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RM-4966-1-ISA/ARPA
NOVEMBER 1966

SOME EFFECTS OF MILITARY OPERATIONS ON VIET CONG ATTITUDES

Frank H. Denton

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Rand
SANTA MONICA, CA. 90406

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Frank H. Denton

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FOREWORD

This report is one of a series of Rand studies that examine the organization, operations, motivation, and morale of the Viet Cong and North Vietnamese forces that fought in South Vietnam.

Between August 1964 and December 1968 The Rand Corporation conducted approximately 2400 interviews with Vietnamese who were familiar with the activities of the Viet Cong and North Vietnamese army. Reports of those interviews, totaling some 62,000 pages, were reviewed and released to the public in June 1972. They can be obtained from the National Technical Information Service of the Department of Commerce.

The release of the interviews has made possible the declassification and release of some of the classified Rand reports derived from them. To remain consistent with the policy followed in reviewing the interviews, information that could lead to the identification of individual interviewees was deleted, along with a few specific references to sources that remain classified. In most cases, it was necessary to drop or to change only a word or two, and in some cases, a footnote. The meaning of a sentence or the intent of the author was not altered.

The reports contain information and interpretations relating to issues that are still being debated. It should be pointed out that there was substantive disagreement among the Rand researchers involved in Vietnam research at the time, and contrary points of view with totally different implications for U.S. operations can be found in the reports. This internal debate mirrored the debate that was then current throughout the nation.

A complete list of the Rand reports that have been released to the public is contained in the bibliography that follows.

(CRC, BJ: May 1975)

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For a description of the Viet Cong Motivation and Morale Project and interviewing process, the reader should first consult W. Phillips Davison, *User's Guide to the Rand Interviews in Vietnam,* R-1024-ARPA, March 1972.

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PREFACE

Since July 1964, The RAND Corporation's field office in Saigon has been conducting a study of Viet Cong motivation and morale under the joint sponsorship of the Office of the Assistant Secretary of Defense for International Security Affairs and the Advanced Research Projects Agency. Information obtained from the interrogation of prisoners and defectors is the primary data on which the study is based; however, captured Viet Cong documents serve as cross-checks on interview materials.

This Memorandum presents a detailed statistical analysis of some aspects of the attitude of prisoners and defectors toward their former role in the Viet Cong and the relationship of this attitude to their military experiences. The analysis is limited to interviews conducted between December 1964 and mid-July 1965.

Additional material related to the topics discussed in this Memorandum is provided in the following RAND publications:

RM-4699-ISA/ARPA — Some Impressions of Viet Cong Vulnerabilities: An Interim Report, by L. Goure´ and C.A.H. Thomson.

RM-4911-ISA/ARPA — Some Findings of the Viet Cong Motivation and Morale Study: June--December 1964, by L. Goure´, A. J. Russo, and D. Scott.

RM-4864-ISA/ARPA — Observations on the Chieu Hoi Program, by L. W. Pye.

RM-4830-ISA/ARPA — Viet Cong Motivation and Morale: The Special Case of Chieu Hoi, by J. M. Carrier and C.A.H. Thomson.

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SUMMARY

Since July 1964 RAND has had a team in Vietnam conducting interviews with captured Viet Cong, defectors, and civilian refugees. A total of about 850 interviews had been completed by July 1965. The present analysis is the result of an experimental application of computer-conducted quantitative analysis of these qualitative materials. Because of the limited effort, the data base for this analysis is restricted to a stratified (by force type) random sample of 167 interviews taken from the approximately 280 conducted with former Viet Cong between December 1964 and July 1965.*

About half of the 167 interviews were with captured Viet Cong, and about half were with defectors. Roughly equal numbers of former members of the Viet Cong main forces, local forces, guerrillas, and civilian organizations are included.

The original interview material is more or less a verbatim translation of the interviewee's response to a standard, but not rigidly adhered to, set of questions. This qualitative or verbal material was transformed into a multiple-response numerical format in order that certain statistical techniques might be used to aid the analyst. This process (coding) involves a careful reading of the interviews to determine the interviewee's answer to a set of numerically coded multiple-response questions. The coder reproduces the interviewee's response when the question to be coded is answered directly. If a direct response is not given, the coder has limited freedom to infer an answer.** Most questions used in the code are answered fairly specifically in the original interview.

The numerical representation of the verbal information contained in the interviews formed the basic data for analysis. The author's

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*A more extensive effort is under way to expand this data base, and the findings in this Memorandum will be supplemented by later material.

**If the answer is obtuse, or if the question is not asked or answered, a response of "unknown" or "irrelevant" is coded.

impressions gleaned from a careful reading of the interviews during coding and occasional further references to the original material for specific information set the background for analysis and interpretation. Mathematical correlation, concept mapping--a technique similar to principal-components analysis--and a logical test program for defining the distribution of interviewee responses for subsets of the total sample provide the basic data-processing routines for computer-based analysis.

The general objectives in this analysis were (1) to ascertain the relationship, if any, between an interviewee's attitudes toward the Viet Cong and the level of United States - Republic of Vietnam (US-RVN) offensive operations against his unit; and (2) to obtain indications, where data permitted, of variations in the same attitudes over a period of time, variations from one area of South Vietnam to another, and variations from one Viet Cong organization to another (main forces, local forces, guerrillas, or civilians). These indications of relationships were largely derived by correlating statements about experiences of US-RVN military operations with statements about degrees of support for the Viet Cong. That is, a relationship was held to exist if those interviewees who had been exposed to more US-RVN operations tended to indicate a lesser degree of allegiance to the Viet Cong than did those exposed to fewer (or no) US-RVN operations.

Findings on the attitudinal effects of US-RVN military pressures can be briefly summarized:

1. Among these interviewees, a significantly less pro-Viet Cong attitude* (allegiance) was found among those who stated they had been exposed to US-RVN air attacks or ground sweeps** than among those who did not mention such exposure.

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*A weighted index constructed from (1) the coder's estimate of interviewee's allegiance to the Viet Cong and (2) several coded statements of the interviewee's likes and dislikes about the Viet Cong. The terms "allegiance" and "likes and dislikes" will be used interchangeably to refer to this index.

**For the purposes of this Memorandum, direct air bombardment and large ground sweeps are classified as attacks. Other operations directed against the Viet Cong, such as defoliation, ambushes, air sur-

2. Although it cannot be stated conclusively, the data indicated that air and ground attacks were about equally effective in influencing individual attitudes, pro and con, about the Viet Cong. Allegiance changes appeared to be more sensitive to the intensity of attacks than to the source of the attacks (air or ground).

3. Interviewees who had been exposed to more of the US-RVN harassing operations--ambushes, aerial observation, defoliation, etc.--did not indicate a lower degree of allegiance to the Viet Cong. That is, pro- and anti-Viet Cong statements were unrelated to statements of the level of harassment experienced while in the Viet Cong.

4. Similarly, the frequency of anti-Viet Cong statements appeared to be unrelated to the interviewee's unit having experienced relatively heavy personnel casualties.

5. Interviewee statements about the adequacy of food and ammunition indicated that the basic Viet Cong logistic system does not appear to have been disrupted by the level of US-RVN operations conducted through mid-1965. Food was considered poor but adequate. Ammunition was not plentiful but was generally felt to be adequate for the needs of the unit. No tendency was noted for the frequency of these statements to change with time.

Attitudes toward various aspects of the Viet Cong system often differed between those who had been with the main forces and those who had been with the local forces:

1. Statements of former main-force members expressing positive or negative sentiments about the immediate social group* in the Viet Cong were not sensitive to the level of exposure to military operation.

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veillance, and various small unit operations, are referred to as "harassing activities" in order to differentiate them from attacks. This is done because of an a priori expectation that these harassing activities are different in their effect on the Viet Cong, and because a preliminary scanning of the data indicated that the interviewees reacted differently to the relatively severe attacks than they did to the harassing operations.

*The immediate social interaction group. In the Viet Cong this is primarily the three-man cell or the squad. However, the coded questions do not refer directly to this group but rather to a positive or negative reaction toward primary social interaction while in the Viet Cong.

Statements of local-force members showed a slightly more negative attitude toward the social group for those experiencing the highest level of attacks. However, the data do not indicate any tendency for a significant deterioration in the Viet Cong primary social structure through mid-1965.

2. The attitude of main-force members toward winning the war was sensitive to exposure to US-RVN ground attacks. That is, those who stated that US-RVN ground units had attacked them in their home areas had a somewhat lower expectation of a Viet Cong final victory than did those who had not been attacked.

3. Local-force members leaving the Viet Cong in mid-1965 expressed concern about physical survival more frequently than did either main-force members or local-force members with experience in the Viet Cong at an earlier time. This was notably the case for those local-force interviewees exposed to the highest levels of US-RVN operations in mid-1965.

Although many of the above relationships are probably not sensitive to time, it should be remembered in using these data that the fighting has been enlarged, both in scope and intensity, since July 1965, when the latest interview in this sample took place.

Also noted are some time and geographic variations in attitude:

1. For the time period covered, statements by main-force members of likes and dislikes about the Viet Cong and about the morale of their units were not sensitive to time of leaving the Viet Cong, which varied from early 1964 to mid-July 1965. Local-force interviewees leaving the Viet Cong in the spring and summer of 1965 stated they disliked many aspects of the Viet Cong and that their unit suffered from poor morale more often than did their counterparts who had left the Viet Cong earlier.

2. Time and geographic patterns of interviewee statements about likes and dislikes and about unit morale follow the pattern of US-RVN operations. Interviewee statements of high allegiance and of high unit morale were more often noted from those serving in the highlands and less often from those serving in the delta.

CONTENTS

FOREWORD iii

PREFACE vii

SUMMARY ix

Section

I. INTRODUCTION 1

II. DATA CODING AND INDEX FORMULATION 3
Data Coding 3
Index Creation 5

III. RELATIONSHIPS BETWEEN ALLEGIANCE TO THE VIET CONG AND MILITARY EXPERIENCE 17
Types of Actions 17
Military Experience 19

IV. INTERVIEWEE ATTITUDE TOWARD ASPECTS OF THE VIET CONG SYSTEM 25
Background 25
Primary-Group Loyalty 27
Parent-Group Loyalty 30
Fear for Survival 31
Material Life 33

V. INDICATIONS OF TIME AND GEOGRAPHIC TRENDS IN VIET CONG ATTITUDE 36
Geographic Variations in Interviewee Military Experience 37
Time Trends in Viet Cong Morale and Attitude 41
Geographic Trends in Viet Cong Morale and Attitude 43

APPENDIX 45

REFERENCES 53

I. INTRODUCTION

This Memorandum is based on the responses of 167 Viet Cong--half of them prisoners and the rest defectors--interviewed during the first half of 1965.* This sample contains roughly equal numbers of former members of the Viet Cong main forces, local forces, guerrillas, and civilian organizations.

The general goals of this analysis were (1) to study the relationship between the interviewee's allegiance to the Viet Cong and his exposure to US-RVN military operations, and (2) to search for possible trends in allegiance in relation to date of leaving the Viet Cong or to area of operation while in the Viet Cong. A more specific goal was to test the feasibility and utility of conducting statistical analyses of these qualitative interviews on a computer. It was expected that such an approach could supplement qualitative analyses by investigating hypotheses and by performing independent checks on predicted relationships.

In order to provide the data base for this trial numerical analysis, certain portions of the material in the original interviews (essay responses) were coded into a multiple-response format by asking and answering questions concerning the interviewee's recorded essay responses. The coder reproduced the interviewee's response when the question to be coded was answered directly. If a direct response was not given, the coder had limited freedom to infer an answer. Most questions were answered fairly specifically, and a limited check indicated a high degree of intercoder reliability. However, the material used for analysis was all coded by the author.

This coded material provided the base for a statistical analysis of possible relationships between Viet Cong attitudes and experiences. The basic mode of analysis was to compare statements about their attitude by interviewees who had had a given experience with statements by interviewees who had not had that experience. The computer was used

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*The 167 interviews constitute about 60 percent of the RAND interviews with a countrywide selection of former Viet Cong during this time.

to divide the data into various categories in order to test for many possible relationships of this nature. While the computations are essentially objective, the interpretation of these computations is still subjective.

Since the coding of the interviews is quite time-consuming, the analysis is necessarily based on a limited number of the total interviews available. As a result, information from some of the more recent interviews is not included in this analysis. While many of these findings are probably not sensitive to time, the use of a particular result should involve some consideration of the change in the character of the war in Vietnam since July 1965.

The findings reported in this Memorandum indicate the effects of US-RVN offensive operations on the Viet Cong, and the relative impact of different types of military operations. Thus, within the above limitations, useful background material is provided for the evaluation of alternative courses of military action.

II. DATA CODING AND INDEX FORMULATION

The original interviews contain a verbatim* recording of the interviewee's verbal response to questions that were often of a general nature. In order to use the desired analysis techniques it was necessary to convert this material into a numerical answer to more specific questions. This process (coding) is an integral part of the analysis. In addition, these basic coded items are often combined into indices representing more complex concepts. The concepts involved in the coding and the method of formulating indices are described in this section.

DATA CODING

The first step involved in formulating the data for analysis was to numerically code some of the verbal responses to the interview questionnaire. The code used was designed to cover only material generally contained in the interviews.** However, not all interviews covered all subjects, and on occasion the interviewee's response to a question was somewhat ambiguous. Several coding devices were employed in order to extract as much of the information as possible from the original interviews while still ensuring that the coded response would have a very high probability of accurately reflecting that information. The following is a description of the important aspects of the coding system:

1. Most of the coded material was based on interviewee responses to direct questions. In coding this material the coder was permitted to make only a minimum inference when the response was not direct. Reliability generally did not present a problem for items of this type.

Examples:

a. Subject mentioned that he disliked the "hard life" of a Viet Cong. Yes = 1, No = 0, Unknown = blank.

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*As limited by the translation problem.

**The code did not attempt to cover all the information contained in the interviews.

b. Subject stated that he joined the Viet Cong because of their "political aims." Yes = 1, No = 0, Unknown = blank.

c. Subject indicated that his unit was bombed or strafed by air while in its home (base) area. Yes = 1, No = 0, Unknown = blank.

2. A few items were needed in the analysis which necessarily had to be based on the coder's overall reaction to the interview. Reliability was more of a problem for these items; however, certain controls, discussed below, were instituted. Reliability was thus maintained at a satisfactory level.

Examples:

a. Coder's opinion: Subject's belief that the Viet Cong will win. Does not believe = 0, Uncertain = 1, Certain = 2.

b. Coder's opinion: Consistency and believability of subject's answers. Low = 0, Moderate = 1, High = 2.

3. A category to include unknown, irrelevant, unanswerable, etc., was permitted for each question coded. This category was used when the interviewee's response was too ambiguous to code or when the topic of interest was not covered in the interview. The "unknown" category is excluded from the statistical analysis.

4. An effort was made to code more than one facet of a topic of interest. This permitted internal checks on coding and, to an extent, checks on interviewee consistency. An example of this is given by item 2b (above) and the following question: Did the interviewer state that the subject was honest? Yes = 1, No = 0, Unknown = blank. (Comparing similar questions indicated a few inconsistencies and mechanical errors which were then corrected.)

5. At the initiation of the study, reliability checks were made between three coders. Also, during the coding, periodic rechecks were made for reliability. And, as will be described in the next section, the items used in the analysis were spot-checked against the original interviews to ensure that the coded material accurately represented the interview text.

As a result of this process there is a high certainty that the items are reliably coded. Although the final coding was all done by

one person, sufficient checks have been made to ensure that the categories are coded as the titles imply.*

INDEX CREATION

In the process of coding the data it was desired to keep most of the questions fairly simple, since it was felt that greater reliability could be achieved with simple questions. However, for analysis purposes it was desirable to treat more complex ideas. In order to obtain an estimate of a complex idea such as "allegiance" an index was created by combining a number of the simple numerical responses into one single measure. Each interviewee was then assigned a number indicating his score on each index relative to the other interviewees in the sample. A brief outline of the method for formulating indices is given below, using allegiance as the concept (a more generalized description is given in the Appendix).

Allegiance

A central question in this analysis was the influence of friendly operations on the Viet Cong will to fight or willingness to obey orders. A basic assumption was made that will to fight or willingness to obey orders is a function of "allegiance" to the organization. That is, those individuals emotionally committed or attached to an organization perform more efficiently and effectively than do those who are disaffected. Thus, any actions taken to lower the individual Viet Cong's allegiance to his organization will lower his effectiveness, that is, his will to fight.

Thus, for this analysis it was desired to have some measure of the interviewee's allegiance to the Viet Cong when he left that organization. Allegiance, however, is a complex concept and it cannot be directly evaluated from a particular item in the interviews. That is, at no point in an interview does the subject give an explicit statement

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*The procedures employed do not permit reliability estimates in the usual sense. Limited checks indicate reliability values in the range of 92 - 95 percent.

about the degree of his support for the Viet Cong. Thus, to code allegiance directly would require the coder to evaluate an overall impression gleaned from the interview. It was felt that such a direct evaluation of relative allegiance was likely to be less reliable and less sensitive to differences between interviewees than desired. The following list of items describes the conceptual process by which a sensitive allegiance estimator was derived from more reliable data:

1. Allegiance is a complex of concepts; however, it might be expected that persons with high (or low) allegiance would show certain symptoms. The data were examined for items which would provide an estimator of allegiance in the sense that high-allegiance persons should respond on these coded items in a certain way.

2. The coded material contains a number of items indicating an interviewee's likes and dislikes about life in the Viet Cong. For example, he may like or dislike Viet Cong political aims, like or dislike their attitudes toward villagers, like or dislike their political organization. These coded items are based on direct questions in the original interview about the subject's likes and dislikes while in the Viet Cong.

3. It is assumed that an individual with a high allegiance toward the Viet Cong should usually express general pride in his organization and his role in it. This type of individual would be expected to emphasize his liking for all or most aspects of the Viet Cong. The disaffected individual on the other hand should express a general dislike of the Viet Cong. That is, low allegiance is assumed to be associated with or manifested in disdainful statements about the Viet Cong or the unappealing aspects of life in the Viet Cong. Such statements of individual likes and dislikes are not expected to provide an exhaustive representation of the concept of allegiance. Rather, it is assumed that the set of individuals who express a general liking for the Viet Cong will contain many more high-allegiance individuals than will the set indicating general dislike. Indifferent individuals can logically be expected to express some likes and some dislikes.

4. There are a number of ways to formulate a single index from a number of individual items. The Appendix discusses the one selected

for use in this analysis. Briefly, mathematical correlation is used as the criterion for index formulation. An index is created to correlate high positively with statements of like and to correlate high negatively with statements of dislike.* This index then has (1) high values when many likes are expressed, (2) low values when many dislikes are expressed, and (3) intermediate values for mixed indications of like and dislike.

5. It is deduced in (1) through (4) that the postulated index should provide an estimate of the concept of allegiance. Several tests were made to determine if the derived index gave results which would be expected from an allegiance index. That is, in addition to being deductively reasonable does the index exhibit relationships with certain other items in the data as would be expected?

The following tests were used:

a. It was expected that defectors would show on the average a lower allegiance to the Viet Cong than would prisoners.

b. Rereading those interviews for which high and low scores are given on the index should show the extreme hard core on one end and the extremely disaffected on the other.

c. It is known that the Viet Cong main forces are the elite units, while the guerrilla units are at the lowest level in the hierarchy. The index should reflect differences (in the proper direction) in allegiance for these force types.

The index used in this analysis was formulated from ten measures of likes and dislikes; the correlation between these ten coded items and the index is shown in Table 1. It is seen that most of the correlations are reasonably high. This indicates that there is some tendency toward polarity in the data; likes tend to occur with other likes and dislikes with other dislikes. Each interviewee is assigned a score on this index to express his allegiance relative to the other interviewees.

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*These correlations are as high as possible, given the empirical relationships in the data.

Table 1

CORRELATION OF ALLEGIANCE INDEX WITH TEN MEASURES OF LIKES AND DISLIKES

Item Coded	Correlation With Index
Subject contented with life in VC	+0.8
Subject liked VC doctrine and aims	+0.7
Subject liked VC political organization	+0.7
Subject liked VC actions toward villagers	+0.4
Subject liked camaraderie of VC	+0.7
Subject believed VC are winning	+0.7
Political organization of VC alienated subject	-0.4
Subject disliked food in VC	-0.4
Subject disliked hard life in VC	-0.4
Subject disliked VC political organization	-0.4

Index Validity. As previously indicated, it would be expected that any reasonable index of allegiance would indicate a higher average value for prisoners than for defectors. Figure 1 plots the percent of the interviewees who were defectors as a function of allegiance score. The dashed line on Fig. 1 is a visual fit to the indicated trends. The expected relationship is strongly confirmed.

This finding is also of interest for reasons other than validity: Defectors express more dislikes and fewer likes than do captured Viet Cong, hence the like-dislike index is a fairly good predictor of behavior in terms of defection.

The Viet Cong military forces are divided roughly into a three-level hierarchy. The main force is the elite group, while the guerrillas tend to be composed of the dull and unenthusiastic. Thus, one would expect the allegiance of interviewees from the main force to be higher on the average than that of interviewees from the guerrilla force. As predicted, the index in Table 2 rates the main force highest and the guerrillas, by far, the lowest.

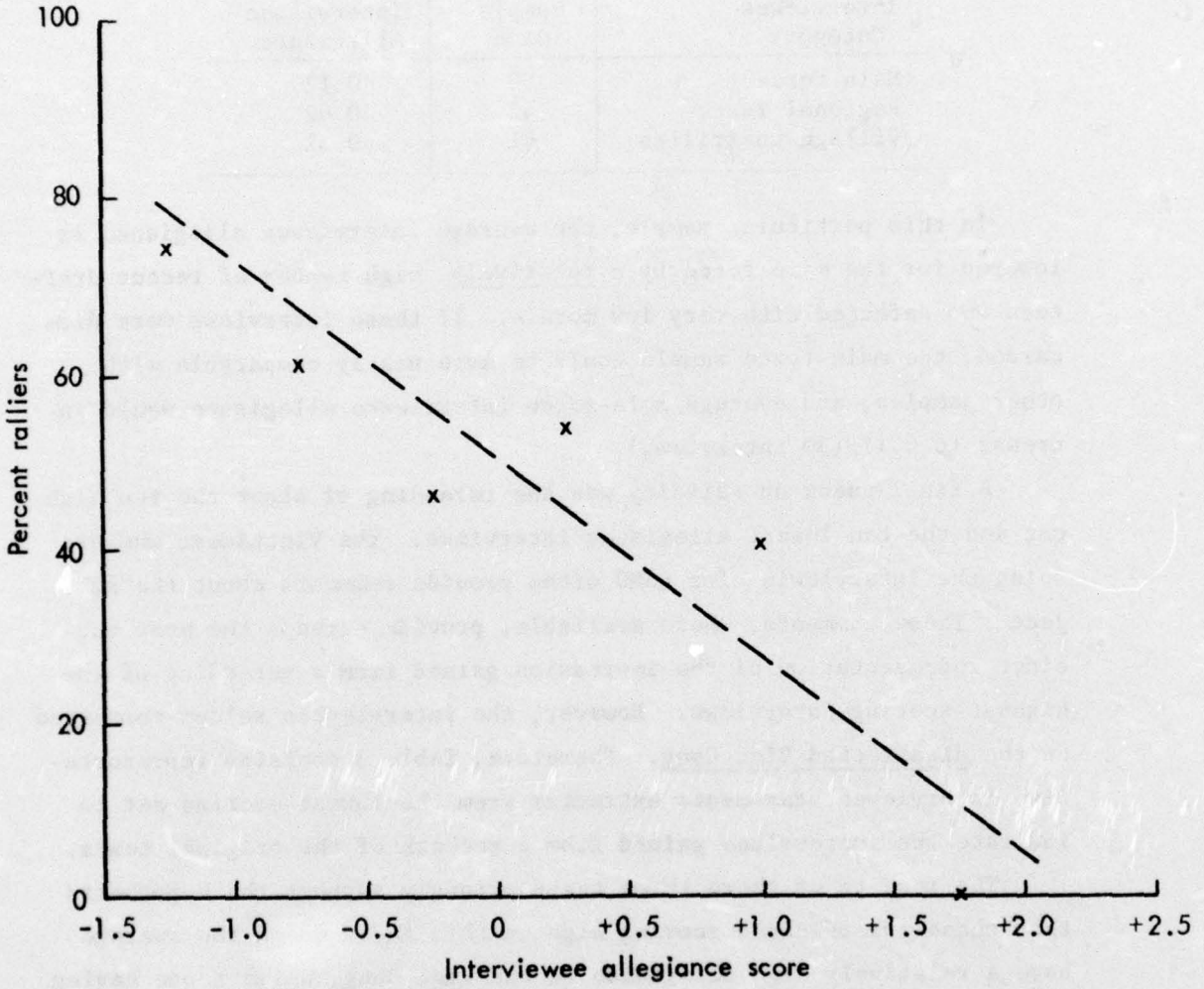

Fig. 1—Relationship of allegiance score to defection

Table 2

ALLEGIANCE INDEX ACCORDING TO FORCE CATEGORY

Interviewee Category	Sample Size	Average Interviewee Allegiance
Main force	50	0.11
Regional force	42	0.02
Village guerrillas	41	-0.31

In this particular sample, the average interviewee allegiance is lowered for the main force by a relatively* high number of recent draftees who defected with very low morale. If these interviews were discarded, the main-force sample would be more nearly comparable with other samples, and average main-force interviewee allegiance would increase to 0.17 (30 interviews).

A final check on validity was the rereading of about the ten highest and the ten lowest allegiance interviews. The Vietnamese who are doing the interviewing for RAND often provide comments about the subject. These comments, where available, provide perhaps the most succinct representation of the impression gained from a rereading of the highest-scoring interviews. However, the interviewers seldom commented on the disaffected Viet Cong. Therefore, Table 3 contains representative interviewee statements extracted from the lowest-scoring set to indicate the impressions gained from a recheck of the original texts.

The results of these three tests strongly support the hypothesis that those interviewees scoring high on this index do on the average have a relatively high allegiance to the Viet Cong, while those having low scores generally express anti-Viet Cong sentiments. This index was used, in this sense, as a primary analytical tool. The index also has certain statistical properties of interest. The index-creation scheme which is used results in a set of values with a zero mean and unit variance. The values for this index roughly approximate a normal distribution (Fig. 2). Thus it is sometimes convenient to think of

*Compared to the local-force and guerrilla samples.

Table 3

REPRESENTATIVE INTERVIEWER AND INTERVIEWEE STATEMENTS

Interview Rank on Allegiance Scale	Comment
Interviewer Comment on Interviewee With High Allegiance	
1	He kept his pride in belonging to the front. Regional Force, POW, Acting Company Commander (AG28).
2	Deeply attached to the front and his faith in communism is unshakeable. Main Force, Reconnaissance Squad Leader, POW (AG195).
3	Highly indoctrinated, hates U.S. and RVN, intelligent and tough. Female Liaison Agent, POW (AG243).
7	He was cooperative but in most answers he adhered to the front's line. Civilian, Propaganda Specialist, POW (AG23).
10	Hard-core communist...intelligent...vented his hatred for Americans. Civilian, Proselyting Cadre, POW (AG206).
Statement by Interviewee With Low Allegiance	
167	Front exploited people by taxes (7-44). Viet Cong live in constant fear of ARVN (7-46). I liked nothing in the Viet Cong (8-47). Regional Force, Rear Services Worker, Rallier (AG82).
166	Viet Cong always hid in bushes while RVN had many things (9-66). All the new recruits (draftees) wanted to return home (10-76). I tried to rally once before. Main Force, Private, Rallier (AG238).
155	Viet Cong threatened that I would be shot if I did not join (4-41). No front aim appealed to me (4-44). I wanted to rally but feared recapture by Viet Cong (7-68). Village Guerrilla, Private, POW (AG85).
154	What do you like best in the front? Nothing (9-75). I was used for cannon fodder (9-73). Not enough food (9-73). Main Force, Cook, Rallier (AG251).

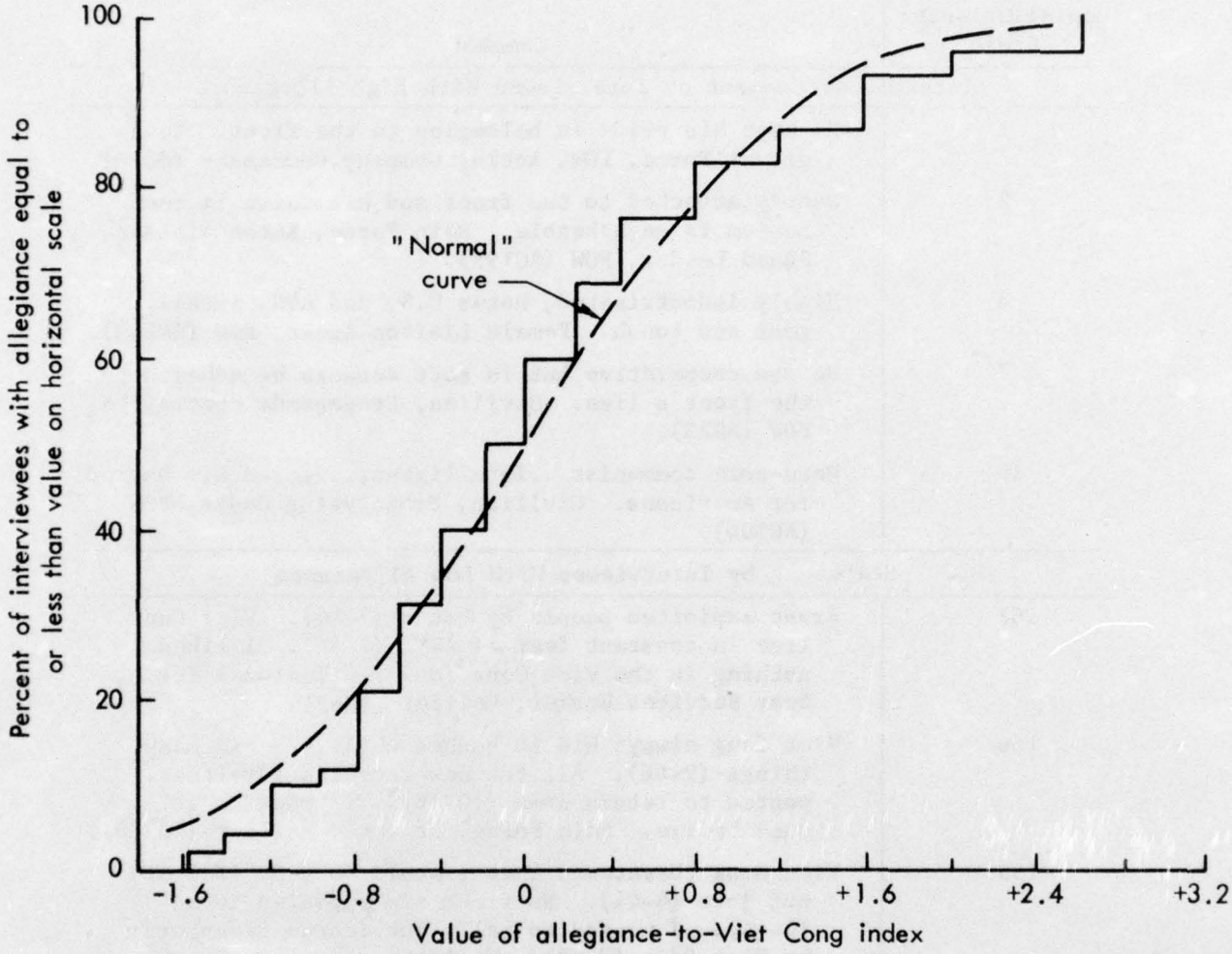

Fig. 2—Distribution of responses in allegiance interviews

the index scores as units of standard deviation in a normal distribution when comparing relative population scores.

In this analysis a number of other indices were developed. None of these is as complex or as important as the central element of allegiance. Since the logical process is essentially similar for the development of the other indices, they are discussed more briefly.

Unit Morale

The previous index represents an attempt to get at the individual's attitude toward his role in the Viet Cong. In addition to the subject's attitude, the original interview usually contains information on the subject's perception of the morale of his unit. Also, the process of the interview usually led to an extended discussion of attitudes and events in the subject's unit. This material provided the information necessary for coding the following three questions:

1. Did the interviewee state that his unit had good or bad morale? Good morale = 1, Bad morale = 0, No response = blank.
2. What was the state of morale of the interviewee's unit? Coder's opinion: Low = 0, Average = 1, High = 2, Indeterminate = blank.
3. Were there indications that the interviewee's unit had instituted coercive measures to prevent defection? Coder's opinion: Little or no = 0, Some = 1, Strong = 2, Indeterminate = blank.

These three measures are used to form an index which is referred to as unit morale in this Memorandum. This index correlated 0.85, 0.85, and -0.60,* respectively, with the above coded variables. As for all indices, several checks were made for validity. The average unit morale for each force type was computed:

	Average Unit Morale
Main force	0.38
Regional force	0.16
Village guerrillas	-0.42

*The minus correlation is used, since morale is assumed highest when no coercive measures are needed to prevent defection. That is, morale is inversely related to the numerical magnitude of question 3.

The pattern of average force morale is not unexpected: Main-force morale is the highest and guerrilla morale is, by far, the lowest.

Air Attacks

Some measure of the extent of exposure to air attacks for each interviewee was desired. However, many (if not most) interviewees did not discuss in great depth the frequency or intensity of air attacks. The following two items were coded as representing the level of information which could be extracted from all but the least informative interviews:*

	Correlation With Air-Attack Index
US-RVN air attacks forced unit to move. Yes = 1, No = 0, Unknown = blank	0.81
Unit (or immediate area) attacked while in camp or while moving from camp to camp. Yes = 1, No = 0, Unknown = blank	0.81

It may be argued that those interviewees exposed to both of these conditions have been exposed to the more intense air attacks. However, for many purposes of the analysis the interviewees are simply identified as "attacked by air" or "not attacked by air" without further differentiation.

Ground Attacks

A ground-attack index was generated in a manner essentially identical to that shown for air attacks. The correlations of the index with the exposure to ground-attack variables is virtually the same as for air attacks.

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*Of course, many interviews contain more information, but the desire here was to keep the sample large. The coded items were made less informative in order to maximize the number of interviews which provided sufficient information to permit coding.

Harassing Operations

The above two types of operations constitute what might be considered the more severe attacks against the Viet Cong. But several other types of US-RVN military operations were discussed by the interviewees. These actions usually involved smaller efforts or were less directly aimed at the individual and his unit. For convenience these other actions have been aggregated and termed harassing activities. The further assumption is made that there is possibly a cumulative effect from these activities, and a single harassing index is formed to represent the composite exposure:

	Correlation With Harassing Index
Ground operations disrupted unit's food supplies. Yes = 1, No = 0, Unknown = blank	0.62
Air operations disrupted unit's food supplies. Yes = 1, No = 0, Unknown = blank	0.62
Unit or portions of unit ambushed--number of times*	0.31
Air surveillance disrupted living patterns--number of times per month**	0.62

Total Military Pressure

It seems reasonable to suppose that these different types of military operations against the Viet Cong would probably have some cumulative effect. That is, an individual (or unit) exposed to all the various types of operations would feel himself to have been exposed to more military pressure than someone exposed to only one or two types. An index positively correlated with all these items was formed to represent the concept of the total military pressure to which the interviewee had been subjected:

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*All RVN ambushes discussed by the interviewees were very small actions.

**Indications of such events as disturbing cooking, training, or food production.

	Correlation With Military-Pressure Index
Ground operations disrupted food supply	0.28
Air operations disrupted food supply	0.20
Air attack forced move	0.65
Ground attack forced move	0.60
Unit attacked by air in home area	0.63
Unit attacked by ground in home area	0.66
Unit attacked by artillery in home area	0.76
Unit ambushed	0.00
Air attack disrupted living patterns	0.46

Punishment (or Casualties) Inflicted

Finally, a measure of the punishment inflicted on the interviewee's unit was desired as a representation of one aspect of military experiences. This index was primarily formulated from coded data on personnel losses. These loss data have the characteristic of being primarily related to Viet Cong offensive operations. That is, casualties were usually mentioned as the result of US-RVN reactions to a Viet Cong-initiated incident. Losses were mentioned relatively seldom in conjunction with a government-initiated incident. The same generally holds true for the "defeated" variable, which represents a fairly rare occurrence in these data. The following correlations were used:

	Correlation With Punishment Index
Unit ever defeated by RVN ground force? Yes = 1, No = 0, Unknown = blank	0.69
Unit have losses to air? Yes = 1, No = 0, Unknown = blank	0.69
Unit have losses to ground? Yes = 1, No = 0, Unknown = blank	0.69
Number of personnel casualties in unit for past six months	0.69

These are the primary indices used in this analysis; the few others used will be described when introduced.

III. RELATIONSHIPS BETWEEN ALLEGIANCE TO THE VIET CONG AND MILITARY EXPERIENCE

In counterinsurgency warfare, actions taken against the insurgents may be considered to have at least the following important goals:

1. To kill or capture personnel.
2. To disrupt logistic and communication networks and sources.
3. To lower the enemy's fighting effectiveness by harassment of his personal life; that is, to lower the enemy's will to fight by making life increasingly difficult and dangerous.

The extent to which the first two goals are accomplished can be judged from overt manifestations of damage. However, changes in the enemy's will to fight can be estimated only by observing the Viet Cong soldier. The prisoner and defector provide potentially useful indirect sources for such observation. Thus, this Memorandum concentrates on how prisoner and defector attitudes (likes and dislikes) toward their role in the Viet Cong relate to their statements about the level of RVN operations directed against them.

TYPES OF ACTIONS

Three general types of military activity designed to accomplish one or more of these goals are conceptualized. First are the US-RVN air attacks against Viet Cong home areas, which are usually perceived by the Viet Cong as a major source of danger. In the base areas fear of air attack varies somewhat. Many interviewees express confidence that their shelter system makes them relatively safe from air attacks.* However, the possibility of air attacks does limit the Viet Cong's mobility and restricts their life greatly; and on those rare occasions when an air attack catches them in the open in their home areas, heavy casualties may be inflicted. Thus, while offensive air does not (based on these interviews) often inflict heavy casualties on the Viet Cong,

*It is possible that recent heavy bombings--not covered in this interview sample--particularly the B-52 raids, may have changed this belief.

it does harass their life, create at least some sense of impotence, and present a continuing psychological pressure because of the minimum warning of attack.

Second are the RVN (and now U.S.) ground sweeps (attacks) designed to seek out and destroy Viet Cong units. During most of the time period covered in this sample of interviews these operations were conducted only by RVN forces. Usually these operations were mounted in such strength that the Viet Cong chose to avoid contact wherever possible. As a result, most of these operations did not inflict serious casualties on the Viet Cong; however, they may be considered to be a direct attack on the image of "invincibility" that the Viet Cong have attempted to inculcate in their troops. Since RVN ground sweeps are usually large, they commonly require that the Viet Cong abandon their camps and remain on the move for the duration of the operation. This contrasts with the air attack, which usually requires only a short stay in a shelter. On the other hand, most ground operations have been telegraphed to such an extent that surprise is seldom an element.

Several different types of military activity have been grouped into the third category and referred to as harassing actions. These actions are usually less of a direct threat to the individual Viet Cong. US-RVN* ambushes of the Viet Cong in these data were almost always small and were typically conducted against an isolated patrol or against a small foraging or resupply element. Few casualties resulted and the

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*United States Special Forces only during this time.

interviewees generally described these operations as more of a nuisance than a central threat. Other actions such as defoliation and ground operations against the Viet Cong food sources are also included in the category.

MILITARY EXPERIENCE

As stated earlier, the average level of pro-Viet Cong attitude varies considerably for interviewees from the different Viet Cong force types. The average level of exposure to RVN military activity also varies by force type. Thus, it is necessary to examine the relationship of attitude to military activity separately for three primary types of Viet Cong forces. (See the Appendix for a brief discussion of some characteristics of these forces.)

Exposure to RVN Ground Operations

The interviewees are divided into two categories, as shown in Table 4: those who stated that they had been attacked in at least one RVN ground sweep and those who said they had not been attacked.

Table 4

EFFECT OF GROUND ATTACKS ON AVERAGE VALUE OF ALLEGIANCE INDEX[a]
(Sample size is in parentheses.)

Force Type	Not Attacked	Attacked
Main force	0.63 (10)	0.19 (20)
Local force	0.41 (12)	-0.17 (26)
Village guerrillas	-0.06 (5)	-0.28 (33)
All military	0.39 (27)	-0.12 (79)

[a]Includes only interviewees with at least five months service in the Viet Cong.

The average value of allegiance for those exposed to ground operations is considerably lower than for those not exposed.* That is,

*The "Not Attacked" mean value is at the 75th centile (that is, only 25 percent of the interviewees have an allegiance value greater

those interviewees who had been exposed to RVN ground attacks were considerably less pro-Viet Cong than those who had not been attacked.

Exposure to RVN Air Operations

The interviewees are again divided into two categories, as shown in Table 5: those who had been attacked by air and those who had not been attacked by air.

Table 5

EFFECT OF AIR ATTACKS ON AVERAGE VALUE OF ALLEGIANCE INDEX
(Sample size is in parentheses.)

Force Type	Not Attacked	Attacked
Main force	0.65 (11)	0.09 (19)
Local force	0.37 (18)	-0.21 (20)
Village guerrillas	-0.02 (17)	-0.42 (21)
All military	0.29 (46)	-0.19 (60)

The overall change (going from "not attacked by air" to "attacked by air") in the allegiance value (-0.48) is roughly the same as for the ground-attack case (-0.51).

Exposure to RVN Harassing Operations

The harassment index, which provides a finer discrimination of the level of exposure than does the air or ground index, is discussed in terms of three levels of exposure: low, medium, and high (Table 6).

The data do not show a decline in allegiance for those exposed to higher levels of harassment, thus indicating that these types of operations were not felt to be a major threat by the individual. This contrasts with the rather marked decline in statements of allegiance for those exposed to ground or air attacks.

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than 0.39), while the "Attacked" mean value drops 22 points to the 53rd centile. A two-way chi square, dividing allegiance into greater-than-zero and less-than-zero categories, indicates a significance level of about 0.15. That is, there is about one chance in seven of a random occurrence giving a distribution at least this unequal. For a more complete description of the chi-square test, see Ref. 1.

Table 6

EFFECT OF HARASSMENT ON AVERAGE VALUE OF ALLEGIANCE INDEX
(Sample size is in parentheses.)

Force Type	Low	Medium	High
Main force	+0.15 (11)	+0.26 (9)	+0.61 (10)
Local force	-0.18 (17)	+0.38 (15)	-0.25 (6)
Village guerrillas	-0.24 (25)	-0.02 (8)	-0.54 (5)
All military	-0.14 (52)	+0.25 (32)	+0.09 (21)

Similarly, allegiance is higher for those interviewees who had been ambushed than it is for those who either had not been or did not discuss ambushes:

	Average Value of Allegiance Index
Had been ambushed by RVN	+0.35
Had not been ambushed	-0.18
No response on ambush	-0.10

Responses concerning defoliation were examined in an attempt to shed some light on the question of the influence of defoliation on morale and on food supply:*

Percentage of interviewees who had heard of defoliation or crop spraying	73
Percentage of interviewees who had seen the effect of defoliation or crop spraying	31
Percentage of occurrences in which the interviewee's response led to the conclusion that defoliation had	
Little influence on either morale or food	86
Some influence on either morale or food	14
Marked influence on either morale or food	0
Allegiance index of interviewees who had seen the effects of defoliation or crop spraying	+0.19
Allegiance index of interviewees who had not seen the effects of defoliation or crop spraying	+0.02

*The examination of reaction to defoliation was coded for a smaller number (109) of interviewees than for the other items.

Both the analysis of the direct responses of the interviewees to questions concerning reaction to defoliation and the attempt to measure response by examining allegiance indicate that defoliation had not been a significant concern for the Viet Cong.* Only 14 percent of the sample stated that defoliation had even a moderate influence on their unit's morale or food supply, and only 30 percent had even seen the effects of defoliation.

Overall, the data would indicate little, if any, tendency for those interviewees experiencing high levels of harassment to give a higher incidence of anti-Viet Cong statements.

Total RVN Military Activity

The objective of the preceding discussion was to find clues to which type of military activities--ground, air, or harassment--tends to be most strongly related to negative attitudes toward the Viet Cong on the part of the interviewees. Independent of the relative influence of these operations, it seems reasonable to suppose that some cumulative effects will result when an interviewee has been exposed to more than one type of action. To test this hypothesis an index positively correlated with all types of military activity is examined in Table 7.

Table 7

EFFECT OF TOTAL MILITARY PRESSURE ON AVERAGE VALUE OF ALLEGIANCE INDEX
(Sample size is in parentheses.)

Force Type	Level of Total Military Pressure		
	Low	Medium	High
Main force	0.70 (8)	0.29 (8)	0.04 (14)
Local force	0.36 (15)	0.27 (8)	-0.40 (15)
Village guerrillas	-0.06 (8)	-0.23 (15)	-0.42 (15)
All military	0.34 (31)	0.03 (31)	-0.27 (44)

*Since this analysis was completed, the level of defoliation and crop-spraying operations has been increased. A future study will examine the reactions to these operations in more detail.

As expected from the previous findings, there is a consistent decline in allegiance to the Viet Cong as the stated level of total military operations directed against an interviewee's unit increases. The decline is a little greater than for either the air-attack or ground-attack categories taken separately.

Casualties or Punishment

The final measure of the interviewee's military experiences is the casualty or punishment index (Table 8). This index provides a measure of the extent to which an interviewee's unit had absorbed punishment, in terms of personnel losses or defeats, during his stay in that unit.

The data are ambiguous regarding any indication of a decrease in allegiance with an increase in casualties or punishment. Since the interviewed cadre often stated that his unit was concerned over a probable loss in unit morale when heavy casualties occurred, the above finding is somewhat surprising. One factor may be that even though the Viet Cong often lose heavily in their offensive operations, the RVN is usually believed to have even heavier losses, creating an aura of Viet Cong success. Thus, losses may be mentally discounted as the necessary price for success. Another possible factor is that the elite units tend to have more losses, since they are more active. Since members of elite units will on the average have the highest allegiance in the Viet Cong, a positive relationship may possibly exist between casualties and allegiance when examining these factors across elite and nonelite units. If this were true, such a relationship could mask an inverse relationship within one unit type. The data as coded do not permit the testing of this possibility.

Other possible explanations exist. The punishment index or the allegiance index may be poorly formulated, for example. It also may be true that at the level of operations through mid-1965, few Viet Cong units (with the probable exception of some local-force units) had been hurt badly enough, in terms of personnel losses, to significantly affect morale.

Table 8

EFFECT OF MILITARY PUNISHMENT ON AVERAGE VALUE OF ALLEGIANCE INDEX
(Sample size is in parentheses.)

Force Type	Level of Military Punishment		
	Low	Medium	High
Main force	0.59 (6)	0.03 (7)	0.34 (17)
Local force	0.28 (17)	-0.73 (5)	0.03 (16)
Village guerrillas	-0.35 (15)	-0.22 (15)	-0.14 (8)
Main and local force	0.36 (23)	-0.29 (12)	0.19 (33)
All military	0.08 (38)	-0.25 (27)	0.13 (41)

Review

There is a certain risk in extrapolating from these data to the Viet Cong still in the field. Yet the trends shown here are based on the only information available on the Viet Cong's view of the conflict. If the findings are considered as only one indicator of relative effectiveness of various types of operations, it seems reasonable to make the following statements regarding the most effective US-RVN operations:

1. Experiences of air or ground attacks are most strongly associated with statements of disaffection from the Viet Cong.
2. Harassing actions do not appear to have significantly affected the allegiance attitudes of the interviewees in this sample. Few interviewees expressed much concern over defoliation, ambushes, aerial surveillance, etc.
3. Interviewees exposed to multiple types of attack show a greater decline in allegiance to the Viet Cong than do those exposed to a single type. The difference is not large in these data. However, more detail is necessary to obtain a better indication of the added increment of multiple versus single attacks.
4. Statements about relatively heavy personnel losses are not, in general, correlated with lower allegiance in these data. A review of the interviews generally supports the idea that such losses may have been offset by a perception of success, since most of these casualties had occurred in relatively successful Viet Cong offensive operations.

IV. INTERVIEWEE ATTITUDE TOWARD ASPECTS OF THE VIET CONG SYSTEM

The allegiance index used in the preceding analysis is a composite of a wide variety of statements about likes and dislikes concerning overall life in the Viet Cong. Also of interest are attitudes toward different aspects of the Viet Cong system. That is, some aspects of the Viet Cong system may be more vulnerable than others, and military operations may have a differential effect on components of the system. This section therefore takes a more selective look at the relationship between interviewee attitudes and exposure to US-RVN military operations.

BACKGROUND

The formulation of the problem discussed in this section is influenced by the results of research conducted on the combat effectiveness of soldiers in World War II and Korea.[2-5] While the information available on the Viet Cong does not lend itself to the more nearly scientific approach used in the above research, it does provide a satisfactory base for examining the relationship between interviewee statements on attitude and military experience.

The above studies generally agree in concluding that primary-group* solidarity is a most important, if not a necessary, condition for high combat effectiveness. That is, the emotional needs of the soldier must be met to sustain him against the stresses and strains of a combat situation. The conclusion is that a soldier performs well in combat in large measure because of a positive loyalty to his immediate social peers and because of the threat of a negative sanction by these peers--fear of being ostracized--if he fails to meet group norms. The German soldier in World War II in many cases continued to fight effectively even though he saw no prospect for victory and had relatively little personal fear that the allies intended to destroy Germany if its armed forces surrendered.[2]

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*The immediate social group of the soldier. In the "ideal" Chinese Communist system largely followed by the Viet Cong, probably the three-man cell and to a lesser extent the squad; in the U.S. system the informal "buddy" relationship and secondarily the squad.

However, it is doubtful if primary-group loyalties are a sufficient condition for combat effectiveness. Loyalties to the parent organization appear necessary at least for the purpose of providing direction to behavior. That is, a well-integrated, cohesive primary group can work effectively against the parent organization's goals as well as working effectively for these goals.* Much of the previous research on combat effectiveness has been concerned with the study of behavior in situations involving international conflict. Under these conditions, parent-group loyalties are relatively clearcut. However, this is not the case for the Viet Cong soldier. Communist propaganda emphasizes Vietnamese nationalism, necessarily arousing some degree of loyalty to the foe. That is, arousing loyalty to RVN Vietnamese forces. Also, the soldier often has close family ties with both the RVN and Viet Cong sides. Thus, loyalty to parent group in the Vietnam conflict is likely to be more uncertain and therefore of more importance in determining effectiveness than it was in the international conflicts considered in most previous studies.

The ability of the primary group (cell, squad) to maintain solidarity is a function of the stresses and strains to which it is subjected as well as its inherent strength. Material life is one of the factors determining daily stress for a soldier. If food and shelter fall below accustomed standards, the emotional frictions which the primary group must control become more intense. Similarly, increased fear for survival will tend to increase the emotional stresses on the system. Indications of increased stresses in these areas may provide clues about primary-group tensions and possibly future weakening of solidarity.

Thus, the following four aspects of attitude are examined in this section:

1. Primary-group loyalty
2. Organization or parent-group loyalty
3. Fear for survival
4. Degree of satisfaction with material life

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*This phenomenon is well illustrated by the many mutinies in military organizations which dot the historical record.

Interviewee attitudes are examined to determine (1) if the maximum level of perceived US-RVN operations is associated with a significant deterioration in the Viet Cong motivation and control system, (2) if aspects of the system show varying vulnerability, and (3) if the vulnerability appears to vary with the nature of the attack (air or ground).

PRIMARY-GROUP LOYALTY

The original coding of the interviews was not done with the four conceptual categories employed here specifically in mind. However, a number of questions relevant to each area were coded. This section discusses the statistical findings from those questions providing information about interviewee primary-group loyalty. Four such questions were coded from the interviews:

1. Did the interviewee indicate that he disliked the Viet Cong sociopolitical organization? Yes = 1, No = 0.
2. Did the interviewee indicate that he liked the Viet Cong sociopolitical organization? Yes = 1, No = 0.
3. Did the interviewee indicate that he liked the group's "camaraderie" while in the Viet Cong? Yes = 1, No = 0.
4. Did the interviewee indicate alienation by the Viet Cong sociopolitical organization as a reason for defection?* Degree of influence: Low = 0, Moderate = 1, High = 2.

The percentage of yeses and nos is computed for each of these as a function of the level of exposure to RVN military operations. Because of the small sample and the need to control for variation in other parameters,** responses are computed only for "high exposure" and "low exposure," as shown in Table 9. The primary measure of exposure

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*Applies to ralliers only.

**That is, interviewee rank, degree of hard-coreness, and detention status provide information about response tendencies. If variations in response with the level of military exposure are to be examined, the sample, as a function of exposure level, must be reasonably homogeneous with respect to the above variables. In this case the high-exposure sample should contain about the same percentage of each interviewee type as does the low-exposure sample.

Table 9

PRIMARY-GROUP LOYALTY AND EXPOSURE TO ALL TYPES OF RVN MILITARY OPERATIONS

Item Coded	Sample Average/Number of Cases	
	Low Exposure	High Exposure
Main Force		
Disliked sociopolitical organization[a]	0.21/14	0.31/13
Liked camaraderie[a]	0.50/8	0.70/8
Liked sociopolitical organization[a]	0.44/9	0.22/9
Defected because of socio-political alienation (degree of influence)[b]	0.43/7	0.70/10
Local Force		
Disliked sociopolitical organization[a]	0.38/13	0.50/22
Liked sociopolitical organization[a]	0.33/12	0.00/16
Liked camaraderie[a]	0.57/14	0.38/21
Defected because of socio-political alienation (degree of influence)[b]	0.50/8	0.94/16

[a]The average value gives the fraction responding yes.
[b]This question is coded Low = 0, Medium = 1, High = 2. Thus, the average does not mean 0.70 responded yes in this case. The change in the average from low to high exposure represents the tendency for a factor to become more or less important as a reason for defection.

is the index representing total exposure to all types of US-RVN military operations. A brief summary is given for different response patterns to air and to ground attacks if this information is relevant. Main-force and local-force interviewees are discussed separately because of their characteristically different "attitude" and "experience" responses.*

*A difference often exists between the organization of a main-force unit and the organization of a local-force unit. The main forces are almost always organized along the Chinese Communist three-man-cell model. The local forces vary in organization, but in general they are less tightly organized than the main forces.

There is little indication that the cohesion of the main-force primary group (cell, squad) had deteriorated significantly. That is, only a relatively small increase in statements about dislike for political organization and an actual increase in positive statements concerning camaraderie are noted with an increase in the exposure to military operations. However, there is a reduction in positive statements about the political organization for high exposure.*

Similar trends are noted in the responses of the local-force members. The responses are more toward a less active liking rather than a positive dislike for the social group.** It would appear that the local forces have been the more strongly influenced; but there are only weak indications of any tendency for a major disruption in the primary-group loyalties. At best the patterns generally indicate that, at the maximum levels as of mid-1965, RVN military pressure is being reflected in a poorer attitude on the part of the Viet Cong but not in a major disruption of the system.

An attempt was made to determine if the difference in responses noted in the above statements was greater for those exposed to air attacks or those exposed to ground attacks. The following shows the average change in response with higher exposure (the plus direction is toward greater disaffection from the Viet Cong):

Force Type	Air Attack	Ground Attack
Main force	+0.05	-0.04
Local force	+0.08	+0.24

The indication from this table is that perhaps the intensity of attack, rather than the type of attack, is more important. The main forces have been exposed to more intense air attacks, while the local forces have encountered more RVN ground attacks. The sensitivity of

*The change is not statistically significant.

**The "like political organization" response is significant (χ^2 = 3.81) at the 0.05 level. The three statements together virtually rule out the possibility of a chance occurrence.

attitude to attack type as indicated by attitude difference is consistent with this relative exposure.

PARENT-GROUP LOYALTY

The indications from the interviews do not confirm a major breakdown in loyalty to the immediate social group even for those individuals experiencing the most attacks. It might be expected, however, that loyalty to the parent group (the Viet Cong as an organization) would be more sensitive to painful military experiences. Four questions are coded which can provide clues regarding identification with the Viet Cong as an organization:

1. Did the interviewee by his statements indicate a dislike for the Viet Cong doctrine? Yes = 1, No = 0.
2. What is the strength of interviewee's belief in the Viet Cong theme (doctrine)? Coder's estimate: Low = 0, Average = 1, High = 2.
3. Did the interviewee believe the Viet Cong would win? Coder's estimate: Did not believe = 0, Uncertain = 1, Certain = 2.
4. Did the interviewee indicate a belief that the Viet Cong could not win as a reason for defection? Degree of influence: Low = 0, Moderate = 1, High = 2.

The findings, shown in Table 10, are somewhat the reverse of the previous case. There is little change in the local-force attitude with increased exposure to military operations, but there is a fairly marked change in main-force attitude. In particular, the main-force expectation of winning appears to be sensitive to military pressure. This finding is consistent with an impression gained from the reading of the interviews. Since the Viet Cong and especially the main-force soldiers are usually bombarded with propaganda about their invincibility, RVN military actions which force the Viet Cong to hide or flee--the usual response to RVN operations--might be considered a direct psychological attack on this perception of invincibility. A decline in the expectation of winning would logically result.

Table 10

PARENT-GROUP LOYALTY AND EXPOSURE TO ALL TYPES OF RVN MILITARY OPERATIONS

Item Coded	Sample Average/Number of Cases	
	Low Exposure	High Exposure
Main Force		
Liked Viet Cong doctrine	0.56/9	0.44/9
Believed in Viet Cong theme[a]	1.00/17	0.54/13
Believed Viet Cong will win[a]	1.00/16	0.62/13
Defected because of "no win"[a]	0.14/7	0.90/10
Local Force		
Liked Viet Cong doctrine	0.36/11	0.27/11
Believed in Viet Cong theme[a]	0.50/18	0.54/13
Believed Viet Cong will win[a]	0.69/13	0.62/13
Defected because of "no win"[a]	0.25/8	0.50/12

[a]Average on a three-point (0, 1, 2) scale.

In terms of ground and air attacks the same trends previously noted hold for these four questions. A greater change in attitude is noted with heavy air attacks for the main force, and a greater change in attitude with heavy ground attacks for the local force. The following shows the difference in average response for the heavy-attack and the light-attack categories (the plus indicates a change in the anti-Viet Cong direction):

Force Type	Air Attack	Ground Attack
Main force	+0.47	+0.25
Local force	+0.12	+0.21

FEAR FOR SURVIVAL

The influence of concern with physical survival on fighting effectiveness is an unknown quantity. Previous research has tended to subordinate the influence of this psychological pressure to other factors such as the need for peer-group approval and the need for the everyday necessities of life (food, clothing, etc.). However, it does seem

reasonable to suppose that as concern for survival becomes greater in the mind of a soldier, his fighting effectiveness will drop.

Three questions concerning fear for survival were asked in the interview coding:

1. Did the interviewee indicate a dislike for the danger of life in the Viet Cong? Yes = 1, No = 0.
2. Did the interviewee indicate the danger of life in the Viet Cong as a reason for defection? Degree of influence: Low = 0, Moderate = 1, High = 2.
3. Did the interviewee indicate a fear of RVN operations against his unit? Degree of influence: Low = 0, Moderate = 1, High = 2.

The variation in response by level of exposure to military operations is given in Table 11.

Table 11

FEAR FOR SURVIVAL AND EXPOSURE TO ALL TYPES OF RVN MILITARY OPERATIONS

Item Coded	Sample Average/Number of Cases	
	Low Exposure	High Exposure
Main Force		
Disliked danger	0.47/15	0.54/13
Defected because of danger[a]	1.00/7	1.00/10
Feared RVN operations[a]	0.65/17	0.67/15
Local Force		
Disliked danger[b]	0.46/13	0.69/13
Defected because of danger[a]	0.89/9	1.17/12
Feared RVN operations[a]	0.53/17	1.00/13

[a] Average on a three-point (0, 1, 2) scale.
[b] $\chi^2 = 0.65$; significance ≈ 0.40.

There is little or no difference in response by the main-force interviewees in the two categories. On the other hand, the local-force respondents who had higher exposure consistently expressed greater concern about survival. Again, the sample is small enough that such a

distribution could have occurred by chance with a reasonable probability* even if no differences existed in the two categories. However, a random occurrence of the three categories with similar behavior is unlikely.

In this case main-force interviewees show a greater increment in anti-Viet Cong statements for a high level of air attack than for a high level of ground attack. Not much difference is noted in attitude change between air and ground exposures among local-force interviewees.

MATERIAL LIFE

The stresses and strains on an individual can be aggravated by inadequate food, constant moving, poor shelter, and so forth. Military operations, even though they may not result in direct contact with the Viet Cong soldier, can disrupt his physical environment. Supplies may be interrupted, base camps destroyed, and units forced to move to avoid contact, as the result of military actions.

A number of statements about material life were coded:

1. Did the interviewee indicate discontent with food while in the Viet Cong? Yes = 1, No = 0.
2. Did the interviewee indicate discontent with the general "hard life" in the Viet Cong? Yes = 1, No = 0.
3. Did the interviewee complain about constant moving while in the Viet Cong? Yes = 1, No = 0.
4. Did the interviewee have adequate food while in the Viet Cong? Yes = 1, No = 0.
5. Did the interviewee ever go hungry while in the Viet Cong? Yes = 1, No = 0.
6. Did the interviewee indicate the "hard life" in the Viet Cong as a reason for defection? Degree of influence: Low = 0, Moderate = 1, High = 2.

Finally, a composite index formed from these statements concerning material life is computed. A positive score on the material-life

*About 1 chance in 2.5 for the "dislike danger" category.

index indicates relative satisfaction, a negative score relative dissatisfaction. The variation in responses with the incidence of military operations is shown in Table 12.

Table 12

MATERIAL LIFE AND EXPOSURE TO ALL TYPES OF RVN MILITARY OPERATIONS

Item Coded	Sample Average/Number of Cases	
	Low Exposure	High Exposure
Main Force		
Disliked food	0.50/16	0.31/13
Disliked "hard life"	0.75/16	0.79/14
Disliked moving	0.19/16	0.31/13
Adequate food	0.94/17	0.86/14
Had to go hungry	0.12/17	0.23/13
"Hard life" contributed to defection	0.86/7	1.10/10
Composite material-life index	0.41/17	-0.27/15
Local Force		
Disliked food	0.45/11	0.62/13
Disliked "hard life"	0.71/14	0.85/13
Disliked moving	0.17/12	0.46/13
Adequate food	0.62/13	0.62/13
Had to go hungry	0.00/12	0.73/11
"Hard life" contributed to defection	1.33/9	1.08/12
Composite material-life index	0.01/18	-0.82/13

Examining the statements for main-force interviewees, not much difference is noted between those who have been exposed to relatively intense pressure and those who have not. Exceptions are the "dislike moving" and "go hungry" statements. It is not uncommon to find an interviewee stating that he had to miss one or more meals while moving to avoid an RVN operation. The above difference is probably a reflection of this type of interruption of daily routine.

A second difference is in the composite measure of material life. From the values for this variable it is seen that the average perception

of material well-being is considerably lower for those who were exposed to relatively heavy RVN military operations.

For the local forces the general perception of material life is worse than for the main forces and the differences with military pressure are greater. In particular, 73 percent of those experiencing heavy military pressure stated that they had on occasion gone hungry, while none of those experiencing light military pressure made such a statement. However, the overall quality of food ("adequate food") does not appear to have been so influenced. Another major difference is complaints about moving--46 percent for heavy pressure versus 17 percent for light pressure.*

The impression gleaned from these data is that the maximum intensity of RVN military operations has not been high enough to threaten the basic survival system of the Viet Cong. Rather, the operations appear to be more at the harassing level. In particular, these operations cause an increase in complaints about moving and an increase in the incidence of missed meals. Equally important, no overall reduction in the perception of the adequacy of food is noted with increased military pressure. Thus, while the individual Viet Cong leads a hard life, even by Vietnamese standards, his basic subsistence system probably had not been significantly affected by RVN military operations up to this time (July 1965).

The attitude changes by type of military operation--ground or air--show much the same variation as before. Statements showing disaffection with the Viet Cong are more sensitive to the perception of air attack among main-force members. In general, among local-force members a greater sensitivity to perception of ground attack is noted. One exception for the local forces is that defection because of a hard life is much more highly related to intense air activity than to ground activity.

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*$\chi^2 = 1.34$; significant at the 0.25 level.

V. INDICATIONS OF TIME AND GEOGRAPHIC TRENDS IN VIET CONG ATTITUDE

Attitudinal statements of interviewees in many cases will not be representative of the attitude of Viet Cong remaining in the field. The RAND interviewees have gone through the experience of capture or defection and usually have experienced one or more previous interview sessions. In addition, the RAND interview sample contains a high percentage of defectors and what might be termed voluntary prisoners; obviously, prisoners and ralliers will have typically different attitudes. Thus, any effort to generalize about trends in the Viet Cong from the information given by these interviewees must be a cautious one.

An additional restriction on the use of the data is that the RAND interviewee selection is strongly subject to the character of the Viet Cong available to the RVN at a particular time and place* and is subject to the intelligence needs--and perhaps whims--of the local commander. As a result it has proven difficult to maintain a constant proportion of various types** of interviewees over time. The previous discussions indicate that Viet Cong force assignment is an important factor in determining the probable attitude of an interviewee. Thus, in any examination of evolving attitudes, the analyst must be concerned with the changing character of the sample. These variables must be controlled in an analysis of time trends.

The goal in this section is to obtain information on Viet Cong fighting capability. Therefore, the analysis is restricted to the primary military forces of the Viet Cong, the main and local forces.

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*RAND interview teams periodically operate in each corps area. A team may remain in an area for a week or two and then move on to another location. Depending on the character of recent operations in an area, the Viet Cong available for interview at a particular time may be largely defectors, main force, guerrillas, etc. Subsequent trips to that area may find a second type of Viet Cong available for interview.

**Main force, ralliers, cadre, etc. That is, typologies which are considered important determinates in attitudes.

GEOGRAPHIC VARIATIONS IN INTERVIEWEE MILITARY EXPERIENCE

It is apparent that reported military experiences vary considerably according to the interviewee's geographic area of operation while in the Viet Cong, and this variation is important in any determination of attitudes and morale. The Viet Cong forces in the northern provinces may evince very different reactions from those in the southern provinces. Furthermore, comparing the MACV reports of the variation in number of RVN ground operations by area with statements of interviewee military experiences provides a partial check on the validity of the trends derived from the interviews.

A general impression of the life of a Viet Cong regular as obtained from the interviews is as follows: In the delta (see Fig. 3*) the Viet Cong military units often live in the villages, moving every two or three days and thus being somewhat exposed to detection and attack. These units are relatively well fed and have at least some contact with the local population and social system. In the highlands* many Viet Cong units live remote from the villages, in mountainous areas. These units are relatively secure from both ground and air attacks, but food is less plentiful than in the delta and life in the jungle is often harsh. In the provinces north and east of Saigon (the central provinces in Fig. 3) the situation varies somewhat. Here there are areas of traditional Viet Cong strength, but since these provinces have a denser civil population and less rugged terrain than the highlands, it is somewhat more difficult for the Viet Cong to operate undetected beyond the reach of the RVN forces. Also, food tends to be a somewhat greater problem for the Viet Cong in the central provinces than in the delta.

The character of RVN actions apparently reflects some of these terrain and population characteristics. Twelve days of large-scale RVN operations in April 1965 were compared with 12 days in May 1964.

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*These are not the usual "divisions" of the country, but they appear to be the most useful ones within the context of these data.

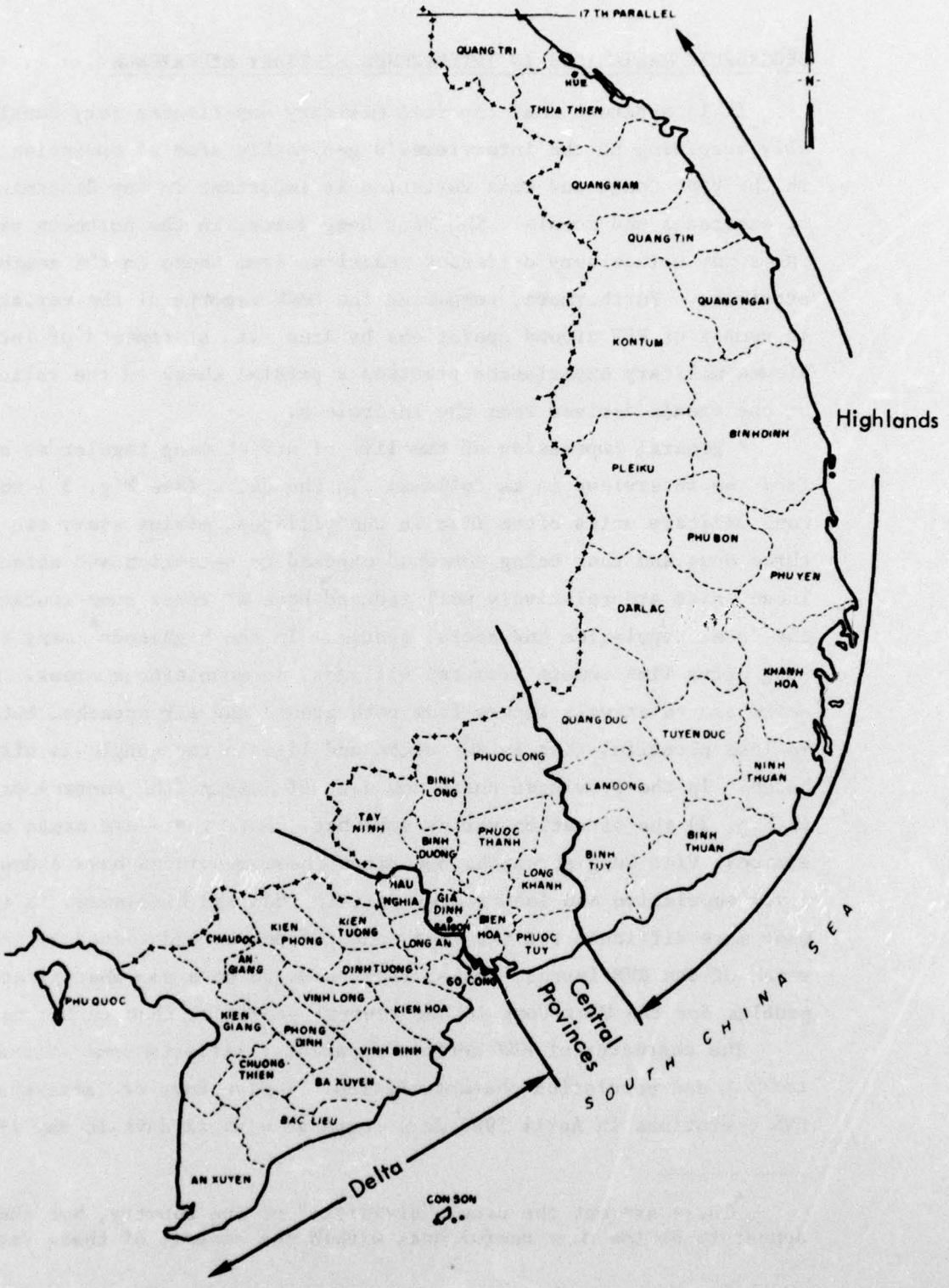

Fig. 3—Provinces of South Vietnam

Operations in seven highland, seven central, and seven delta provinces were examined for the two periods. The following table gives the average number of operations initiated per day per 1000 Viet Cong of that force type stationed in the province in May 1964:

Force Type	Highland	Central	Delta
Main force	0.011	0.048	0.055
Local force	0.184	0.287	0.242

Shown below are average values of the index used to represent interviewee perception of "intensity of ground attack":

Force Type	Highland	Central	Delta
Main force	-0.30	+0.16	+0.17
Local force	+0.14	+0.07	+0.39

The interviewers generally perceive a pattern of operations similar to that shown in the author's examination of reported RVN operations. The local forces have been exposed to more operations than have the main forces.* (The main forces in the highlands were seldom disturbed in May 1964.) However, in the spring of 1965 the rate of RVN operations was stepped up markedly, particularly in the highlands.** These changes are apparently reflected in the interview statistics. The following table shows the average value of the ground attack index for interviewees leaving the Viet Cong before February 1965 and after this date (through July 10, 1965):

Force Type	Date Interviewee Left Viet Cong	
	Before Feb 65	After Feb 65
Main force	-0.48	-0.05
Local force	-0.32	+0.95

*This does not allow for the fact that the operations against the main force have usually been the larger operations.

**The number of operations initiated per day more than doubled in April 1965 over May 1964

The statistics provide a reflection of the general trend of increasing RVN ground activity. Some interviewees with recent local-force experience indicated a severe increase in pressure from RVN ground operations and a resulting marked increase of insecurity in their units. However, the main-force units through this time were still relatively secure in the highlands, less so in the delta.

Interviewee statements about air attacks show a pattern somewhat different from those about ground attacks. The following shows average values of the index used to represent interviewee perception of "intensity of air attack":

Force Type	Highland	Central	Delta
Main force	-0.26	+0.96	+0.73
Local force	-0.32	+0.23	+0.33

The increased rate of RVN operations is again reflected in the following table which shows the average value of the air-attack index for interviewees leaving the Viet Cong at various times:

	Date Interviewee Left Viet Cong			
Force Type	Before May 64	May 64-Oct 64	Nov 64-Jan 65	Feb 65-Jul 65
Main force	+0.60	+0.34	-0.41*	+0.53
Local force	-0.40	-0.18	+0.26	+0.18

Air attacks are reported more often by the main-force interviewees. An increase in intensity of air operations is reported by local-force interviewees with 1965 experience, however. Air attacks, as reported

*An unexplained deviation.

in the interviews, show a geographical pattern similar to that shown by ground attacks.

In summary, then, the following characteristics are exhibited:

1. The main forces, particularly in the highlands, have not been subjected to as heavy pressure from RVN ground operations as have the local forces.
2. The overall level of Viet Cong exposure to RVN military pressure increased considerably in the spring and summer of 1965.
3. Air attacks against the main-force units have been relatively constant during the time period of this sample.
4. Ground sweeps against local units were markedly increased in the spring of 1965.

TIME TRENDS IN VIET CONG MORALE AND ATTITUDE

The above material provides the background for discussing possible changes in the morale and attitudes of the Viet Cong in the field. If RVN military activity is a primary factor in negatively influencing Viet Cong morale, the above findings indicate that main-force-interviewee morale will show, perhaps, a slight decline with time. Local-force interviewees should exhibit a more precipitous decline in morale. That is, the level of activity against main forces showed a small increase in early 1965, while the level of military operations against local forces showed a considerable increase.

Table 13 indicates the time changes noted in this sample of interviewees. Average values for the index of unit morale and interviewee allegiance are given. Because the distribution of ralliers and prisoners in the sample changes radically with time, it has been necessary to modify the simple average index values to account for this change. The modified values are the average of the mean index score for ralliers and the mean index score for prisoners.

Despite the small sample sizes, the trends are roughly as expected. The interviewees from the main forces give an indication of perhaps a slight decline in unit morale. It is interesting to note that the perception of unit morale remained fairly constant despite the fact that

Table 13

TIME CHANGES IN MORALE AND ATTITUDE
(Five months or more of service.)

Item	Date of Leaving Viet Cong			
	Before May 64	May 64-Oct 64	Nov 64-Jan 65	Feb 65-Jul 65
Main Force				
Sample size	5	8	8	9
Percent ralliers	80	75	50	22
Raw unit morale	0.72	0.43	0.61	0.33
Modified unit morale	1.06	0.66	0.67	0.53
Raw interviewee allegiance	0.18	0.28	0.35	0.24
Modified interviewee allegiance	0.60	0.63	0.35	0.00
Local Force				
Sample size	5	6	7	20
Percent ralliers	40	33	57	70
Raw unit morale	1.20	0.62	0.46	-0.15
Modified unit morale	0.95	0.81	0.42	-0.02
Raw interviewee allegiance	0.30	0.67	0.19	-0.32
Modified interviewee allegiance	0.13	0.66	0.21	-0.18

the interviewees in the spring of 1965 were somewhat more disaffected from the Viet Cong than previously.*

On the other hand, a precipitous decline in the mean value of both indices is indicated by the local-force interviewees who left the Viet Cong in the spring of 1965. This finding is consistent with interviewee perception of increased pressure from RVN ground and air operations. It is also consistent with the marked increase of ground operations directed against the local forces, which was reported for the spring of 1965. However, the results must be used cautiously because of the small sample size.

*As indicated by the fairly steep decline of interviewee allegiance in the 1965 sample.

GEOGRAPHIC TRENDS IN VIET CONG MORALE AND ATTITUDE

It was difficult to examine geographic variations in morale because of the process by which the interviewees are obtained. Typically, a batch of prisoners or a batch of defectors is interviewed by a team of interviewers in a given corps area. The interviewees thus tend to be homogeneous for a given area during a given time. Subsequent interviewee batches can be very different. For example, in the sample from the highland provinces for 1965 there are only prisoners, and in the sample from the delta provinces for 1964 there are only ralliers.* The following table gives the geographic variations in morale indices for some cases:

Force Type	Highland	Central	Delta
Main Force			
Unit morale	0.66	---	0.14
Interviewee morale	0.46	---	0.20
Local Force			
Unit morale	0.15	0.02	----
Interviewee morale	-0.06	-0.02	----

The trends generally are as expected from the variation in the intensity of RVN military actions.

The above indices do not provide an exhaustive description of the concept of morale, but they are generally consistent with the known level of US-RVN military operations. Hence these morale indices do appear to provide useful indications of probable Viet Cong reactions to US-RVN military operations.

*This is for the 60 percent of the total interviews which were recorded for this analysis.

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APPENDIX

This appendix contains a short background description of some characteristics of the Viet Cong military forces and the methodology employed in index creation for this analysis.

VIET CONG FORCES

Many types of Viet Cong are included in these data. This Memorandum is devoted largely to a discussion of attitudes of former members of the Viet Cong military, rather than the various civilian agencies and operations, because the sample of civilian interviewees was so heterogeneous that to generalize from it was difficult.

On the military side the Viet Cong forces are roughly divided into a three-level hierarchy. The more or less regular units constitute the main and local forces. The village guerrillas form a paramilitary force used for minor harassing actions, village security, and probably police functions.

The main force is the Viet Cong elite organization. It apparently gets the best qualified personnel.* Often an individual's history includes service in the guerrillas and/or local forces prior to being "promoted" to the main force. The local forces are next in the hierarchy and are closer in capabilities to the main than to the guerrilla units. The guerrillas are composed of the least qualified and least motivated individuals. A brief description of some of the characteristics of these organizations is given below.

Unit Organization and Weapons

The Viet Cong main-force units were reasonably well equipped with small arms, light machine guns, and support weapons through the 81-mm mortar. Typically, main-force units operated as independent battalions or less often as independent companies. A few cases of coordinated regimental operations apparently have occurred in 1965 and 1966. The

*These data largely antedate significant intervention by the North Vietnamese Army (NVA).

units often had an antiaircraft section (up to 12.7-mm machine guns) and a mortar and antitank section. Ammunition was not plentiful but was generally considered to be adequate (see Table 14).

The local forces were organized along regular military lines. However, they were typically less well equipped than the main forces. Normally, these units operated as independent companies or less often as independent platoons. Local-force respondents more often felt they were not adequately equipped than did former members of the main force (see Table 14).

The guerrillas constituted a loosely organized paramilitary organization. Typically, they operated as independent squads or platoons, often lived at home in the stronger Viet Cong areas, and were usually expected to furnish their own food. They seldom participated in offensive military operations, their primary job being village security. The usual case was that only a few weapons were available to the unit, and ammunition typically was in short supply (see Table 14).

Table 14

WEAPONS

Item	Percent Responding Yes		
	Main Force	Local Force	Guerrillas
Unit had adequate weapons	94	74	33
Unit had adequate ammunition	81	65	43
Unit had antiair weapons	68	21	0
Unit had antitank weapons	74	25	0
Unit had mortars	87	48	0

The Soldier's Background

The main-force soldier (as exemplified by this sample) was typically intelligent and well educated by Vietnamese standards. Contrary to communist dogma, he usually professed at least some theological beliefs. He came in about equal numbers from the Viet Cong middle and poor economic classes (see Table 15).

The local-force soldier was on the average (if this sample is representative) a cut below the main-force soldier in education and capa-

Table 15

SOLDIER'S BACKGROUND

Item	Main Force	Local Force	Guerrillas
Average years of education	4.1	2.9	2.4
Percent literate[a]	95	90	89
Percent rated as intelligent by interviewer[b]	95	81	66
Percent professing no religion	9	19	17
Social class[c]			
Percent poor	49	56	75
Percent middle	41	42	23
Percent rich	10	3	2

[a] Minimum reading capability.

[b] As opposed to categories of dull or stupid.

[c] The Viet Cong assign most families in their areas to one of several "social classes." The most common classes in the rural areas are the poor, middle, and rich peasants. Roughly, the poor peasants are those living close to the subsistence level, the middle peasants are those with production adequate for their needs, and the rich are those with an excess product.

bilities. The guerrillas vary in capability; however, the unenthused or the very dull are usually assigned to these units. It is interesting to note that the guerrillas more often tended to come from the Viet Cong-designated "poor" social class.

Military Experiences

The military experiences of individuals from the three forces tended to be quite different. The main forces often operated in remote areas, were relatively well equipped, and had been largely immune to ground sweeps. However, they had been subjected relatively often to air attacks and to incidents classed as "harassing." The guerrillas, in particular, had been exposed to the highest incidence of ground sweeps (see Table 16).

On the other hand, the main-force units constituted the primary offensive arm of the Viet Cong. Their reported rate of operations was almost twice that of the local forces.

Table 16

MILITARY EXPERIENCES

Item	Main Force	Local Force	Guerrillas
Average Value of Index			
Ground attack by RVN	-0.26	0.07	0.48
Air attack by RVN	0.11	-0.06	-0.02
Harassment by RVN	0.18	0.14	-0.26
Total RVN military pressure	-0.04	0.00	0.20
Average Number			
Offensive actions[a]	1.79	1.08	0.23

[a]For last six months in Viet Cong.

Enthusiasm and Material Life

The difference in the forces again showed up in the interviewee's comments about life in the Viet Cong, his reasons for joining, and his attitude toward the Viet Cong (see Table 17). The main force had considerably more volunteers who were still devoted to the Viet Cong. The guerrillas were often the disaffected draftees.

The main-force interviewees, despite their remoteness from the village, complained less often about their material life. Apparently, the local force experienced the most difficult existence at this time.

Table 17

ENTHUSIASM

Item	Average Value of Index		
	Main Force	Local Force	Guerrillas
Allegiance to Viet Cong	0.11	0.02	-0.31
Volunteered	0.05	0.05	-0.31
Drafted	-0.24	0.01	0.30
Material life	0.31	-0.14	0.00

METHOD OF INDEX CREATION

The methods used in this analysis, particularly the one employed for index creation, are a little atypical. For this reason it seems appropriate to briefly describe the concepts involved and to list some references which will give a more complete explanation of the technique.

The RAND interviews are, as closely as possible, a verbatim translation of the interviewee's responses to a fairly standard set of questions. Many of these questions are somewhat general and, of course, many times the interviewee's response is less than direct. One of the problems in coding such material into a numerical format is reliability. That is, the problem of always coding the same information in the same manner. In order to minimize this reliability problem, it was desired to keep the description of the items to be coded as simple and as straightforward as possible. However, many of the ideas or concepts of interest were not simple and straightforward. A method was needed to combine these simple measures into an index which could better represent a more complex concept.

Indices formulated from a number of simple measures are often used to represent more complex concepts. For example, a cost-of-living index is typically formulated by combining the price of a few basic foods with items such as representative rents, clothing, and costs. Or, as another example, the state of the stock market is sometimes estimated by combining the prices of a number of individual stocks in various ways into a single index.

In each case the index covers more aspects of the concept than any one of the measures. In addition, chance fluctuations of a single measure are damped out by summing several separate measures to form the index. The damping is accomplished because the same chance fluctuations are not likely to occur in all measures and, as a result, the summed signal (index) will be less influenced by such fluctuations than would any one measure. To return to the stock-market index, a single stock may deviate from the market trends because of a particularly good year, or because of bad management, etc. However, by summing the stocks of several companies, these side effects tend to be averaged out.

The index then is not an uncommon concept in everyday life. Typically, most indices are formed by either simple or weighted summations of individual variables. For example:

$$I = a_1x_1 + a_2x_2 + \ldots a_nx_n$$

where

I = index of interest
a_j's = weighting factors
x_j's = individual measures

The x's are weighted in terms of their relative importance in describing the index by the a's.

This procedure is often satisfactory. However, for x_j's which are highly intercorrelated, the relative contribution of a particular x to the index I will not be proportional to the weight assigned. That is, if the correlation of I with x_j (r_{Ix_j}) is taken as measuring the contribution of x_j to I, then the correlation r_{Ix_j} is dependent both on a_j and on $r_{x_jx_k}$ ($k = 1, n; k \neq j$). That is, only in the case of uncorrelated x's do the a's determine the relative contribution of each x to the index I. For this reason the indices formed in this analysis are formed using the correlations r_{Ix_j} ($j = 1, n$) relative to one another as the criterion.

A method for forming an index under these rules has been developed by R. D. Jones of the University of Missouri.[7]

In this approach an index I is formed:

$$I = a_1x_1 + a_2x_2 + \ldots + a_nx_n$$

subject to the constraint

$$r'_{Ix_j} = C_j \quad (j = 1, n)$$

where r'_{Ix_j} is the desired relative value between the correlation r_{Ix_j} and the remaining correlations; that is, the weight for x_j relative to the weight of the other x's. For example:

$$r'_{Ix_1} = 1.0 \qquad r'_{Ix_3} = -1.0$$

$$r'_{Ix_2} = 1.0 \qquad r'_{Ix_4} = 0.7$$

and in this example a hypothetical index might correlate as follows:

$$r_{Ix_1} = 0.69 \qquad r_{Ix_3} = -0.69$$

$$r_{Ix_2} = 0.69 \qquad r_{Ix_4} = 0.48$$

The mechanics of formulating the index are described in Ref. 5. The technique is akin to multiple correlation and to factor analysis. For discussion on these topics see Refs. 7 and 8.

The index-creation process is used

1. To embody more aspects of a concept than could be accomplished with any of the single coded items
2. To obtain an index more reliable than any of the individual measures

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