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TECHNICAL MEMORANDUM
ORO-T-62
(AFFE)

C0012775

A Study of Ineffective Soldier Performance under Fire in Korea, 1951

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OF
BY JEAN BONHA, ON

by

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DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF
WASHINGTON 25, D. C.

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CSRD/E (4 Aug 55) 26 August 1955

SUBJECT: Technical Memorandum ORO-T-62 (AFFE), "A Study of Ineffective Soldier Performance Under Fire in Korea, 1951." (U)

TO: 1-45 COMMANDANT 1 CY
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1. Forwarded herewith for your information and retention is a copy of Technical Memorandum ORO-T-62 (AFFE), subject as above.

2. This document is a working paper of the Operations Research Office. The basic information included therein should be used as background information and does not constitute approved Army policy.

3. The following general comments on the attached study are furnished:

a. The study represents preliminary findings and it is not known at this time whether the conclusions are adequate for field implementation. However, the conclusions presented appear to be valid for the area and personnel under consideration and for the specific circumstances that prevailed in the Korean conflict at the time of the study.

b. It is not evident, however, that the study can be utilized directly as a basis for determination of ineffectiveness of soldiers under fire in other areas or in different circumstances. Because of the peculiarities of terrain and the relatively limited area and type of operations involved in Korea, certain weapons were not employed to their maximum capability. For example, had the area and situation lent itself to the employment of armor on a mass scale, the measure of soldier ineffectiveness as a result of exposure to armor might have been significantly different from the findings of the study.

c. While the study is of value in determining the psychological effect of certain weapons on enemy soldiers, the study does not provide a basis for selection of weapons to produce a significant psychological result. Selection of weapons for employment undoubtedly should continue to be based on such factors as the given tactical situation, casualty producing effect under given conditions and the extent to which advance of friendly forces will be furthered.

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d. The reliance on the cooperation of POWs tends to depreciate the data in this study. POWs are unlikely to admit their own ineffectiveness. This is especially true in the Far East where "face saving" is a basic personality characteristic.

e. The following conclusions derived from this study are considered acceptable:

(1) The unexpected type of exposure to fire is of greatest psychological importance in bringing about ineffective performance; artillery and air bombs were especially effective as psychological factors.

(2) Captured and surrendered POWs tend to be below average in their military performance as soldiers; soldiers who surrendered were less effective than those who were captured.

(3) Mortars and combinations of automatic infantry weapons were the types of weapons most frequently involved in enemy fire power against units of U. S. soldiers interviewed in September, 1951.

4. Request that comments as desired by addressees be forwarded in duplicate within 90 days after receipt to the Chief of Research and Development, Office of the Chief of Staff, Department of the Army (ATTN: Operations and Personnel Research Division).

FOR THE CHIEF OF RESEARCH AND DEVELOPMENT:

1 Incl
TM ORO-T-62 (AFFE)

SELWYN D. SMITH, Jr.
Colonel, GS
Acting Chief, Operations and Personnel
Research Division

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U. S. Army Military History Institute

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WORKING PAPER

This is a working paper of members of the technical staff of ORO and subcontractors concerned with ORO Study 82.2.

The objective of this study is to examine the psychological effects of weapons fire. This paper deals with the effects of fire on Chinese Communist Forces and North Korean Army personnel, and undertakes to discover the relation between ineffective performance of soldiers in Korea and their exposure to fire from different types of UN weapons. The findings and analysis of this paper are subject to revision as may be required by new facts or by modification of basic assumptions. Comments and criticism of the contents are invited. Remarks should be addressed to:

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FIELD DIVISION
Project 4 (AFFE)
Technical Memorandum ORO-T-62
Received for Publication: 8 October 1954

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SUMMARY

PROBLEM

To study the general problem of psychological effects of weapons fire on Chinese Communist Forces (CCF) and North Korean Army (NKA) personnel, and specifically to discover the relation between the performance of soldiers in Korea and their exposure to fire from different types of UN weapons. Some consideration is also given to the performance of US soldiers under effective enemy fire.

FACTS

Prisoners of war have been used previously by ORO analysts as a source of information in a variety of contexts. On the basis of the success of these efforts at obtaining valid information from POW source data* this study was considered feasible, and a field team of psychologists went to Korea in August 1951. They trained and supervised a staff of 21 Korean interrogators and translators.

Interviews were conducted with 856 POWs and 260 US soldiers. Among the POWs, 393 were from the CCF and 463 were from the NKA. The POWs provided critical incidents involving their own and other's behavior during a 7-day period immediately before they became prisoners. A total of 1875 incidents was obtained, each describing an ineffective performance by an enemy soldier. Each POW also described the circumstances that surrounded his becoming a prisoner and what he actually did under these circumstances.

DISCUSSION

Since specific accounts of actual performance by enemy soldiers were needed in this study rather than attitudes or opinions, the critical-incident technique was employed. Essentially this technique directs the attention of the interviewee to recent acts or behavior patterns that were either very effective

*See ORO-T-19(FEC), "Pretesting Procedures for Psychological Warfare Printed Media: Phase I: The Group Interview Method," Nov 52, CONFIDENTIAL; ORO-T-26(FEC), "US Troop Attitudes toward Taking and Treatment of Prisoners of War in Korea," Nov 52, SECRET; and ORO-T-31(FEC), "A Study of Chinese and North Korean Surrenderers," Dec 52, CONFIDENTIAL.

or ineffective in specific situations. The technique tends to discourage extraneous remarks and rationalizations about why an individual acted as he did and to confine answers to relatively concise descriptions of what was done or seen to take place. It is assumed that such answers describe what almost any observer would have seen if he had been in the situation in place of the individual being interviewed.

Six categories of ineffective performance and six categories of surrender behavior were formulated from analyses of the incidents and the descriptive accounts of behavior when becoming a POW. In addition to giving information on their ineffective performances and behavior when being taken prisoner, POWs reported on the types of weapons fire to which they had been exposed during the same 7-day period.

Each POW was then classified into a series of contingency tables on the basis of whether or not he had been exposed to fire from a specific type of UN weapon and whether or not he had cited one or more incidents of his own ineffective performance. The resulting frequencies in these contingency tables were then tested for their statistical significance. Other contingency tables were used that classified POWs in the exposed or nonexposed groupings according to their differences in behavior at the time they became prisoners.

Brief interviews were held with small groups of US infantry soldiers. These soldiers were asked to write a description of what they or their units had done in their most recent encounter with the enemy in which he had used his fire power effectively to prevent them from carrying out their intended mission. The soldiers were also asked to name the weapons used by the enemy in these specific situations. The analysis made of this information consisted in classifying the performance of the US unit by the specified weapon or weapon combinations used by the enemy.

CONCLUSIONS

1. Of the many UN weapons studied, artillery, bombs, napalm, and air-strafing were outstanding in producing a significant psychological effect in terms of ineffective performance by enemy soldiers.

2. On the basis of "rates of ineffectiveness" computed for the different classes of POWs studied, those who were captured had fewer incidents of ineffective behavior than those who surrendered. However, they had a higher rate of ineffective behavior than POWs who were seriously wounded before being taken prisoner and thus could neither surrender to nor resist their captors.

3. Interviewing POWs with the critical-incident technique provided relatively accurate information on the performance of enemy soldiers. There was internal consistency of content within the incidents as well as consistency of certain of the more obvious empirical findings with what might have been expected on strictly logical grounds. (An example of this was the significant

associations found between capture of enemy soldiers and types of weapons physically carried by infantry personnel who necessarily would be expected to do the capturing.)

4. Mortars and combinations of automatic infantry weapons were the types of weapons most frequently involved in effective enemy fire power against units of US soldiers interviewed in September 1951.

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A STUDY OF INEFFECTIVE SOLDIER PERFORMANCE UNDER FIRE IN KOREA 1951

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INTRODUCTION

It is a truism that soldiers vary in their reactions to enemy fire; "green" troops are distinguished from "seasoned" troops primarily by differences in behavior under enemy fire. The ability of an experienced unit to hold its position and to fight back against overwhelming opposition is not primarily owing to any physical characteristic of its members but to their mental and emotional characteristics. Much of the training given to prospective combat soldiers, therefore, consists of teaching them how to protect themselves physically from enemy fire power and how to react psychologically to it so as to maintain their morale and continue to carry out their assigned missions.

Because fire power seems to have a great psychological effect on soldiers, the comparative effects of the different types of weapons producing it should be studied and evaluated. Such study and evaluation can be made apart from an evaluation of the so-called "kill effect" of these weapons, although there is undoubtedly a close relation between the psychological and lethal effects of most weapons.

BACKGROUND

This study is concerned with the psychological effects of physical exposure to fire from different types of weapons. Its purpose is to study ineffective performance of combat soldiers and to throw additional light on the general problem of the comparative effectiveness of different weapons systems in affecting morale and military efficiency of soldiers.

Specifically, this is an investigation of the relation between exposure to the effects of specific types of weapons and the performance of soldiers engaged in the military action in Korea from February through August 1951. It deals primarily with the performance of soldiers in the North Korean Army (NKA) and in the Chinese Communist Forces (CCF) who had been exposed to fire from the types of weapons used by UN forces during that period. Also included in the study is limited information on the effects of weapons used by the NKA and CCF forces in action against US troops.

Under certain favorable circumstances it may be assumed that exposure to fire from any type of weapon would so upset an individual psychologically that his subsequent behavior or performance would be affected. Therefore one research question of this investigation was: Is exposure to the effects of specific types of weapons of the UN forces in Korea reflected in the performance of enemy soldiers? To answer this question it was necessary to obtain information both on the performance of individual enemy soldiers and on the

types of UN weapons fire to which these soldiers had been exposed. These two types of information could then be correlated and any resulting relation could be statistically tested.

A second research question concerned the types of enemy weapons considered by US Army troops to have been effective against them. It is safe to assume that the military authorities of the UN know which types of enemy weapons proved most effective against their troops, and the question posed in this study is not directed toward duplicating such information; rather it is directed toward finding out which weapons the individual soldier thinks are effective. From a psychological point of view what a soldier thinks is true affects his behavior more than what may be true in objective fact. To answer the second question of this study it was necessary to interview US troops about the specific weapons they thought were used effectively against them.

ASSUMPTIONS AND METHODOLOGY

There is little disagreement about the general psychological process by which such a physical event as fire from a weapon is changed by an individual into a subjective and relatively nonobservable experience that may affect his behavior. For example, a soldier may know that he is in danger and try to do something about it; he perceives in the weapons fire a threat to his personal security and reacts to remove that threat. The manner in which each soldier reacts may or may not fit into an accepted pattern of military discipline. If it does not, his behavior will be regarded as poor performance for a soldier. On the other hand if his reaction is in accordance with what is expected by his superiors, he may be regarded as performing well.

Why any particular soldier performs as he does is very difficult to determine, and the researcher must rely to a great extent on what the individual can and will tell about his thoughts, feelings and emotions, and beliefs. In the case of enemy soldiers such reliance on personal testimony would be highly questionable. However, a design based on the nature of causality in human behavior was evolved to test the effect of weapons on the performance of enemy troops.

It is probably true that "the cause" of any particular act that may be observed is not a single event that preceded the observed act but a whole series of events, most of which take place in the "mind" of the individual and cannot be easily observed. What is often loosely referred to as "the cause" consists of a complicated chain of events of which the observed act is only one of the final links. Two or more individuals might be seen to act identically, yet the chain of events responsible for the act can be quite different in each case.

Although the chains of events that resulted in the same act of performance by several individuals might have differed in detail, each chain would have had at least two common events if exposure to a specific type of weapons fire were a causative factor: exposure to the weapons fire and performance of the particular act. This would be true regardless of similarities and differences of the intervening events—subjective and difficult to observe or objective and easily observed—that together with exposure would be the cause of the act for any individual soldier. On the other hand if exposure to fire

from a specific weapon were not a factor, it would not appear as one of the preceding events to the act. Thus there are four possible alternatives for classifying individual soldiers with respect to evidence about their exposure to weapons fire and their performance: (a) soldiers exposed to fire from a particular weapon and the occurrence of a particular type of performance; (b) soldiers exposed to fire from a particular weapon and the nonoccurrence of a particular type of performance; (c) soldiers not exposed to fire from a particular weapon and the occurrence of a particular type of performance; and (d) soldiers not exposed to fire from a particular weapon and the nonoccurrence of a particular type of performance.

By classifying individuals according to these four categories, it is possible to test whether the factors on which the classification was based—weapons-fire exposure and performance—are statistically related or not. Since the two factors were chosen on the basis of an assumption of causality between them, a statistical relation would be compatible with the assumed causal relation. Conversely the lack of a significant statistical relation would indicate that the assumed causal relation was either nonexistent or too slight to detect.

Variations in this general method were used to test specific hypotheses on each of 11 types of weapons used by the UN forces and the occurrence of several different kinds of poor performance by NKA and CCF soldiers. In all tests of statistical significance, the 5 percent level of confidence was used to decide whether or not any given relation should be considered as significant.* There was one variation of this general method that deserves further explanation since it involved an additional assumption.

Information was available for classifying enemy soldiers on the occurrence or nonoccurrence of incidents of ineffective performance and exposure to types of UN weapons fire during the same 7-day period. However, information was not available on whether exposure to a particular type of weapons fire took place before or after any incident of ineffective performance. Also, it was impossible to ascertain weapons-fire exposure immediately prior to the start of the week in which ineffective performance may or may not have occurred. However, it is conceivable that such exposure would be related to performance occurring in that week and especially to acts occurring at the beginning of the week. Furthermore, since all soldiers in the study were taken prisoner at the end of the same week on which information was obtained about their weapons-fire exposure, it is reasonable to assume that some of them became prisoners before they had had an opportunity to perform ineffectively as a result of this exposure. The effect of classifying soldiers without regard to the time of weapons-fire exposure in relation to either the time of or opportunity for the occurrence of incidents of ineffective performance is to attenuate any statistical relations that may exist between the factors being tested. In other words the data used for certain tests of significance are such that they tend to obscure the relations that are subjects for study. (For a more complete discussion of the logic involved in this assumption of attenuation, see App B.)

In dealing with data on the weapons used by NKA and CCF soldiers against US Army troops, frequency tables were constructed relating types of weapons used and kinds of performances that took place. No tests of the significance of relations found among these data were made.

*A relation is considered significant if it is likely to arise by chance less than 5 times in 100.

Critical-Incident Questionnaire

The use of POWs as a source for research data on the psychological effects of weapons was considered feasible as a result of a series of successfully completed studies in which POWs had been used for source data.* That is, because of the POWs' cooperation and their seeming honesty in replying to interview questions, it was believed that they could also be interviewed about experiences that took place when they were still members of either the NKA or CCF; especially if they were interviewed within a short time after they became prisoners and before they had had time to take on the attitudes and beliefs of POWs.

A basic technique was used for getting persons to recall specific happenings in which they had acted, or had observed others to act, either very effectively or ineffectively in a specific situation and under certain specific conditions. This technique, called the "critical-incident technique," results in a factual account of incidents of what someone actually did in a particular situation and excludes or minimizes the personal opinion and ex post facto reasoning of the person being interviewed. The critical-incident technique was ideally suited for use with POWs since what were desired were factual accounts void of interpretations and/or rationalizations of what some enemy soldier had done in specific situations.

A team of research workers went to Korea in August and September 1951 to arrange for and to supervise the interviewing of POWs. In preparation for the trip, the team studied reports on interviewing enemy personnel and types of weapons being used in Korea, and conferred with technical personnel on the requirements for data that could be used in different research studies dealing with weapons and weapon systems. Tentative interview questions were also drawn up during this period for critical review; these questions were revised several times both in the US and in Korea.

Two native Koreans with a good knowledge of English individually translated the final revision of the interview questions into Korean. Then two other Koreans who had not seen the original English version retranslated the two Korean versions back into English. Members of the field team and the four translators then discussed all five versions—the original English, the two Korean translations, and the two English translations—and put together a version that all agreed was both "natural" in Korean and connoted the same meaning as the original English version. Using the same procedure Chinese-speaking Koreans then translated the Korean version into Chinese for the Chinese version. (See App A for the questionnaire schedules used with POWs and US troops.)

Interviewers

The native research staff consisted of 21 interrogators, 6 translators, and a supervisor. All the native staff were Koreans, most of whom had had

*See ORO-T-19 (FEC), "Pretesting Procedures for Psychological Warfare Printed Media: Phase I: The Group Interview Method," Nov 52, CONFIDENTIAL; ORO-T-26 (FEC), "US Troop Attitudes Toward Taking and Treatment of Prisoners of War in Korea," Nov 52, SECRET; and ORO-T-31 (FEC), "A Study of Chinese and North Korean Surrenderers," Dec 52, CONFIDENTIAL.

some college training. About half of the staff had spent time in China or Manchuria and were able to interview Chinese POWs without difficulty. Although the questions were asked in the language of the particular POW being interviewed, the answers were written in Korean; these answers were later translated into English.

The interrogators were trained by US research personnel through the Korean supervisor. Each question in the interview was discussed in detail, and the types of answers that would be acceptable and unacceptable were noted by each interrogator. A standard procedure was established for asking the questions, for placing the number of each question on an answer sheet at the same time it was asked, and for recording the answers verbatim if the POW were Korean or as an exact translation into Korean if the POW were Chinese. The results from each interrogator's first few interviews were carefully discussed with him and certain of these early interviews were discarded because of interviewer error. It was not long, however, until all interrogators had mastered the interviewing procedure, although close supervision was maintained throughout the interviewing phase.

Interrogation Procedures

Prisoners of War. During August and September 1951 POWs were being sent to a collecting point not far behind the front lines within 24 to 48 hours after their capture or surrender. This point, at the time of study, was at Yongdong Po. Here the wounded were given medical treatment and then sent to hospitals at Pusan. The nonwounded prisoners at the collecting point were registered, tagged, deloused, given haircuts, etc., and kept at Yongdong Po for varying periods before being sent to Pusan where they remained from a few days to a month or more before being sent to POW compounds on Koje-do, an island off the southern coast of Korea. Since it was considered desirable to question POWs as soon as possible after being taken, original plans called for interviewing only at Yongdong Po. However, since wounded POWs could not be interviewed there and since only small numbers of enemy soldiers were being taken prisoner at the time, it was necessary to interview also at Pusan.

No problem in the selection of POWs to be interviewed was encountered at Yongdong Po and it was possible to interview practically every prisoner who was not wounded. At Pusan no attempt was made to interview those wounded who were seriously ill or in great pain. With this exception, every POW within any selected hospital ward was interviewed. An attempt was also made to interview every prisoner among the nonwounded at Pusan awaiting shipment to Koje-do within all compounds in which interviewing was permitted. In these compounds an occasional man was not available because of sickness or participation in a work party, but there was no reason to believe that any POW who was missed differed in any important respect from those who were interviewed.

Intentional selection was exercised with respect to the total number of POWs from the CCF and NKA interviewed at Pusan. Interviewers were directed to wards and compounds in such a way as to obtain information from both nationalities of POWs in about equal numbers so that comparisons between the groups could be made more easily. This was not done, however, at Yongdong Po, where every POW was interviewed regardless of nationality.

The total number of available officers (who were kept in separate compounds) was small. Since POWs were classified as enlisted men or officers according to their own declaration, it was uncertain whether few officers became prisoners or whether some officers who were captured claimed to be enlisted men. The latter explanation seemed to be widely held among UN officers. There was, however, a small group of CCF officers who had been assembled at Pusan by another research group that was made available for interview for this study.

The interviewing situation necessarily varied from compound to compound and from ward to ward. It was usually possible to arrange for interviews to be conducted in a large tent, quonset hut, or other building. Although several interviews might be conducted at the same time, the POWs were separated by 15 or more feet of space so that the answers being given by one POW would not be intelligible to another. Commanding officers of prison camps and of hospitals were most cooperative in facilitating arrangements so that relatively standard conditions were obtained for all interviews.

US Troops. Interviews of US troops and officers of the US Eighth Army in Korea took place in groups and virtually all such interviews were conducted within artillery range of the enemy on the battle front north and east of Seoul. The men were first gathered together for instructions by a member of the field team. Then they were handed a single sheet of paper that contained the questions they were to answer. Each of these questions was discussed before the group members, who dispersed to nearby places to write their individual answers. The team member who supervised this activity walked among the men as they wrote their answers and volunteered to help anyone who requested assistance.

The US personnel interviewed had recently returned from the front lines; none had been off the line for more than 3 weeks, and some for only a few days. New replacements who had been with the group for less than a month were usually excused at their request because of limited experience.

Company commanders, platoon leaders, and platoon sergeants were usually interviewed together in small groups varying in size from two or three to about six men. Squad leaders were usually interviewed with the rest of the troops, and these groups would vary from 10 to over 50 men. Such variation was caused by the availability of troops under field conditions and the necessity for taking only those who were immediately available.

Samples

Prisoners of War. A total of 860 POWs were interviewed. Practically all of them answered a great proportion of the long list of questions used in every interview. In general the POWs were neither defiant nor surly but seemed to accept the role of prisoner with equanimity.

Four of the 860 POWs interviewed proved later to have been prisoners of too long a duration, and the results from their interviews were not considered. Of the remaining 856, 393 were CCF soldiers and 463 were North Koreans. (See App C, Tables C1 and C2 for complete distributions on characteristics.)

Eighty-one percent of the POWs ranged from 17 to 30 years of age, with 18 percent in the "30 years or over" group and less than 1 percent in the "under 17 years" group. The average (median) age for the CCF was 24.8 years and for the NKA, 23.1 years.

According to their own declarations, 18 percent of the CCF were officers and 82 percent were enlisted men; among the NKA, 5 percent said they were officers as compared to 95 percent who said they were enlisted men. This difference reflects the inclusion of the special group of CCF officers mentioned earlier.

Farming was cited most frequently as the former occupation of both the CCF and the NKA POWs, followed in both cases by the occupation "student." A difference appeared between the groups in the third highest frequency of former occupation cited; for the NKA it was a semiskilled job, but for the CCF it was military or police service, reflecting the inclusion of many former Nationalist Chinese soldiers in the CCF.

The average (median) length of schooling for the CCF group was 4.2 years, and for the NKA, 5.9 years. Against the standard of being able to read and write his native language, 50 percent of the CCF were literate as compared to 81 percent for the NKA.

There was a great difference between the groups with respect to the length of time they had served in their respective armies. For the CCF the average (median) length of service was 20.3 months, but for the NKA it was only 5.9 months. Among the CCF the average (median) length of time in Korea before they became POWs was 4.46 months.

The infantry was the branch of service in which 80 percent of the CCF were serving before capture as compared with 92 percent for the NKA.

Two hundred and thirty-eight or approximately 60 percent of the POWs who had been with the CCF had been wounded one or more times as compared to 210 or approximately 45 percent of the POWs who had been with the NKA.

Three hundred and fifty-two or approximately 90 percent of the POWs from the CCF said that they were not members of the Communist Party; 31 or approximately 8 percent said that they were members; and 10 or about 2 percent did not answer the question on Party membership. Among the POWs from the NKA, 425 or 92 percent said that they were not members; 17 or slightly under 4 percent said that they were either members of or candidates for membership in the Korean Labor Party; and 20 or slightly more than 4 percent did not answer the question on Party membership.

US Troops. Two hundred and seventy-two individuals were assembled for these interviews. Two soldiers did not answer any of the questions and two others answered only the first question. Eight soldiers misinterpreted the questions and described a situation in which they, rather than the enemy, were effective. Thus the answers from 260 individuals were used in the analysis.

ANALYSIS AND INTERPRETATION OF RESULTS

The findings from an analysis and classification of information in the interviews with POWs and US troops are presented in the five sections that immediately follow. The first section deals with the types of surrender behavior and prior exposure of POWs to the effects of different types of UN

weapons. The second section deals with ineffective performances of some of these POWs before they became prisoners, again in terms of their exposure to weapons fire. In the third section the relations between types of surrender and the occurrence of ineffective performance are examined. In the next section, based on information from the POWs, some of the direct effects of UN weapons on enemy personnel and their units are analyzed by types of weapons involved. The analyses of interviews with US troops are presented in the final section. For the sake of brevity much of the statistical and tabular data in support of the findings has been placed in App C.

Surrender Behavior and Exposure to Weapons Fire

Case 1: June 13, 1951, our battalion began to attack enemy in order to occupy a certain hill near Rinkjae but we received such severe mortar fire of ROK that numberless of our soldiers fell down. ROK continued to fire ceaselessly so our enlisted men began to run away. I tried to find any chance to ran away, but I could not because our chief of political affairs was shouting, "Fugitives will be shot by me." and shooting pistols just behind me. So I hid myself at the back of a rock, holding my breath. At that time I resulted in being wounded by a bullet of mortar dropped near. Next day, I resulted in being taken prisoner, not being able to move farther.

This is a translation of the answer given by a 17-year-old North Korean private in response to the standard question asked by interrogators: "Describe in detail the exact manner in which you became a prisoner." The ex-NKA soldier was interviewed in a hospital in Pusan approximately 2 months after the events he described took place, and it was known from other parts of his interview that he had been slightly wounded by a rifle about a month before his capture and that at least twice during the week prior to his capture he had left his assigned post to seek protection from strafing by US fighter planes. Perhaps this soldier might have surrendered voluntarily to the UN forces if he had not been wounded or if he had succeeded in finding "any chance to ran away." However, it is clear from his description that he was physically incapacitated and unable either to resist capture or to surrender voluntarily. There were 90 such cases in the sample of 856 POWs; 44 of them came from the CCF and 46 came from the NKA.

Case 2: After arriving (at) the high ground located in northeast of Wolchung-Ri, each platoon pitched a defending position on the mountain by order. Accordingly, our team was arranged on the front mountain and began to make an air raid shelter. At that time a scout plane flew over from an unknown quarter and after a while artillery gun shell began to flow down around our position. Four men were killed on the spot and all the soldiers began to disperse in their own way. I remembered our superior's warning that if we were not to defend the front position to the last he would shoot me to death, and I went down south to surrender to the enemy for fear of being shot to death. I showed up the Stars and Stripes and surrendered to the UN Army as they began to fire against me when I reached there.

There are several similarities between what this 29-year-old Chinese soldier reports and what the young Korean reported in Case 1. Both of them had been under fire from UN weapons, both had witnessed casualties in their units, and both had been threatened with death by their superiors. However, the Chinese soldier sought an opportunity to surrender although he was not

wounded. Among the 856 POWs interviewed, there were 332 who sought an opportunity to surrender, 289 of whom were not wounded and 43 who were wounded but still physically able to resist capture if they had so desired. Of these 332 POWs who surrendered voluntarily, there were 231 North Koreans and 101 Chinese, or almost 50 percent of all NKA personnel interviewed and slightly over 25 percent of all CCF.

Case 3: We had stationed in a mountain about 1 1/2 miles west of Korangpo. On August 15, regiment commander gathered about 150 men and order to annihilate about 200 men enemy soldiers who are staying in a mountain just north of the Imjin river. We reached the mountain but there was no enemy. On our return we strayed and walked along a highway. On this highway UN troops fired to us and we resisted. Later we could not but retreat, but we artillerymen could not get away because it was too close contact. After several hours we surrendered.

This report by a 22-year-old Chinese private typifies a third major type of surrender behavior found in the interviews. The soldier did not seek an opportunity to surrender. He surrendered only because he was in an unfavorable tactical situation that, if continued, would most probably have resulted in his death. This soldier was one of 428 who were taken in our sample of 856 POWs. Some of the 428 resisted capture more vigorously than this particular POW, but none of them reported "assisting" the UN forces in bringing about their capture. If they had, they would have been considered as voluntary surrenderers and would have been classified with POWs who sought an opportunity to surrender. Among those 428 POWs who were captured, 245 were from the CCF and 183 were from the NKA, or approximately 62 percent of CCF personnel and 40 percent of the NKA.

TABLE 1

POWS CLASSIFIED BY TYPES OF SURRENDER BEHAVIOR AND NATIONALITY

Surrender behavior	Chinese, percent of 393 cases	North Korean, percent of 463 cases	All POWs, percent of 856 cases
Sought opportunity to surrender	25.7	49.9	38.8
Surrendered because of unfavorable tactical situation	62.3	39.5	50.0
Physically unable to seek or resist surrender	11.2	9.9	10.5
Deserted without intent to surrender	.8	.7	.7

Table 1 shows a classification of surrender behavior of the 856 POWs into these three major categories by nationality of prisoners. This table also shows a fourth category of behavior not previously mentioned: deserting one's own unit without intent of deserting to the enemy. From the standpoint of the number of POWs who reported such behavior, this is a minor category. It is, nevertheless, a necessary one since the 6 POWs—3 CCF and 3 NKA—who reported that they were inadvertently picked up by UN forces after deserting

their own units could not be legitimately included with POWs who sought an opportunity to surrender or with POWs who were physically incapacitated or who surrendered because they found themselves in an unfavorable tactical situation. (See App C, Table C1 for a more detailed classification of the information shown in Table 1.)

It can be seen from Table 1 that the Chinese and North Koreans differed in the percentage of each group that fell into the four categories. These differences proved to be statistically significant (at the 0.001 level) when the numbers in all four categories were considered and also when the cases of physically incapacitated and deserters were removed and only the numbers of Chinese and North Koreans in the remaining two categories—those who surrendered voluntarily and those who were captured—were considered (see App C, Table C4). Because of this significant difference, the two groups were considered separately in all subsequent analyses where type of surrender was one of the factors under study.

Other findings concerned with surrender behavior show that POWs who disclaimed any affiliation with the Communist Party or the Korean Labor Party differed significantly from those who were either members of or candidates for membership in these Parties. Fewer Communists surrendered voluntarily than would have been expected from their proportion in the total group of POWs (see App C, Table C5).

NKA officers differed significantly from NKA enlisted men in their surrender behavior. Fewer officers surrendered voluntarily than would have been expected from their proportion in the total group of POWs from the NKA. This is not true, however, for CCF officers when compared with CCF enlisted men. Actually, in proportion to their numbers in the CCF group more officers surrendered voluntarily than enlisted men although the difference is not statistically significant. It should be recalled that POWs were classified as either officers or enlisted men by UN authorities on the basis of their own declarations. It is possible, therefore, that the different surrender behavior found for NKA and CCF officers as compared to that found for their respective enlisted men may actually reflect a difference between NKA and CCF officers declaring their commissioned rank correctly.

There is one additional finding of the analysis of surrender behavior that should be mentioned before turning to the kinds of UN weapons fire to which POWs were exposed prior to becoming prisoners. This concerns the time spent in the army as reported by the POWs and their surrender behavior. Here again there are contrasting findings for the NKA and CCF. NKA soldiers who had served 6 months or less were found to have surrendered voluntarily with greater frequency than would have been expected by their proportion in the total NKA group. However, the opposite was found for the CCF group. Among the POWs from the CCF, those with 6 months or less of service appeared less frequently in the surrender category and more frequently in the capture category than would have been expected (see App C, Tables C9 and C10).

Each POW was questioned closely about the UN weapons used against his unit during the week before he became a prisoner. Each time he answered that a particular type of weapon had been used, he was asked how often exposure to the fire from this weapon occurred. This additional questioning had

a twofold purpose: to verify the fact of exposure and to get some measure of its intensity. It was found, however, that many POWs seemingly did not understand the concept of intensity of exposure as precisely as had been hoped. That is, instead of giving answers in terms of specific and additive numbers, such as the number of days on which they were exposed to fire from a particular type of weapon or the number of rounds of fire on any particular day, they answered metaphorically; for example, "artillery shells fell like hail," or "planes filled the sky." Such answers fulfilled the purpose of verifying exposure to fire from a particular weapon, but they did not yield a usable measure of the intensity of that exposure.

It was not possible, therefore, to make any distinction among the POWs on the basis of the intensity of their exposure to fire from any particular weapon. Instead they were classified solely on the basis of evidence that they had been exposed one or more times to the fire from a particular type of UN weapon during the 7-day period just prior to becoming prisoners.

Figure 1 shows 11 types of UN weapons and the percentage of the group of 856 who indicated that they had been exposed to the fire from these types.

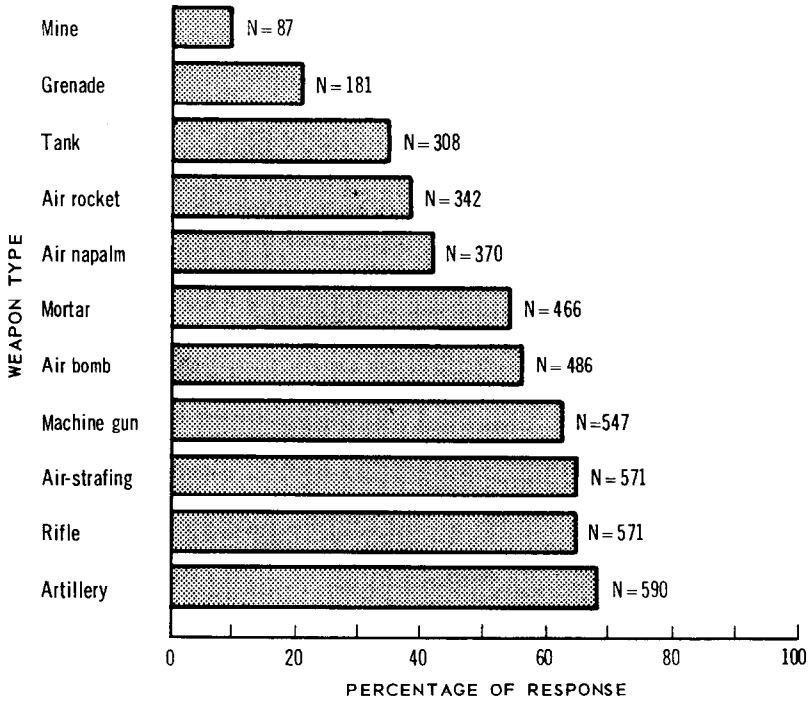

Fig. 1—Exposure to UN Weapons Fire, Cited by 856 POWs

Over one-half the 856 POWs reported exposure to fire from UN rifles, machine guns, mortar, artillery, air bombs, and air-stafing. Over one-third of the group reported exposure to fire from tanks, air rockets, and air napalm. It will be noted that only a small percentage of the group reported an exposure to mines or mine detonation. Unlike exposure to fire from other types of weapons, it is very difficult to determine what constitutes exposure to mines or mine

detonation unless the detonation occurs close by or unless a soldier knows for certain that he is crossing an area that has been mined by the enemy. Since the POWs were given no special help in answering questions about their exposure to mines, it is probable that the almost 90 percent who did not report it simply did not know whether or not they had been exposed to it in the same sense that they had or had not been exposed to other types of weapons fire.

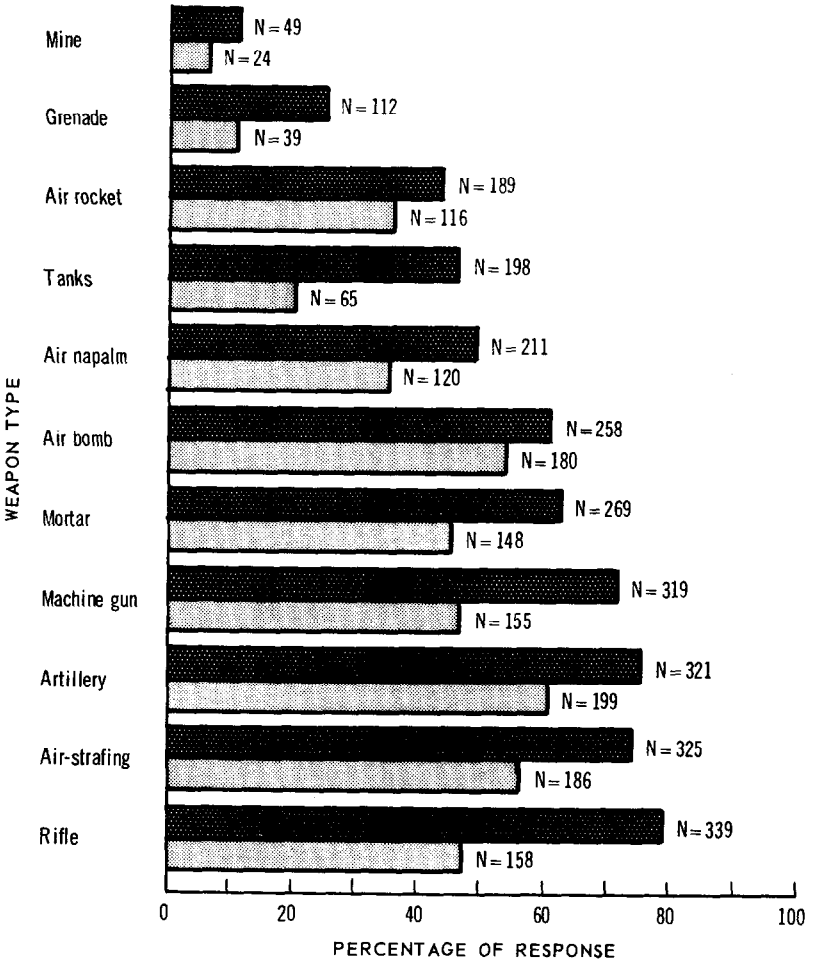

Fig. 2—Exposure to UN Weapons Fire, Cited by 428 Captured and 332 Surrendered POWs

Captured Surrendered

Although the accuracy of the information about exposure and nonexposure to mine detonation may be justifiably questioned, the obtained information was used in subsequent analyses since it was believed that soldiers who reported exposure to mine detonation (even if there were none) might differ in some psychological sense from those who reported no exposure.

With the information concerning both surrender behavior and weapons-fire exposure classified, it was then possible to relate the two and to test the significance of this relation, as shown in Fig. 2.

It is apparent from Fig. 2 that exposure to the fire from any of 11 types of UN weapons is associated more with capture than with voluntary surrender. But it is questionable whether or not the differences found between the numbers who were captured and the numbers who surrendered in both groups of POWs—those who reported being exposed to fire from a particular weapon and those who did not—were large enough to be considered statistically significant. In view of the previous finding that POWs from the NKA differed significantly from those from the CCF in their types of surrender behavior, it was necessary to ask this question for the Chinese and for the North Koreans separately. Table 2 summarizes the results of contingency tests performed. (See App C, Tables C11 and C12 for the basic data of these tests.)

TABLE 2

CONTINGENCY TESTS ON OCCURRENCE OF CAPTURE OF CCF AND NKA POWS AND THEIR EXPOSURE TO UN WEAPONS FIRE

Weapon	χ^2	
	CCF	NKA
Rifle	26.3003[a]	59.7037[a]
Machine gun	19.9127[a]	39.4684[a]
Grenade	3.5605	27.5657[a]
Mine	2.3926	0.8098
Mortar	12.2346[a]	22.4794[a]
Artillery	12.5046[a]	2.9352
Tank	14.2109[a]	16.5857[a]
Air bomb	2.2961	0.5132[b]
Air rocket	7.4201[a]	1.5540
Air napalm	5.1397[c]	7.4664[a]
Air-strafing	7.3239[a]	8.6108[a]

[a] Significant at .01 level
[b] Negative relation
[c] Significant at .05 level

Table 2 reveals that for certain weapons the association found between capture (as contrasted with surrender) and exposure (as contrasted with non-exposure) are statistically significant for a large number of the tests.* Significant relations were found for both CCF and NKA POWs with respect to the rifle, machine gun, mortar, tank, napalm, and air-strafing. Significant relations were also found for CCF exposure to the fire from artillery and air rockets, two types of weapons that were not significantly related to capture among NKA POWs. In contrast, grenades were significant for the NKA but not for the CCF. With the sole exception of air-bombing for the NKA, the

*The conclusion that a statistically significant relation exists is based on known probabilities of obtaining similar statistical associations or results if groups of the same size were used and the two factors, capture and weapons-fire exposure, were actually not related. Such probabilities are often called "chance probabilities." In the case of a weapon where significance is shown at the .05 level, the chance probabilities that exposure to that weapons fire and capture are not related are less than 5 in 100; where significance is shown at the .01 level, the chance probabilities are less than 1 in 100 that the conclusion of the existence of a statistically significant relation is wrong.

associations between exposure to the fire from any of the 11 UN weapons and capture were positive. For POWs from the NKA, exposure to air-bombing proved to be slightly more associated with voluntary surrender than with capture; this association was not, however, statistically significant.

Ineffective Performance before Becoming a POW and Exposure to Weapons Fire

Surrender behavior was only one type of enemy performance that was analyzed and related to weapons-fire exposure. A second type was behavior that occurred from 1 to 7 days before the POW became a prisoner. Information on such behavior was collected in the form of specific incidents of ineffective performance, as illustrated in the following examples:

> The day before we made any action with enemy, while we were staying in a certain village receiving the air attack done by seven US fighters, the squadron chief shouted "Come out of the house." But we could not go out of the house for fear and our squad chief told us, "Do not go out." So we did not go out. Then the squadron chief shouted, "If you don't come out you will be shot to death by my pistol," shooting four rounds continuously. But we pretended as if we did not hear him and came out after the planes disappeared.
>
> When I had been under the duty of sentry, being out of a trench, UN forces began to fire their artilleries. Looking at my friends killed by gun shells, I was possessed by attachment for living and entered the trench fearing for gun shells. Platoon leader found me in the trenches.
>
> On August 8, our unit was in a preparation to station and we were ordered to make trenches. But I neglected to make them pretending to be ill though I was recovered.
>
> On the way to our regiment to carry food, I kept about 70 meters from the leader. Then I met one of my relatives who is in the same company and was told this was the chance to make flight so we separated from the lines. We went into an orchard to take some pears to eat but were discovered by the squad leader and was reproved.

The above incidents are only four out of a total of 1875 given by the POWs. Of the total, 1056 incidents involved a poor performance by the POW himself and 819 were specific accounts of poor performance by another soldier directly observed by the POW informant. All incidents took place while the POWs were still active members of their respective armies and occurred not earlier than 7 days before the POW reporting the incident was taken prisoner.

Not all the POWs gave incidents of their own or of another's poor performance. There were 263 who either gave no incidents or who stated that they had performed all their assigned duties satisfactorily during the week before they became prisoners. By contrast, there were 134 POWs who gave three incidents of their own poor performance, 195 who gave two such incidents, and 264 who gave one. A classification of these 1875 incidents is given in Table 3.

Over half the incidents classified in Table 3 involve the ineffective performance of some routine assignment in a combat area, and slightly less than 15 percent of the incidents involve ineffectiveness when exposed to UN fire. It would be incorrect, however, to conclude that UN fire power was a factor in only about 15 percent of the incidents. If the reasons given by the POWs for ineffective behavior in all the incidents were considered, there would be

only a small number not classifiable under "ineffective under UN fire." In a large proportion of the incidents classified as "ineffective in routine assignment," the reasons for the poor performances mentioned included fear of becoming exposed to UN fire or fatigue from continuous marching or digging trenches to avoid UN fire, and lack of food, ammunition, or medical supplies because of UN bombardment. This is illustrated in the following incidents, one by a Chinese and one by a North Korean:

> In the Korangpo area when we [were] ordered to dig trench, I thought that even if we made trenches we cannot be safe under air raid. Anyhow I shall die after all [and] I would like to be not tired [at that time]. So I did not make trenches.
>
> After a fierce action was made, I was ordered to carry the wounded to army surgeon section. But I have suffered from waist ache since before, therefore, I avoided to do so, and I was impeached of my doing by my platoon leader.

TABLE 3

PERCENTAGES OF INCIDENTS OF POW'S OWN AND OTHER'S INEFFECTIVE PERFORMANCE BY TYPE OF BEHAVIOR

Behavior	Own ineffective performance, 1056 cases	Other's ineffective performance, 819 cases
Ineffective in routine assignment	61.7	46.0
Ineffective under UN fire	13.3	16.0
Deserted	8.2	23.9
Feigned illness or injured self to avoid assignment	8.7	7.0
Temporarily left post	3.8	4.9
Circumstances prevented good performance	4.3	2.2

Each time a POW related an incident of ineffective performance he was asked to describe the event that immediately preceded the occurrence of that incident. The variety of different events given in response to such questions was too large to analyze and classify efficiently. Instead, an analysis was made of only those events in which UN weapons were mentioned. It was found that, in 354 incidents, the events immediately preceding them involved exposure to some type of UN fire, and a classification was made of such events on the basis of the types of weapons and weapon combinations involved (see App C, Table C13). Figure 3 illustrates a summary of the results of this classification for ground force weapons, for air force weapons, and for combinations of both ground and air force weapons.

It is interesting to note that in the events that immediately preceded incidents of ineffective performance, artillery was named either alone or in combination with other ground weapons in 76 percent of the events in which specific types of ground weapons were named. It was also mentioned in every specifically named combination of ground and air weapons. Another high-explosive weapon, the air bomb, was the only other weapon that was mentioned

in these events with notable frequency; it was named either alone or in combinations with other air weapons in 78 percent of the cases of specified air weapons and in 42 percent of the cases of air-ground combinations. Whether exposure to high-explosive weapons fire has a greater effect in bringing about

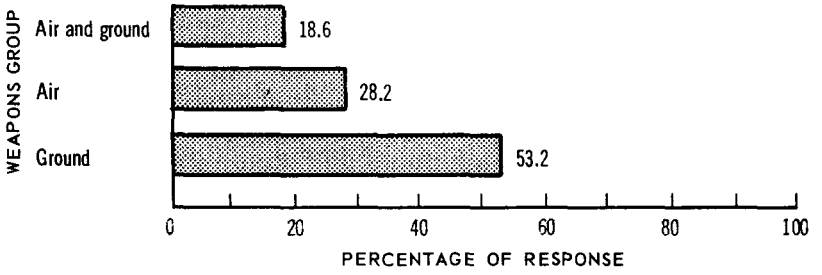

Fig. 3—Types of Weapons Involved in 354 Events that Immediately Preceded Incidents of Ineffective Performance

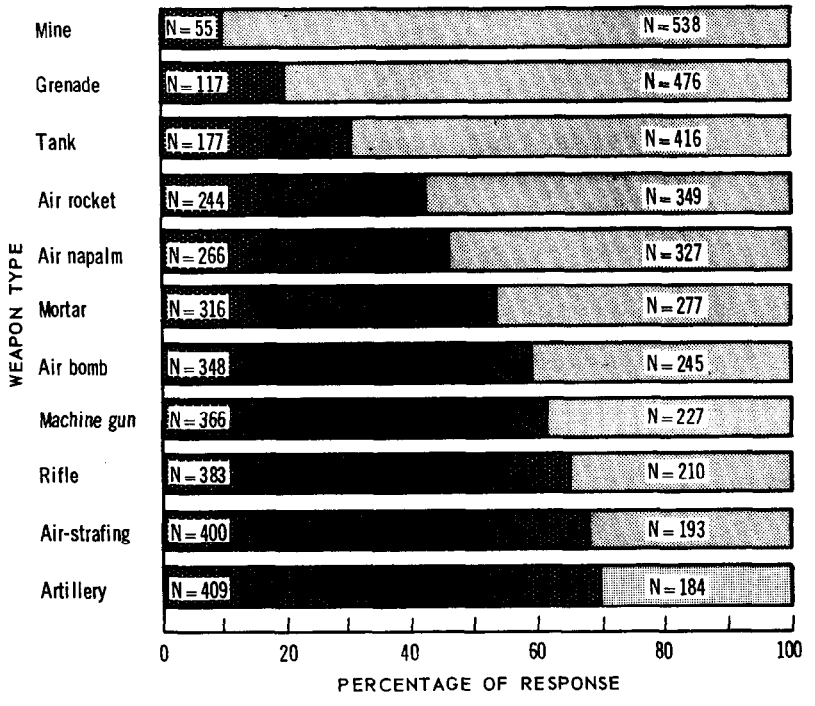

Fig. 4—Own Ineffective Performance and Exposure to UN Weapons Fire, Cited by 593 POWs

immediate ineffective performance among enemy personnel than fire from other weapons or whether the enemy was exposed more frequently to these types of weapons fire cannot be determined from the present data.

As with the types of surrender behavior, effective and ineffective behavior could be statistically related to weapons-fire exposure. POWs were

classified on the basis of the occurrence-nonoccurrence of incidents of ineffective performance and on their exposure to the 11 types of UN weapons.

There were 593 POWs who gave one or more incidents of their own ineffectiveness during the week before they became prisoners and 129 who stated positively that they had performed all their duties during that week in a satisfactory manner. (There were 134 POWs who did not answer questions about their effectiveness and hence could not be considered.) Figure 4 shows the percentage of the 593 POWs reporting incidents of their own ineffective performance who also reported exposure to different kinds of weapons fire.

Exposure to fire from rifles, machine guns, mortars, artillery, bombs, and strafing is reported in over half the cases of ineffective performance. This may mean that exposure to fire from these weapons is significantly related to the occurrence of ineffective performance. On the other hand it may

TABLE 4

CONTINGENCY TESTS ON OCCURRENCE OF INEFFECTIVE PERFORMANCE AMONG CCF AND NKA SOLDIERS AND THEIR EXPOSURE TO UN WEAPONS FIRE

Weapon	χ^2	
	CCF	NKA
Rifle	0.3901[a]	1.6603[a]
Machine gun	0.3801[a]	0.2424[a]
Grenade	2.3811[a]	0.0550
Mine	0.0042[a]	0.1736[a]
Mortar	1.0379[a]	0.5669
Artillery	2.6478	3.8864[b]
Tanks	1.0498[a]	3.7252[a]
Air bomb	5.9258[b]	6.0872[b]
Air rocket	2.5519	2.9746
Air napalm	1.0186	5.4766[b]
Air-strafing	4.3243[b]	7.5901[c]

[a] Negative relation
[b] Significant at .05 level
[c] Significant at .01 level

only mean that more of the enemy's soldiers were exposed to fire from these types of weapons than from other types. Therefore, to test the statistical significance of the occurrence of ineffective performance and exposure to fire from different types of weapons it is also necessary to consider the exposure of those soldiers who performed effectively. That is, are there significant differences between the numbers of soldiers who performed effectively or ineffectively in the two groups—those who reported exposure to fire from a particular type of weapon and those who did not? Again the answers to this question are shown separately for the Chinese and the North Koreans in Table 4. (For data used in contingency tests, see App C, Tables C14 and C15.)

For both CCF and NKA soldiers who later became prisoners, statistically significant associations were found between ineffective performance and exposure to bombing and to strafing. Exposure to rocket fire closely approached

significance for both groups (significant between the .20 and .10 levels for the CCF and between the .10 and .05 levels for the NKA). Air napalm was found significant for the NKA but not for the CCF; the same was also true for exposure to artillery fire.

Until additional research data are available it must remain a matter of conjecture as to why exposure to certain kinds of weapons fire was more closely associated with ineffective performance among the North Koreans than among the Chinese. It might be found, for example, that UN forces facing the CCF during the time these data were collected used certain types of weapons much more frequently than other UN forces who were facing the NKA. A second possible hypothesis might be constructed about differences in personality or temperament between Chinese and North Korean soldiers. A third explanation might be found in the different proportion of combat-experienced soldiers serving in the two armies.

Relation between Type of Surrender and Performance

The incidents of ineffective performance represent a valuable source of information about performance behind the enemy lines. It was desirable, therefore, to tease out as many relations as possible between this relatively difficult-to-get information and other types of information that could be gathered more easily. Type of surrender behavior, or the amount of resistance

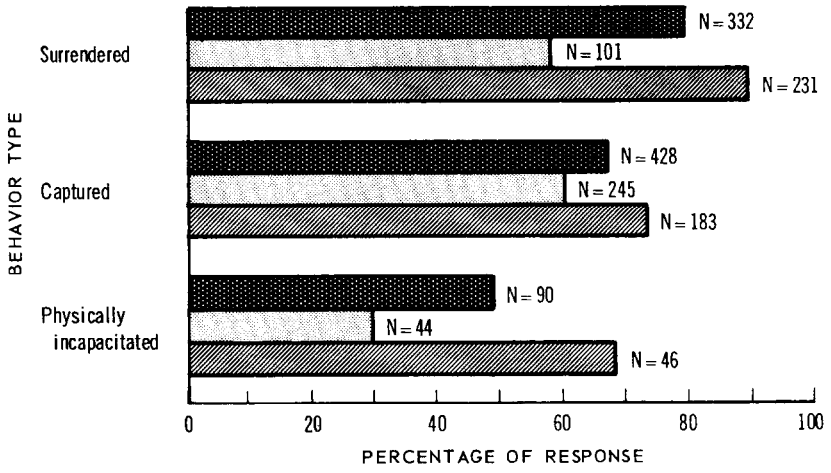

Fig. 5—POWs in Major Behavior Categories Who Cited Incidents of Own Ineffective Performance

All POWs CCF NKA

to capture, is one of the kinds of information that is relatively easy to obtain from POWs. Incidents of performance were related to weapons-fire exposure in the preceding section. In this section these incidents will be related to surrender behavior.

Figure 5 shows the three major categories used to classify the different types of behavior of POWs at the time they were taken prisoner. It also shows the percentage of all POWs in each behavior category who gave one or more

incidents of their own ineffective performance that occurred during the previous 7 days. In addition to the percentages for POWs from both the CCF and the NKA combined, Fig. 5 shows the percentages for each of these groups separately.

There appears to be a relation between surrendering voluntarily to an enemy and the occurrence of previous ineffective performance. However, among POWs who did not surrender voluntarily but instead showed varying amounts of resistance to capture, over 65 percent reported one or more incidents of poor performance on their own parts during the previous week. Of particular interest is the percentage of POWs in the physically incapacitated category who reported previous ineffectiveness. Since the enemy soldiers in this category came under the control of UN forces through no effort on their parts, they can be considered a special group. POWs in the physically incapacitated category are probably more representative of all other enemy soldiers who are not POWs than those in any other category since they were "selected" from enemy soldiers on the front line by a means that may be considered relatively objective and unbiased—fire from UN weapons that were directed at all enemy soldiers without regard to individual men. Yet among this group of POWs almost half reported incidents of their own ineffectiveness as soldiers.

Some measure of the amount of ineffectiveness, as distinguished from its occurrence or nonoccurrence, was available in data on the number of incidents that POWs reported. Each POW was asked three separate questions about possible ineffectiveness on his part during the week he became a prisoner. Figure 6 illustrates the percentages of men in each of the three behavior groupings who gave one, two, or three different incidents.

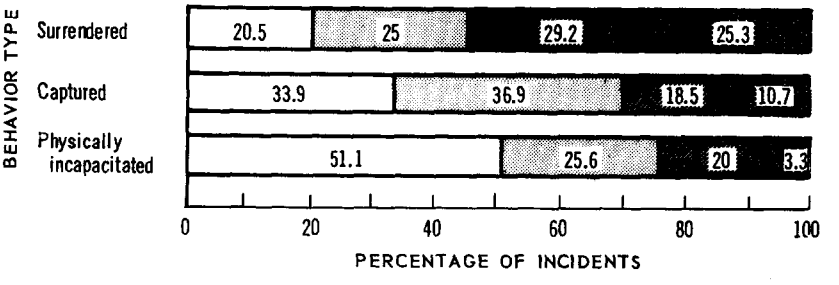

Fig. 6—POWs in Major Behavior Categories Who Cited None to Three Incidents of Own Ineffective Performance

No incidents | One incident | Two incidents | Three incidents

Among POWs who surrendered, a greater proportion gave three incidents of ineffective performance than POWs in the other two groupings; this was also true of the proportion who gave two incidents.

Since every POW in all the surrender behavior groups had an opportunity to cite a maximum of three distinct incidents if that many had occurred in the 7-day period being considered, it was possible to compute a simple percentage rate of ineffectiveness for each group. It was found that in the group of 332 POWs who surrendered there were 529 incidents cited out of a theoretical limit

of 996 for that group. The rate of ineffectiveness of this group was thus 53 percent. In the captured group of 428 POWs, there were 454 incidents out of a possible 1284, or a rate of about 35 percent. Among the 90 POWs who were physically incapacitated, the total of 68 incidents gives a rate of approximately 25 percent.

TABLE 5

BREAKDOWN OF INEFFECTIVE PERFORMANCE CITED BY POWS IN MAJOR BEHAVIOR CATEGORIES

Behavior	Percent of response		
	CCF	NKA	All POWs
Surrendered			
Ineffective in routine assignment	59	62	61
Ineffective under UN fire	20	5	8
Feigned illness	7	10	10
Deserted	7	15	11
Temporarily left post	5	7	8
Circumstances prevented good performance	2	1	2
Captured			
Ineffective in routine assignment	57	67	62
Ineffective under UN fire	21	15	18
Feigned illness	7	7	7
Deserted	2	2	3
Temporarily left post	6	2	3
Circumstances prevented good performance	7	7	7
Physically incapacitated			
Ineffective in routine assignment	72	70	70
Ineffective under UN fire	11	19	17
Feigned illness	0	2	1
Deserted	0	0	0
Temporarily left post	12	2	4
Circumstances prevented good performance	5	7	8

These rates reflect minimum amounts of ineffectiveness in these groups, since it is probable that some of the POWs in each group who gave the maximum of three incidents might have been able to cite additional incidents if they had been given the opportunity to do so. However, these rates are useful in reaching tentative conclusions about the quality of performance of enemy soldiers who became POWs as compared to the performance of those who did not. If one assumes that the rate of ineffectiveness for the physically incapacitated group was approximately the same as that for enemy soldiers who did not become prisoners, several conclusions follow: first, enemy soldiers who surrendered voluntarily to the UN were among the most ineffective; as a group,

they were over twice as ineffective as those who did not become prisoners as shown by their rate of 53 percent as compared with a rate of 25 percent. Second, prisoners who were captured by UN forces were likewise less effective as soldiers than other enemy troops; their rate of ineffectiveness, as a group, is about 40 percent higher than that of "average" enemy soldiers (35 percent as compared to 25 percent).

As shown elsewhere the incidents of ineffective behavior differed considerably; i.e., not all incidents were of the same degree of seriousness. Table 5 shows a classification of these incidents into six types of performance and the percentage of each type given by POWs in the three major behavior groups.

Ineffective performance in a routine assignment accounted for over half the incidents given by each grouping and over 70 percent of those given by the physically incapacitated. Also, in the physically incapacitated group there was only one incident of feigning illness and none of desertion—two types of ineffectiveness that occurred with considerable frequency in incidents from POWs who surrendered. Feigning illness also occurred with notable frequency in incidents from the captured group, but desertion did not. The captured group is quite similar to the physically incapacitated group with respect to the proportion of incidents that involved ineffectiveness while facing UN fire power —a category that accounts for only 8 percent of the incidents of POWs who surrendered. The physically incapacitated and the captured groups are also similar with respect to ineffectiveness due to "circumstances beyond the POW's control." In terms of types of ineffectiveness, therefore, POWs who surrendered are least like those who were physically incapacitated. POWs who were captured resemble those who surrendered in the proportion of feigned illnesses that they reported and resemble the physically incapacitated in incidents caused by circumstances beyond their control. All three groups have very similar proportions of incidents that involved leaving a post temporarily. POWs from the CCF and from the NKA within each category of surrender behavior differed only slightly in their proportions of incidents classified into the six types of performance.

Direct Effects of UN Weapons on Enemy Personnel and Units

The three preceding sections have dealt with findings derived by analysts from relating information obtained in one part of the interview to information obtained in other parts. It is extremely doubtful that many of the POWs consciously connected questions asked about their surrender behavior at the beginning of a 3-hour interview with questions about their exposure to weapons fire asked an hour or more later. In this section, however, the findings deal with relations that the POWs themselves reported—those that the POWs felt existed between UN weapons and the wounds attributed to them and between UN weapons and their effects on the units to which the POWs belonged.

There were 411 POWs interviewed who were wounded at the time they became prisoners. There were also an additional 37 POWs who were not wounded at the time they became prisoners but who had been wounded previously in the Korean action. Out of this total group of 448, 413 or 92 percent had been wounded only once; 29 or slightly under 7 percent had been wounded

twice; 5 POWs reported that they had been wounded three times; and 1 prisoner reported being wounded on four occasions. Every POW who had been wounded was asked, "By what weapon or weapons were you wounded?" A classification of replies by type of weapon is shown in Table 6.

TABLE 6

FREQUENCY WITH WHICH SPECIFIC WEAPONS WERE CITED AS THE CAUSE OF WOUNDS BY 448 POWS

Weapon	Frequency
Pistol	2
Burp gun	1
Rifle	164
Machine gun	32
Grenade	27
Mine	7
Mortar	19
Artillery	96
Tank	15
Air bomb	18
Air rocket	3
Air napalm	7
Air-strafing	16
Unspecified ground weapon	44
Unspecified air weapon	5
Unknown or uncertain	34
Total	490

Weapons of the ground forces account for the great proportion of wounds received by POWs; rifle and artillery are the two ground weapons mentioned most frequently. In noting how infrequently wounds are attributed to air weapons, it should be remembered that most exposure to fire from air weapons must necessarily take place slightly behind the MLR. Therefore it is reasonable to suppose that many enemy soldiers wounded by fire from air weapons would be in the custody of their own medical personnel and not accessible to capture by or surrender to UN forces. This would be less true of those wounded by weapons of the infantry and weapons used in the direct support of front-line troops. It should also be pointed out that it must be relatively difficult for soldiers to distinguish between wounds caused by different types of penetrating weapons and those caused by explosive projectiles. Thus some of the wounds attributed to rifles may have been caused by burp guns, pistols, or machine guns.

From a psychological point of view a somewhat more illuminating finding concerns UN weapons to which POWs attributed some harmful or upsetting effect on their unit's efficiency. The POWs were asked if UN ground or air forces did anything during the week before they became prisoners that was especially harmful or upsetting to them or to their units. Weapons were not mentioned in the question nor had they been mentioned in any questions previous to this one. Therefore the mention of specific weapons and their effects

in an answer was not the result of any cues given by the interrogator but was the recall of a relation between exposure to weapons fire that had become established in the mind of the POW through experience. For example:

A fierce engagement was waged on a hill 8 kilometers southeast of the Han river. The enemy's artillery fire inflicted heavy losses on our troops. We suffered about 150 wounded. As our supply lines were cut off, when we took to retreat, we also suffered heavy casualties from the artillery fire of the pursuing enemy. More than half the members of our battalion were killed or wounded. We were without food supplies. We were obliged to retreat.

This is an answer of a Chinese private who was captured while hiding in a trench in a mountain recess south of Hongchon. A North Korean private who surrendered voluntarily on 2 September answered the same question as follows:

In the daytime on September 1, when our regiment, 15th Rgt 6th Div, were disposed at defensive positions on Mt Taegu, we were detected by two UN forces reconnaissance planes. And about 3 minutes later, receiving a fierce 50-caliber gun fire, 20 of us were killed instantly. Forty of us were wounded seriously, 40 of us were wounded lightly. Two mortars were destroyed and our whole unit was scattered everywhere. Therefore we retreated, remaining two platoons at the position.

The answers of 340 POWs, or almost 40 percent of the 856 interviewed, indicated a relation between different types of UN weapons and some upsetting effect on their unit during the week before they became prisoners. Although descriptions of these effects vary a great deal in detail, the effects were amenable to classification in terms of causing casualties, damaging fortifications or supplies, stopping the unit's advance, or causing it to retreat or to scatter. (A complete classification of these effects by ground weapons, air weapons, and a combination of ground and air weapons is shown in App C, Table C16.)

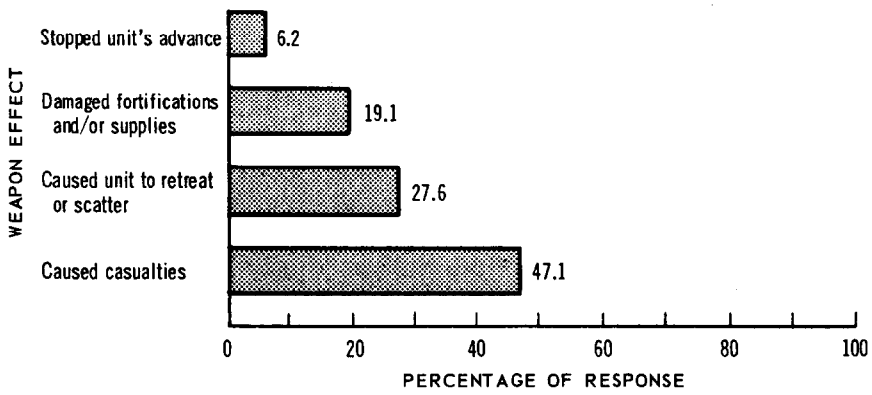

Fig. 7—Effects of UN Weapons Fire on Enemy Units

Figure 7 summarizes the results of such a classification. As shown in this figure the proportion of times that casualties were mentioned as the only effect of weapons fire is limited; actually, casualties were mentioned as an additional effect in almost all the cases shown in the other three categories.

Specific weapons and their various combinations that were cited as responsible for the effects shown in Fig. 7 are too numerous to list in this re-

port. An examination of such a list would clearly show that artillery and air-bombing were the weapons most frequently cited either alone or in combination with another weapon. Other combinations cited with notable frequency were napalm and strafing, and artillery in combination with air weapons. Table 7 lists the frequency with which a ground or air weapon was cited alone or in combination as being involved in the different types of upsetting actions.

TABLE 7

WEAPON SYSTEMS CONSIDERED BY 340 POWS AS CAUSE OF SPECIFIED EFFECTS ON THEIR FORMER UNITS

Weapon effect	Weapons system			Total
	Ground	Air	Air-ground combinations	
Caused casualties[a]	62	67	31	160
Damaged supplies	6	51	3	60
Damaged fortifications	1	2	2	5
Stopped advance	7	13	1	21
Made unit retreat	22	4	15	41
Made unit scatter	16	28	9	53
Total	114	165	61	340

[a] Exclusive of casualties included in other categories.

A breakdown of the information shown in Table 7 into that reported by POWs from the CCF and by POWs from the NKA indicates a marked difference in the frequencies of ground- and air-weapons effects reported by each group. The CCF attributed a substantially greater number of upsetting effects to air weapons and those from the NKA attributed a greater number to ground weapons. To interpret this finding completely would require data on the relative amounts of exposure to ground- and air-weapons fire experienced by the CCF and NKA during the 6-month period these POWs became prisoners. Such data were not available.* If the NKA had been engaged in more actions where ground weapons were used than had the CCF, some differences might be expected between reports of POWs from the two enemy forces about the effects of ground and air weapons on their respective units. Conversely if both enemy forces were engaged about equally with similar weapons during this period, the finding that ground weapons are more frequently upsetting to NKA units than to CCF units takes on added significance. This finding would have been investigated further for a more complete picture of the psychological effects of weapons in the Korean action, had circumstances permitted.

In addition to the question about UN actions that were upsetting to their units, POWs were asked if UN ground or air forces had done anything during the same 1-week period that actually helped these units. Only 50 POWs gave

*An attempt was made to abstract such data from the daily action reports of US Army units. However, it was found that these reports were not specific enough in their references to opposing enemy forces to use for this purpose.

affirmative answers, which fell into five categories with the following frequencies: bombed deserted positions—37; shelled deserted positions—6; unnecessarily exposed troops and/or equipment to enemy action—3; bombed own troops —5; and strafed own troops—1.

Effects of Enemy Weapons on Performance of US Infantry Units

Investigation of the effects of enemy fire power on the performance of UN personnel was considered ancillary to the study of the effects of UN fire power on enemy personnel.* Instead of questioning US infantry personnel extensively about their reactions to enemy fire, the $^1/_2$-hour limit established for interviewing such personnel was used to obtain detailed information about one particular experience in combat. This experience involved a specific time during their most recent tours at the front when they or their units could not perform well because of the weapons being used against them. If any individual in the groups interviewed said that he had not had such an experience he was excluded. A total of 260 soldiers were sampled who claimed to have had such a recent experience and who gave varying amounts of information about this experience. Table 8 shows the types of action in which the units of these soldiers were engaged at the time they met the effective enemy fire that they reported upset their plans and prevented them from performing well.

TABLE 8

UNIT ACTION AT TIME OF EXPOSURE TO EFFECTIVE ENEMY FIRE CITED BY 260 US SOLDIERS

Action	Frequency
Advancing	25
Attacking	140
Defending or holding	43
Supporting	25
Screening	9
Patrolling	11
Retreating	6
Not specified	1
Total	260

Members of these units cited different types of weapons that contributed to the effectiveness of enemy fire power. Table 9 gives eight weapon types and the frequencies with which fire from these weapon types was cited either alone or in combination with other types as being responsible for preventing US units from carrying out their mission.

*For comparative purposes it would have been desirable to have obtained the answers of UN combat soldiers to many of the same questions that were asked of POWs. This would have required interviews lasting several hours and covering subjects that field commanders might properly have felt were unwise to discuss with personnel preparing to return to combat.

It is apparent from Table 9 that effective enemy fire was seldom the result of a single type of weapon. Also, it appears that mortar fire was most frequently involved in effective enemy actions, followed closely in frequencies by fire from automatic weapons such as the automatic rifle and the burp gun and fire from machine guns.

There were three ways in which the effects of the reported enemy fire power were determined from the limited information contained in the interview: (a) by classifying what action enemy troops were said to have been able to take in these situations; (b) by analyzing what US units did to counter the effective fire; and (c) by analyzing the reasons given by US soldiers for considering the enemy as effective in these situations.

TABLE 9

WEAPON TYPES INVOLVED IN EFFECTIVE ENEMY FIRE AGAINST US UNITS, CITED BY 257 US SOLDIERS

Weapon	Cited alone	Cited in combination	Total
Mortar	9	138	147
Automatic infantry weapon	13	132	145
Machine gun	7	135	142
Grenade	4	77	81
Small arm	2	46	48
Artillery	4	43	47
Mine	0	2	2
Tank	0	0	0
Total	39	573	612

The different actions that enemy forces were able to take fell into five general categories: to advance, to counterattack, to withdraw in an orderly fashion, to improve their tactical position by surrounding or flanking the US unit involved, and to stop an advance. These five kinds of actions are shown in Table 10 together with the weapons that were used in taking such action against opposing US units. Again, for purposes of presentation, the many different types and combinations of weapons have been grouped into three "systems" or classes: I, "light" weapons that infantry soldiers carry with them such as small arms, machine guns, and grenades; II, "heavy" weapons that give support to infantry soldiers such as mortars, artillery, and mines; and III, combinations that involve weapons from categories I and II.

In considering the results of the classification shown in Table 10 it should be remembered that mortars were previously found to be the most frequently mentioned type of weapon used by the enemy. Therefore a high proportion of the combination of light and heavy weapons, shown under III in this table, consists of mortars in combinations with types of light weapons.

The use of effective enemy actions as one indication of the effects of weapons on US troops assumes that many such actions would not have been possible if the weapons used had not adversely affected the performance of the opposing US units. No information was obtainable on units that had faced

similar enemy weapons fire and had prevented the enemy from taking the types of actions indicated in Table 10. However, it is clear from the results of the whole Korean action that more US units have successfully withstood fire from such weapons than have not.

TABLE 10

EFFECTIVE ENEMY ACTIONS AGAINST US UNITS BY TYPES OF WEAPONS USED, CITED BY 257 US SOLDIERS

Effective enemy action	Weapons used			Total number of actions
	I[a]	II[b]	III[c]	
Advanced	9	2	15	26
Counterattacked	5	3	19	27
Made an orderly withdrawal	12	5	21	38
Surrounded or flanked US unit	15	0	10	25
Stopped US unit's advance	59	14	68	141
Total	100	24	133	257

[a] Small arms, automatic infantry weapons, machine guns, grenades
[b] Mortars, artillery, mines, heavy weapons
[c] Combinations of weapons in both a and b

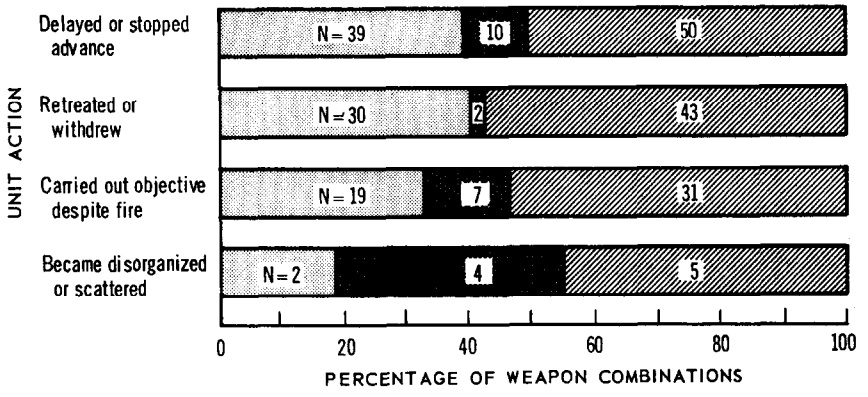

Fig. 8—Unit Action Taken on Exposure to Effective Enemy Fire and Use of Weapon Combinations, Cited by 242 US Soldiers

Small arms, auto. infantry weapons, MG, etc.
Mortars, artillery, mines, "heavy" weapons
Combinations of "heavy" and "light" weapons

Somewhat more specific effects of enemy weapons can be inferred from what US units did in the same situations, as shown in Fig. 8. A few soldiers did not tell what was done by their units as a result of the effective enemy fire and others did not name the enemy weapons used against them; there were, however, 242 soldiers whose answers were complete enough for purposes of analysis.

It was found that the action that was taken most frequently was the stopping or delaying of an enemy unit advance. This action was cited by 99 of the 242 soldiers. Such a high proportion, almost 41 percent, might be expected in view of the previously presented finding that most of the units were advancing or engaged in an attack at the time they met the enemy fire that they considered effective.

The action of US units mentioned with the second greatest frequency was retreating or withdrawing, an activity that only 6 soldiers had reported as engaged in by their units at the time effective enemy fire was encountered. Retreating or withdrawing was mentioned by 75 of the soldiers, or about 31 percent. Fifty-seven of the soldiers, over 23 percent, reported that their units carried out their objectives despite effective enemy fire, and 11 soldiers, about 5 percent, said that their units either became disorganized or the members scattered in face of the fire.

Each of the four action types may be considered as an undesirable effect of enemy fire power: the first three because the objectives of the units were not achieved, the fourth—carrying out objectives despite fire—because of the high casualty rates that may be inferred from unit actions of this type.

When these four types of undesirable actions were considered in light of the types of weapons involved, however, no striking relations were found. Similar weapon types were involved in the four action types in about equal proportions.

Although some slight significance might be attached to the fact that combinations of heavy weapons were involved in about one-third of the cases of units that became disorganized, it must be pointed out again that there was only a total of 11 cases of this type given. Combinations of light and heavy weapons were involved in over 50 percent of the actions of each type except that of "became disorganized." Again, the high proportion of combinations of this sort may be attributed to the frequent use of mortars with different types of light weapons.

Another effect of weapons fire could be changes in group morale that might follow an experience in which weapons were used effectively against a unit. It was not possible to investigate this effect directly since such an investigation would require knowledge of the level of morale both before and after the experience. It was possible, however, to get information that suggested that the morale in the units of the soldiers interviewed had not been greatly reduced, if at all, by these experiences with effective enemy fire power.

Each soldier who described a situation in which the enemy had used his fire power effectively was asked, "Why was the enemy effective?" Any soldier could respond to such a question with reasons that stressed either some superiority of the enemy or some weakness of his own unit; the superiority of one side in a combat situation is a function of, or is relative to, weaknesses of the opposing side. Therefore, to choose to stress the superiority of the enemy rather than the weakness of his own unit is an indication on the respondent's part, admittedly imperfect, of positive group morale or esprit de corps. This follows somewhat from the observation that, when a group's morale is high, outcomes unfavorable to it tend to be explained by its members in terms of influences or factors outside the group and over which the group is not expected to have much control. When a group's morale is low, unfavorable out-

comes tend to be explained by members in terms of poor judgment of leaders, lack of cooperation between members, or other factors or conditions that are centered in the group itself.

Two hundred and fifty-four soldiers gave reasons why the enemy was effective with his fire power in the specific situations they described. It was found that 167 of them attributed this effectiveness to some superiority possessed in that situation by the enemy and only 38 gave answers that were oriented to some weakness of their own unit. The reasons given by the remaining 49 men included mention of both the enemy's superiority and a weakness of their unit. However, in all but 6 of these 49 cases, the major emphasis was on the enemy's superiority. In percentage terms, therefore, it was found that 83 percent of the soldiers explained the enemy's effectiveness in such a way that an interviewer, like the research investigator, could not find any fault with the way their units performed.

Such a finding cannot be evaluated in precise terms of the degree of morale shown by the soldiers since there were no norms for comparison purposes. It is believed, however, that this finding strongly suggests an absence of poor morale within the units of the soldiers who were interviewed even if there were no basis for concluding anything about how high the morale in these units might have been.

In summary, it was found that in situations where US soldiers considered the enemy to have used his fire power effectively, the weapons most frequently involved were combinations of mortars, automatic infantry weapons, and machine guns. Grenades also were mentioned with considerable frequency. US units reacted to effective enemy fire power primarily by a shift in their tactics, and less than 5 percent of the soldiers interviewed indicated that their units became disorganized or that the members reacted in some undisciplined manner. It was inferred from the explanations given of why the enemy was effective that the morale of the US units was not seriously affected by their encounter with enemy fire power that their members considered effective.

GENERAL CONCLUSIONS

Specific conclusions have been set forth throughout this memorandum at places where the relevant data were presented; here certain of these are brought together so that general conclusions may be drawn.

1. UN artillery and air bombs were identified as the weapons most frequently involved in UN fire that immediately preceded acts or incidents of ineffective performance on the part of enemy soldiers. Furthermore, exposure to fire from certain weapons at any time during a 1-week period was more closely associated with the occurrence of incidents of ineffective performance during that week than was exposure to fire from other weapons. On the other hand, exposure to fire from many of the weapons not found to be closely associated with ineffective performance was found to be associated instead with the capture of enemy personnel. Table 11 brings together the findings for the different weapons. POWs who were or were not exposed to fire from each weapon during the week before they became prisoners were separately classified according to whether they had performed ineffectively during that week and whether they were captured or had surrendered at the end of that week.

Exposure to air-strafing was significantly associated with both capture and ineffective performance of CCF and NKA personnel. Exposure to napalm was likewise associated with both capture and ineffective performance of the NKA but only with capture of CCF personnel. Rockets were significantly associated with capture for the CCF but not for the NKA. Exposure to bombs, one of the two weapons (bombs and artillery) found to be most frequently involved in the fire that immediately precedes incidents of ineffectiveness, was also found to be significantly associated with such incidents when this exposure

TABLE 11

SIGNIFICANT ASSOCIATIONS BETWEEN EXPOSURE TO FIRE FROM UN WEAPON TYPES AND OCCURRENCES OF INCIDENTS OF INEFFECTIVE PERFORMANCE AND OF CAPTURE[a]

UN weapon type	Level of significance			
	Ineffective performance		Capture	
	CCF	NKA	CCF	NKA
Rifle	–	–	.01	.01
Machine gun	–	–	.01	.01
Grenades	–	–	–	.01
Mines	–	–	–	–
Mortar	–	–	.01	.01
Artillery	–	.05	.01	–
Tanks	–	–	.01	.01
Air bombs	.05	.05	–	–
Air rockets	–	–	.01	–
Air napalm	–	.05	.05	.01
Air-strafing	.05	.01	.01	.01

[a] Taken from Tables 2 and 4.

took place any time during the week of the incident. However, a different finding obtained with respect to artillery; i.e., exposure to artillery fire was significantly associated with ineffective performance among the NKA but not among the CCF. Conversely it was found that exposure to artillery fire for the CCF was significantly associated with capture. Grenades and capture was significantly associated for the NKA but not for the CCF. All other types of weapons except mines were significant with capture of personnel from both the CCF and NKA; these were rifles, machine guns, mortars, tanks, air napalm, and strafing.

(a) The associations found between capture and exposure to fire from UN rifles, machine guns, grenades, and to some extent those for exposure to fire from mortars and tanks, strongly suggest that information obtained from POWs by the interviewing techniques used in this investigation were quite accurate. Since capture implies a certain amount of face-to-face contact between the person being taken prisoner against his will and the person who "takes" the prisoner, it would have been surprising indeed if significant associations had not been found between capture and exposure to fire from types of weapons

used by the infantry soldier and infantry combat teams. However, to use a technique to get findings that agree with what would be expected on the basis of common knowledge permits greater confidence to be placed in findings from that technique when they deal with matters about which there is little knowledge, such as occurrence of acts of ineffectiveness by enemy personnel behind their own lines.

(b) Air weapons, with the exception of bombs, tend to be effective both in bringing about ineffective performance within enemy ranks and in the capture of individual enemy soldiers. This is especially true of strafing but also true of napalm when used against the NKA. Air bombs are important in producing ineffective performances by both NKA and CCF personnel.

(c) It is the unexpected exposure to fire from a weapon more than the type of weapon that is important psychologically in bringing about acts of ineffective performance. This can be inferred both from the types of weapons that were found to be significantly associated with incidents of ineffective performance and from the content of many of the incidents themselves. Mention was often made in incidents of a sudden bombardment by artillery or planes or of an unexpected strafing or napalm attack from the air. It is also exposure to the fire from such weapons that was found to be associated with the occurrence of all incidents regardless of whether any direct mention was made of weapon fire in the incidents. Further support for this conclusion comes from a consideration of the types of weapons not found to be associated with the occurrence of incidents: for the most part, they are weapons of more limited range, and weapons that are fired from relatively fixed positions. Therefore their fire would tend to be directed at targets in small and somewhat more restricted areas where personnel would be expecting enemy fire, and where they would be better prepared psychologically to carry out their duties effectively.

2. Another set of general conclusions arises out of findings on the performance of POWs before they became prisoners. Those who surrendered were found most frequently to be those who had performed their duties as enemy soldiers in an ineffective manner. This group of POWs was followed in the number of incidents of ineffective performance by the captured group. Although the rate of ineffectiveness computed for the captured group was lower than the rate for the surrendered group, it still exceeded the rate computed for POWs who neither assisted nor resisted capture by UN troops because they were physically incapacitated at the time they were taken prisoners. Based on the reasonable assumption that the rate of ineffectiveness for this physically incapacitated group most closely approximates the rate for enemy soldiers who were not UN prisoners, (a) captured and surrendered POWs tend to be below the average in their military performance as enemy soldiers; and (b) POWs who are captured have performed as enemy soldiers more effectively than those who seek an opportunity to surrender.

On the basis of the rate of ineffectiveness found for physically incapacitated POWs it would be desirable to draw a third conclusion about whether this rate is high or low as compared to a similarly computed rate for UN troops. Unfortunately, the gathering of information for computing such a rate for UN soldiers was not within the scope of this study. Were it feasible,

it would be recommended that such a study be undertaken to establish relative rates of ineffectiveness (or effectiveness) for units of comparable types of US troops. The establishment of such rates and a practical procedure for noting periodic fluctuations would be a most valuable contribution to the solution of the "criterion problem" that is so frequently met in research on military personnel and in operations analysis.

Appendix A

QUESTIONNAIRES USED WITH POWS AND US ARMY PERSONNEL

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ENGLISH TRANSLATIONS OF QUESTIONS USED IN INTERVIEWS WITH NORTH KOREAN AND CHINESE POWS

1. Number of interview. (To be stamped at US base of operations)
2. Date of interview.
3. Place of interview.
4. Name of interviewer.
5. Name of translator.
6. Are you Chinese or North Korean?
7. What is your name?
8. What is your serial number?
9. What is your rank?
10. How old are you?
11. What is the location of your home?
12. What was your occupation before you entered the army?
13. What is your father's occupation?
14. Can you read and write in your native tongue?
15. What was the highest grade in school that you successfully completed?
16. How long have you been in the army?
17. How many months have you been in Korea since June 1950? (No answer for North Koreans)
18. How many times have you been wounded during the present war?
19. (If POW has been wounded:) By what weapon or weapons were you wounded?
20. Are you a member of the Communist Party?
21. What was the date when you became a prisoner?

22. Where did you become a prisoner?

23. In what military capacity were you functioning at the time you became a prisoner?

24. Describe in detail the exact manner in which you became a prisoner. (Suggested probes: What else happened? Tell me more about it. Did anything else happen?)

25. Describe in detail what occurred just before you became a prisoner.

    (If not included in the answers given to questions 24 and 25, find out the following details:)

26. At what time of day did you become a prisoner?

27. To whom did you surrender or become a prisoner?

28. Did you become a prisoner alone? If not, with whom?

29. Were you under fire just before you became a prisoner?

30. (If the answer to 29 is yes:) What kinds of weapons were being used against you?

31. Now I want to ask you about your last week of duty before you became a prisoner. No one is a perfect soldier at all times. There are times when a soldier does not or can not do his duties as he should. Did anything like this happen to you during the last week before you became a prisoner? Please give me all of the details that you can.
    (Suggested probes: Is there anything more? What happened next?)

32. What happened just before that?

33. Was there another time during the last week before you became a prisoner that you did not or could not perform your duties as you should? Give me all of the details that you can.

34. What happened just before that?

35. Was there another time during the last week before you became a prisoner that you did not or could not perform your duties as you should? Give me all of the details that you can.

36. What happened just before that?

37. During your last week of duty did you see an officer or an enlisted man at a time when he did not or could not perform his duties? Give me all of the details that you can.

38. What happened just before that?

39. Were you with the man you were just talking about during most of the last week before you became a prisoner?

40. Was there another time during the last week before you became a prisoner that you saw an officer or an enlisted man when he did not or could not perform his duties? Please give me all of the details that you can.

41. What happened just before that?

42. Were you with the man you were just talking about during most of the last week before you became a prisoner?

43. Was there another time during the last week before you became a prisoner that you saw an officer or an enlisted man when he did not or could not perform his duties? Give me all of the details that you can.

44. What happened just before that?

45. Were you with the man you were just talking about during most of the last week before you became a prisoner?

46. Did the UN forces, ground or air, do anything during the last week before you became prisoner, and not already mentioned, that was especially harmful or upsetting to you or your unit? Please give me all of the details that you can.

47. (If the answer to 46 is yes:) What did you or the men in your unit do?

48. Did the UN forces, ground or air, do anything during the last week before you became prisoner that was foolish or wasted effort or that really helped you or your unit? Please give me all of the details that you can.

49. (If the answer to 48 is yes:) What did you or your unit do?

50. In what area or kind of terrain were you located during the last week before you became a prisoner?

51. In what kind of action was your unit engaged?

52. (If the answer to 51 indicates that the unit was on the defensive:) What was the defensive situation?

    Which of the following ground weapons were used by your forces in the area where your unit was stationed during the week before you became a prisoner?

53. Small arms? How often?

54. Machine guns? How often?

55. Hand grenades? How often?

56. Mortars? How often?

57. Artillery? What kind? How often?

58. Land mines? How many?

59. What other kinds of ground weapons did you use? How often?

What kinds of air attacks and air weapons did your forces use in the area in which your unit was stationed in the week before you became a prisoner?

60. Bombing? What kind of bombing and how often?

61. Napalm? How often?

62. White phosphorus? How often?

63. Machine-gun strafing? How often?

64. Rockets? How often?

65. What other kinds of air weapons were used? What kinds? How often?

What kinds of ground weapons did your enemy forces use against your unit in the week before you became a prisoner?

66. Small arms? How often?

67. Machine guns? How often?

68. Grenades? How often?

69. Mortars? How often?

70. Artillery? What kind? How often?

71. Land mines? How many?

72. Flame-throwers? How often?

73. Tanks? What kind? How many? How often?

74. Other ground weapons? What kind? How often?

75. Bombing? What kind? How often?

76. Napalm? How often?

77. White phosphorus? How often?

78. Strafing? How often?

79. Rockets? How often?

80. Other air weapons? What kind? How often?

81. During the last week before you became a prisoner were any weapons that you had never seen before used against you? Which ones?

QUESTIONNAIRE FOR USE WITH US ARMY TROOPS

Do not put your name or the name of any unit on this paper.

This is a study of how our troops are affected by enemy weapons. In this study we do not want your general impressions. We want you to tell about a particular time when you saw enemy weapons used effectively.

Think of your last tour of duty at the front. Do you remember a time when you or your unit did not or could not perform well because of the weapons used against you? Use the space below to describe just what happened.

1. Where were you?

2. What were you doing?

3. How many other US troops were involved?

4. What happened?

5. What weapons did the enemy use?

6. What did the enemy do?

7. Why was the enemy effective?

8. What exactly was it that you or your unit did, or what was it you did not do?

Appendix B

DISCUSSION OF ASSUMPTION OF ATTENUATION

by

Marion F. Shaycoft

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PROBLEM

A problem arises in the report proper in connection with the interpretation of some of the $\chi 2$ values intended to indicate the relation between exposure to certain weapons fire and the occurrence of ineffective critical incidents. This problem lies in the fact that only part of the period in which incidents were collected may follow the exposure to the weapons fire; in many cases a substantial proportion of the period will precede the exposure. For instance the prisoners were asked whether they had been exposed to air napalm during the week preceding surrender, and they were also asked (in effect) whether they had manifested any ineffective behaviors during that week. It is entirely probable that many of the ineffective incidents that were reported occurred before the air napalm attack, but there is no way of differentiating between these incidents and those that occurred after the attack. Thus the problem is to determine what effect this ambiguity has on the value of $\chi 2$ obtained, and how to take account of it in interpreting the results.

The hypothesis has been advanced that the fact that some incidents included in the count occurred before exposure to the weapon constitutes an attenuating factor, systematically reducing any $\chi 2$ value that is obtained. It does not bias the results in the direction of increasing the chi-square and thus causing a spurious relation where no real relation exists. The correctness of this hypothesis will be demonstrated in this appendix.

In the remainder of this appendix the term "true relation" will be used to designate the relation that would have prevailed if for the group exposed to the weapons fire under consideration the exposure had occurred immediately before the beginning of the period for which ineffective incidents were reported.

Three situations are possible:

Case I: There is no relation between exposure to fire from a specific weapon and the occurrence of ineffective incidents.

Case II: There is a positive relation between exposure to fire from a specific weapon and the occurrence of ineffective incidents. In other words exposure increases the likelihood of ineffective incidents.

Case III: There is a negative relation between exposure to fire from a specific weapon and the occurrence of ineffective incidents. In other words exposure reduces the likelihood of ineffective incidents.

The effect of the fact that in the actual situation the exposure did not necessarily occur at the beginning of the period to which the incidents reported were limited is discussed for each of these three cases in the following paragraphs. Paragraph (a) in each instance refers to the hypothetical true relation and paragraph (b) to the obtained relation (the contingency table corresponding to the actual situation).

DEMONSTRATION

CASE I (NO RELATION)

(a) True Relation. Assume the true relation is represented by the following cell frequencies, which would correspond to a $\chi 2$ of 0:

Group	Ineffective performance	Effective performance	Total
Nonexposed	a	b	$a+b$
Exposed	ka	kb	$k(a+b)$
Total	$a(1+k)$	$b(1+k)$	$(1+k)(a+b)$

In the table above a, b, ka, and kb are the cell frequencies, k being a positive constant which represents the ratio of exposed individuals to nonexposed individuals. In the total group the ratio of individuals manifesting ineffective performance to individuals manifesting effective performance is $a:b$. Since Case I hypothesizes that there is no relation, the same ratio $(a:b)$ prevails for the exposed group and the nonexposed group.

(b) Obtained Relation. It is self-evident that the same ratio would continue to prevail in the actual situation (some of the incidents reported for the exposed group occurring before exposure) since it is hypothesized that exposure or lack of exposure has no effect on the occurrence of ineffective incidents. The $\chi 2$ would continue to be 0, or not significantly different from 0.

CASE II (POSITIVE RELATION)

Observed Frequencies (f)

(a) True Relation. The true relation would be indicated by the following cell frequencies:

Group	Ineffective performance	Effective performance	Total
Nonexposed	a	b	$a+b$
Exposed	$ka+c$	$kb-c$	$k(a+b)$
Total	$a(1+k)+c$	$b(1+k)-c$	$(1+k)(a+b)$

It will be noted that for the nonexposed group the ratio of ineffective performance to effective performance is assumed to be the same as in Case I. The entry in the "exposed—ineffective performance" cell, on the other hand, is represented by $ka+c$ instead of ka. Here c represents the number of individuals whose ineffective performance is associated with the fact that they were in the

exposed group. It is hypothesized that since a individuals perform ineffectively even in the nonexposed group there would be ka individuals in the exposed group who would have performed ineffectively even it they hadn't been exposed and kb individuals in the exposed group who wuld have performed effectively if they hadn't been exposed but who might or might not perform effectively after exposure.

The c cases in the exposed group whose ineffective performance might be considered to be due to exposure of course have to be subtracted from this group of kb cases who could have been expected to perform effectively if they had not been exposed or if there were no relation between exposure and performance. This gives $kb-c$ cases in the "exposed-effective performance" cell.

(b) Obtained Relation. The obtained relation may be represented by the following cell frequencies:

Group	Ineffective performance	Effective performance	Total
Nonexposed	a	b	$a+b$
Exposed	$ka+[c/(1+k')]$	$kb-[c/(1+k')]$	$k(a+b)$
Total	$a(1+k)[c/(1+k')]$	$b(1+k)-[c/(1+k')]$	$(1+k)(a+b)$

In this table the number of individuals whose ineffective performance might be considered to be due to exposure to the weapons fire is represented by the term $c/(1+k')$. The letter c of course has the same meaning as in Case IIa, representing the number of individuals who would have performed ineffectively if the entire specified period (e.g., 1 week) for which ineffective behavior was reported had occurred directly after exposure to the weapons fire, rather than, as happened in most cases, partly before and partly after. The fact that the latter was the case means that not as many individuals had the opportunity to manifest the expected ineffective behavior as would otherwise have done so. Thus c is divided by $1+k'$ (k' representing a positive constant with an appropriate value) in order to reduce the number of potential ineffective behaviors associated with exposure to the number of these actually occurring. These $c/(1+k')$ cases of ineffective performance all occurred after exposure. Again it is hypothesized that ka of the individuals in the exposed group who performed ineffectively would have done so even if they hadn't been exposed. Some of these ka cases of ineffective performance occurred before exposure and some after exposure, but all of them would have occurred, regardless of exposure.

Theoretical Frequencies (f')

Theoretical frequencies corresponding to Case IIa and to Case IIb are computed in the usual way (dividing the product of the marginal totals by the

total number of cases) for purposes of determining $\chi 2$. These values are as follows:

(a) True Relation.

Group	Ineffective performance	Effective performance
Nonexposed	$a + [c/(1+k)]$	$b - [c/(1+k)]$
Exposed	$ak + [ck/(1+k)]$	$ck/(1+k)$

(b) Obtained Relation.

Group	Ineffective performance	Effective performance
Nonexposed	$a + [c/(1+k)(1+k')]$	$b - [c/(1+k)(1+k')]$
Exposed	$ak + [ck/(1+k)(1+k')]$	$bk - [ck/(1+k)(1+k')]$

Chi-Square Values

Chi-square values, computed from the usual formula, $\chi^2 = (f-f')^2/f'$ are as follows for the two situations under Case II:

(a) True Relation.

$$\chi^2 = c^2/k(1+k)\,[(1+k)/(a+ak+c) + (1+k)/(b+bk-c)]$$

(b) Obtained Relation.

$$\chi^2 = c^2/[k(1+k)(1+k')]\,[(1+k)/(a+ak+c+ak'+akk') + (1+k)/(b+bk-c+bk'+bkk')]$$

Comparison of these two values reveals that the former is necessarily larger than the latter since

$$1+k' > 1$$

$$a+ak+c+ak'+akk' > a+ak+c$$

$$b+bk-c+bk'+bkk' > b+bk-c$$

Thus it has been proved that the fact that the design of the study was such that for some of the cases of ineffective performance included in the "exposed-ineffective performance" cell of the contingency table the ineffective incident occurred before the exposure tends to reduce the obtained $\chi 2$ value, rather than systematically to increase it.

CASE III (NEGATIVE RELATION)

The fact that $\chi 2$ is systematically reduced (or attenuated) rather than increased can be demonstrated for Case III just as for Case II. The development for Case III is omitted in the interests of brevity since it is almost identical with that for Case II except for a reversal of the values for the ineffective and effective groups.

APPLICATION

An example of how these principles work out when applied to actual data might be appropriate at this point. Consider the following contingency table for exposure to air napalm during the week before capture.

Group	Ineffective performance	Effective performance	Total
Nonexposed	139[a] (150.27)	35 (23.73)	174
Exposed	279 (267.73)	31 (42.27)	310
Total	418	66	484
		$\chi^2 = 9.67$ (significant at .01 level)	

[a] Numbers in parentheses represent theoretical cell frequencies; numbers not in parentheses represent observed frequencies.

The foregoing data may be considered an example of Case IIb. Reference to the literal notation used in the preceding section shows that

$$a = 139 \tag{1}$$

$$b = 35 \tag{2}$$

$$k = 310/174 \tag{3}$$

$$ka + c/(1 + k') = 279 \tag{4}$$

$$kb + c/(1 + k') = 31 \tag{5}$$

Substituting (1) and (3) in (4), or (2) and (3) in (5), leads to the conclusion that

$$c/(1 + k') = 31.36 \tag{6}$$

Thus 31.36 (or 31) more individuals in the exposed group manifested ineffective behavior than would have been expected on the basis of chance alone if there were no relation between exposure to air napalm and ineffective performance.

It should be noted that the value of k' cannot be determined on the basis of the available information and that therefore c is indeterminate.

Appendix C

STATISTICAL TABLES

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TABLE C1

BACKGROUND CHARACTERISTICS OF SAMPLE

Characteristic	CCF, percent of 393 cases	NKA, percent of 463 cases
Age		
Under 17	1.0	0.2
17–18	5.3	10.6
19–20	11.7	20.7
21–22	13.2	13.6
23–24	16.0	14.0
25–26	15.3	8.7
27–28	10.7	6.9
29–30	9.7	5.2
Over 30	16.3	19.2
Unknown	0.8	0.9
Median age	24.8	23.14
Occupation		
Professional	2.0	1.9
Skilled	1.5	3.9
Semiskilled	0.5	1.7
Unskilled	4.1	10.8
Agriculture, fish, forestry, etc.	64.7	60.1
Clerical and sales	8.4	5.4
Service	5.6	1.3
Student	12.2	13.4
Unknown	1.0	1.5
Literacy		
Can read and write	50.4	80.8
Can't read and write	48.8	18.6
Unknown	0.8	0.6
Education of Literate POWs[a]		
Less than 1 month	0.5	9.6
1–23 months	8.6	3.2
2 years	20.2	3.5
3 years	16.1	5.3
4 years	5.1	5.1
5 years	8.6	6.2
6 years	11.1	37.2
7–9 years	15.7	16.0
10–12 years	8.6	7.7
Over 12 years	3.0	2.7
Unknown	2.5	3.5
Median schooling time	4.2 years	5.9 years
Army Service		
Less than 1 month	–	0.9
1–6 months	14.3	54.0
7–18 months	33.1	38.4

[a] Note that in sample on Education of Literate POWs, the number in sample has decreased and is based only on those POWs who declared themselves literate. The sample thus represents a percentage of 198 CCF POWs (50.4% of all CCF POWs) and 374 NKA POWs (80.8% of all NKA POWs).

TABLE C1 (continued)

Characteristic	CCF, percent of 393 cases	NKA, percent of 463 cases
2 years (19–30 months)	13.0	2.8
3 years	10.2	0.9
4 years	6.9	1.1
5 years	4.8	0.4
6 years	2.5	0.2
Over 6 years	14.7	–
Unknown	0.5	1.3
Median time in army	20.28 months	5.95 months
Physical Condition when Becoming POW		
Not wounded		
Sought opportunity to surrender	20.9	44.7
Surrendered because of unfavorable tactical situation	20.1	15.3
Deserted without intent to surrender	0.8	0.7
Wounded		
Sought opportunity to surrender	4.8	5.2
Surrendered because of unfavorable tactical situation	42.2	24.2
Physically unable to seek or resist surrender	11.2	9.9

TABLE C2

POWS BY TYPE OF SERVICE, NATIONALITY, AND COMMISSIONED STATUS

Service	CCF		NKA	
	Officer, percent of 72 cases	Enlisted, percent of 321 cases	Officer, percent of 23 cases	Enlisted, percent of 440 cases
Infantry	81.9	80.4	78.2	92.3
Artillery	16.7	9.6	13.0	4.8
Medical	–	3.7	4.4	1.6
Propaganda	–	1.6	–	–
Signal Corps	–	1.9	4.4	1.1
Transportation	–	1.2	–	–
Unknown	1.4	1.6	–	0.2

TABLE C3

TEST OF SIGNIFICANCE
BETWEEN TYPE OF BEHAVIOR AND NATIONALITY

Behavior	CCF	NKA	Total
Surrender	101	231	332
Capture	245	183	428
Physically unable to resist	44	46	90
Deserted	3	3	6
Total	393	463	856

$DF = 3$; $\chi^2 = 54.5616$; $P = <.001$

TABLE C4

TEST OF SIGNIFICANCE BETWEEN NATIONALITY
OF POWS AND SURRENDER-CAPTURE STATUS

Behavior	CCF	NKA	Total
Surrender	101	231	332
Capture	245	183	428
Total	346	414	760

$DF = 1$; $\chi^2 = 54.2403$; $P = <.001$

TABLE C5

TEST OF SIGNIFICANCE BETWEEN MEMBERS IN THE COMMUNIST PARTY
AND SURRENDER-CAPTURE STATUS

Behavior	Member of Communist Party[a]	Nonmember of Communist Party	Total
Surrender	10	313	323
Capture	33	377	410
Total	43	690	733

$DF = 1$; $\chi^2 = 8.0285$; $P = <.005$

[a]Member or candidate for membership in Communist Party or in Korea Labor Party

TABLE C6

TEST OF SIGNIFICANCE BETWEEN SURRENDER-CAPTURE STATUS AND OFFICERS-ENLISTED MEN[a]

Behavior	Officers	Enlisted men	Total
Surrender	32	300	332
Capture	56	372	428
Total	88	672	760

$DF = 1$; $\chi^2 = 2.1664$; $P = <.20 >.10$

[a] All POWs voluntarily or involuntarily surrendering out of 856 prisoners interviewed regardless of nationality.

TABLE C7

TEST OF SIGNIFICANCE BETWEEN SURRENDER-CAPTURE STATUS AND NKA OFFICERS-ENLISTED MEN

Behavior	Officers	Enlisted men	Total
Surrender	5	226	231
Capture	12	171	183
Total	17	397	414

$DF = 1$; $\chi^2 = 3.3699$; $P = <.10 >.05$

TABLE C8

TEST OF SIGNIFICANCE BETWEEN SURRENDER-CAPTURE STATUS AND CCF OFFICERS-ENLISTED MEN

Behavior	Officers	Enlisted men	Total
Surrender	27	74	101
Capture	44	201	245
Total	71	275	346

$DF = 1$; $\chi^2 = 3.3699$; $P = <.10 >.05$

TABLE C9

TEST OF SIGNIFICANCE BETWEEN LENGTH OF TIME IN NKA AND SURRENDER-CAPTURE STATUS

Behavior	In army 6 months or less	In army 7–18 months	In army 19 months or more	Total
Surrender	165	50	11	226
Capture	74	100	9	183
Total	239	150	20	409

$DF = 2$; $\chi^2 = 47.5322$; $P = .001$

TABLE C10

TEST OF SIGNIFICANCE BETWEEN LENGTH OF TIME IN CCF AND SURRENDER-CAPTURE STATUS

Behavior	In army 6 months or less	In army 7–18 months	In army 19 months or more	Total
Surrender	8	26	67	101
Capture	37	88	118	243
Total	45	114	185	344

$DF = 2$; $\chi^2 = 9.4588$; $P = .01$

TABLE C11

CONTINGENCY TEST DATA FOR CCF BETWEEN SURRENDER-CAPTURE AND EXPOSURE-NONEXPOSURE TO SPECIFIED WEAPONS FIRE

Weapon	Captured		Surrendered		χ^2
	Exposed	Nonexposed	Exposed	Nonexposed	
Rifle	184	61	47	54	26.3003[a]
Machine gun	188	57	53	48	19.9127[a]
Grenade	53	192	13	88	3.5605
Mine	31	214	7	94	2.3926
Mortar	138	107	36	65	12.2346[a]
Artillery	199	46	64	37	12.5046[a]
Tank	149	96	39	62	14.2109[a]
Air bomb	171	74	62	39	2.2961
Air rocket	109	136	29	72	7.4201[a]
Air napalm	120	125	36	65	5.1397[b]
Air-strafing	200	45	69	32	7.3239[a]

[a] Significant at .01 level for 1 degree of freedom.
[b] Significant at .05 level for 1 degree of freedom.

TABLE C12

CONTINGENCY TEST DATA FOR NKA BETWEEN SURRENDER-CAPTURE AND EXPOSURE-NONEXPOSURE TO SPECIFIED WEAPONS FIRE

Weapon	Captured		Surrendered		χ^2
	Exposed	Nonexposed	Exposed	Nonexposed	
Rifle	155	28	111	120	59.7037[a]
Machine gun	137	46	102	129	39.4684[a]
Grenade	59	124	26	205	27.5657[a]
Mine	18	165	17	214	.8098
Mortar	131	52	112	119	22.4794[a]
Artillery	122	61	135	96	2.9352
Tank	49	134	26	205	16.5857[a]
Air bomb	87	96	118	113	.5132[b]
Air rocket	80	103	87	144	1.5540
Air napalm	91	92	84	147	7.4664[a]
Air-strafing	119	64	117	114	8.6108[a]

[a] Significant at .01 level for 1 degree of freedom.
[b] Negative relation.

TABLE C13

TYPES OF WEAPONS AND WEAPON COMBINATIONS INVOLVED IN 354 EVENTS THAT IMMEDIATELY PRECEDED INCIDENTS OF INEFFECTIVE PERFORMANCE BY ENEMY PERSONNEL

Weapon	Incident of POW's own performance	Incident of other's performance	Total	
			Number	Percent
Ground Forces Weapons				
Artillery	41	26	67	18.9
Grenade	0	1	1	0.3
Machine gun	1	0	1	0.3
Mortar	3	3	6	1.7
Pistol	1	0	1	0.3
Rifle	2	2	4	1.1
Tank	2	3	5	1.4
Artillery-grenade	1	0	1	0.3
Artillery-machine gun	2	2	4	1.1
Artillery-mortar	2	0	2	0.6
Artillery-rifle	5	2	7	2.0
Grenade-rifle	1	0	1	0.3
Machine gun-rifle	2	0	2	0.6
Machine gun-tank	1	0	1	0.3
Mortar-rifle	2	1	3	0.8
Artillery-mortar-rifle	2	0	2	0.6
Grenade-machine gun-rifle	1	0	1	0.3
Unnamed ground weapons	38	41	79	22.3
Subtotal	107	81	188	53.2
Air Forces Weapons				
Bomb	20	19	39	11.0
Napalm	0	3	3	0.8
Strafe	8	2	10	2.8
Bomb-strafe	2	4	6	1.7
Unnamed air weapons	26	16	42	11.9
Subtotal	56	44	100	28.2
Combinations of Ground and Air Weapons				
Artillery-bomb	6	4	10	2.8
Artillery-napalm	0	1	1	0.3
Artillery-strafe	1	1	2	0.6
Artillery-unnamed air	5	7	12	3.3
Artillery-bomb-strafe	2	2	4	1.1
Artillery-rifle-unnamed air weapons	2	1	3	0.8
Artillery-rifle-strafe-napalm	0	1	1	0.3
Artillery-bomb-strafe-napalm	1	0	1	0.3
Artillery-rifle-machine gun-bomb-strafe	0	1	1	0.3
Artillery-rifle-napalm-machine gun-rocket	2	0	2	0.6
Artillery-rifle-tank-machine gun-grenade-mortar-unnamed air	0	1	1	0.3
Unnamed ground and air weapons	13	15	28	7.9
Subtotal	32	34	66	18.6
Total	195	159	354	100.0

TABLE C14

CONTINGENCY TEST DATA ON CCF EFFECTIVE-INEFFECTIVE PERFORMANCE AND EXPOSURE-NONEXPOSURE TO SPECIFIED WEAPONS FIRE

Weapon	Effective		Ineffective		χ^2
	Exposed	Nonexposed	Exposed	Nonexposed	
Rifle	55	23	148	74	.3901
Machine gun	57	21	154	68	.3801
Grenade	20	58	39	183	2.3811
Mine	9	69	25	197	.0042
Mortar	40	38	99	123	1.0379
Artillery	54	24	174	48	2.6478
Tank	46	32	116	106	1.0498
Air bomb	43	35	156	66	5.9258[a]
Air rocket	23	55	88	134	2.5519
Air napalm	30	48	100	122	1.0186
Air-strafing	54	24	179	43	4.3243[a]

[a]Significant at .05 level for 1 degree of freedom.

TABLE C15

CONTINGENCY TEST DATA ON NKA EFFECTIVE-INEFFECTIVE PERFORMANCE AND EXPOSURE-NONEXPOSURE TO SPECIFIED WEAPONS FIRE

Weapon	Effective		Ineffective		χ^2
	Exposed	Nonexposed	Exposed	Nonexposed	
Rifle	37	14	235	136	1.6603
Machine gun	31	20	212	159	.2424
Grenade	10	41	78	293	.0550
Mine	5	46	30	341	.1736
Mortar	27	24	217	154	.5669
Artillery	25	26	235	136	3.8864[a]
Tank	14	37	61	310	3.7252
Air bomb	17	34	192	179	6.0872[a]
Air rocket	15	36	156	215	2.9746
Air napalm	14	37	166	205	5.4766[a]
Air-strafing	20	31	221	150	7.5901[b]

[a]Significant at .05 level for 1 degree of freedom.
[b]Significant at .01 level for 1 degree of freedom.

TABLE C16

EFFECTS OF FIRE FROM UN GROUND AND AIR WEAPONS ON ENEMY UNITS AS CITED BY 340 POWS

Unit effect	UN weapons			
	Ground	Air	Combination air-ground	Total
Casualties	62	67	31	160
Casualties—supplies damaged or destroyed	4	29	2	35
Casualties—fortifications damaged or destroyed	0	0	1	1
Casualties—unit retreated	19	4	9	32
Casualties—unit scattered	14	17	9	40
Casualties—unit unable to advance	2	4	1	7
Casualties—unit retreated—supplies damaged or destroyed	2	0	2	4
Casualties—supplies damaged or destroyed—unit unable to advance	1	4	0	5
Casualties—supplies damaged or destroyed—fortifications damaged or destroyed	0	1	1	2
Casualties—supplies damaged or destroyed—unit scattered	2	2	1	5
Supplies damaged or destroyed	2	21	1	24
Supplies damaged or destroyed—unit retreated	1	0	0	1
Supplies damaged or destroyed—impossible to treat wounded	0	1	0	1
Supplies damaged or destroyed—unit scattered	0	2	0	2
Fortifications damaged or destroyed	1	1	0	2
Unit retreated	0	0	1	1
Unit scattered	0	7	2	9
Unit unable to advance	4	5	0	9
Total	114	165	61	340