the troops find the basic foodstuffs purchased for their mess acceptable. What does elicit negative attitudes is the "Preparation" given this food. Obviously, "Preparation" varies from location to location, but on the whole, troops viewed it negatively. "Greasiness" elicited a good many negative comments, stressing that grease is particularly unpalatable in the tropics.

b. Intra-Population Attitude Comparisons

The Panama population viewed all dimensions relating to meals more positively than did the Hawaii population. A difference of .42 on the Global question and .51 on the Topic Score indicates a substantial difference between groups. It is interesting to note that though there is this absolute difference between populations, a comparison of the rank orders of dimensions for both locations shows only one reversal. "Quality" is most positive with "Variety" second in Panama while the opposite is true for the troops stationed in Hawaii. Therefore Figure 8 reflects very accurately the relative evaluations of the dimensions probed in both locations.

c. Summary

Over-all, the troops viewed the food purchased by the Army for their local mess halls as being acceptable. "Quality" and "Variety" were seen as being somewhat more acceptable than "Quantity" which was right on Hypothetical Neutral for the total non-combatant population, though unacceptable in Hawaii. "Preparation" and the dimensions related to it, "Taste" and "Greasiness" are viewed as being unacceptable by the troops. This assertion is substantiated

by both the Your Comments cards and Sentence Completion data. The most unacceptable facet of "Preparation" is the "Greasiness" of the food. It was emphasized by the troops that grease is particularly unpalatable in the tropics.

8. RUCKSACK

a. Combatant Population Attitudes

Combatant troops attitudes towards the rucksack were probed and found to be positive. Broad dimensional areas explored were "Durability," "Capacity" and "Comfort." Additional specific dimensions subsumed under "Comfort" which were investigated were "Weight," "Fit" and "Movement." The only dimension receiving an attitude rating below the neutral rating of 4.0 was "Weight." Even so, the 3.96 rating given this dimension does not reflect a significant degree of dissatisfaction. The general high esteem in which the rucksack is held is further attested to by the fact that the rucksack received the sixth highest attitudinal topic score for the 13 topics evaluated by combatant troops. Listing of personal equipment of most value in the jungle resulted in a rank order of twentieth out of 22 items. The fact that few other than the combatant group had any experience with the rucksack is probably a major factor in the lowness of this particular rating.

The interest in the rucksack was great enough to achieve a rank order of fifth out of 14 selected topics for Your Comments cards for the troops in Okinawa. Your Comments responses indicated acceptance of the rucksack. "Size," "Comfort" and "Waterproofing" were the major foci of these comments.

Examination of Figure 9 shows the most positive attitude towards the "Capacity" of the rucksack. Evidently, most of the troops believe that the rucksack's capacity is optimal. However, Sentence Completion responses which differentiated size from carrying space indicated that though the capacity was good the external size was too great. The "Durability" of the rucksack is also portrayed as being good by the troops on the Objective items but this conclusion is made somewhat dubious since the rucksack ranked seventh out of 12 pieces of equipment identified as wearing out quickly in the jungle. "Comfort," though acceptable, is the least favorable aspect of this piece of equipment's design. "Weight" and "Movement" are appreciably less acceptable than "Fit" as they relate to the comfort of wearing the rucksack.

b. Summary

Over-all, combatant tropical troops had very positive attitudes towards the rucksack as an item of personal equipment. Its "Capacity" is thought to be appropriate though it is too large externally, and it is thought to be quite durable. The "Comfort" of wearing a rucksack is acceptable, but not highly so. Specific aspects of "Comfort" which are poor relative to other aspects of the rucksack design are "Weight" and "Movement." The "Fit" of the rucksack is quite acceptable to the troops.

9. TIGER SUIT

a. Combatant Population Attitudes

The tiger suit is not an item of government issue to U. S. troops. There is no single manufacturer or source of tiger suits, but rather it is a generic term describing a light weight, camouflaged fatigue uniform. This

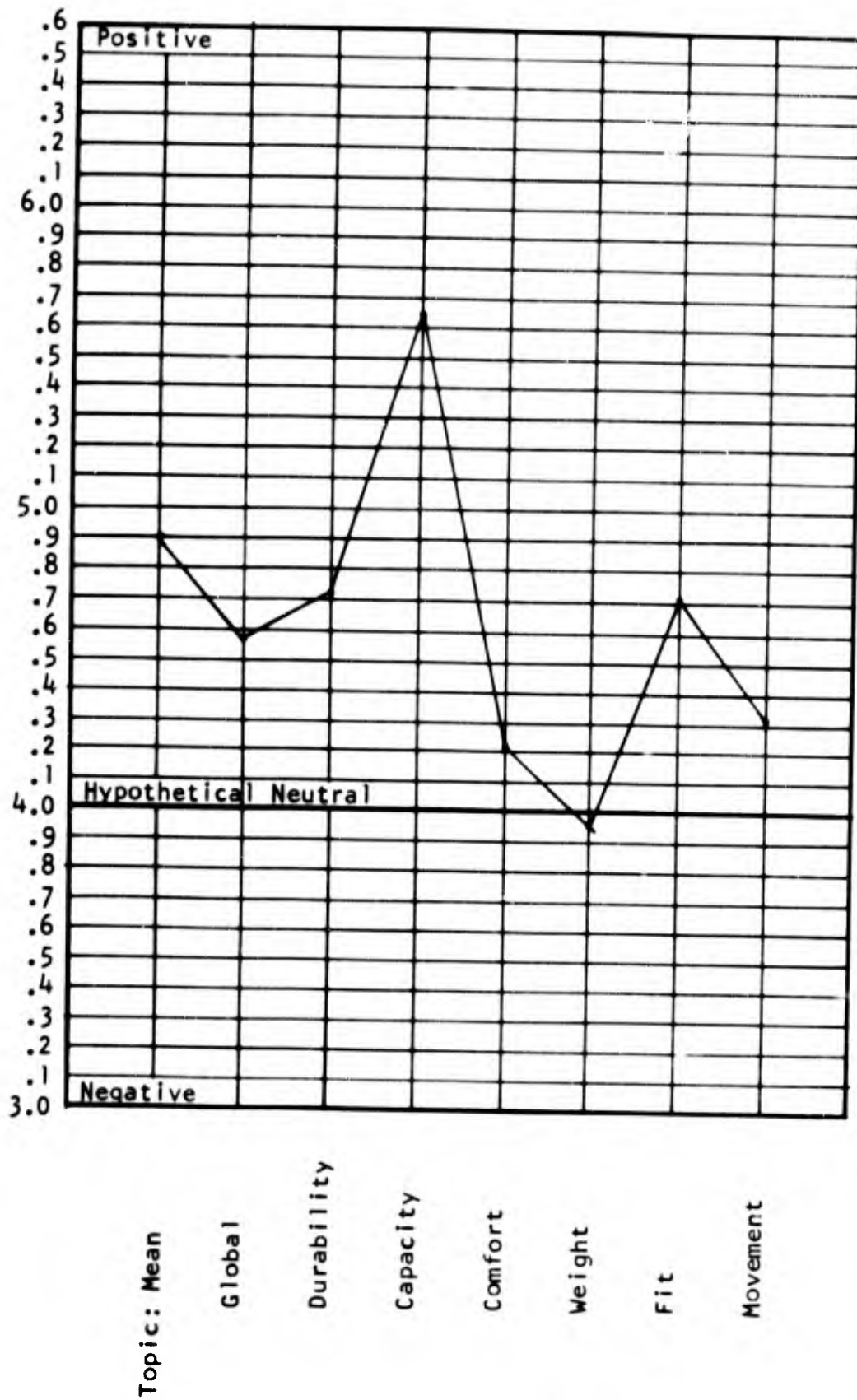


Fig. 9. Combatant Population Attitudes - Topic: Rucksack

topic was included in the study because during the early phases of the program it was found that a large number of personnel serving in Viet Nam purchased these items for use in jungle warfare.

Figure 10 clearly shows that the combatant troops have a very positive attitude towards the tiger suit. As might be surmised from the nature of the tiger suit, its "Camouflage" characteristics received the most positive attitude rating (5.48). "Comfort" also elicited a high positive attitudinal response. Comparison with the "Comfort" rating given fatigues in Figure 10 shows a striking difference in favor of the tiger suit. In fact, the highest dimension for fatigues, "Protection" (4.30), exceeds only the lowest two dimensions for the tiger suit, i.e., "Durability" and "Insects" (4.27 and 4.20). Therefore, while the relative "Durability" and "Insect" protection capabilities are not as highly regarded as other aspects of the tiger suit, it is clearly acceptable to the troops in all ways.

b. Summary

Comparison of the responses from the same population to identical questions regarding conventional fatigues and tiger suits shows a markedly more positive attitude towards the tiger suit on the part of the combatant sample. Figure 10 presents substantial evidence that the shortcomings of conventional fatigues under conditions of tropical combat are corrected by the tiger suit. Therefore, the development of a government issue tiger suit for tropical troops is recommended.

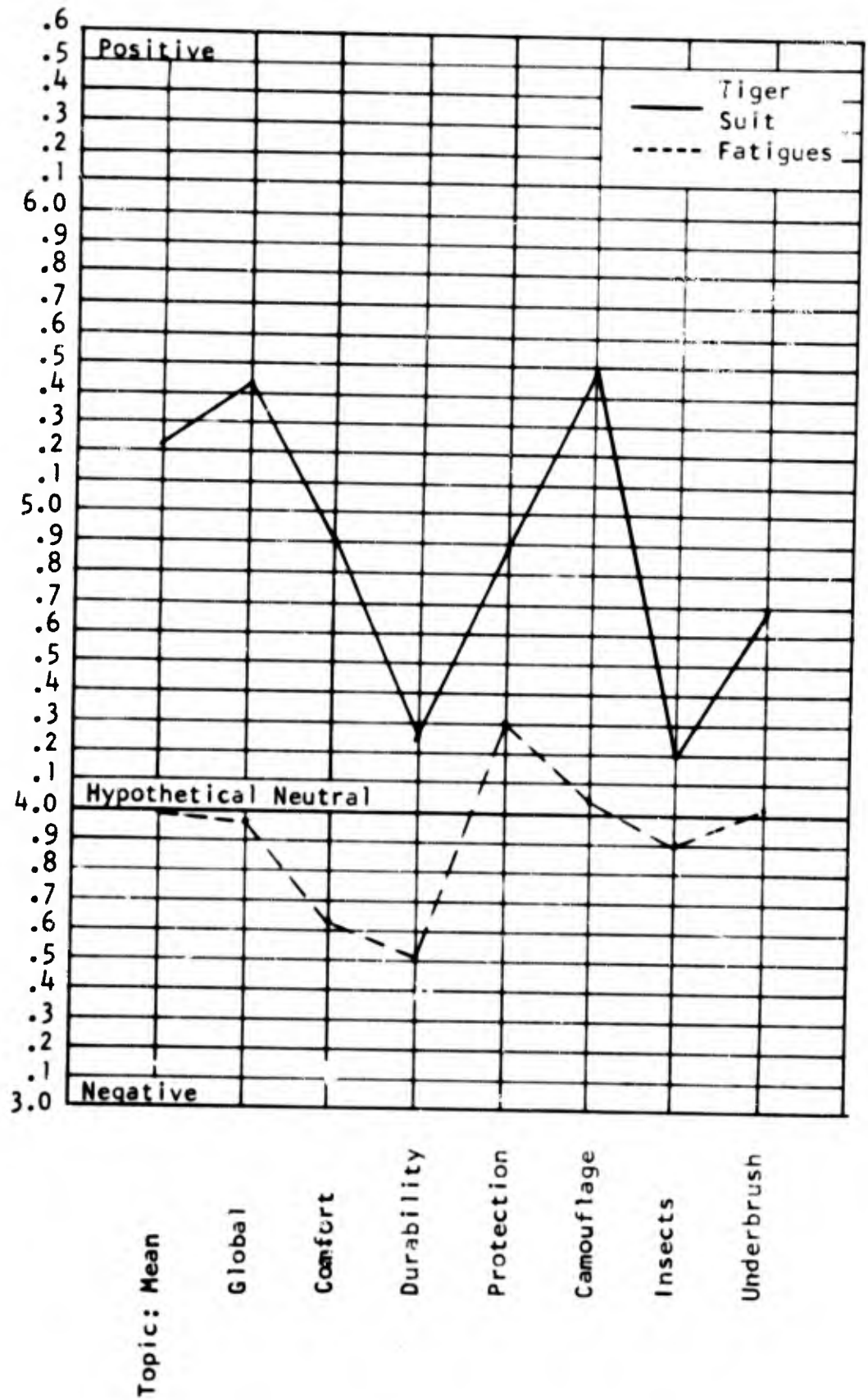


Fig. 10. Combatant Population Attitudes - Topics: Tiger Suit and Fatigues

10. HAMMOCK

a. Combatant Population Attitudes

U. S. troops with recent combat experience in the tropics were queried concerning the "Portability," "Protection" and "Durability" of the new jungle hammock. Figure 11 shows that the troops had positive attitudes towards this item of personal equipment. The dimension which was deemed most acceptable was "Protection." Probably this esteem is directed mainly at "Insect Protection," since some of the Your Comments data indicate that one is a "sitting duck" in the new hammock both because it can be easily spotted by the enemy and because it takes too long to get out of. This is a minority opinion but of enough importance to be reported. Unfortunately, due to the fact that this aspect of "Protection" was not questioned specifically, it is not possible to state categorically how the majority of troops feel on this issue. "Portability" and "Durability" are both viewed as being acceptable by the troops, but not as highly acceptable as was "Protection." Your Comments data indicated some dissatisfaction with the bulkiness of the hammock. Also some of the troops indicated that it took too long to put up the hammock.

Despite these specific areas of dissatisfaction, the generally positive evaluation of the hammock is attested to by the fact that the hammock ranked seventh out of 22 items identified as being "most valuable" in the jungle. Likewise, this topic received the eighth highest Topic Score for the 13 topical areas about which combatant troops were questioned.

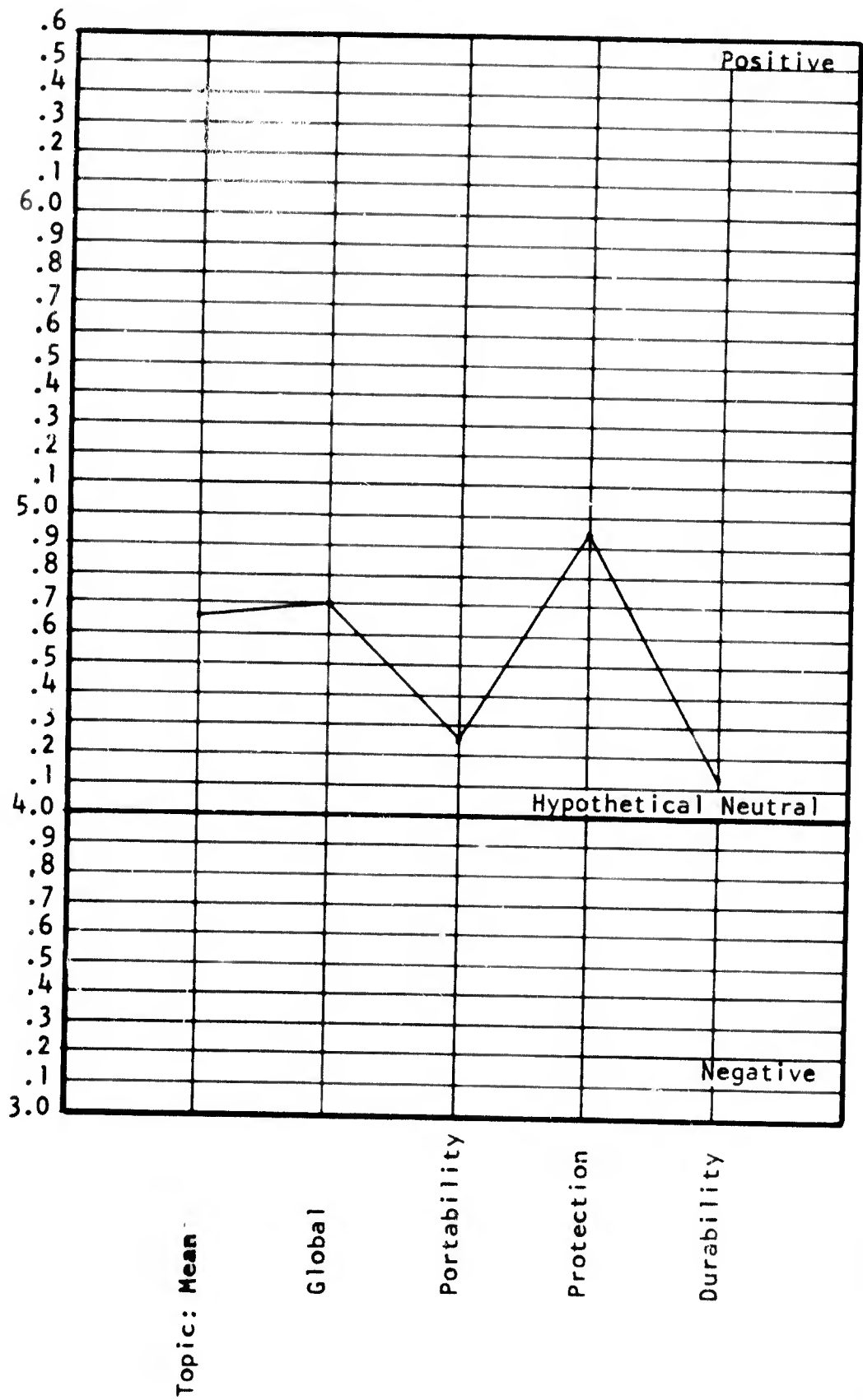


Fig. 11. Combatant Population Attitudes - Topic: Hammock

b. Summary

The hammock is regarded as a valuable item of personal equipment for troops engaged in jungle warfare. Positive attitudes were expressed towards all dimensions probed. Some dissatisfaction with the hammock's bulkiness, ease of exit, and visibility were expressed, but these factors were evidently overshadowed by the good features of the hammock when the attitudinal ratings were made.

11. PONCHO LINER

a. Combatant Population Attitudes

The Okinawa sample, representing the oldest, most militarily experienced group participating in the study and also the sample having the greatest number of personnel having been to Viet Nam, was queried concerning the new poncho liner.

The data displayed in Figure 12 clearly demonstrate that the troops have a consistently positive attitude towards the poncho liner. The dimensions probed were "Portability," "Durability" and "Protection." The lowest mean rating on any of these dimensions was 4.70 for "Durability." Both "Portability" and "Protection" were highly esteemed with means of nearly 5.0.

The over-all acceptance of the liner was emphasized by the fact that even though only the Special Forces troops stationed on Okinawa had been issued the poncho liner, it still ranked fifteenth out of the 22 items of equipment identified by respondents from all locations as being of greatest value in the jungle. Oral comments heard from some of the Special Forces

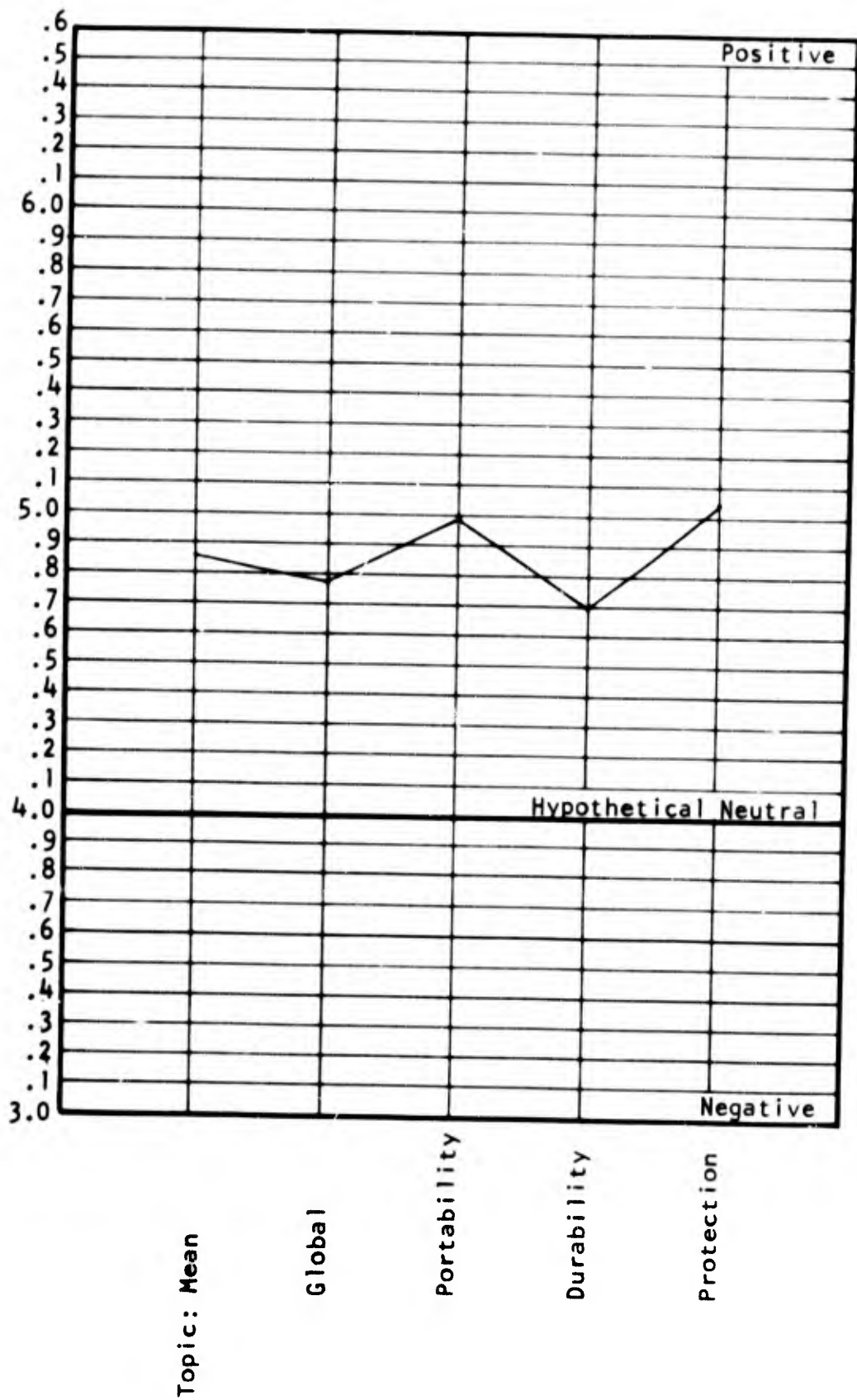


Fig. 12. Combatant Population Attitudes - Topic: Poncho Liner

troops on Okinawa indicated that the poncho liner is an extremely valuable multi-purpose protective covering, even better than the poncho itself.

b. Summary

All available evidence indicates that tropical troops who have used the poncho liner have very positive attitudes towards it. It is viewed as a valuable and versatile item of equipment.

B. SITUATIONAL TOPICS

1. WATER

Broad dimensional areas investigated concerning the acquisition of drinking water in the tropics were: "Availability," "Healthfulness" and "Taste." There were distinct differences among the three populations with respect to these areas. For every dimension probed, the Hawaii sample was the most strongly positive, the Panama sample second and the Okinawa sample third. The responses on all dimensions were close to the mean for both the Hawaii and Panama populations. The Okinawa population, on the other hand, responded both above and below the mean concerning the various dimensions of the topic "Water."

Examination of the data displayed in Figure 13 indicates that the "Availability" of drinking water was not viewed as a problem by the populations studied. The data also shows that the "Taste" of drinking water found in the tropics is acceptable. However, the Your Comments cards were used by the troops to point out that the "Taste" is poor when it is necessary to add water purification tablets to the water.

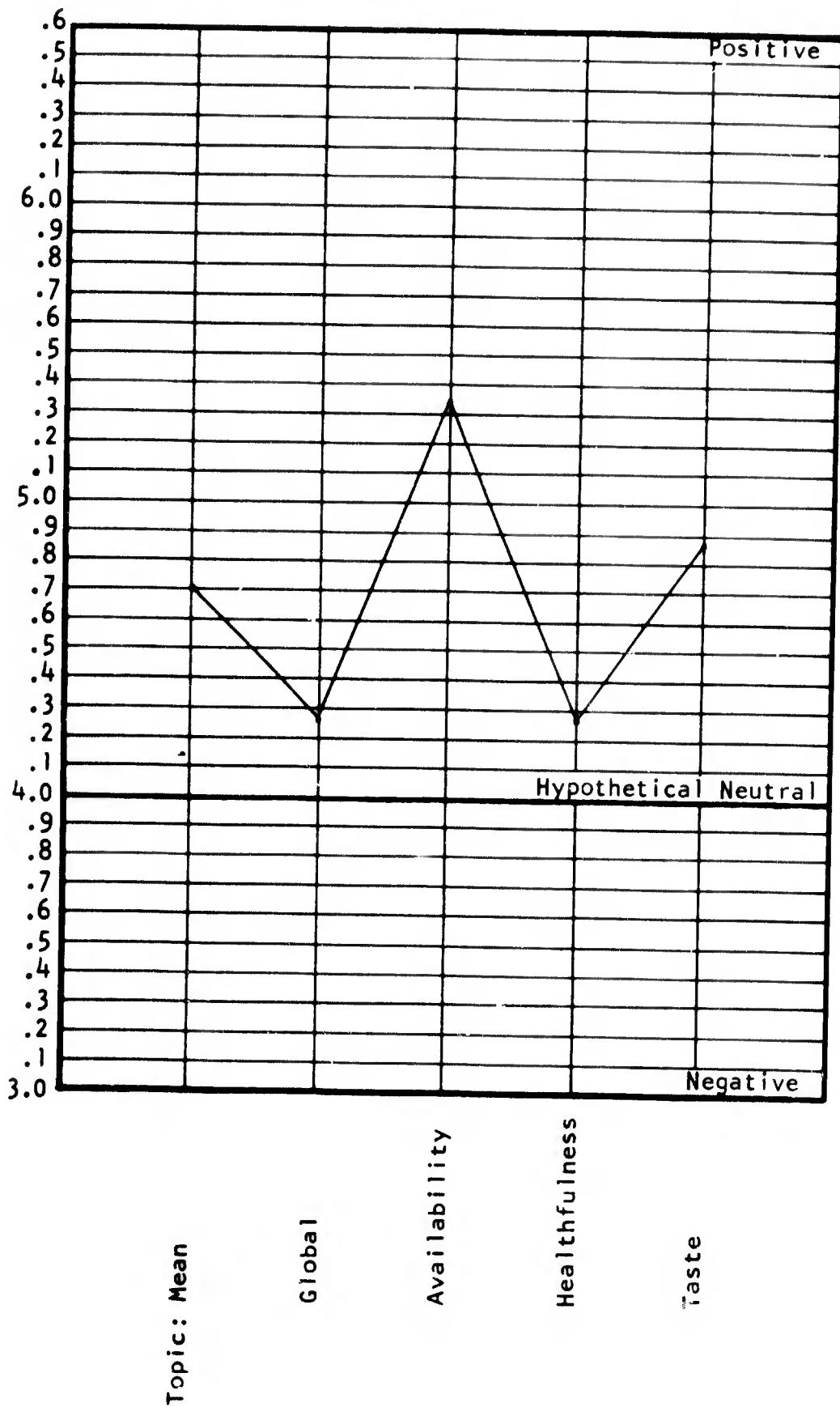


Fig. 13. Total Population Attitudes - Topic: Water

The thing that really does concern the troops is the "Healthfulness" of the water which is available. Though the total population attitude is above the mean (4.27), the troops in all three locations were more negative towards "Healthfulness" than any of the other dimensional areas. Interestingly enough, the population Global mean is approximately equal to this lowest dimension. This seems to indicate that "Healthfulness" is the most salient issue to the troops. Though personnel in all locations viewed "Healthfulness" as the least favorable aspect of the local drinking water, only the Okinawa attitude scores indicated that the "Healthfulness" was unacceptable. The low Global score (3.22) given water by the Okinawa sample, plus the fact that "Healthfulness" was rated below the mean, indicates that there is significant difficulty in acquiring healthful water in Okinawa. The Panama group also seems to harbor some doubts about the "Healthfulness" of local water, but still believes it to be acceptable. The U. S. troops in Hawaii have no problems with water at all since high positive attitudes were given in responses to questions on all dimensions.

2. WEATHER

Examination of the data on weather indicates a clear-cut hierarchy among the three geographical locations relative to the weather. Attitudinal responses indicate that the Hawaii population regards their weather favorably, the Okinawa sample somewhat negatively and the Panama sample quite negatively. Respective Topic Scores for the three populations are 4.02, 3.25, and 2.86. This trend held for all dimensions with only one exception. This exception was a reversal between Hawaii and Okinawa on "Rainfall." Evidently this is about the only aspect of the Hawaiian climate which is quite annoying to the

troops. "Humidity" is also given a rating below the mean (3.02 by the Hawaii population) but this is still a great deal higher than the rating given by either the Panama or Okinawa samples.

Examination of Figure 14 clearly shows that over-all, "Humidity" is viewed as the major weather problem in the tropics with "Rainfall" a close second. "Temperature," though receiving an overall rating below the mean is consistently regarded as the least troublesome aspect of the environment.

In short, the "Humidity" and related "Rainfall" are the aspects of a tropical environment which really bother the troops not the "Temperature." This data would seem to indicate a need for well ventilated, light weight, easily drying clothing, and moisture and rust resistant field equipment.

3. INSECTS

The attitudes of the troops in the tropical areas in which testing took place can be characterized quite simply with respect to insects. All the troops believe the insects to be a problem, but the magnitude of the problem varies from location to location. The Panama troops are most negative, followed by Okinawa and Hawaii troops. This trend holds for all insect dimensions.

Examination of Figure 15 shows that the troops do not regard tropical insects as presenting a significant "Danger" to them. A slightly negative attitude towards this dimension was present in the Panama and Okinawa samples but still it was very much less negative than any other dimension.

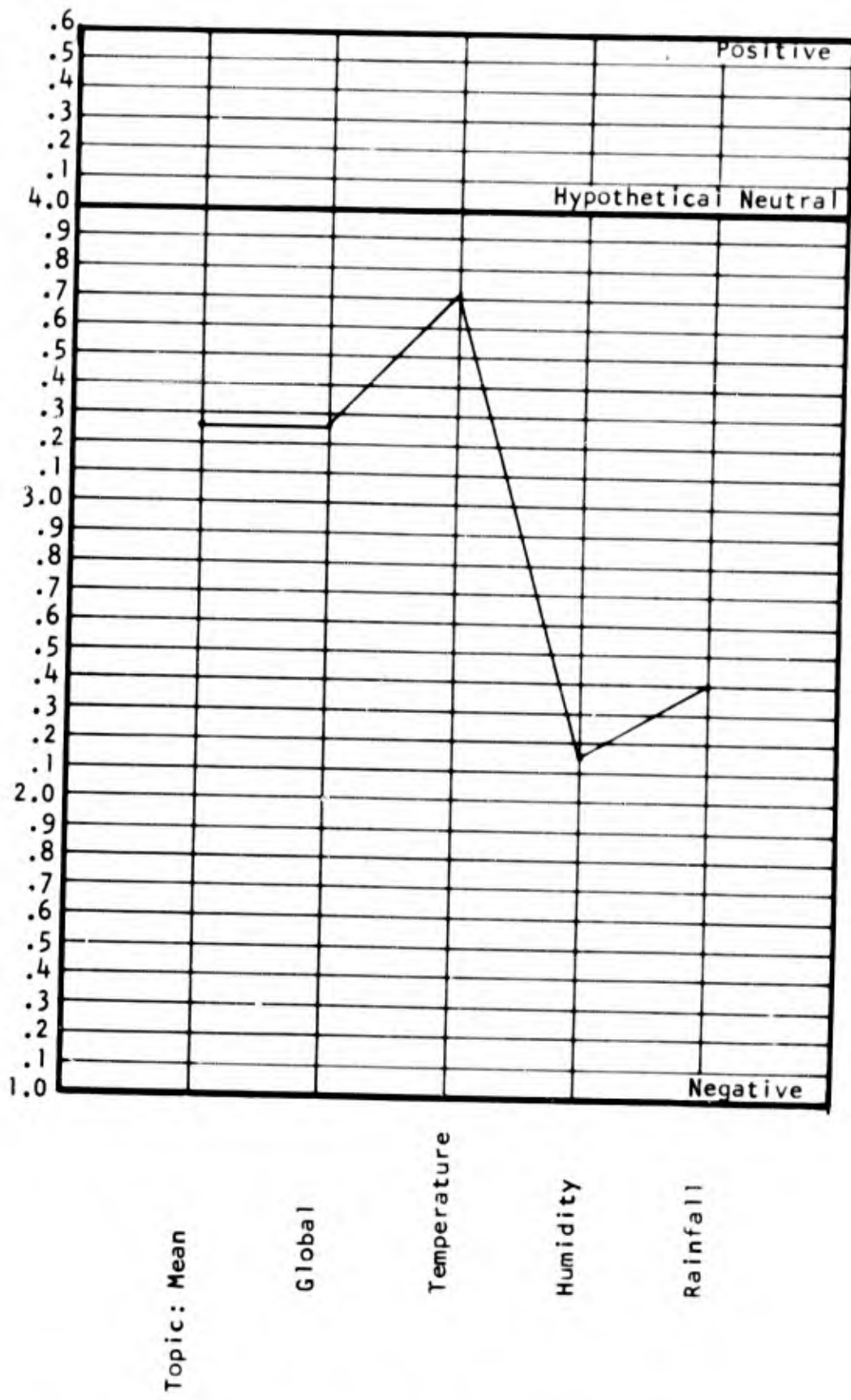


Fig. 14. Total Population Attitudes - Topic: Weather

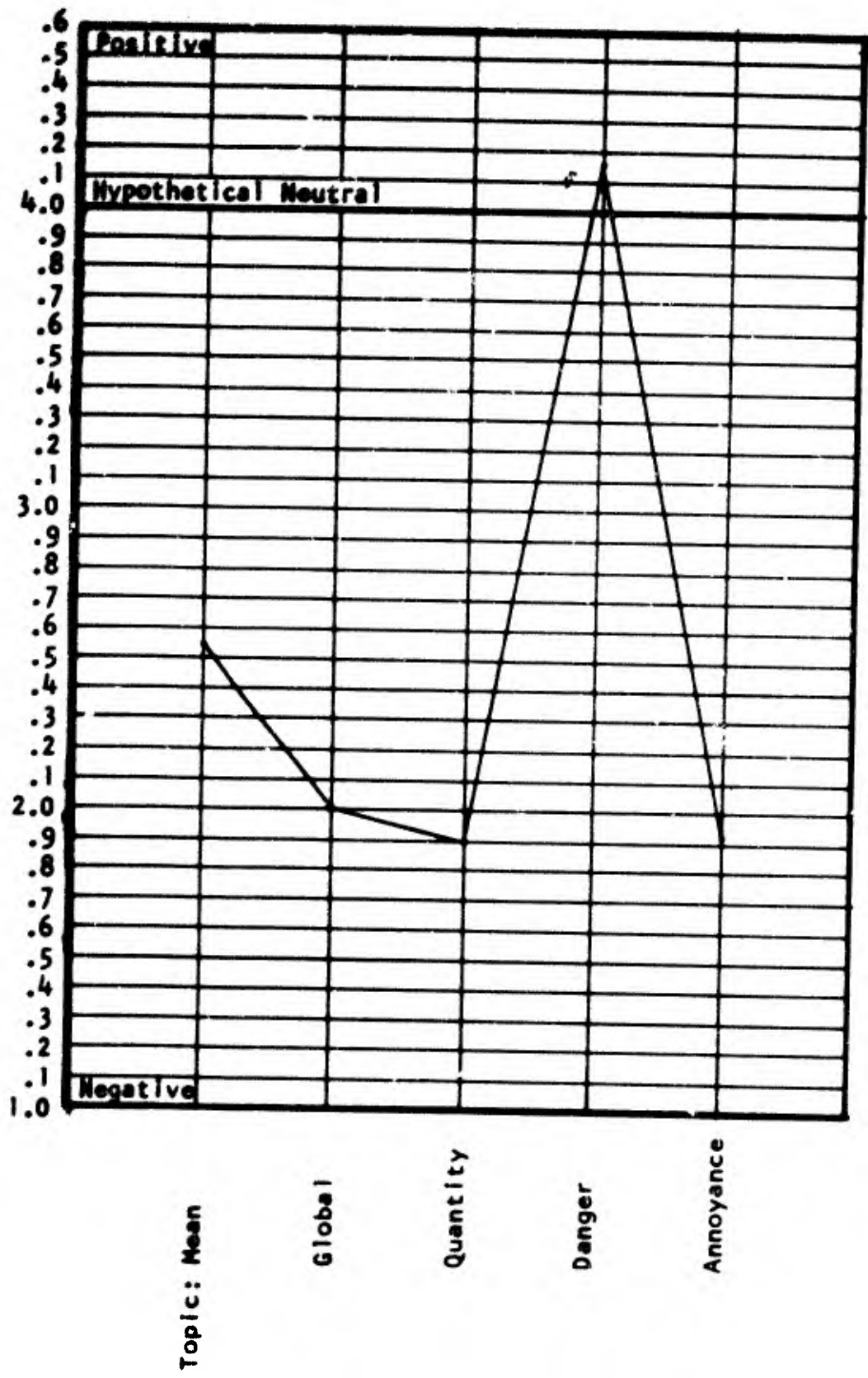


Fig. 15. Total Population Attitudes - Topic: Insects

The "Quantity" and "Annoyance" of insects was highly negative in both Panama and Okinawa. Overall population scores of 2.25 and 2.10 reflect the degree of dissatisfaction these troops have with insects. The Hawaii troops were quite negative relative to "Quantity" and "Annoyance" also, but noticeably higher than the other two populations. The fact that insects received the lowest over-all Topic Score of both the 15 non-combatant topics and 13 combatant topics further emphasizes the magnitude of the problem created by insects in the tropics.

In summary, it may be said that none of the troops like insects. They do not view them as a significant health menace but find them extremely annoying due to the quantities in which they are present. The annoyance problem is quite acute in both Panama and Okinawa. Evidently the troops in Hawaii do not find insects such a severe problem as demonstrated by their consistently less negative responses.

4. OFFICERS

The non-combatant troops were questioned concerning the broad dimensional areas of "Experience," "Common Sense" and "Understanding" of officers. A striking similarity was found between the Panama and Hawaii troops on these dimensions, with the greatest difference being 0.13 on the dimension "Understanding." Though the differences between population were extremely small, the Panama population tended to be less negative than the Hawaii group.

Figure 16 shows that lack of "Experience" on the part of some officers is the principal factor which the troops regard as unacceptable.

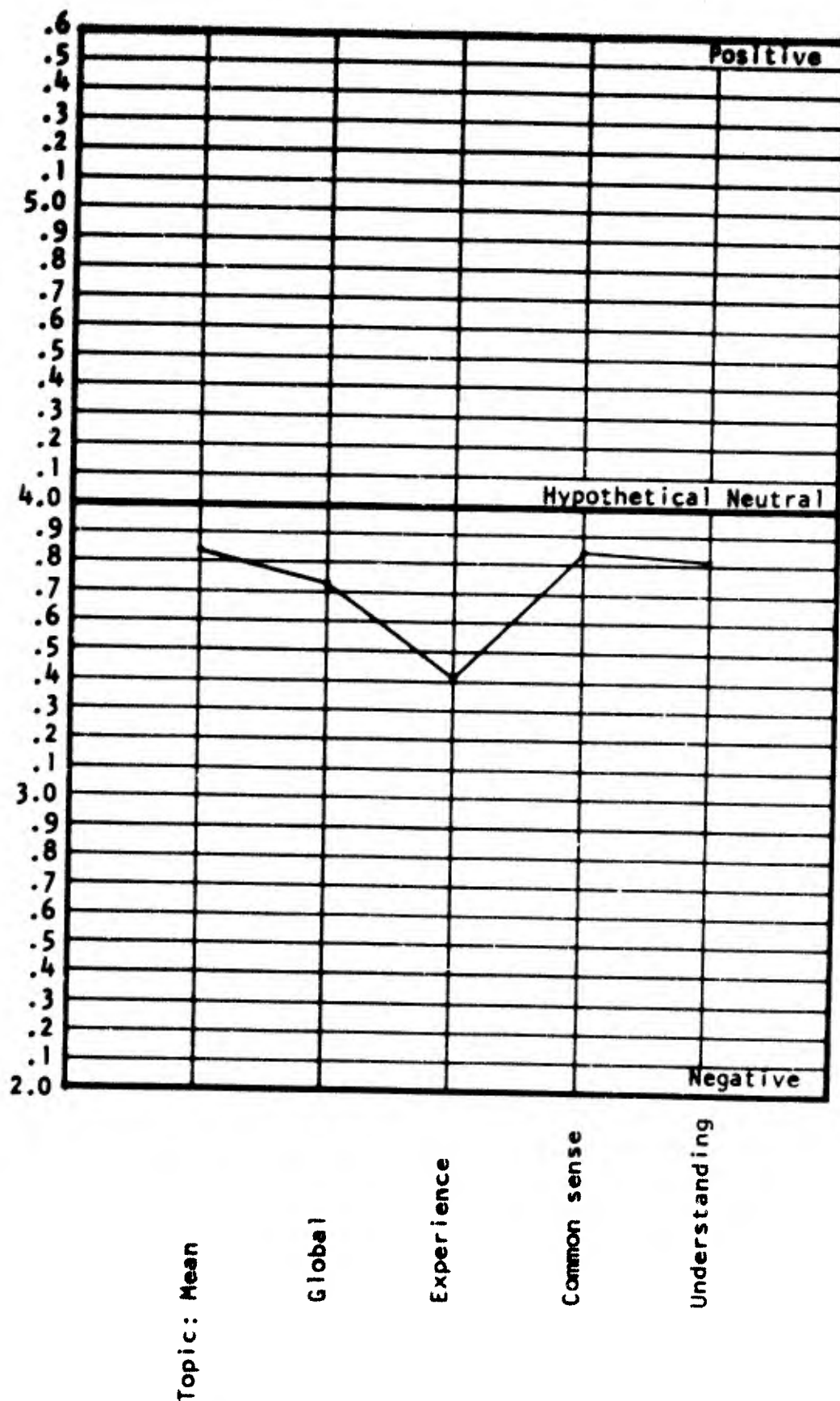


Fig. 16. Non-Combatant Population Attitudes - Topic: Officers

Though dissatisfaction with the dimensions of "Common Sense" and "Experience" is evident, (3.84 and 3.83 respectively), the troops' degree of negativity is not great enough to say that the officers are viewed as being unacceptable in these regards. Indeed, the fact that the Global rating is much nearer the ratings for "Common Sense" and "Understanding" than to that on "Experience" tends to indicate that "Common Sense" and "Understanding" are more salient than "Experience" to the troops.

Sentence Completion responses concerning officers brought forth a variety of characteristics that were viewed negatively by the troops who responded to this technique. "Experience," "Considerateness," "Young Officers" and "Decision Making Capabilities" were among the items viewed negatively by those who responded in terms of specifics. However, the Global comments made indicated a 2 to 1 positive attitude towards the officers. Over-all, there were more negative comments (749) than positive comments (516), but for the most part those respondents who had positive attitudes did not define why they liked their officers in contradistinction to the specifics cited by those with negative attitudes.

Drawing together the data it would appear that the troops do not like young inexperienced officers and evidently feel there are too many around. "Considerateness" or "Understanding" appears to be one of the most important facets of an officer's personality as perceived by the troops. Over-all, the attitude towards personality traits is negative, though not strongly so. "Common Sense" is also viewed in a similar manner. Sentence Completion responses focusing on "Fairness" indicated an even split on this dimension between those holding positive and negative attitudes.

5. ENTERTAINMENT

Based on the assumption that entertainment is an important aspect of the over-all environment of a soldier, particularly when stationed overseas, the non-combatant tropical troops were queried concerning the 'Quantity' of entertainment available in their locations. They were also asked to express their specific attitudes towards both 'On-Base' and 'Off-Base' entertainment. The fact that entertainment is an important situational variable is attested to by the fact that entertainment ranked fifth for both Panama and Hawaii out of fourteen topics which elicited a substantial number of Your Comments responses.

Figure 17 shows that the troops feel that sufficient entertainment is not available to them. The degree of dissatisfaction of the non-combatant troops with entertainment is indicated by the fact that the entertainment Topic Score ranked fourteenth out of fifteen topics for non-combatant personnel. In all cases, the Panama troops were substantially more negative about entertainment than the troops in Hawaii. The relative rank order of attitudes towards the dimensions probed was similar except for a reversal between 'Off-Base' entertainment and 'Quantity' for the Hawaii group relative to the Panama group.

Both populations seem to feel that the over-all 'Quantity' of entertainment available to them is inadequate and both have more positive attitudes towards the 'Off-Base' than 'On-Base' entertainment. In Panama, the 'On-Base' entertainment was deemed unacceptable with a mean of 2.51. The differential between this value and the 'Off-Base' mean (1.06) was much greater

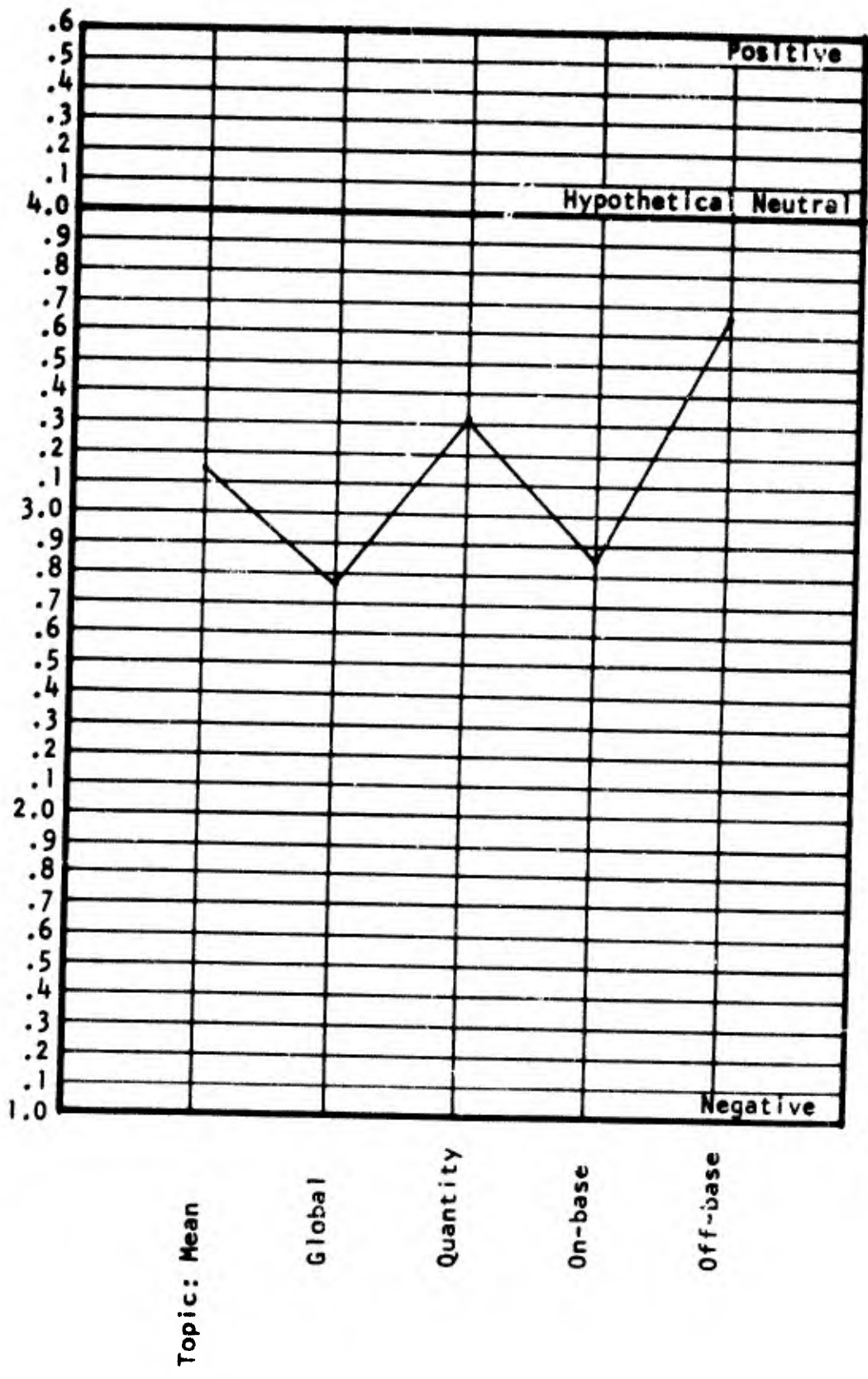


Fig. 17. Non-Combatant Population Attitudes - Topic: Entertainment

than that for the Hawaii troops (0.36). The extreme dissatisfaction of the Panama troops with 'On-Base' entertainment is probably due to the fact that at the time the attitude battery was administered the troops had experienced several months of restriction to base following the January 1964 Panamanian disorder. The fact that this restriction had aroused the hostility of the troops was apparent from both the tone and content of many Panama Your Comments cards.

The Hawaii sample, though less negative towards entertainment in all respects than the Panama sample was not happy with the entertainment opportunities open to them. Your Comments responses indicated that the major area of dissatisfaction was the high cost of entertainment in Hawaii. The general impression was gained that there was a good potential for entertainment in Hawaii but that high cost precluded most G.I.'s from enjoying it to a significant degree.

Over-all, a generalized dissatisfaction with the entertainment situation is evident in both Panama and Hawaii. Special circumstances in both locations, i.e., restriction to base in Panama and high cost in Hawaii, probably tend to make the over-all appraisal more negative than might otherwise be the case.

6. FAMILY

The non-combatant population's responses to questions concerning dependent families living in the tropics reflects a fairly wide range of attitudes. In both Panama and Hawaii a quite positive attitude was expressed towards having one's family with him in the tropics. It certainly comes as

no surprise that this is desired by both populations. It is, however, evident that the mechanical aspects of implementing this desire are viewed negatively. Examination of Figure 18 shows that "Acclimation" is difficult for the families of the U. S. troops in the tropics. Obtaining "Authorization" to have their families with them is evidently a very severe problem for troops stationed in Panama (2.76), but poses no problem at all in Hawaii (4.30). "Quarters" are viewed similarly by both populations. Attitudes are negative in both cases but not strongly so.

The high cost of living and the unfriendliness of the local population towards enlisted personnel were focused on in the Your Comments cards from the Hawaii group. Most of the Your Comments complaints from U. S. troops stationed in Panama stressed the poorness of the housing available to them.

Over-all, men in both locations desire to have their families with them. Both populations experience difficulty in carrying out this objective but it is evidently much more difficult for the troops to get permission to have their families with them in Panama than in Hawaii. The Hawaii sample believes the attitudes of the local populace and the high cost of living make "Acclimation" for their families difficult. "Acclimation" is less of a problem in Panama but since initial "Authorization for having one" family there is not easy to obtain, it is difficult to conclude which group is better off.

C. SUMMARY

The topics for which attitudinal data has been collected, processed and analyzed in this study may be classified two different ways; by type of population to which the assessment battery was administered, and by type of

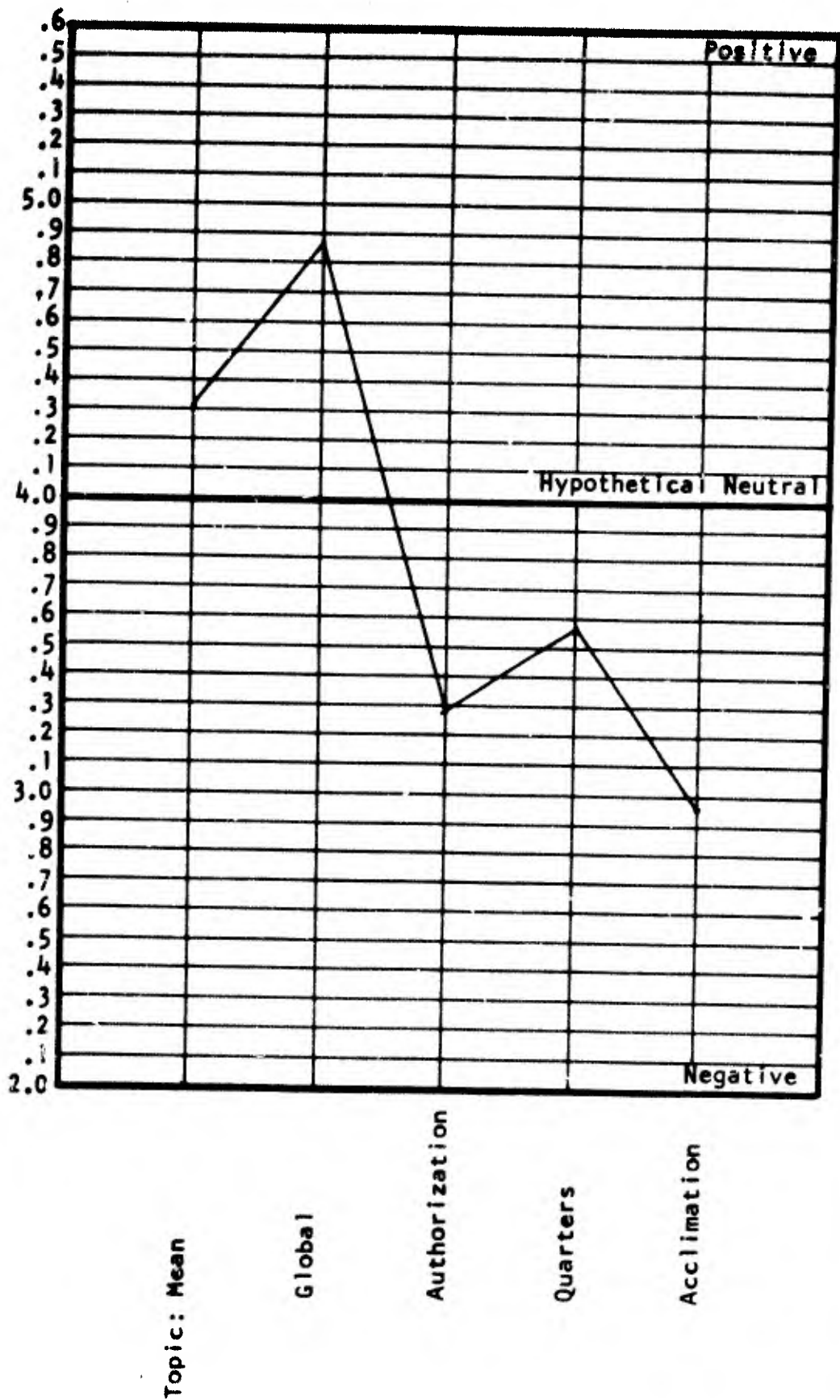


Fig. 18. Non-Combatant Population Attitudes - Topic: Family

topic. There were two types of population, non-combatant and combatant, and a topic which was administered to both of these populations is referred to as a Common Topic. Topics administered exclusively to the non-combatant populations are referred to as non-combatant (NC) and combatant (C) topics respectively. The other method of classification is simple in that each topic pertains to some item of equipment or some situational variable. These two classification schemes are displayed in Table 3.

Although an oversimplification, an attempt has been made to identify the items of equipment and situational variables with respect to acceptability. Topic Score means of 4.1 or greater are considered to indicate group acceptance, means of 3.9 or less are considered to indicate group non-acceptance and means between 3.9 and 4.1 are neutral. On some topics some characteristics are acceptable while others are not and this tends to confuse the issue somewhat, but most of the deviation within a topic is of degree rather than of kind.

Without exception, those items of equipment which were developed with use in a tropical environment as a prime consideration were regarded as acceptable by the troops in the tropics. These items of equipment are: jungle boots, tiger suit, hammock and poncho liner. The assumption is made here that the tiger suit, which for the most part was developed by the Japanese, due to its light weight, durability and camouflage characteristics, was designed especially for use in the tropics. Those items of equipment which apparently were designed without use in the tropics as a prime consideration were seven in number of which two were acceptable (canteen and rucksack), two were regarded as neither acceptable nor non-acceptable (meals and pack) and three were not acceptable (fatigues, poncho and combat boots). Interestingly

enough, two of the three items which were deemed not acceptable (poncho and combat boots) by the troops were regarded as acceptable for use in the United States.

Of the six situational topics the troops were required to express attitudes about, three were not acceptable (weather, insects and entertainment), one was neither acceptable nor unacceptable (officers), and two were acceptable (water and family). The acceptability of the topic "Family" is somewhat misleading in that the investigators were trying to determine if having families with the troops in a tropical environment was desirable or undesirable insofar as the troops were concerned. While the general feeling was very positive insofar as desiring the families to be with them, the troops indicated that it was a very difficult administrative task to accomplish and once in the tropics the families found it very difficult to become acclimated.

Ten of the topics included the dimension of "Durability." Table 12 indicates that three of the topics were unacceptable with respect to "Durability," one was neutral and six were acceptable. "Comfort" seemed to be the most bothersome dimension in that half of the six topics which included "Comfort" as a measure were viewed as unacceptable on that dimension. The rest of the most commonly used dimensions on all of the topics were acceptable to the troops. Note that only one dimension of only one of the items of equipment designed for use in the tropics was found to be unacceptable, and that was the "Durability" dimension of jungle boots.

It would seem that those items of equipment which have been designed with some of the problems inherent in a tropical environment in mind are much

TABLE 12

ACCEPTABILITY OF SELECTED DIMENSIONS OF EQUIPMENT TOPICS
INCLUDED IN OSGOOD QUESTIONNAIRE

	<u>Dimensions</u>					
	<u>Global</u>	<u>Durability</u>	<u>Comfort</u>	<u>Protection</u>	<u>Portability</u>	<u>Capacity</u>
<u>Designed for Tropics</u>						
Jungle Boots	+	-	+			
Tiger Suit	+	+	+	+		
Hammock	+	+		+	+	
Poncho Liner	+	+		+	+	
<u>Not Designed for Tropics</u>						
Fatigues	-	-	-	N		
Poncho	-	N	-	+		
Combat Boots	-	-		+		
Canteen	+	+			+	N
Pack	N	+	-			+
Rucksack	+	+	+			+

Note.- + = mean greater than 4.1
 N = mean between 3.9 and 4.1
 - = mean less than 3.9

more likely to be accepted by the troops than equipment not specially designed for use in the tropics. Also, of the several equipment characteristics examined in the present study, "Durability" and "Comfort" appear to elicit the most negative responses.

D. ATTITUDE CHANGE

One hundred eighteen subjects were administered the test battery the day before and the morning of the flag incident in Panama. Although somewhat of a serendipity the following research design resulted from the incident. The conditions under which the 118 troops were tested may be thought of as the pre-test conditions; the alert status and riot situation in which troops and rioters were killed during the flag riots is the major intervening effect; and the second test administration to the same troops a few months later, after the riots, is the post-test experimental condition.

Of the 118 respondents, 87 were Mechanized Infantry and 31 were Medics. It was hoped that enough of each group would be available for the post-test to prevent the necessity of combining the groups. Unfortunately this hope was not fulfilled. Through attrition of one kind or another fifty per cent of each group was lost during the time which elapsed between pre- and post-tests. The post-test groups had N's of 47 and 14 for Mechanized and Medics respectively, or a total of 61.

It will be noted in Table 13 that for the Mechanized group fourteen of the fifteen mean differences are in the same direction. In 14 cases the means for Experimental Condition II are more negative than the means for Experimental Condition I, and five of the differences are statistically

TABLE 13

MEANS AND STANDARD DEVIATIONS OF THIRTEEN TOPICS FOR A MECHANIZED INFANTRY GROUP TESTED BEFORE (EXPERIMENTAL CONDITION I) AND AFTER (EXPERIMENTAL CONDITION II) A COMBAT SITUATION

<u>Topic</u>	<u>Means</u>			<u>Standard Deviation</u>		
	<u>Condition I</u>	<u>Condition II</u>	<u>Diff.</u>	<u>Condition I</u>	<u>Condition II</u>	<u>Diff.</u>
Fatigues	4.10	4.00	-.10	1.65	1.52	-.13
Poncho (S)	4.84	4.26	-.58***	1.56	1.26	-.30
Jungle Boots	5.21	5.05	-.16	1.50	1.47	-.03
Combat Boots (S)	5.91	5.64	-.27	1.04	0.86	-.18
Canteen	5.51	5.14	-.37	1.33	1.48	+.15
Poncho (T)	3.78	3.21	-.57**	1.71	1.36	-.35
Weather	3.49	3.20	-.29	1.78	1.72	-.06
Insects	2.55	2.09	-.46**	1.41	0.97	-.44
Water	5.31	4.68	-.63***	1.39	1.38	-.01
Meals	4.12	4.20	+.08	1.57	1.62	+.05
Combat Boots (T)	3.97	3.45	-.52*	1.63	1.33	-.30
Pack	4.30	4.17	-.13	1.71	1.46	-.25
Officers	3.70	3.41	-.29	1.66	1.83	+.17

* .05 level of significance

** .02 level of significance

*** .01 level of significance

Note. - The positive and negative signs in the Difference columns are indicators of the direction in which the Condition II group differs from Condition I.

significant beyond the .05 level of confidence. There were no trends in either direction with respect to mean differences between the Medic experimental groups. The mean difference for poncho (S) was the only one which was significant.

To insure the legitimacy of the comparison between the means of Experimental Conditions I and II, means were computed separately for that part of Group I which was not tested under Condition II. This precautionary measure was taken because of the possibility that those respondents who were lost through attrition after the pre-test might have had significantly more positive attitude scores than the group remaining. Such a condition as this could have accounted for the drop on all of the means in the post-test. As it turned out there were no significant differences between the sub-group lost through attrition and the total group.

For the Mechanized group, there appears to be a very definite shift in attitude between Conditions I and II. The mean responses after the combat situation are statistically significantly more negative in more than one third of the cases and more negative for all but one of the topics. When examined for a possible relationship between shift magnitude and kind of topic, it would appear that there was a slightly larger negative shift for situational topics than for equipment related topics.

The Medics were not subjected to statistical analysis on the basis of the very small N of the Experimental Condition II group.

It was originally intended to include a control group into the design by administering the battery to a group in Hawaii on route to Okinawa, and then

test them again on the way back. This would have allowed two administrations to the same group with about a month's interval in between, but without the combat situation intervening. Military scheduling, both of troops and transportation for the investigators, did not permit implementation of this plan.

As expected, a considerable amount of attitude change appears to have taken place in the interim between the pre-test and the post-test. The interpretation of the change, however, is made rather difficult due to the long time period after the "combat situation" commenced in Panama. In fact, rather than measuring effects of the combat situation (shooting and killing and fear of being shot and killed) upon attitudes, it seems more likely that the effects measured were of a somewhat different nature.

There is considerable evidence to support the notion that the general hostility level of the troops increased appreciably between the pre-test and the post-test, and that this increased hostility acted as a negative global attitude which influenced other attitudes in a negative direction. The mean difference for "Entertainment" between the Panama and Hawaii groups was greater, with Panama more negative, than for any other topic save one. The tone and content of many of the Your Comments cards from the Panama group indicated exceptionally strong feelings about the restrictions imposed on them following the January 1964 disorder in Panama. It was, in fact, true that the troops had been restricted to base and on constant alert during the interim period following the flag incident up to the post-test session.

In summary, it would seem that although the change of attitude which took place between pre- and post-tests cannot be directly attributable to combat involvement variables, there is strong supportive evidence for the

notion of a global attitude (increased hostility due to prolonged restriction and confinement) which adversely affected the equipment and situational attitudes measured in the study.

E. CONCLUSIONS

The principal objectives of this study were twofold: (1) to develop new and more effective means for measuring attitudes (accomplishment of this objective is reported in full in Volume Two of this report), and (2) to apply the newly developed techniques to the measurement of tropical troops' attitudes toward selected items of Quartermaster issue. These dual objectives were pursued in a two-year research effort.

Two types of information resulted from analysis and interpretation of the attitudinal data. First, attitudes toward specific items of Quartermaster issue such as the poncho, jungle boots, and canteen resulted and have been reported herein. Secondly, interaction effects among population elements and situational variables were detailed. After careful analysis of the equipment specific data, the data related to situational variables and their interactions, a number of conclusions were reached. These conclusions are presented below.

1. BROAD ATTITUDINAL CONCLUSIONS

Conclusion 1

The jungle boots, hammock and poncho liner, all members of a new generation of equipment designed with jungle warfare in mind, are regarded as valuable items of personal equipment by U. S. troops serving in the tropics.

The only aspect of any of these items deemed unacceptable was the "Durability" of the jungle boots.

Conclusion 2

The tiger suit, though not developed by the Quartermaster, finds a high degree of acceptance among troops who have served in Viet Nam. Many of the aspects of the conventional fatigue uniform which are unacceptable in the tropics are rectified by the tiger suit.

Conclusion 3

Those items of issue which were developed without focusing upon the needs of the tropical soldier were divided in their over-all acceptability to tropical troops. The canteen and rucksack were regarded as acceptable, meals and pack were regarded as marginal and fatigues, poncho and combat boots were deemed unacceptable in the tropics.

Conclusion 4

Major areas of dissatisfaction relating to equipment used in the tropics were "Durability" and "Comfort." Jungle boots, fatigues and combat boots were deemed unacceptable with respect to "Durability" in the tropics. Similarly, the "Comfort" of fatigues, poncho and pack were viewed negatively by tropical troops.

Conclusion 5

Weather, insects and entertainment were evaluated as unacceptable aspects of the environment provided by tropical military service. The situational topic "Officers" was of marginal acceptability while "Family" and "Water" were acceptable.

2. EQUIPMENT SPECIFIC ATTITUDINAL CONCLUSIONS

Conclusion 6

The fatigue uniform is both too hot and not durable enough for use in the tropics.

Conclusion 7

While U. S. troops stationed in the tropics recognized the need for long-sleeved fatigues for protection in the jungle, they desire a short-sleeved version for use in garrison.

Conclusion 8

The poncho is not comfortable as a garment under either temperate or tropical conditions. In the tropics it is regarded as being particularly poor in this respect since it induces excessive sweating. Despite its limitations as a garment the poncho is highly regarded by tropical troops as a multi-purpose, protective covering.

Conclusion 9

Jungle boots are liked very much by troops training in the jungle or engaging in jungle warfare. Limited 'Durability' is the facet of the boot's design which needs substantial improvement according to the troops.

Conclusion 10

Combat boots are regarded as being acceptable in temperate zones and not acceptable for use in the tropics. The 'Traction' and 'Durability' features are both inadequate for jungle operations. Also, the large amounts of rain and high humidity present in the jungle induce a great deal of 'Rotting' and discomfort due to dampness.

Conclusion 11

Over-all, the metal canteen is highly regarded as an item of equipment. It is easy to carry, quite durable and generally is thought to hold sufficient water. Despite the over-all acceptance, too much noise is caused by the rattling of the chain connecting the cap with the body of the canteen. Also, canteen metal corrodes quickly in the tropics.

Conclusion 12

Though fairly limited data was available on the new bladder type canteen, the following inferences were possible: the increased capacity is desirable; the water tastes better; they snag and tear on bushes too easily and they are too difficult to fill.

Conclusion 13

The pack is viewed as being marginally unacceptable by non-combatant U. S. troops stationed in the tropics. The dimensions of "Durability" and "Weight" are acceptable to the troops; "Capacity," "Fit" and "Movement" of marginal unacceptability and "Comfort" is very unacceptable to the troops.

Conclusion 14

The non-combatant troops regard the food procured by the Army for their mess halls as being quite acceptable with respect to "Quality" and "Variety" and marginally acceptable with respect to "Quantity."

Conclusion 15

The "Preparation" given the food by local mess hall cooks is unacceptable on the whole. "Taste" and "Greasiness" are both viewed negatively with particular stress being laid on the fact that greasy foods are very unpalatable in the tropics.

Conclusion 16

The rucksack is thought to be a very acceptable item of equipment by combatant U. S. troops stationed in the tropics. Its "Capacity" is viewed as being just right and its "Durability" good. "Comfort" and the related dimensions of "Weight" and "Movement" are acceptable, but not highly so. "Fit" is the most acceptable aspect of "Comfort." Negative attitudes were expressed towards the overall external size of the rucksack, however.

Conclusion 17

The poncho liner is viewed as being a very good piece of equipment in the jungle. Its versatility is highly valued.

Conclusion 18

The new jungle hammock is well accepted with regard to "Portability," "Protection" and "Durability" by the combatant sample. Bulkiness, ease of exit and visibility drew some negative comments from the troops.

Conclusion 19

The tiger suit is very highly regarded and very much desired as an item of issue by the combatant sample. It is acceptable in all respects. "Durability" and "Insects" are not rated as highly acceptable, but are decidedly within the acceptable range.

3. SITUATIONAL ATTITUDINAL CONCLUSIONS

Conclusion 20

Water is generally available in the tropics which has a satisfactory taste. However, in some areas it is a matter of considerable concern whether

the water is healthful or not. When water purification tablets must be added to the water the acceptability of the "Taste" of the water is greatly diminished.

Conclusion 21

Non-combatant U. S. troops stationed in the tropics desire to have their families with them for the most part. In some areas, it is difficult to get "Authorization" for one's family. "Acclimation" can be a severe problem as can the cost of living and "Quarters Availability" for those soldiers having their families with them.

Conclusion 22

The non-combatant sample viewed the entertainment opportunities open to them negatively.

Conclusion 23

Young, inexperienced officers are viewed negatively by the non-combatant population. "Considerateness" and "Understanding" are important to the troops and are seen as being somewhat unacceptable on the whole. "Fairness" as a trait is thought to be positive by some, negative by others. Over-all, the officers are of marginal acceptability as seen by their troops.

Conclusion 24

The acceptability of weather to troops in the tropics varies as a function of location. The two related elements of the weather which cause dissatisfaction among tropical troops are "Humidity" and "Rainfall."

Conclusion 25

Attitudes towards insects in the tropics are, to some degree, also a function of location. Over-all, insects are not thought of as a health menace, but are felt to be extremely annoying in some areas.

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APPENDIX

TABLE 14

TOPIC SCORES AND ITEM MEANS FOR COMMON TOPICS

Topic	Population												
	Panama			Hawaii			Okinawa						
	MI	ME	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
FATIGUES Topic Score	M	3.71	4.10	3.51	3.43	3.99	4.27	4.04	4.17	4.24	4.35	4.12	3.54
	S	1.63	1.65	1.72	1.54	1.59	1.68	1.54	1.73	1.58	1.45	1.58	1.48
	N	166	84	151	90	238	31	225	83	113	81	176	91
Global	M	3.77	4.05	3.51	2.83	3.73	4.31	4.24	4.24	4.25	4.46	4.05	3.28
	S	2.22	2.10	2.24	1.84	2.04	2.23	2.13	2.10	2.11	1.98	2.23	1.94
	N	163	77	148	88	235	30	216	82	107	77	171	91
Comfort	M	3.38	3.50	3.39	3.12	3.34	4.16	4.00	3.89	3.65	3.99	3.87	3.19
	S	2.15	2.02	2.13	1.79	1.99	2.14	2.04	2.03	2.01	1.75	2.03	1.73
	N	161	76	140	85	230	29	202	81	105	77	171	86
Durability	M	2.88	2.58	3.06	2.97	3.76	3.25	2.98	3.09	3.60	3.75	3.43	3.31
	S	1.74	1.56	1.85	1.44	1.57	1.82	1.65	1.80	1.73	1.57	1.59	1.55
	N	163	77	145	88	230	29	214	81	110	78	172	87
Protection	M	4.07	3.97	3.47	3.67	4.71	4.06	3.99	4.17	4.63	4.35	4.86	4.01
	S	1.97	1.78	2.00	1.82	1.63	1.99	1.73	1.90	1.64	1.58	1.59	1.79
	N	161	71	148	87	234	31	213	80	110	81	164	87
Camouflage	M	5.21	4.99	4.49	3.78	5.13	4.75	4.58	4.92	4.84	4.73	4.85	2.82
	S	1.89	1.86	2.06	1.83	1.56	1.87	2.02	1.76	1.53	1.68	1.55	1.68
	N	154	77	138	86	224	30	220	81	109	79	165	89
Insects	M	3.24	3.13	2.68	3.76	4.45	3.76	4.06	3.95	4.25	3.83	4.20	3.73
	S	1.95	1.87	1.85	1.74	1.48	1.95	1.86	1.86	1.79	1.77	1.79	1.72
	N	160	70	145	87	232	31	217	81	107	79	166	87

TABLE 14 (Continued)

Topic

Population

	Panama						Hawaii			Okinawa			
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF
FATIGUES (Cont.)													
Underbrush													
M	3.84	3.44	3.33	3.48	3.38	3.94	3.74	3.66	3.67	3.96	3.88	4.34	4.00
S	2.05	1.87	1.98	1.84	1.87	1.58	1.90	1.65	1.91	1.65	1.58	1.60	1.68
N	160	77	141	85	222	31	212	82	111	80	172	85	145
PONCHO (in States)													
Topic Score													
M	4.54	4.84	4.09	4.99	4.15	4.21	4.37	3.84	4.08	3.68	4.43	4.32	4.23
S	1.50	1.56	1.57	1.22	1.48	1.27	1.50	1.64	1.51	1.32	1.34	1.14	1.29
N	166	83	150	90	238	31	221	83	114	81	176	90	163
Global													
M	4.11	4.03	3.73	4.80	3.96	3.87	4.11	3.69	3.70	3.35	4.18	4.04	3.93
S	1.78	1.51	1.92	1.35	1.68	1.56	1.69	1.85	1.80	1.54	1.52	1.30	1.55
N	158	71	147	87	233	31	211	81	108	81	171	84	148
Durability													
M	5.68	5.24	4.99	5.70	5.13	5.81	5.13	4.33	4.88	5.11	5.51	5.49	5.36
S	1.46	1.66	1.74	1.29	1.75	1.38	1.67	1.96	1.78	1.62	1.40	1.26	1.50
N	150	70	136	83	222	31	209	81	104	80	170	87	152
Protection													
M	4.75	4.62	4.26	5.34	4.25	4.61	4.54	4.22	4.15	4.11	4.60	4.41	4.39
S	1.79	1.60	1.76	1.46	1.76	1.41	1.73	1.86	1.74	1.59	1.51	1.40	1.60
N	160	71	143	85	234	31	212	83	111	81	168	86	149
Comfort													
M	3.41	3.93	3.30	3.67	3.13	3.07	3.30	2.89	3.06	2.66	3.28	2.58	3.17
S	2.32	2.28	2.19	1.98	2.06	2.00	2.08	2.01	2.03	1.78	1.93	1.74	1.79
N	160	73	148	87	237	30	216	81	109	79	173	85	149

TABLE 14 (Continued)

Topic	Population												
	Panama			Hawaii			Okinawa						
	MI	ME	SF	IN	MO	IN	AR	ME	SU	AB	AR	SF	
JUNGLE BOOTS													
Topic Score													
Global													
M	5.31	5.21	5.26	4.79	4.83	5.22	5.05	5.08	5.09	5.07	5.33	4.95	5.54
S	1.50	1.50	1.27	1.69	1.51	1.12	1.57	1.23	1.62	1.14	1.10	1.47	1.06
N	156	84	150	89	234	31	221	82	112	79	174	64	151
M	5.24	5.27	5.61	4.94	5.05	5.10	4.98	5.19	4.98	5.25	5.64	4.38	5.91
S	1.71	1.90	1.70	2.19	1.98	1.58	1.98	1.72	2.07	1.64	1.43	1.74	1.46
N	140	77	142	86	228	30	205	79	103	77	170	56	150
Comfort													
M	5.04	5.07	5.01	4.91	4.76	5.39	4.88	4.78	4.94	4.79	5.09	4.88	5.71
S	1.74	2.02	2.09	1.81	1.95	1.26	1.83	1.87	1.78	1.63	1.51	1.20	1.23
N	135	71	148	86	227	31	200	78	95	75	164	52	147
Traction													
M	4.95	5.47	5.40	5.12	5.03	5.63	5.09	5.13	4.74	5.38	5.56	4.50	5.62
S	1.80	1.60	1.74	1.81	1.84	1.17	1.78	1.62	1.88	1.37	1.42	1.34	1.34
N	138	78	139	84	225	30	201	72	100	74	169	56	146
Durability													
M	4.30	2.86	3.23	2.92	3.20	4.39	3.73	3.70	3.96	3.75	3.67	4.39	3.72
S	1.84	1.75	1.97	1.77	1.81	1.40	2.00	1.87	1.90	1.67	1.65	1.31	1.66
N	138	77	144	86	220	28	202	77	102	75	170	54	144
Cracking													
M	3.62	3.10	3.51	2.91	3.23	4.10	3.49	3.32	3.50	3.34	3.80	3.65	3.68
S	1.68	1.79	2.06	1.74	1.86	1.33	1.89	1.76	1.91	1.56	1.57	1.29	1.80
N	133	78	138	79	215	30	199	76	96	73	168	54	146
Rotting													
M	3.67	3.36	3.54	2.79	3.25	4.10	4.00	4.03	3.84	3.74	3.83	3.82	3.58
S	1.86	1.88	2.02	1.83	1.84	1.61	1.90	1.98	2.01	1.63	1.64	1.57	1.68
N	132	70	138	82	217	31	199	76	95	72	164	51	151
Stitching													
M	4.08	3.61	4.22	3.65	3.95	4.96	4.20	4.75	4.19	3.97	4.49	4.54	4.82
S	2.23	2.19	2.27	2.19	2.13	1.64	2.03	2.01	1.96	1.85	1.92	1.51	1.96
N	140	76	146	84	227	27	208	73	93	77	167	56	147

TABLE 1+ (Continued)

Topic	Population													
	Panama			Hawaii			Okinawa							
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
COMBAT BOARDS (in States)														
Topic Score	M	5.67	5.91	5.25	5.75	5.45	5.62	5.49	4.96	5.37	4.86	5.25	5.57	4.90
	S	1.63	1.04	1.32	1.05	1.15	0.89	1.21	1.40	1.46	1.28	1.17	0.97	1.25
	N	166	84	149	90	238	31	219	82	114	80	176	91	152
Global	M	5.67	5.75	5.33	5.83	5.48	5.65	5.49	4.85	5.35	4.85	5.23	5.61	5.01
	S	1.49	1.18	1.56	1.22	1.36	1.03	1.67	1.73	1.64	1.57	1.41	1.16	1.54
	N	159	71	144	84	225	31	212	80	109	79	170	89	151
Traction	M	5.18	4.86	4.13	4.64	4.59	5.45	4.84	4.52	4.92	4.27	4.64	4.97	4.02
	S	1.94	1.61	2.08	1.78	1.75	1.16	1.77	1.74	1.79	1.59	1.62	1.47	1.77
	N	159	74	141	87	218	29	200	81	106	75	168	87	147
Protection	M	5.64	5.61	5.32	5.77	5.45	5.61	5.37	5.12	5.26	4.96	5.33	5.71	5.05
	S	1.61	1.19	1.80	1.33	1.58	1.18	1.61	1.66	1.66	1.42	1.33	1.35	1.50
	N	159	71	138	83	224	31	213	81	109	78	171	90	150
Durability	M	5.52	5.65	5.39	5.76	5.28	5.54	5.48	5.32	5.08	4.79	5.19	5.50	4.92
	S	1.80	1.45	1.75	1.31	1.76	1.68	1.70	1.97	2.03	1.92	1.73	1.76	1.85
	N	163	77	145	88	236	28	205	79	110	77	170	88	147
Cracking	M	5.11	5.22	4.79	5.39	5.00	4.48	5.07	4.58	4.85	4.37	4.74	4.92	4.61
	S	1.99	1.62	1.83	1.64	1.95	1.78	1.78	1.90	1.79	1.92	1.66	1.72	1.75
	N	159	69	146	84	230	31	206	77	105	75	163	88	151
Rotting	M	5.89	5.87	5.37	6.10	5.58	5.48	5.80	5.00	5.52	5.10	5.35	5.80	5.26
	S	1.52	1.38	1.63	1.08	1.62	1.74	1.32	1.80	1.62	1.72	1.52	1.43	1.53
	N	160	69	145	87	233	31	206	78	106	78	168	90	150
Stitching	M	5.97	5.87	5.53	6.07	5.73	5.97	5.79	5.13	5.51	5.27	5.57	5.97	5.36
	S	1.51	1.43	1.62	1.26	1.54	1.23	1.54	1.88	1.72	1.62	1.49	1.43	1.66
	N	159	71	143	87	234	31	208	79	108	77	169	89	147

TABLE 14 (Continued)

Topic	Population													
	Panama				Hawaii				Okinawa					
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
Topic Score	M	5.11	5.51	4.49	5.41	4.86	5.34	5.36	5.30	4.87	5.09	4.90	5.08	4.65
	S	1.48	1.33	1.58	1.29	1.31	0.96	1.27	1.33	1.47	1.28	1.21	1.20	1.38
	N	165	84	150	90	238	31	224	83	114	81	176	91	153
Global	M	4.96	5.11	4.36	5.27	4.74	5.45	5.30	5.32	4.47	4.81	4.85	4.77	4.48
	S	2.08	1.91	2.17	1.95	1.93	1.39	1.85	1.91	2.05	1.90	1.70	1.63	1.89
	N	157	70	146	86	235	31	214	79	110	79	169	88	147
Portability	M	5.52	5.71	5.65	5.15	5.53	5.67	5.76	5.38	5.71	5.74	5.56	5.62	4.51
	S	1.87	1.66	1.83	1.87	1.62	1.45	1.62	1.63	1.59	1.20	1.56	1.34	1.97
	N	161	73	145	88	228	30	219	82	112	78	174	84	144
Durability	M	4.86	4.70	3.83	5.30	4.51	4.11	5.23	5.56	4.75	5.04	4.76	4.78	5.21
	S	2.16	1.97	2.24	1.57	1.93	1.92	1.85	1.64	1.91	1.65	1.85	1.57	1.76
	N	161	76	139	84	225	28	214	80	110	76	171	87	147
Capacity	M	4.77	4.73	3.61	5.46	4.38	5.48	4.67	4.30	4.64	4.69	3.99	4.81	4.03
	S	2.26	1.83	2.29	1.81	2.09	1.34	2.01	2.11	1.98	1.94	2.04	1.68	2.16
	N	160	71	148	85	231	31	220	81	107	78	173	83	153

TABLE 14 (Continued)

Topic	Population													
	Panama			Hawaii			Okinawa							
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
PONCHO (in Tropics)														
Topic Score	M	3.54	3.78	3.58	4.69	3.15	3.35	3.90	3.72	3.82	3.60	4.20	4.04	4.30
	S	1.64	1.71	1.52	1.29	1.49	1.30	1.65	1.54	1.63	1.40	1.44	1.13	1.33
	N	1.66	84	151	90	238	31	224	83	114	81	176	91	153
Global	M	2.84	2.97	3.42	5.23	2.65	2.87	3.92	3.71	3.81	3.32	4.31	3.88	4.73
	S	2.06	2.03	2.20	1.78	1.96	1.82	2.21	2.09	2.19	1.91	1.99	1.65	1.89
	N	145	74	135	88	221	30	213	80	108	78	175	89	150
Durability	M	4.51	4.24	3.88	4.36	4.15	4.71	3.66	4.05	3.77	4.25	4.63	4.95	4.44
	S	1.92	1.80	2.02	1.71	1.91	1.76	1.88	2.06	1.89	1.74	1.73	1.45	1.68
	N	157	71	145	84	224	31	217	79	109	76	168	87	149
Protection	M	3.51	3.39	3.10	4.69	2.99	3.74	4.21	3.78	3.58	3.52	4.25	4.10	4.22
	S	1.83	1.81	1.90	1.77	1.69	1.72	1.83	1.85	1.81	1.42	1.72	1.37	1.74
	N	158	71	150	86	233	31	210	82	103	75	166	88	147
Comfort	M	1.67	2.01	1.80	1.99	1.66	1.80	2.49	2.33	2.31	2.18	2.85	2.79	2.14
	S	1.29	1.67	1.40	1.56	1.26	1.35	1.81	1.58	1.67	1.34	1.86	1.77	1.42
	N	161	58	140	83	232	31	214	81	103	74	171	87	146
Fit	M	2.91	3.28	2.88	4.06	2.65	3.41	3.00	2.54	2.72	2.65	3.02	2.99	3.20
	S	2.08	2.08	1.98	1.90	1.81	2.01	2.00	1.74	1.96	1.79	1.90	1.66	1.95
	N	163	76	146	88	230	29	220	81	112	77	173	85	147
Movement	M	3.10	2.57	2.52	2.81	2.70	3.97	2.85	2.95	2.78	3.26	3.11	3.31	2.48
	S	2.05	1.41	1.68	1.63	1.80	1.65	1.78	1.82	1.79	1.91	1.85	1.53	1.39
	N	163	76	140	86	232	29	214	80	106	76	174	89	147
Temperature	M	1.33	1.40	1.40	1.54	1.30	1.33	1.97	2.54	2.11	2.01	2.37	2.12	1.50
	S	0.95	0.86	0.88	1.12	0.96	0.65	1.37	1.83	1.63	1.29	1.41	1.23	0.90
	N	141	77	118	78	187	30	215	82	108	77	171	86	145

TABLE 14 (Continued)

Topic	Population													
	Panama			Hawaii			Okinawa							
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
Topic Score	M	2.64	3.49	3.11	2.90	2.62	3.02	4.00	4.13	3.99	4.19	3.23	3.05	3.33
	S	1.36	1.78	1.66	1.52	1.42	1.33	1.41	1.51	1.57	1.24	1.38	1.26	1.33
	N	166	84	150	90	238	31	224	83	113	81	176	91	153
Global	M	2.60	3.27	2.98	2.70	2.41	3.21	4.14	4.17	4.20	4.44	3.27	3.01	3.39
	S	1.75	1.94	2.00	1.72	1.67	1.79	1.93	1.90	2.07	1.73	1.74	1.54	1.52
	N	162	77	140	83	227	29	213	81	109	80	165	85	143
Temperature	M	2.90	3.41	2.94	3.08	2.64	3.06	5.17	5.31	5.09	5.37	3.54	3.44	3.63
	S	1.94	2.06	2.00	1.84	1.92	2.06	1.85	1.74	1.99	1.62	1.96	1.80	1.68
	N	158	71	146	87	231	31	217	80	109	79	170	88	150
Humidity	M	1.52	2.14	1.87	1.75	1.77	1.58	2.96	3.18	2.94	2.38	1.85	1.45	2.20
	S	1.13	1.58	1.29	1.12	1.41	0.75	1.70	1.78	1.71	1.40	1.10	0.83	1.28
	N	148	77	123	83	200	31	212	78	110	76	173	91	148
Rainfall	M	2.09	2.77	2.24	2.39	1.88	2.90	2.29	2.86	2.44	2.38	2.82	2.95	2.59
	S	1.49	1.79	1.65	1.58	1.37	1.49	1.50	1.89	1.46	1.40	1.73	1.58	1.54
	N	160	77	139	87	227	31	214	79	108	76	168	85	148

TABLE 14 (Continued)

Topic	Population													
	Panama						Hawaii						Okinawa	
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	AB	AR	SF	
Topic Score	M	2.10	2.55	2.12	2.23	1.97	2.47	3.23	3.28	3.16	3.13	3.03	2.13	2.73
	S	1.06	1.41	1.26	1.12	1.01	1.30	1.57	1.67	1.53	1.28	1.35	1.17	1.28
	N	165	84	150	90	238	31	223	83	114	81	176	91	153
Global	M	1.60	1.52	1.57	1.59	1.43	2.00	2.46	2.78	2.45	2.56	2.64	1.59	2.36
	S	1.12	0.83	1.17	0.94	0.97	1.39	1.57	1.80	1.63	1.54	1.54	1.05	1.45
	N	162	77	141	86	230	29	209	81	110	80	171	86	149
Quantity	M	1.36	1.64	1.40	1.31	1.28	1.77	2.45	2.92	2.50	2.59	2.56	1.78	2.17
	S	0.82	1.03	0.90	0.70	0.62	1.29	1.70	1.96	1.79	1.51	1.51	1.08	1.32
	N	159	70	148	87	236	31	210	78	107	79	166	89	149
Danger	M	4.03	3.73	3.52	4.45	3.76	3.52	5.26	4.69	5.25	5.43	4.07	3.35	3.99
	S	1.99	1.71	2.05	1.56	1.78	1.36	1.73	1.82	1.68	1.35	1.51	1.62	1.57
	N	158	71	143	86	225	31	210	81	110	77	165	88	151
Annoyance	M	1.54	1.48	1.44	1.44	1.28	2.20	2.50	2.86	2.45	2.47	2.50	1.30	2.21
	S	1.18	1.10	1.03	0.90	0.85	1.68	1.87	1.94	1.85	1.52	1.63	0.68	1.47
	N	162	77	146	88	230	30	212	81	107	79	172	88	146

TABLE 14 (Continued)

Topic

Population

	Panama			Hawaii			Okinawa							
	MI	ME	SF	IN	MD	IN	AR	ME	SF					
Topic Score	M	4.76	5.31	4.50	4.29	4.69	4.78	5.50	5.55	5.44	5.52	3.88	4.17	3.71
	S	1.64	1.39	1.57	1.42	1.24	1.24	1.41	1.17	1.21	1.21	1.36	1.60	1.29
	N	166	84	150	90	238	31	224	83	114	81	176	91	153
Global	M	4.29	4.64	3.98	3.79	4.27	4.43	5.28	5.54	5.27	5.44	3.16	3.47	3.12
	S	2.20	1.93	2.08	1.84	1.90	1.65	1.86	1.54	1.67	1.62	1.94	2.11	1.77
	N	160	75	145	88	227	30	212	80	110	79	174	86	150
Availability	M	5.57	5.77	5.24	5.41	5.50	5.68	5.66	5.63	5.62	5.71	4.65	4.73	5.07
	S	1.70	1.33	1.80	1.33	1.60	1.28	1.46	1.44	1.38	1.37	1.66	1.54	1.31
	N	146	65	131	81	202	31	215	80	109	76	165	88	148
Healthfulness	M	4.14	4.28	4.11	3.53	4.02	4.45	5.17	5.24	5.31	5.42	3.95	4.36	3.19
	S	2.24	1.98	1.98	1.91	2.09	1.85	1.94	1.74	1.65	1.56	1.88	1.90	1.85
	N	159	71	148	88	233	31	210	79	108	79	167	88	151
Taste	M	5.06	5.55	4.76	4.66	4.71	4.83	5.50	5.29	5.27	5.28	4.58	4.47	4.10
	S	1.83	1.42	1.93	1.69	1.65	1.39	1.70	1.65	1.67	1.40	1.66	1.63	1.68
	N	161	77	142	87	229	30	215	82	110	81	173	88	149

WATER

TABLE 15

TOPIC SCORES AND ITEM MEANS FOR NON-COMBATANT TROOPS

MEALS	Topic	Population											
		Panama						Hawaii					
		MI	ME	AB	SF	IN	MD	IN	AR	ME	SU		
	Topic Score	M	4.87	4.12	3.93	4.74	3.76	4.84	4.04	3.83	3.59	3.16	
		S	1.55	1.57	1.72	1.20	1.66	1.37	1.54	1.54	1.75	1.39	
		N	166	87	150	87	238	31	225	83	113	81	
	Global	M	4.63	3.58	3.71	4.50	3.47	4.52	3.79	3.64	3.31	2.63	
		S	1.87	1.79	2.03	1.48	1.93	1.56	1.85	1.79	2.02	1.62	
		N	164	80	145	86	232	31	221	81	110	80	
	Variety	M	4.79	3.58	3.92	4.83	3.81	5.00	4.44	3.98	3.95	4.03	
		S	2.09	1.97	2.23	1.90	2.07	1.93	2.08	2.02	2.12	2.14	
		N	155	81	142	86	221	30	214	81	110	78	
	Quantity	M	5.14	4.33	3.73	4.92	3.43	5.40	4.08	3.75	3.26	3.40	
		S	2.01	2.02	2.19	1.83	2.16	1.69	2.00	2.03	2.11	1.88	
		N	161	76	143	85	230	30	219	80	110	78	
	Quality	M	4.57	3.97	4.26	5.08	3.89	4.84	4.27	4.08	3.77	3.55	
		S	2.07	1.91	2.03	1.38	1.96	1.67	1.86	1.97	2.17	1.94	
		N	161	70	149	85	229	31	214	80	110	78	
	Taste	M	4.62	3.21	3.48	4.47	3.21	4.55	3.47	3.33	3.05	2.47	
		S	2.01	1.76	1.99	1.50	1.93	1.56	1.87	1.77	2.05	1.64	
		N	161	70	147	85	235	31	219	82	109	76	
	Greasiness	M	3.76	3.46	3.08	4.41	3.09	3.65	3.02	2.84	2.86	2.40	
		S	1.72	1.48	1.84	1.18	1.71	1.47	1.53	1.65	1.57	1.50	
		N	162	70	147	85	233	31	215	82	106	80	
	Preparation	M	4.69	3.57	3.48	4.55	3.41	5.03	3.70	3.66	3.36	2.52	
		S	1.98	1.96	2.15	1.63	2.04	1.84	1.95	1.98	2.11	1.70	
		N	165	81	147	85	232	31	218	82	106	81	

TABLE 15 (Continued)

Topic	COMBAT BOOTS (in Tropics) Topic Score	Population									
		Panama					Hawaii				
		MI	ME	AB	SF	IN	MD	IN	AR	ME	SU
	M	3.72	3.97	3.53	3.66	3.42	3.66	3.54	3.62	3.84	3.63
	S	1.56	1.63	1.61	1.48	1.47	1.33	1.46	1.45	1.61	1.33
	N	163	87	149	89	235	31	220	83	110	80
Global	M	3.54	3.62	3.40	3.33	3.08	3.39	3.37	4.01	3.63	3.52
	S	1.81	1.92	1.93	1.62	1.66	1.60	1.71	1.85	1.74	1.63
	N	158	82	146	83	226	31	217	79	107	79
Traction	M	3.48	3.30	2.78	2.55	2.68	3.84	3.13	3.45	3.55	3.37
	S	1.94	1.95	2.09	1.72	1.87	1.69	1.78	1.74	1.95	1.68
	N	156	70	147	86	223	31	215	83	106	78
Protection	M	3.95	4.46	4.02	4.48	3.83	4.32	3.97	4.09	4.02	3.99
	S	1.84	1.66	1.96	1.59	1.72	1.59	1.79	1.73	1.88	1.60
	N	160	81	145	86	226	31	212	78	105	79
Durability	M	3.21	3.01	3.10	3.20	2.93	3.16	2.88	2.73	3.23	3.28
	S	1.90	1.74	1.91	1.56	1.68	1.46	1.68	1.54	1.88	1.64
	N	154	82	140	81	213	31	216	79	110	76
Cracking	M	2.98	3.24	3.24	3.63	3.21	3.26	3.51	3.40	3.61	3.18
	S	1.96	1.94	2.05	1.92	1.82	1.90	1.83	1.86	1.93	1.83
	N	156	79	143	87	229	31	207	81	110	76
Rotting	M	2.81	3.05	3.03	2.93	2.91	2.90	3.28	3.17	3.52	3.33
	S	1.89	1.90	1.86	1.70	1.76	1.49	1.70	1.67	1.85	1.64
	N	159	80	144	85	219	31	220	82	108	78
Stitching	M	3.75	3.50	3.64	3.65	3.52	3.70	3.85	3.62	3.94	3.95
	S	2.02	1.92	2.06	1.88	1.87	1.68	1.91	1.78	1.91	1.87
	N	162	80	146	86	228	30	219	77	111	78

TABLE 15 (Continued)

PACK	Topic	Population											
		Panama						Hawaii					
		MI	ME	AB	SF	IN	MD	IN	AR	ME	SU		
Topic Score	M	4.36	4.30	4.14	3.72	3.72	4.59	3.68	4.07	3.99	3.97		
	S	1.64	1.71	1.67	1.62	1.50	1.11	1.64	1.51	1.33	1.29		
	N	165	86	149	89	238	31	225	83	112	80		
Global	M	4.18	3.69	3.72	3.52	3.26	4.68	3.34	3.87	3.83	3.97		
	S	2.17	2.16	2.26	1.98	1.97	1.25	1.97	1.89	1.85	1.79		
	N	159	81	141	87	228	31	213	79	111	79		
Durability	M	4.61	4.27	4.33	3.47	4.04	4.87	3.82	4.01	4.34	3.95		
	S	1.86	1.82	2.13	1.85	1.94	1.48	2.04	1.85	1.70	1.67		
	N	155	71	146	86	228	31	219	79	109	80		
Capacity	M	4.16	4.10	4.46	3.31	4.11	4.39	3.08	3.80	3.56	3.78		
	S	2.23	2.16	2.33	2.52	2.16	2.03	2.16	2.12	2.03	2.07		
	N	161	70	145	88	233	31	214	81	106	79		
Comfort	M	3.72	3.20	3.77	3.87	3.06	4.00	3.10	3.61	3.60	3.40		
	S	2.18	1.89	2.24	1.86	2.01	1.69	2.02	1.99	1.96	1.76		
	N	155	70	145	84	219	30	218	79	108	77		
Weight	M	5.04	4.40	4.41	4.58	3.97	4.23	4.52	4.66	4.67	4.60		
	S	1.88	1.70	2.17	1.82	1.85	1.18	1.83	1.71	1.86	1.82		
	N	159	81	145	85	234	31	213	82	110	78		
Fit	M	4.31	3.84	4.07	4.07	3.58	4.52	3.36	3.60	4.00	3.73		
	S	2.07	1.79	2.20	1.89	1.85	1.41	1.88	1.74	1.69	1.59		
	N	163	82	144	86	225	31	222	82	103	77		
Movement	M	4.36	3.68	3.95	3.85	3.72	4.71	4.28	3.79	4.36	4.08		
	S	1.83	1.76	2.07	1.44	1.73	1.40	1.70	1.62	1.59	1.32		
	N	163	80	147	87	231	31	216	77	105	78		

TABLE 15 (Continued)

Topic	Population									
	Panama					Hawaii				
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU
OFFICERS										
Topic Score										
M	4.07	3.70	4.12	4.42	3.72	3.31	3.82	3.93	3.69	3.44
S	1.85	1.66	1.83	1.28	1.50	1.15	1.50	1.66	1.60	1.41
N	164	86	150	89	238	31	225	82	113	81
Global										
M	3.94	3.36	3.99	4.33	3.72	3.19	3.66	3.88	3.51	3.35
S	1.94	1.54	1.94	1.25	1.67	1.20	1.56	1.65	1.53	1.51
N	157	80	137	86	227	31	218	80	108	81
Experience										
M	3.74	2.73	3.57	3.81	3.20	2.97	3.51	3.68	3.22	3.08
S	2.19	1.71	2.08	1.74	1.90	1.58	1.87	1.94	1.76	1.65
N	159	70	144	86	228	31	212	80	105	78
Common sense										
M	4.02	3.50	4.14	4.22	3.61	3.68	3.94	4.03	3.76	3.58
S	2.25	1.92	2.06	1.58	1.97	1.71	1.88	1.99	1.99	1.79
N	161	82	147	86	233	31	220	79	111	81
Understanding										
M	4.17	3.48	3.90	4.68	3.63	3.58	3.78	3.75	3.56	3.72
S	2.02	1.78	2.06	1.33	1.84	1.79	1.71	1.89	1.82	1.67
N	161	82	146	87	232	31	216	80	108	81

TABLE 15 (Continued)

<u>Topic</u>	<u>Population</u>										
	<u>Panama</u>					<u>Hawaii</u>					
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	
ENTERTAINMENT											
Topic Score	M	2.81	3.84	2.76	2.86	2.71	2.81	3.89	3.68	3.32	3.45
	S	1.68	1.84	1.51	1.52	1.47	1.45	1.77	1.64	1.81	1.70
	N	157	86	142	86	221	30	204	79	99	78
Global	M	2.39	2.84	2.25	2.61	2.44	2.52	3.67	3.21	3.01	3.15
	S	1.89	1.99	1.79	1.85	1.93	1.83	2.16	2.00	2.13	1.85
	N	158	69	145	85	232	31	216	80	105	78
Quantity	M	3.08	3.77	2.81	3.39	2.84	3.48	3.99	3.79	3.78	3.79
	S	1.76	1.75	1.77	1.62	1.64	1.56	1.80	1.84	1.96	1.77
	N	159	81	140	86	228	31	215	81	107	81
On-base	M	2.46	2.92	2.21	2.64	2.43	3.10	3.61	3.50	3.51	3.29
	S	1.96	1.94	1.73	1.78	1.78	1.64	1.98	1.85	2.10	1.90
	N	158	75	145	88	229	30	211	78	108	79
Off-base	M	3.32	3.65	3.96	2.57	3.45	2.87	3.99	4.23	3.57	3.62
	S	2.28	2.20	2.31	1.85	2.19	2.03	2.20	1.99	2.25	2.05
	N	158	82	139	88	230	30	211	78	110	79

TABLE 15 (Continued)

Topic	Population										
	Panama					Hawaii					
	MI	ME	AB	SF	IN	MD	IN	AR	ME	SU	
Topic Score	M	4.28	4.67	4.14	4.41	4.05	4.07	4.77	4.40	4.33	
	S	1.56	1.45	1.39	1.16	1.47	1.25	1.53	1.52	1.29	
	N	154	85	137	81	213	30	196	78	99	78
Global	M	5.32	5.10	4.50	5.41	4.73	4.84	5.00	4.86	4.70	4.92
	S	2.03	1.93	2.02	1.70	2.00	1.73	2.12	2.08	2.09	1.77
	N	153	81	131	79	210	31	196	76	104	79
Authorization	M	2.30	3.59	2.91	3.29	2.33	3.26	4.38	4.32	4.18	4.26
	S	1.88	2.00	1.90	2.24	1.81	2.03	2.24	2.05	2.25	1.94
	N	151	80	136	83	218	31	191	79	102	78
Quarters	M	3.20	3.90	3.46	2.99	3.61	3.42	4.00	3.53	3.60	3.65
	S	2.15	1.74	1.86	1.85	1.87	1.77	1.77	1.88	2.01	1.54
	N	152	81	133	83	213	31	188	77	101	77
Acclimation	M	2.91	3.51	3.23	2.96	2.73	3.10	2.95	2.91	2.83	2.74
	S	1.91	2.02	1.77	1.62	1.74	1.59	1.95	1.98	1.98	1.82
	N	149	70	133	78	214	31	199	81	101	80

TABLE 16

TOPIC SCORES AND ITEM MEANS FOR COMBATANT TOPICS

<u>Topic</u>				<u>Population</u>		
				Okinawa		
	AB	AR	SF	AB	AR	SF
TIGER SUIT						
Topic Score						
M	4.96	4.67	5.65			
S	1.07	1.34	0.93			
N	138	45	144			
Global						
M	5.07	4.10	6.17			
S	1.36	1.52	1.10			
N	135	39	138			
Comfort						
M	4.58	4.05	5.46			
S	1.20	1.18	1.35			
N	129	40	142			
Durability						
M	4.21	4.31	4.32			
S	1.01	1.24	1.39			
N	126	39	137			
Protection						
M	4.63	4.55	5.24			
S	1.21	1.18	1.31			
N	126	42	140			
Camouflage						
M	5.27	4.87	5.86			
S	1.39	1.36	1.40			
N	127	39	142			
Insects						
M	4.20	4.23	4.20			
S	1.18	1.17	1.36			
N	121	40	140			
Underbrush						
M	4.70	4.49	4.74			
S	1.14	1.36	1.27			
N	123	41	142			

TABLE 16 (Continued)

<u>Topic</u>	<u>Population</u>		
	AB	Okinawa AR	SF
HAMMOCK			
Topic Score	M	4.34	4.93
	S	0.95	1.40
	N	37	131
Global	M	4.24	4.95
	S	1.34	1.83
	N	37	126
Portability	M	4.06	4.50
	S	1.53	2.03
	N	34	127
Protection	M	4.12	5.46
	S	1.39	1.57
	N	34	127
Durability	M	4.21	4.13
	S	0.96	1.51
	N	34	128

TABLE 16 (Continued)

<u>Topic</u>	<u>Population</u>		
	AB	Oklnawa AR	SF
PONCHO LINER			
Topic Score			
M	4.93	4.51	4.90
S	1.44	1.15	1.47
N	122	39	152
Global			
M	3.79	3.35	5.94
S	1.55	1.44	1.48
N	105	43	142
Portability			
M	4.24	4.05	5.80
S	1.28	1.59	1.58
N	101	42	142
Durability			
M	4.29	3.98	5.20
S	1.23	1.49	1.36
N	100	42	142
Protection			
M	4.29	4.38	5.77
S	1.17	1.66	1.41
N	100	42	142

TABLE 16 (Continued)

Topic	Population			
	AB	Okinawa AR	SF	
RUCK SACK Topic Score	M	4.15	3.79	5.78
	S	1.25	1.08	1.18
	N	106	43	143
Global	M	4.75	4.39	4.49
	S	1.54	1.28	2.06
	N	113	36	150
Durability	M	4.64	4.18	4.91
	S	1.43	1.45	1.74
	N	113	38	148
Capacity	M	5.10	4.43	6.37
	S	1.56	1.26	0.99
	N	117	37	150
Comfort	M	4.34	3.78	4.21
	S	1.58	1.47	2.17
	N	116	37	148
Weight	M	4.20	4.03	3.77
	S	1.38	1.53	2.06
	N	117	37	148
Fit	M	4.68	4.08	4.89
	S	1.35	1.20	1.84
	N	119	38	149
Movement	M	4.28	4.24	4.38
	S	1.16	1.36	1.65
	N	116	37	144