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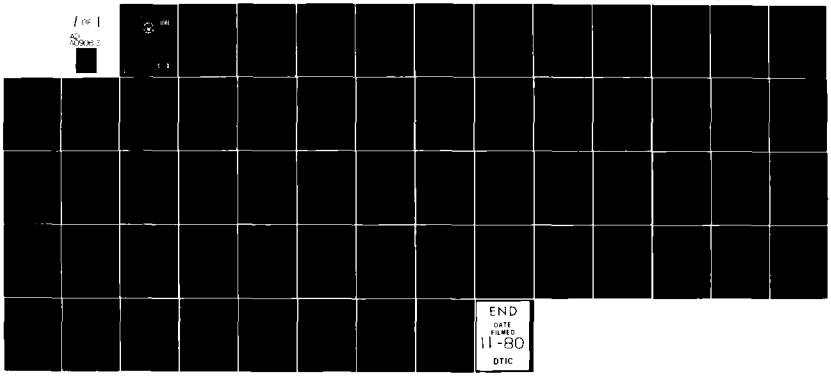

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Symposium Proceedings

by

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Five papers representing different frames of reference examine the question "What is Military Psychology?" Their objective is to ferret out the unique aspects of psychology as it is practiced in the military environment that differentiate it from research in, and applications of, psychology in other settings. The purpose in doing this is to sharpen the focus and improve the products of military psychology. Areas examined cover (1) human-machine systems, (2) military personnel, training, and organizational effectiveness; (3) psychological operations/warfare and the area of "hearts and minds";

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(4) community mental health, consultation to command, and the psychologist in uniform; and (5) stress, fitness, and the relationships of military psychology with its neighboring disciplines in the biomedical sciences. Constraints and ethical considerations in the uses of psychology in the military environment and in the pursuit of military objectives are considered.

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FOREWORD

The papers in this report were presented in a symposium entitled "What is Military Psychology" that was held on 3 September 1979 at the 87th Annual Convention of the American Psychological Association (APA) in New York City. It was organized by the editor who, as secretary-treasurer of the Division of Military Psychology (Division 19 of the APA), recognized a need for an airing of views on the topic and met an enthusiastic response from those who might be able to speak to the topic most authoritatively. The introductory paper in the series provides details regarding the compelling reasons for initiating the symposium.

The participants in the study, in addition to their proven competence and leadership in the area of military psychology, were chosen to cover the broad range of interests and subdisciplines within military psychology with the lease amount of redundancy among the participants. The disciplines represented are applied experimental psychology, industrial-organizational psychology, applied social and personality psychology, clinical and counseling psychology, and physiological psychology and ergonomics. In content or program terms, the areas represented are (1) human-machine systems, (2) military personnel, training, and organizational effectiveness, (3) psychological warfare and "hearts and minds" research and operations; (4) community mental health, consultation to command, and the psychologist in uniform, and (5) stress, fitness, and relationships with neighboring biomedical disciplines--particularly work physiology.

The individual participants were:

Dr. Robert R. Mackie, President, Human Factors Research, Inc., Goleta, CA, and incoming president of the Division of Military Psychology.

Dr. E. Ralph Dusek, Director, Personnel and Training Research Laboratory, US Army Research Institute in the Behavior and Social Sciences, Alexandria, VA and president-elect of the Division of Military Psychology.

Dr. Preston S. Abbott, President, Abbott Associates, Inc., Alexandria, VA and chair of the Fellows Committee, Division of Military Psychology.

Colonel Robert S. Nichols, Ph.D., Medical Service Corps, US Army. During the organization of the symposium, Colonel Nichols held key posts at the Army War College, Carlisle, PA and the Uniformed Services University of the Health Sciences, Bethesda, MD. He is currently Chief, Education and Training Division, US Army Medical Department Personnel Support Agency, Washington, D.C. Colonel Nichols is the Division of Military Psychology liaison representative with the Inter-University Seminar on Armed Forces and Society.

Dr. Walter L. Wilkins, Scientific Director of the Naval Health Research Center, San Diego, CA. Dr. Wilkins, now retired from this position in which he has been the only incumbent since the activation of the center 20 years ago, was chair of the History of Military Psychology ad hoc committee of the Division of Military Psychology.

In addition to the above-listed participants, Colonel L. Ralph Chason, USAF was a scheduled speaker by virtue of his experience in editing and revising the Brochure on Military Psychology of the Division of Military Psychology. An ill-timed reassignment of Colonel Chason from his post at the USAF Academy, CO to an important position in the directorship of the Air Force Institute of Technology at Wright-Patterson Air Force Base, OH prevented him from fulfilling his commitment. Nevertheless, his contributions and advice in organizing the symposium were most helpful.

The symposium was cosponsored by the Division of Military Psychology of the APA and the Inter-University Seminar on Armed Forces and Society.

The editor wishes to thank and acknowledge the unstinting support of his symposium by the participants and their superb contributions. The symposium and these proceedings could not have been consummated without the generous support of the Naval Postgraduate School and the Office of Naval Research. -- J.K.A.

WHY "WHAT IS MILITARY PSYCHOLOGY?"

James K. Arima
Naval Postgraduate School

The Division of Military Psychology receives several inquiries each month for information regarding military psychology. The Division's membership committees have been recruiting some 50 or more new members and associates annually. In the allocation of votes that determines the composition of the governing body of the American Psychological Association (APA), the Division of Military Psychology (Division 19 of the APA) receives well over one percent of all votes cast, which is sufficient to give it its own representative on the governing council. The proportion of its members who are fellows of the APA is one of the highest of all the APA divisions. The division is solicited by several current coalitions to participate in the discussion and solution of professional problems that afflict the APA. Thus, military psychology would seem to be a significant element of organized psychology in America today.

This continuing interest in military psychology and some recent events call for a reexamination of the question, What is Military Psychology? First, there is the revision of the Division 19 brochure on military psychology which has been accomplished by Colonel Ralph Chason and to whom we should be most grateful for the splendid effort. Reading it, we cannot but be impressed by the scope of the military psychology effort and the variety of its programs. Nevertheless, there is the lingering feeling, is military psychology just psychology practiced in, or supported by, the military establishment? Based on insights obtained during the process of preparing the brochure, Colonel Chason argues that--:

> Military psychology is uniquely specific only in its juxtaposition with the military. The orientations of psychologists involved in military psychology are broadly representative of psychologists who work in civilian sectors. The actual application of psychological principles within the context of the military, both in terms of research and applications, reflects most of the patterns found in non-military psychology. In many respects, military organizations may be thought of as part of the larger civilian community and share many of the same problems. Accordingly, military psychologists may be thought of as psychologists who apply their skills in a military environment in the same manner their counterparts do in the civilian environment.
>
> ...It is believed that...the term "military psychology" is defined by the context of the environment in which psychological principles are studied and applied, and not by anything specifically unique in the application of a specialized and separate body of knowledge (Chason, undated).

It will be left up to the succeeding papers in this symposium to sustain or refute his position.

Another fairly recent event would seem to indicate that perhaps military psychology does have its unique aspects and can be a field apart from other branches of psychology. This event is the publication by Peter Watson (1978) of his book, War on the Mind. It is subtitled, The Military Uses and Abuses of Psychology. To oversimplify his thesis, Watson is saying that military psychology applies psychology to its own forces so that they can better survive the rigors of battle and accomplish the task of defeating the enemy while, at the same time, psychology is applied to the enemy to disrupt its effort and destroy the enemy's will to continue the fight. He provides many examples on both sides. Thus, military psychology is a tool of war that works through the minds of individual men and women. In his 1967 address to the APA Convention, Dr. Donald A. MacArthur, the Deputy Director of Defense for Research and Engineering, said that we needed much more work on theory and methodology in this area of "hearts and minds" because of its importance to national security planning. But I am not aware of any great rush to develop such an important area. Why does this situation exist? Finally, still another event was particularly cogent to the topic at hand. The Division of Military Psychology received a letter from a professor at a university in the Middle East asking where he could send a student for graduate work leading to a degree in military psychology. The reply stated that no institution gave a formal, advanced degree in military psychology. But that brings up the question, how does one learn military psychology? What would be the content and how would a course or curriculum in military psychology be taught? Is on-the-job-training the only way to learn about military psychology? When does one become a qualified military psychologist?

Actually, there is no dearth of information about military psychology. Over a decade ago, Uhlaner (1967a) organized the Division 19 program on the theme "Psychological Research in National Defense Today" and published the papers in an exemplary BESRL technical report. More recently, we have seen the annual gathering at the Air Force Academy referred to as "Psychology in the Department of Defense." The annual meetings of the Military Testing Association have become so broad in scope that their compendiums of the presented papers read like encyclopedias of ongoing military psychology. In a more theoretical bent, excellent papers have been published over the years by Melton (1957), Bray (1962), Crawford (1970), and Wilkins (1971). From a historical approach, Uhlaner (1967b, 1968) provides both a chronology of military psychology in the Army and the individuals who made history in military psychology. These efforts document psychology as it is or has been practiced and studied in the military environment. Some may even suggest how it should be practiced and studied. But they do not ask what there is about all of this that makes it unique enough to require a special name with an identifiable body of practitioners.

These and similar considerations led to the formation of this symposium on "What is Military Psychology?" The participants hope that a thorough examination of the topic should help us as individuals to define for ourselves the critical aspects of psychology as it is practiced in the military that make it uniquely military psychology. Doing this, we believe, should result in better military psychology products wherever it may be practiced.

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SOME DISTINGUISHING ASPECTS OF EXPERIMENTAL PSYCHOLOGY IN THE MILITARY CONTEXT

Robert R. Mackie
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Initiation of the newly accredited Ph.D. into the domain of military experimental psychology will involve a journey into both the familiar and unfamiliar. The academic training will prepare him or her well for the experimental paradigms, methods of analysis, and logical arguments familiar to all experimental psychologists. Indeed, these will be found to be the essential tools of the trade. The initiate will quickly find, however, that there are many differences--differences that not only are not trivial, but constitute the very reason-for-being of military experimental psychology.

While the following list is very likely incomplete, these are some of the important dimensions in which military experimental psychology will differ from what he or she experienced in the academic environment:

1. The underlying motivation for performing the research.
2. The special importance of the experimental task.
3. The significant role of the experimental environment.
4. The greater importance of temporal considerations.
5. The particular characteristics of the experimental subjects.
6. The frequent emphasis on team behavior.
7. The extent of interdisciplinary involvement.
8. The emphasis on practical as opposed to scientific criteria of evaluation.

I will elaborate on each of these differences in turn. Let me emphasize at the outset, however, that no value judgment is implied by the differences I will describe. Each research arena clearly serves its own purposes, and each has shortcomings in attempting to solve the kinds of problems addressed by the other.

1. Experimental Psychology in the Military is Oriented, in Varying Degrees, Toward the Mission or Goals of the Sponsoring Organization

Usually the goal of experimental military psychology is to make something involving human behavior work, or to make it work better. Military experimental psychology takes place in the context of systems. I am using "system" in a very general sense. It may be a man-machine system, though it need not be. It may be a management system, such as that concerned with the recruitment and retention of military personnel. It may be a training system, requiring tests of some of the countless hypotheses generated by the enormous training problems of the military. Whatever the system context, be it organizational, training, or man-machine, the system will be found to have an identifiable purpose. Meister (1976) has emphasized that all systems are purposeful.

Thus the military experimental psychologists will find themselves concerned with how well the system works now (they may have to expend considerable effort measuring how well it works now, since this may by no means be clear), and with answering such questions as: Will it work better using one proposed system design or operational treatment rather than another? What functions should be allocated to the human and the machine? What human-related factors might degrade performance? What effects do different training systems have on performance? How do fatigue and various incentive conditions affect performance degradation or enhancement?

The fact that military experimental psychology is conducted, directly or indirectly, in the interests of a system objective is, perhaps, the most singular characteristic differentiating it from its counterpart in the academic laboratory. In emphasizing this point, however, I do not wish to convey the impression that military experimental psychologists are motivated solely by system objectives. Whereas their academic ounterparts may consider their sole motivating force to be the pursuit of knowledge, military psychologists find themselves serving two gods at once; they will be delighted, certainly, if their experimental findings lead to an enhancement of the performance of the system under study, for this is what they are paid for; but they are just as likely to feel that they are in the business of furthering fundamental knowledge about human behavior. However, they may be handicapped in this endeavor by some of the other differences between academic and military experimental psychology that will now be considered.

2. The Experimental Task in Military Experimental Psychology has Special Importance

One of the most important consequences of the fact that experimental military psychology is goal or system oriented is the fact that the experimental task is often imposed on the experimenter rather than selected on the basis of convenience. In contrast to the academic experiment in which the experimental task often is contrived in such a way as to emphasize possibly different outcomes of the experimental treatments, military psychologists must often experiment with an actual operational task or a careful simulation of it. Since systems operation is often the subject of study, the experimental task is likely to reflect critical operational requirements. The experimental stimuli may be imposed rather than arbitrary. In fact, our new initiate may be surprised to find that the stimulus and the stimulus context often are objects of study in themselves. For example, the detectability of a signal, the discriminability of two similar signals, or the confusability of a signal with background "noise" may be matters of particular interest. The experimental response is also likely to be meaningful in terms of individual or organizational objectives, and may have to be very carefully patterned after that called for by the operational task. As a consequence, the

motivation of the subjects may be quite different from that which prevails in the academic laboratory, a point which will be discussed in more detail later.

In terms of behavioral processes, military experimental psychologists may employ many of the same constructs that their academic counterparts do: perceptual discrimination, information processing; short-term memory; cognitive errors; decision thresholds. The important difference, however, is that the experimental task employed to study these processes must not be far removed from apparent operational relevance. Ironically, perhaps the most defensible generalization about human behavior is that it is stimulus-specific. Thus, if the experimenter's objective is to answer a question concerning human behavior in an operational system, whatever its nature, he or she cannot justifiably stray very far from the stimulus and response conditions that prevail in that system.

3. The Military Experimental Environment is Relevant to the Investigation, not Arbitrary or Sterile

In contrast to the academic laboratory whose environment may be devoid of meaning except in the sense of affording stimulus control, the task environment of military experimental psychology is often (a) far less controlled, with various sources of extraneous stimuli permitted to have their "normal" effects on the performer; and/or (b) the influence of environmental variables may themselves form a part of the inquiry. Indeed, the study may address the question of what limitations certain environmental variables place on operational performance. For example, how do terrain features affect the detectability of targets from the air? What effects do masking noises have on sonar signal detection? How much environmental vibration can be tolerated for how long, before performance degrades? Is a certain amount of environmental noise stressful or facilitating, particularly in its effects on the performance of monotonous tasks? How do atmospheric contaminants degrade performance and what are the limits of tolerance before performance suffers? How does extreme heat and cold affect performance? As an off-shoot of such questions, military experimental psychologists may also find themselves concerned with determining the effectiveness of various mechanisms designed to protect the human from environmental stress and how these mechanisms should be designed to maximize performance effectiveness.

All of this indicates that military experimental psychologists must often perform their experimental work either within the actual operating environment or in an environment that carefully simulates the important stressors associated with actual operations. I do not wish to suggest that the academic psychologist is never concerned with the impact of stressful environments on performance. However, it seems to me that the academician is much more likely to employ a benign, well-controlled environment than is his or her military counterpart. In

fact, until recently the whole matter of stressful environments, and their impact on human performance, has largely been the domain of physicians and applied physiologists. It is clear that psychology has important contributions to make in this arena. (This topic is addressed in the last paper of this symposium.)

Unfortunately, a consequence of the importance of the task environment is that the experiment conducted in the military context is often necessarily less controlled than that conducted in the academic laboratory, with all of the unfortunate implications that this has for unwanted variance. Indeed, this may be a major source of frustration for the military experimentalist since the effects of the variables being manipulated may very well be obscured by environmental "noise."

4. The Temporal Characteristics of the Military Experiment are Likely to be More Important Than Those of the Academic Experiment

Experiments conducted in the military context are often of considerably longer duration than those of the academic laboratory. Indeed, there is often major concern with temporal effects per se. For example, attention may focus on the deterioration of performance as a function of time, or with circadian effects on performance, or with optimum work-rest cycles. Some problems addressed by military psychologists demand extended experimental periods. Experiments on vigilance may require several hours of continuous performance. Experiments on the effects of incentive conditions may involve paradigms that extend for days or even weeks at a time. Experiments on the effects of organizational change could require months.

Clearly, performance as a time-dependent phenomenon is a matter of major interest to the military as well as many areas of civil operations. But the study of time-dependent phenomena calls for paradigms that are quite different from those employed in the typical academic laboratory. The military experimental psychologist is not likely to find this an easy factor to deal with. Periods of data collection are lengthy, many uncontrolled variables may exert their influence during the course of the study, and peculiar time-dependent characteristics of human subjects such as short-term mobilization and "end-spurts" may confound otherwise neat trends in the investigator's data. Further, because experiments are conducted over a period of days, weeks, or even months, the military experimentalist is confronted with the disquieting possibility that some subjects may drop out, be transferred, or otherwise be unavailable in the final stages of the study with the consequent loss of data, and reduction in the size of the probably already minimal-sized subject sample.

5. The Subjects Must be Representative of the Population of Interest

It may sound peculiar to suggest that this consideration is different for military psychologists than it is for their academic

counterparts. Surely, the academic psychologists whose concern is with the understanding of fundamental behavioral phenomena believe their results to be generalizable to the population at large, or at least to certain sizable segments of it. The fact is, however, that this assumption is rarely put to test and it cannot be denied that their experimental subjects often comprise rather select samples from the intellectual continuum.

Military experimental psychologists, however, should expect to be immediately challenged if they cannot show that their experimental subjects are representative of the military population of interest in terms of intellectual, personality, and other operationally relevant characteristics. To meet this requirement, they will usually sample from the military population itself so that the question of generalizability does not become an issue. They recognize that because of both planned and unplanned selection factors, military subjects may differ from the population at large in many respects, some of which may be relevant to the experimental task.

A second, most important factor concerns the motivation of subjects to perform the experimental task. Here there is a very interesting difference. Since many experimental tasks used in the academic world have little personal meaning to the subjects, motivation to perform must be extrinsic, i.e., it must take the form of incentives supplied by the experimenter. While extrinsic motivators are not uncommon in military experimental psychology, there may be a considerable element of intrinsic motivation as well because the experimental task is often clearly related to the subject's job. However, the experimenter would be naive to assume that this motivation will always be positive!

Finally, military psychologists have one other concern in regard to subjects that is of greater interest to them than their academic counterpart. They must be prepared to deal in an operationally meaningful way with individual differences in psychological attributes that relate to operational performance. While it would be unfair to suggest that academic psychologists have no interest in individual differences, it is perhaps fair to say that many of them view individual differences more as an annoying source of unwanted variance, than anything else. The military experimental psychologist had better not view individual differences that way if his or her objective is to identify variables that will enhance system performance. Today, the military faces no more difficult problem than that of effectively matching different levels and kinds of human abilities to the operational and maintenance demands of its new, technologically advanced systems. Thus, for military psychologists, individual differences are a source of relevant variance, and any significant subject-effects are matters requiring special attention.

6. Military Experimental Psychology is Often Conducted in a Team Context

Much military behavior occurs in a team context, and the team operates within a purposeful system. While military and academic psychologists may share an interest in team behavior, there is a major difference in that military experimentalists often find the makeup of the experimental team to be imposed rather than controlled by them. This is another illustration of the fact that military experimentalists must often work with conditions that may not be ideally suited to their theoretical interests.

Because of the interactive nature of teams, major methodological problems may confront military psychologists in their attempts to isolate the contributions of individual team members to the performance of a complex system. Often, they must devote considerable effort, and ingenuity in identifying performance criteria at different levels in the hierarchical structure of the team, whereby the impact of independent variables on team performance can be identified. Measures of overall system output are rarely suitable or sufficiently sensitive for this purpose.

In addition, military experimentalists must often understand, very well, the functioning of the hardware systems within which the team performance takes place. This is far different from the situation faced by their academic counterparts who may study team behavior in a context where they both invent and completely control the rules of the game.

Military experimentalists also may face special problems in replicating their observations of team performance. They may well be able to develop standardized problem scenarios that have specifiable beginning conditions, but once the problem is started, the responses of one team member become the stimulus to the next; control over the stimulus-response chain is broken, and many uncontrolled variables may be the result. While this problem can be circumvented to some extent by clever programming of the experimental scenario, it represents a complication less often faced by their academic counterparts. Indeed, the present interest of the Department of Defense in research on team behavior very likely reflects the need, and difficulty, of performing definitive research in this area.

7. Military Experimental Psychology is More Often Interdisciplinary

The newly accredited Ph.D. who enters the realm of military experimental psychology is likely quickly to find him or herself in an interdisciplinary working group. Interdisciplinary research is spawned by real-world operational problems, whether they be military or otherwise. Thus, though military psychology by no means has an exclusive claim to interdisciplinary research, the probability of

involvement with other disciplines is substantially greater for military experimentalists than for their academic counterparts.

The interdisciplinary team can be made up of a variety of disciplines, of course, but some of the most familiar partners include engineers, physiologists, and computer scientists. Military experimental psychologists must learn to be comfortable working with such disciplines, and to respect the very different viewpoints brought by them to the solution of operational problems. At the same time, they will find that their own professional training will prepare them to make many significant contributions from the unique viewpoint of the behavioral scientist.

Working from an interdisciplinary point of view, military experimentalists are offered the opportunity to advance the understanding of human behavior in ways that are otherwise much less likely. For example, the work of both physiologist and experimental psychologist are required for effective research on performance under various kinds of environmental stress, for research on vigilance and attention, and for research on fatigue and endurance. I believe we have just begun to experience the rewards of interdisciplinary effort in areas such as these; indeed, in the past, research within the military has suffered from some of the same disciplinary isolationism that so often characterized research in the academic setting.

Interdisciplinary research involving physical scientists, engineers, and psychologists also offers increasing opportunities for contributions by experimental psychology to the design of man-machine systems. I do not mean simply the contributions derivable from the kinds of data found in human engineering handbooks, however important they may be. These do not represent the limits, or even the most important types of contributions, that psychology can make to system design. Rather the real challenge comes in those areas where only experimentation can resolve a significant system design issue that hinges on the capabilities or limitations of the human. Unfortunately, perhaps, it is the nature of our business that the application of previously developed behavioral data to new system designs is fraught with uncertainty and surprises. This is, at once, the frustration of our profession and the challenge that keeps us in business. In any case, the military psychologist who makes a significant contribution to new system design by answering a question that can only be answered through a skillfully designed interdisciplinary experiment will find a unique satisfaction in the contribution he or she has made.

8. Military Experimental Psychology is Subject to Evaluation by Practical and Economical Criteria.

Since military psychology is, by and large, sponsored by organizations that are mission oriented, it is not surprising that the scientist, or his or her technical sponsor, find themselves answerable to program managers on the basis of practical outcomes and investment value. It

was noted earlier that military experimental psychologists must serve two masters at once: (a) the requirement for relevance to the operation of military systems, and (b) the requirement for scientific rigor and defensible conclusions.

Military experimental psychologists will find that different sponsors employ these two criteria in various mixes. There are some agencies in the Department of Defense that sponsor "basic" research, but "budget time" finds even these agencies attempting to bridge the gap between the research being sponsored and the military's operational problems. (Senator Proxmire's shadow always lurks in the background.) At the other extreme, there are agencies that view research simply as a means to a rapid fix to an operational problem, with little regard for either the scientific rigor of the work performed or for the advancement of knowledge. These agencies have found that they can make excellent use of the problem-solving skills of experimental psychologists. The psychologists may not be entirely comfortable with the requirement to supply answers in the absence of clearly defensible data, but this is often what they will be asked to do.

Between these two extremes, military experimental psychologists may find an intriguing opportunity to strike an effective balance between the narrow, well-controlled, scientifically dependable, but often operationally meaningless research of purely academic persuasion and the need for the application of their skills to operationally meaningful research tasks. In so doing, they will face both the challenges and frustrations of working with complex stimuli and responses, subject motivations they cannot readily manipulate, temporal factors that strain the reliability of their performance data, and environmental variables that may totally obscure their cherished treatment factors. The frustrations are great, but so are the rewards.

I have tried to convey to you why I feel that military experimental psychology is both similar to, and different from academic experimental psychology. The differences lie not in the scientific methods, experimental paradigms, or arguments of evidence, but in the types of stimuli, tasks, responses, subjects, temporal factors, and environmental variables that are employed in the process of relating the research to operational problems. These are not trivial differences. At the very least, they are essential if the military experimentalist is to make a significant contribution to the solution of a systems problem. Whether or not these differences are also critical to, or counter-productive in, advancing fundamental understanding of human behavior is more open to debate. In my view, the potential for this kind of contribution is equally great.

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PERSONNEL AND TRAINING RESEARCH IN THE MILITARY

E. Ralph Dusek
US Army Research Institute in the Behavioral and Social Sciences

In discussing military psychology it is worth noting that the first large impetus was given to the field in World War I. Some of this country's most distinguished psychologists offered their services to the defense effort during that period of mobilization. As a result of their efforts personnel and training psychology and its military applications began. Noteworthy among the contributions in World War I were psychologists' contributions to perfecting apparatus for selecting and training gun pointers, developing techniques for predicting successful fighting aviators, and the development of group testing of military personnel--the Army Alpha (for classification of literates) and the Army Beta (for illiterates). Moreover it was during this period that psychologists introduced systematic methods for judging and rating qualifications of officer candidates and for training soldiers with differing ability to learn (Uhlaner, 1978). However, following World War I the Army reverted to its prewar procedures of using the apprentice system of selection and assignment and the research psychologists returned to their positions in universities and industry.

In the years between World Wars I and II psychologists continued to improve techniques for testing general intellectual and aptitude areas for vocational guidance, for training and education, and for selecting persons for jobs. In this period the rapid development of aircraft for commercial use led to studies of high altitudes and associated hypoxia on physiological and psychological responses of the individual (McFarland, 1932). Since altitude chambers were not available much work was done in the high altitudes of mountains. These were the beginnings of aviation psychology and methods for the medical and psychological screening of potential pilots and aircrew.

As World War II raged in Europe and Asia in 1939 American psychology once again began to contribute to military psychology. In August of 1939 the Army General Classification Test was ready for standardization and in April 1941 a second form was ready. In addition nonlanguage tests for illiterates, mechanical and clerical tests, and trade tests had been prepared. At the same time techniques for selecting individuals for officer training were being developed (Uhlaner, 1978).

As United States involvement in World War II approached in 1940 the first selective service inductees were administered the Army General Classification Test and mass testing of men in World War II was initiated. In addition achievement and aptitude tests were constructed for use in selecting and training aircraft pilots.

During World War II great impetus was given to testing, selecting, classification, and training -- areas in which psychologists had

already established a pool of knowledge in their civilian jobs. As the war proceeded new areas opened up rapidly. In selection and training a flood of new apparatus and devices was being developed. In addition a new field -- human engineering -- directed toward improving the compatibility of man with equipment began to emerge. Thus, military psychologists were now involved in research on how to select and classify persons, how to train them, and, finally, how to best design equipment for effective use by individuals.

Two other areas closely associated with modern industrial psychology evolved for use in military psychology during World War II -- attitude and morale testing and assessment centers for selecting leaders. Prior to the war Gallup and Roper and others had begun the study of attitudes of the American people with their public opinion polls. During World War II a number of these psychologists joined the Army in the Research Branch of the Information and Education Division of the War Department. A primary purpose of this organization was to provide accurate data on soldier attitudes to Army commanders in a timely fashion in order to help in policy formulation (Dusek, 1974). The use of attitude research in World War II had a stimulating effect on the rapid expansion of attitude and opinion surveying in the United States. Use of such surveys is closely associated today with organizational development and organizational effectiveness.

The assessment center techniques used to evaluate potential managers came to public attention at the end of World War II when it was revealed as a method that had been used during the war to select intelligence operators for the Office of Strategic Services. The methods were described in a book, Assessment of Men (Bray, 1976). The methods contrasted sharply with the paper and pencil approach to selecting potential leaders and provided interesting and imaginative simulations and scenarios which motivated participants and appeared to have face validity.

ince World War II each of the areas of military psychology I have mentioned above has found application in both the military and civilian sectors of the American economy, some sporadically and some with ever increasing emphasis. However, at this time I would like to take up what I believe are the more significant thrusts in personnel and training psychology as used in the military today.

The traditional areas of testing, selection, and classification still occupy an important place in military personnel psychology; however, social and cultural changes as well as the relative maturity of some areas are leading to important changes in emphasis. The validities of predictor variables are being improved marginally within the conditions imposed by available criteria and personnel assignment policies. Moreover in a period where there is emphasis on minority and women rights and on development of underpriviledged persons

emphasis has shifted from screening and selecting to training and appropriate assignment and utilization. In addition, in the All Volunteer Force military psychologists have been increasingly concerned with issues such as quality of life, organizational climate, the military family, incentives, discipline, etc. -- factors believed to have significant impact on the attraction and retention of qualified men and women.

Recent research indicates that in selection and testing the more promising future developments are in computer-assisted testing, in a substantially broadened range of content and substance on which prospects are tested and in improved criteria. The computer provides a technique for rapidly determining a person's levels of capability and achievement and quickly assessing these levels across a range of aptitudes (Weiss, 1978). In addition psychomotor and other abilities may be sampled, something for which current paper and pencil tests are ill-suited.

Most current selection tests used by the military are heavily loaded with cognitive factors. However, each of the services is exploring the potential for using tests of adjustment and of interests for screening, selecting, and assigning men and women into their respective services. There may be other promising tests which, when combined with computer testing and scoring, may provide considerable cost-effective improvement over current screening, selection, and assignment procedures.

The criteria currently used for validating screening tests used by the military usually involve successful or unsuccessful completion of a school for a military occupational speciality (MOS). Since the skills acquired in an MOS producing school are closely associated with the skills required to perform jobs to which personnel who earn the MOS are assigned, the criteria have been acceptable for establishing the validity of the test. However, recent developments in the Army do have potential for improving the criteria. The Army is now going to Skill Qualification Testing of soldiers for determining whether they are sufficiently qualified to hold their current grade and MOS specialty and whether they may be considered for promotion to a higher grade in the speciality (Osborne, et al., 1977). Thus there is a potential for obtaining improved criteria measures for occupational specialities for which personnel are recruited and screened.

I have already indicated that personnel limitations associated with the voluntary military system have resulted in military personnel psychologists investigating factors associated with incentives, recruitment, attrition, and retention of personnel (Borman & Bleda, 1978). These investigations include factors associated with quality of life for the soldier and his or her family in the unit and in the community in which they live. Moreover policy makers continue to ask for information relevant to military problems associated with equal

opportunity, race and minority groups, women, drugs, and discipline. These and other questions are so persistent and urgent that a computerized information system which can access relevant personnel records on a longitudinal basis needs to be developed. Such information could then be related to that obtained from recurring surveys of soldier attitudes and opinions. Without such a system I believe policy makers will continue to be disappointed with the information personnel managers and military personnel psychologists can provide to answer their pressing problems. Unfortunately a critical obstacle may be that regulators overseeing computer procurement and utilization may not be convinced of the cost/benefits of such a computerized information system.

The selection and development of leaders continues to be an important area of interest to military psychologists. Each of the service academies has extensive selection procedures and courses for training leaders. However, the Reserve Officer Training Corps located throughout our college and university system produces a vast majority of the young officers entering the services. Within the Army considerable research has been devoted to procedures for evaluating the performance of officers and potential officers. For example, military psychologists worked closely with the Training and Doctrine Command in developing Basic and Advanced ROTC Student/Cadet Evaluation Systems (US Army Training and Doctrine Command, 1978). Included in these evaluations are (1) Physical Fitness Evaluation, (2) Graded Military Skills Training Test (a performance test), (3) Job Performance Rating (ability to handle people and situations) and (4) Peer Rating. The Basic Camp Evaluation also includes Student Grade Point Average. Particularly noteworthy is the fact that the evaluation relies on multiple measures of the cadet's performance. Currently research is underway to develop assessment center methods for evaluating all Army ROTC cadets prior to their signing a contract and entering Advanced ROTC status.

In the late 1950's the Army conducted an extensive research effort on junior officers involving field assessment techniques. A major finding of this work was that leadership requirements are influenced by situational factors (Helme, Willemin, and Grafton, 1971). The results led the researchers to conclude that two major categories of situations should be distinguished when making officer assignments. These were (1) combat (command) and (2) technical-managerial. The new officer personnel management system in the Army provides Army officers with experience in both situations through career planning for primary and secondary military occupational specialities. Perhaps a reasonable comparison to the significance of such distinctions exists in academia where administrative, teaching, and research responsibilities exist. Just as a teacher may vary considerably in his or her proficiencies in each of these areas, so may an Army officer vary considerably in his or her relative proficiencies in command and technical-managerial capabilities.

A brief word should be devoted to the Officer Efficiency Report (OER), a report that is critically important to an officer's career. An overwhelming factor associated with the OER is the inevitable negative skewing of the rating curve across officers. Thus, if an officer is not rated in the 99.5 percentile his career progression may be severely affected. Periodically attempts are made to change the OER so that it will produce a more Gaussian (normal) distribution of ratings. Inevitably this lasts for a very few years when the curve becomes highly negatively skewed again. Through research we know that a forced-choice technique might remedy this problem -- at least in part. However, such a rating technique is unacceptable to the commanders and supervisors. Thus we continue to live with the skewed distribution. However, we should note that in spite of these difficulties the Army continues to use the OER in making career decisions for officers.

A major thrust in each of the services has included using the organizational development techniques developed in business and industry in a military setting (Spencer and Cullen, 1978). While there have been limited efforts at job enrichment which have been highly successful (Cohen and Turney, 1978), in the Army, at least, the major efforts have been to develop staff officers for divisions and installations who are skilled in the methods of (1) diagnosing organizational problems, (2) planning and considering alternative intervention methods and recommending an intervention strategy, (3) conducting an intervention, and (4) evaluating the intervention and, if necessary, subsequently modifying it to increase its effectiveness. The Army has systematically trained quality officers -- usually at the major level -- to be organizational effectiveness staff officers. In addition many of the techniques are being adapted for use by noncommissioned officers and are included in school curricula for training officers and noncommissioned officers. Finally an effort is being made to evaluate factors contributing to the effectiveness of the organizational effectiveness program in the Army. Military psychologists have contributed research efforts to facilitate adaptation of organizational change techniques into the Army. At this time it appears that the organizational change techniques developed by industrial and organizational psychologists will have a pervasive influence on the future commanders and leaders of the volunteer Army. I suspect other services will experience a similar influence on their future leaders.

Up to now I have emphasized military personnel psychology. Now I would like to move on to training in the military. As we all know the Army, Navy, Air Force, and Marines spend large sums of money on training each year. Many military psychologists believe that the best way to reduce personnel and morale problems is to have a continuous and meaningful training program in the units as well as the schools.

For the purposes of this discussion I will discuss military training under three major areas: (1) Individual Skill Training, (2) Team Training, and (3) Training Devices and Aids. It will also be important to note that training in these areas may occur in institutions (schools), in units, or at installations.

Two major thrusts now coming to fruition in training the Volunteer Army have been: (1) the emphasis on performance-oriented training and (2) the development of systematic procedures for development of instructional programs.

The trend toward performance-oriented training began with the concern over the Army tendency to place masses of troops in grandstands and "talk to them." This instructional method had the following consequences: (1) soldiers were inadequately trained to perform their assigned jobs, (2) soldier morale was poor -- lectures tended to be dull, overcomplicated, putting men to sleep while the Army punished the soldier for not paying attention, (3) overemphasis on paper-and-pencil type tests, (4) less verbally fluent soldiers were penalized and high-school dropouts were thrust into a setting similar to that in which they had previously failed and, finally, (5) instructional time was not used effectively since, in most instances, only one instructor was actively involved in instructing. The others had essentially nothing to do until the lecture was completed and then they tried to train the man to do what was expected of him in the time remaining. Performance-oriented training corrected many of these problems although the realization of the full benefits have yet to be realized. Research on methods for conducting performance-oriented training is currently being accomplished and implemented to improve Army training.

Paralleling the trend on performance-oriented training has been the emphasis on Skill Qualification Testing (SQT). The military occupational speciality (MOS) test required for a soldier to hold his speciality or be promoted was essentially written. Some soldiers who performed their jobs effectively were not good readers. As a result they failed the test and were discharged from service. The development of SQT, with its emphasis on performance-oriented testing, corrected many of the problems inherent in MOS testing. Although SQT's still contain some written questions -- the written portions must be directly related to performance.

The adoption of Interservice Procedures for Instructional Systems Development formalized methods for developing performance-oriented military training in the services (US Army Training and Doctrine Command, 1975). The five phases to these procedures are shown in Figure 1.

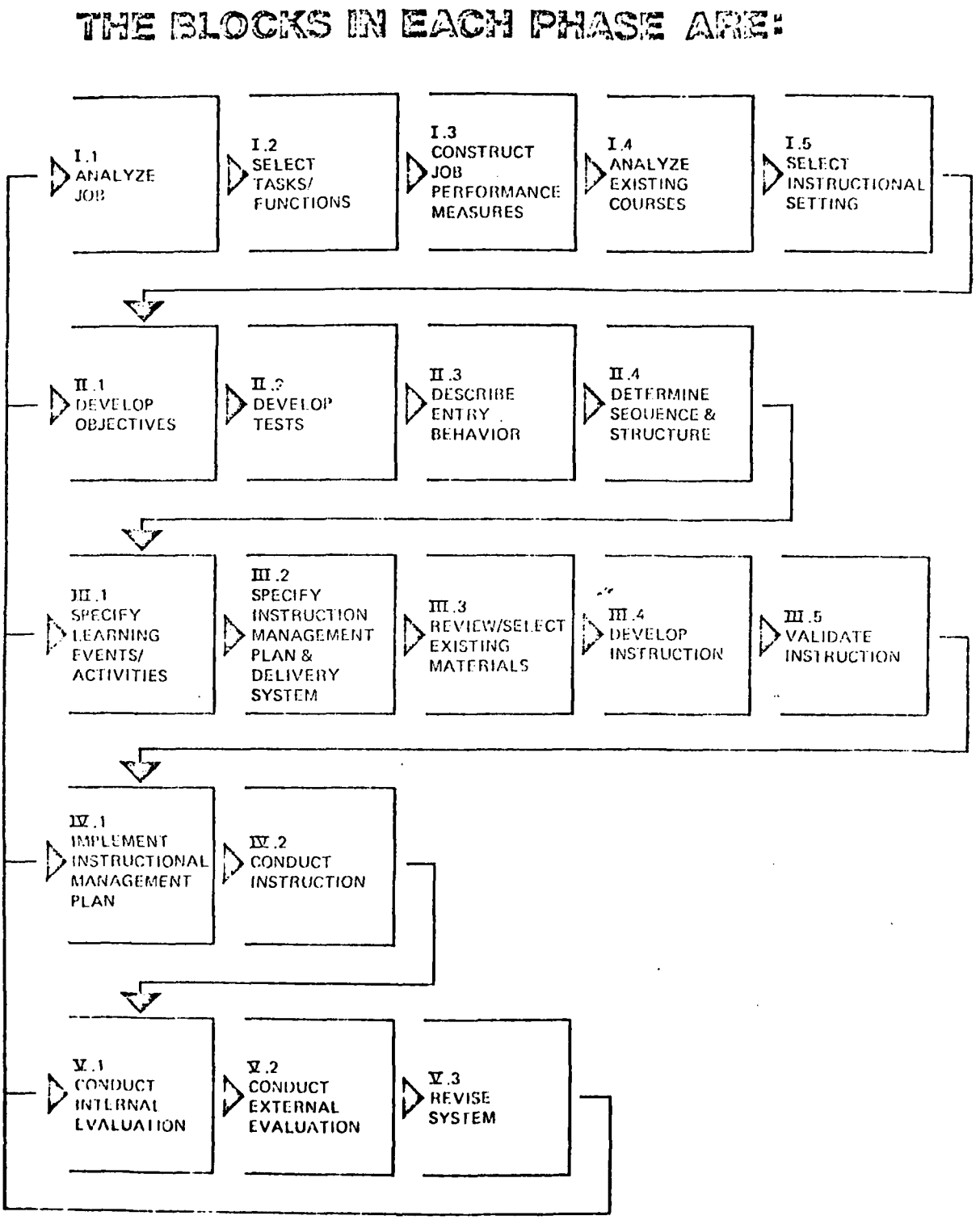

Figure 1: Procedures for instructional systems development

These procedures have become the guidelines for course design, development, and implementation. Within the Army they influence the training given in schools as well as that which the schools design and develop for correspondence and extension courses and for on-the-job training in units or at installations. Four important points should be made. First, the implementation of these procedures can tax the resources and talents available to a school severely. Secondly, even the front-end task analysis can be a severe challenge to the talent available to do it. Third, altogether too frequently distinctions are not made between task analyses done for the purposes of designing training courses, managing personnel, or designing equipment. Nevertheless when properly implemented the procedures can produce very effective courses. Finally, no matter how good the training if the soldier is not motivated to learn it is unlikely to be effective. To help the trainer and supervisor provide conditions which will motivate the soldier is one of the most important challenges the research psychologist has.

The Army has given great emphasis to unit and team training, in large part, as a result of research conducted by military psychologists. Tactical engagement simulation is the term used for some of this training as developed by the Army (US Army Training and Doctrine Command, 1977). Such training is characterized by (1) two-sided free play tactical exercises, (2) objective and realtime casualty assessment, (3) simulation of lethality of modern weapons, (4) simulation of all weapons signatures, and (5) accurate reconstruction of tactical exercises. When tactical engagement is conducted with combined arms elements of the Army it is called REALTRAIN. Figure 2 describes how the Army relates REALTRAIN to experiential learning. Results from evaluation research indicate that REALTRAIN is a very effective method of training units and in motivating the individual soldier participating in the training. Current research involves further development of engagement simulation techniques using eye-safe lasers to simulate weapons and sensors to give signatures of hits (MILES -- Multiple Integrated Laser Engagement System). This research is leading to highly significant advances in effectiveness of team and unit training.

Experiential Learning	REALTRAIN
Individual is a participant, not an observer.	Individual's duties assigned and performed based on realistic mission scenarios.
Cues in training should resemble those in combat.	Units employ all organic equipment and weapons systems. Realistic weapons signatures present.
Individuals should be able to respond in training as they would in combat.	Individual's and unit's ability to react constrained only by normal boundaries, mission orders, time, and logistics.
The situation should change as the individual responds. Immediate feedback available.	Casualty and damage effects of weapons are concurrently and objectively determined.
Post-exercise feedback available.	After-action review.

Figure 2: Parallels between experiential training and REALTRAIN.

The development of training devices, whether for operators, maintenance personnel, or teams, frequently requires important contributions from military psychologists. The initial front-end analyses are critical for determining the characteristics to be incorporated into training devices. Moreover, in the absence of good quantitative theory to predict the generalizability of learning from devices, psychologists are frequently required to provide judgments. In any event it is quite clear that costs of ammunition, missiles, energy, etc., are leading to increasing emphasis on training simulators and devices where criteria for effectiveness are difficult or almost impossible to obtain. To solve these difficult technical problems will require the best creative energies of military psychologists and other scientists involved in developing training devices.

I would like to conclude with two major points about the future of personnel and training psychology in the military. The dual pressures of a decreasing manpower and womanpower pool and the increased sophistication of military weapons and systems is increasingly going to force us to look at personnel-training-equipment systems and their impact on available manpower resources. Ekstrand's presidential address to the Division of Military Psychology in 1972 anticipated this current development in the services (Eckstrand, 1972). Thus developing methods and techniques for projecting the impact of newly planned weapons and equipment in the Army, Air Force, Navy, and Marines on the common manpower and womanpower pool is becoming a major technical challenge to personnel, training, and engineering psychologists working on military problems.

Finally, I want to close by pointing out that research may produce new personnel and training techniques, procedures, methods, or programs which fail during the attempt to implement them in the services. It is becoming increasingly clear that research psychologists working with the military must always consider the capability level of the military personnel they expect to use their developments and that current policies and current personnel management within a service may preclude effective use of the new developments. For example, some of the very promising training techniques developed for the Army are experiencing difficulty in implementation when turned over to the operational Army. Some possible reasons for this include the demand on time and resources imposed by the new training techniques and the turbulence caused by individual assignment of personnel (particularly of officers and noncommissioned officers). As a result of these problems I believe Army psychologists will have to devote more time and resources on the problems of how to insure that new personnel and training developments can be implemented in the operational Army.

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SOCIAL AND BEHAVIORAL SCIENCES CONTRIBUTIONS TO THE REALITIES OF WARFARE

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The "Hearts and Minds" concept was most popular in the Vietnam era. It encompassed tactics, strategies, and philosophies promulgated by civilian and military personnel alike that in order to be victorius in war, one must not only win militarily but be able to "capture" the support of and convince the civilian populations involved that our side is right and the most powerful. In order to accomplish these aims, all participants must be sensitive to the needs, customs, mores, and motivations of such foreign peoples to enlist their cooperation. At the same time, the enemy forces must be prevented from gaining this same leverage and must be made to believe that their cause is wrong, that their government cannot win, and that their individual efforts are useless.

The phrase "hearts and minds" in our discussion will include many kinds of research studies and specialties because in one way or another they contribute to these general goals. Psychological operations or warfare research, a major field of study, is concerned with the communication of messages to others through a variety of media and methods to convince audiences to perform or behave in ways which, the senders believe, will meet their objectives. Ethnographic analyses result in descriptions of cultures, societies, customs, behaviors, and value systems which assist the military and civilian personnel living and operating in foreign environments to interact more sensitively and intelligently with the various groups they wish to cultivate and influence or just plain not offend. Insurgency/counter-insurgency research, a very popular and somewhat ill-defined set of inquiries, contributed to examining the causes of dissent, the motivations to defect from the established governments to join the ranks of opposers, and to predict success or failure of revolutionary efforts. Such research also delved into organizational structures of insurgents as well as ways by which to convince the discontent to rejoin the predominant political power. Obviously, this amorphous program would, by definition, include efforts to incite revolt and establish opposition groups against those in power.

Although truly not "hearts and minds," the comprehensive studies on stress, sensory isolation, and prisoner of war investigations were related and contributed to this general concept, to at least understand how our fighters, our captives, and our dissenters could best cope under conditions of war, deprivation, and foreign environments. Brainwashing research, of course, was also relevant both as a means of understanding what the enemy could accomplish with our soldiers and how the techniques might be applied more generally in psychological operations.

Peter Watson, in his book War on the Mind, references these research areas as the products of psychology and psychologists, which is

not strictly accurate. Many of the endeavors were by colleagues in sociology, political science, and anthropology -- others by amateurs caught up in the swirl of the excitement of the times and the war. Nonetheless, we psychologists have been the chief contributors and have borne the brunt of publicity and at times the scorn.

The "hearts and minds" research absorbed a considerable number of professional manyears for over two decades. Although not exclusively funded by the military, a large portion was accomplished by private organizations wedded to the Defense Department as Federal Contract Research Centers (FCRCs), in-service facilities, companies in the private sector, as well as the universities and colleges.

Initial efforts occurred in World War II, branching beyond the traditional psychological specialties of selection and training. Psychologists were associated with studies to assist in co-opting civilian populations of occupied territories to initiate resistance forces or to augment and guide those already formed. Propaganda programs for friends and foes were developed with the help of psychologists, as were black operations, and the feasibility of dramatic dirty tricks -- some successful, some not. Such participation in the war effort was perceived as a worthy cause in that period, so little consideration seemed to be given to moral or ethical restrictions. Winning the war through military conquest and enemy demoralization were the approved objectives.

An outstanding contribution for our field culminated these efforts. A study of the psychological effects of intensive bombing indicated that it caused the Germans to become more cohesive and even more determined and willing to continue the battle. Although such a finding may not be startling, if our decisionmakers in later military ventures had chosen to draw upon this social science repertoire, perhaps they would not have chosen to perform mass bombings in other arenas with reportedly the same antithetical psychological results.

World War II was followed by a cold war atmosphere and the Korean "police action." Psychologists and their brethren became part of the team, having proven their worth. Centers dedicated to all fields of military psychology flourished. It (military psychology) had come of age.

The Korean incident lead to a concentrated concern for PW behavior. For the first time publicly, U.S. troops apparently faltered under imprisonment. Some troops collaborated with the enemy; some actually chose not to return to their homes. An additional element chose to disagree with the rules of conduct to which they were supposedly bound while serving as prisoners. A host of studies, debriefings, and books by scientists and laymen were forthcoming to explain these reactions. Some experimenters concentrated on techniques of sensory deprivation supposedly used by the Chinese, others on the reasons for psychological defection and its impact on U.S.

defense policies, while others concerned themselves with "updating" or revising the code of conduct.

A corollary of this epic was the research on "brainwashing." What procedures had the enemy employed? How might they be countered? And, of course, what were their applications in other fields such as mental health, therapy, or preparation for captivity?

Obviously, there were many other studies evoked in this conflict. How does the military select the best "fighter" -- what are the differentiating psychological characteristics? (Frighteningly, they are the same as personnel who would be dependable, reliable, in any situation -- basically bright and willing to participate.) Stress research became unusually popular. The "fighter" studies reported by Watson raised extreme doubts as to their propriety in the sense that subjects were unwittingly exposed to experimental situations without prior knowledge, which might be called inhumane and terrifying. Other professionals objected publicly to these studies. The press here and in England, particularly, began to raise ethical issues about methodologies, perhaps for the first time.

The cold war in Europe led to studies on population and refugee exploitation and insurgent movements. Psychological operations research in use of media to influence audiences behind the Iron Curtain were voluminous to assist the West in influencing the attitudes of East Europeans. Similar studies were being conducted in support of emigres from mainland China.

Massive movements of American personnel to foreign assignments occurred in the late 1950s and early 1960s. Cross-culture research flowered to aid these transplanted emissaries in understanding new cultures, communicating with other life styles, and influencing their new hosts to support their missions and objectives. It also contributed to new techniques and methodologies for understanding cultures.

Although there had been questions along the path about the ethics, the effectiveness, and even the expenditure of funds, this softer, risk-laden, more qualitative branch of social science seemed to be making progress. In fact, the army was sufficiently impressed to invest in a rather sizable endeavor. The objectives of this research, which would enlist the assistance of outstanding scholars of social science, were never totally defined because the project became the nemesis of our profession in 1965. Reputedly the researchers were to investigate the causes or antecedents of dissent or dissatisfaction which at times lead to revolution. Many studies described by Watson in his opus had already examined insurgency causes and effects. Counter-insurgent techniques and treatments had been studied but somehow this particular project included ingredients which incited detrimental reactions. For one, most of the other efforts had involved data collections from documents and case studies

written about foreign environments without on-site observation. Camelot, the program's short title, was to be "live" in a foreign setting (South America). Intellectually, if one could understand and isolate the variables causing potential revolution, then a government could find a benign set of actions to reduce dissent. Unfortunately, the study evidently was not properly "coordinated" -- it was made public in Chile by a consultant who perhaps was not articulate, perhaps his statements were misinterpreted purposely, or innocently. Perhaps, as a few leaning to conspiracy theory suggest, an Eastern Bloc country's intelligence apparatus made a major "disinformation operation" out of the study. Regardless of cause, the effect was catastrophic for social scientists conducting overseas research. The event touched off a struggle between the Departments of Defense and State over who was responsible and who would control future studies. The President finally designated the State Department to serve as arbiter of all research conducted in foreign settings and with overseas implications. Approval procedures to initiate studies became so cumbersome and time consuming that few organizations or individuals had the stamina to continue their interest. Military funding and interest for their FCRCs began to wane. Overseas studies were more and more relegated to in-house laboratories which did not have the lengthy review requirements and contract organizations turned their attention to less sensitive issues. Not only was military psychology damaged but also university colleagues were restricted and hampered in their more basic anthropological and social studies.

The Vietnam War occurred during this period. The impetus for psychological operations studies and tribal customs interest was sufficiently great that these efforts continued overseas in Vietnam and Thailand under the aegis of the Department of Defense. Although curtailed, these studies resulted in some effective knowledge for the military. Studies of refugees from North Vietnam had important input to Secretary McNamara (perhaps too much, in fact). Psychologists also contributed to the Chieu Hoi program to attract defectors from the ranks of the Vietcong.

The large numbers of air force and navy pilots captured in Vietnam created new interest in PW studies. The Services established comprehensive programs to study the effects of captivity, including the examination of family as well as pilot stress and distress. These efforts continued a few years at the end of the war and are probably the most thorough data collection ever organized. Unfortunately, more studies concerning adjustment of these pilots and their families now and in the future are not presently being conducted.

The end of the Vietnam War saw a final step in the deemphasis in research attention to these areas. The military became concerned with other critical problems such as drug abuse, organizational effectiveness, and the volunteer force. Congress, reacting to the climate of

the antiwar sentiment, refused to allocate monies for psychological operations and allied fields. Eventually it even reduced the military's funding role in the drug areas seeing the responsibilities as belonging to HEW because the problem was in all sectors and not just in the military community. Recently because of Congressional members' first-hand observations of the troops in Europe, they have reinitiated drug investigations under military aegis.

I have tried to review "what is military psychology" in the "hearts and minds" arena. Although its history would seem to indicate that these areas are sensitive and, as Peter Watson says, may lead to abuse of subjects and the application of the results to other sectors of society. It is a reality of warfare that the "mind" of which he speaks, is a battlefield. If the United States becomes involved in a war of survival, then such techniques probably will be listed in military arsenals along with tanks, guns, and nuclear weapons. Therefore, research and development will undoubtedly be continued at some level as it is today in most other countries.

Specialized education in military psychology for this realm of studies obviously encompasses methodologies of all social and behavioral sciences. It calls for rigorous experimental procedures in order to escape the amateur's "insights" and pet theories. It calls also for creative techniques for evaluation of effectiveness of media messages and motivation measures. Above all, it requires experimental atmospheres for tests which will not abuse subjects.

We can fervently hope and pray that the U.S. military will not be required to fight again in overseas environments. If it is, however, social science research has made still-unused contributions that may assist in reducing physical casualties and influencing audiences favorably.

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THE NATURE OF MILITARY PSYCHOLOGY AND UNIFORMED MILITARY PSYCHOLOGISTS

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INTRODUCTION

Those of you who have an interest in history may recall, and the rest of you might well be reminded, that England entered World War II against Germany just 40 years ago today. Even those of you who were born after that date are aware of the enormous impact of that war. However, many of you may not fully realize that one of the significant, if less central, effects of that war was that it played a key role in bringing military psychology into focus as a significant area of psychology. It is quite fitting, therefore, that this symposium on the nature of military psychology should be held on this anniversary.

My talk today is divided into two parts. I shall deal both with my views of the nature of military psychology, and the special roles and problems of uniformed psychologists. The first topic is one I share with my fellow panelists, so I shall be brief and mainly discuss the ways in which I agree or disagree with the views they are presenting. I shall try to spend more of my time discussing the role of uniformed psychologists, a topic which only I will be addressing and in which I obviously have a special interest, having spent my entire professional career as an officer psychologist.

WHAT IS MILITARY PSYCHOLOGY?

Military psychology is psychology which is performed in, by, or for the military services. While this definition is obvious, and also somewhat grandiose, it carries implications for the definitions of the special characteristics of military psychology. Among these characteristics are the following:

(1) Military psychology overlaps with, and uses, nearly every other branch of psychology, ranging from physiological to industrial/organizational psychology and even including humanistic psychology.

(2) Military psychology is primarily, but not exclusively, applied psychology. There is, of course, some basic research and theorizing done by military psychologists, particularly in areas where we cannot apply knowledge that is already "on the shelf" in civilian laboratories, schools, and clinics. However, the laws governing Department of Defense (DoD) research activities place severe limits on DoD conduct of basic research. This role is given to civilian agencies except when it can be shown that unique military needs exist which cannot be met by civilian knowledge and techniques. As a result, most military psychology is applied rather than basic in nature.

(3) Military psychology may be used with single individuals, as in clinical situations, but more often it is applied to very large groups of people, as in psychological operations (PSYOPS) or personnel classification and assignment. This need to apply psychology on a large scale is a major characteristic of military psychology, and has a major impact on our successes and failures. A great many times we have found that techniques and principles that work well on a small scale either do not fit larger groups or require managerial and technical skills that are difficult to develop for large organizations.

(4) The principles and procedures of military psychology must be applicable to an extremely broad range of human abilities and performance. The enormous diversity of military personnel is almost beyond belief, especially in wartime. For example, a psychologist who must deal effectively with a group of illiterate soldiers and then make their problems understandable and solvable to a four-star general serving as the Army Chief of Staff has a real challenge on his or her hands. In my own clinical career I have had to deal with clients ranging from mentally retarded privates to overly strict generals having discipline problems with their own children. Psychologists in the nonclinical areas have faced comparable ranges of problems.

(5) The operations of military psychology often must lend themselves to relatively routine and standardized applications that can be learned and applied by nonpsychologists. Because of the large number of people in the military, and the very small number of psychologists, a major share of the psychological work, even in the clinical areas, has to be done by nonpsychologists or by paraprofessionals. They have limited psychological training and often use techniques that have in many cases been developed by professional psychologists. This utilization may or may not be supervised by professional psychologists. Dr. George Miller's concept of "giving psychology away" is widely practiced by military psychologists, who have learned a great deal about how and to whom psychology can be "given away."

(6) Military psychology must usually be developed in, and generally is applied in, very large and highly bureaucratic organizations. This means that military psychologists must know how to operate effectively in, and through, bureaucratic structures, a skill that is unfortunately seldom taught in most graduate or even most professional schools of psychology. The process of learning these bureaucratic skills on the job can be agonizing, as many of us can testify, but it is essential to success.

(7) Because of the uses to which it is put, military psychology must deal with problems unusual in most civilian environments, such as the use of force, the application of high degrees of authority, the presence of high levels of physical and psychological stress, the use of coercion, etc. Since these problems are relatively uncommon

in civilian life, there is apt to be a shortage of experts and expertise to deal with them. Who, for example, is apt to be an authority on the psychological effects of nuclear weapons, or "brain-washing," or interrogation of enemy prisoners to gain needed intelligence? Few claim such expertise, and some who claim it turn out to lack it.

(8) Military psychology deals with many issues that are alien to, and in some instances discomforting to, civilian psychologists. To name just two:

(a) How does a clinical psychologist deal with the ethical concerns that arise when he must treat a case of "combat fatigue" in order to restore a soldier to effective performance so he can return to face the hazards of combat, or

(b) How does a psychologist evaluate the need to give a drug-abusing officer a fair chance at rehabilitation without taking him off duty when that officer is currently performing ineffectively as a unit commander and adversely affecting the performance of his subordinates. Of course, there are major ethical problems in civilian psychology too, but some of the problems in the military seem especially severe and far-reaching in their scope.

(9) The applications of military psychology and the consequences of its application can have broad implications for national policy (volunteer Army, utilization of women, race and ethnic relations, utilization of low-aptitude personnel, etc.) In many cases, for better or worse, the military often breaks new ground in major areas that affect social policy. The use of women in nontraditional roles and the beneficial or not-so-beneficial effects of mandatory mixing of people with very different ethnic and social backgrounds are two clear examples.

(10) The potential scope and power of military psychology can at times make it highly visible and very controversial. It was, for example, the military which originated Project Camelot, an effort to study factors which might affect the failure or success of dissident military actions against established governments. It is no accident that very severe restrictions have been put on many proposed military psychological projects that were judged "too controversial." It is particularly hard to get approval for studies of social, cultural, and organizational processes in the military because these are so apt to be controversial in the eyes of at least some observers.

(11) Despite (or perhaps because of) the possible power and scope of military psychology, it has usually been an area of little interest and low prestige in the minds of most nonmilitary psychologists. It is now a relatively small and underpopulated specialty.

There was a great spurt in the growth of military psychology during and immediately after World War II, and many of today's senior American psychologists made major contributions to military psychology during the 40's and early 50's. However, most gradually drifted away from this field later in their career, and in more recent years most psychologists have not been interested in military issues. Psychologists have not been drafted into the military, and few of the younger generation have served in the military or shown any interest in the field. During the Vietnam era, in fact, what little interest there was in military psychology was generally negative and there were even attempts to expel military psychologists and Division 19, the Division of Military Psychology, from the American Psychological Association.

THE ROLES AND CIRCUMSTANCES OF UNIFORMED MILITARY PSYCHOLOGISTS

There is obviously much more that could be said about military psychology, but it is time now to turn to my second topic: The roles and circumstances of uniformed psychologists. Most military psychologists, paradoxically, are civilians, at least in peacetime. Some work for the military as civil servants, and many others work indirectly for the military as consultants or on a research-contract basis. There are, however, many uniformed military psychologists. The exact number is unknown, partly because there is no acceptable definition of who is a uniformed military psychologist. This is partly because there are several groups of people who might be called "uniformed military psychologists":

(1) Persons with full professional training, holding the doctorate, and working full time as psychologists throughout their military career. The majority of such persons are in clinical and research positions and are in the medical service or biomedical science corps of their respective services where they serve as commissioned officers.

(2) Officers with advanced training in psychology, usually at the masters level, who work at psychologically-related duties during some, but not most, periods of their military careers. These officers are primarily trained in, and have careers in, fields other than psychology such as infantry, artillery, signal work, etc., but have also developed a second psychological specialty. They may work in such areas as education and training, command and management, personnel management, human factors engineering, organizational development, and PSYOPS. A related but clearly different group is the large number of military chaplains who have graduate training in counseling or group work. Another related special group is the small number of relatively permanent faculty members at the service academies and other military schools who have advanced psychological training at the masters or (rarely) the doctoral level.

(3) Enlisted personnel with special training in various areas of applied psychology (usually provided in military rather than civilian schools) who function as behavioral science specialists, research assistants, personnel classification specialists, etc.

Of these groups, the first group clearly deserved to be considered as professional psychologists since their training and experience is fully comparable to that of their civilian counterparts.

The Army has insisted for over 30 years that full-time professional psychologists should have doctoral degrees and has had an extensive program for funding the training of these psychologists. Similar policies, but of somewhat lesser scope, have been followed by the Navy and Air Force. Most of the doctoral uniformed psychologists obtained by all three services have been procured by these training programs, which carry a number of years of payback obligation. Unfortunately, very few psychologists have been willing to stay in service after their obligation was completed. The consequence has been that most doctoral uniformed psychologists have been relatively young and low in rank, seldom staying long enough to go beyond the rank of Captain (or Lieutenant in the Navy). They have been a talented and effective group in daily work but have rarely stayed in the system long enough to have significant impacts on policy and broad administrative issues. In addition, while the number of psychologists in relation to the population served has steadily increased in civilian life, this has not been so true in the military. This is largely true because total military manpower ceilings are so constrained that a new profession can only grow at the expense of previously existing ones. For these and other reasons there has often been a shortage in the number of uniformed doctoral psychologists, especially in the clinical and counseling specialties, during the past 30 years.

The second group of uniformed psychologists to some degree corresponds to masters level workers in psychology, but with the important difference that they do not spend their entire careers in psychology. Rather, they alternate between psychological and non-psychological tours of duty, and they must remain "branch-qualified" in their basic specialties of infantry, signal, or whatever. Many of these officers have a remarkably high level of psychological expertise, despite their part-time psychological careers. They are an increasingly large group, especially in recent years, and they often occupy important administrative positions which involve control over the development and application of psychological programs. Since they often have more contact with, and credibility with, other line and staff officers, they frequently play a crucial "bridge" role between full-time uniformed and civilian military psychologists and the rest of the military. One sign of their significant role is the fact that a number of psychologists in this category have achieved general officer rank, whereas no full-time doctoral level uniformed psychologist has ever done so. Although

they may have less psychological training this group often has more influence and certainly more authority than the full-time uniformed psychologists. This is not always so, of course, but it is nonetheless true that many of these "part-time" psychology officers play a very important role.

The third group of psychological personnel, namely the enlisted personnel, have little policy impact but they play very significant roles in the day-to-day provision of psychological services. For example, the concept of "Paraprofessionals" in the mental health field, which is now widely accepted in the civilian world, was already widely employed in the military during and after World War II, and even to a limited degree in World War I. This was at a time when civilian professionals considered such practices both unwise and a threat to their own professional status. In this area, as in a number of others, the military led the way. Another example, by the way, of a military initiative was the use of the methods of "community mental health," "social psychiatry," and "community psychology" long before these concepts gained wide application in civilian life.

Because of the great diversity in their training, it is hard to generalize about the roles and circumstances of uniformed psychologists, but some statements can be made especially with regard to doctoral level psychologists. First, why should we have some psychologists in uniforms? A number of circumstances may make this desirable:

(1) It permits a greater degree of administrative and program continuity if some career uniformed psychologists are available for long periods.

(2) The military can control uniformed psychologists very effectively, and can send them where needed, including overseas or with combat forces, promptly and in the numbers required.

(3) Uniformed psychologists, serving as officers, can often interface more effectively than civilians with other military personnel in administrative and policy positions.

(4) Many military clients find it more credible to receive assistance and advice both in clinical and in nonclinical circumstances, from fellow military personnel who share, and are familiar with, the conditions of military life.

(5) It is useful to have senior officers with fully recognized psychological credentials to serve in higher level training, management, and policy-making positions.

(6) Because of their generally varied experience gained in a series of differing assignments, uniformed military psychologists are often able to function more as "generalists" rather than "specialists" who may have too narrow a perspective.

Another kind of question is: What do uniformed psychologists do? Some answers to the question have already been provided, but the best answer is that they do just about everything that is done by civilian psychologists of comparable training. They are probably more involved in policy-making and administration than are many civilian psychologists. On the other hand, they are somewhat less apt to be involved in teaching, and more apt to be involved in applied rather than basic research if they are researchers. A significant share of time is also spent in consultation.

There may also be some interest in the administrative assignments that affect uniformed psychologists. There is little central control over their actions, even in a particular service, except in setting the initial standards of professional qualification and in assigning psychologists to particular duty stations. Once at a duty post, psychologists are fully responsible to local commanders, and their duties depend upon local missions. Most psychologists tend to work in settings where there are only a few other psychologists (except for teaching hospitals and large research labs). This can lead to feelings of professional isolation but it can also lead to very fruitful collaboration with workers in other disciplines. It also tends to lead to considerable role variation from one psychologist to the next. There is little pressure to be a "typical" or "standardized" psychologist. Most uniformed psychologists report a high degree of professional freedom and control over their roles, despite stereotypes to the contrary.

There are other unusual aspects of being a uniformed psychologist, since this usually means serving as an officer as well as a psychologist. The young psychologist must learn early to exercise supervisory and administrative responsibility and to function acceptably and effectively within hierarchical authoritarian structures. There are some obvious dangers and discomforts in such roles, but there are also some useful strengths and advantages. Many psychologists learn to make very effective use of both their officer and their psychological roles and are able to avoid or resolve conflicts between these two aspects of their function.

Many civilian psychologists may wonder what are the advantages of being a uniformed psychologist. There are a number, some of them related to the general nature of a military career and some more unique to the psychologist. As an officer, the psychologist at times has status and influence that adds to that which he might have just as a psychologist. For example, the uniformed psychologist can arrange to have his clients assigned to more appropriate duties or removed from stressful conditions. He can create other helpful environmental changes that many of his civilian colleagues might envy. It is also possible to apply psychological knowledge to topics and issues that are very challenging and rather unique to the military. For example, though I am a clinical psychologist, I have been asked to deal with issues as varied as military strategy, psychological warfare, and lessons learned from our Vietnam experience, to cite only a few. There is also the advantage that one can shift from one type of

professional role to another with minimal career hazard. In a full military career a psychologist can be a clinician, teacher, student, consultant, researcher, and administrator, either concurrently or in successive assignments. This chance for role variation and role enlargement can be stimulating and very rewarding professionally. It is also quite satisfying to feel, as many of us do, that we are performing work of significant and direct national value, in addition to being of immediate help to our patients and clients.

There are, however, a number of disadvantages, many of which have played a key role in keeping down the number and influence of uniformed psychologists. A brief list is all that time permits:

(1) Pay is below civilian standards, at least during the early professional years when career decisions are made. Senior psychologists are relatively better paid but entry level psychologists are not. Civilian psychologists, especially in clinical areas, earn more than uniformed ones.

(2) Promotions come slowly, especially for junior officers. Since military status and pay depend upon rank, this is a great drawback. Other professions--such as physicians, dentists, veterinarians, and optometrists--receive extra pay and accelerated promotions, but uniformed psychologists have never gotten very many incentives of this type.

(3) Some psychologists find life in a bureaucracy very frustrating and are uncomfortable with the managerial and supervisory responsibilities inherent in their officer status.

(4) The mobility of military life and the relative lack of publication and research opportunities make it harder to make contacts and to achieve recognition among civilian colleagues. For career uniformed psychologists this is compensated for, in some cases, by greater recognition within the military; but for young psychologists this is less likely.

(5) The mobility of military life does not appeal to many, especially if they have spouses with careers of their own, a condition that is becoming increasingly frequent.

(6) Another significant deterrent, particularly in the last decade, has been the general low opinion which civilian psychologists have tended to express toward uniformed military psychologists.

To sum it up, as a career uniformed psychologist, I have obviously found that the rewards have exceeded the drawbacks. On the other hand, I must regretfully acknowledge that most of those with whom I trained, and most of those whom I have seen or heard of in subsequent years, came into the service to be trained, paid back

their obligations, and then left the service. I wish this were not true, but it is, and how to correct it would require a much longer analysis than the time for this talk will allow.

I would take time to say, however, that many of the solutions to the problems of recruiting and retaining uniformed psychologists will depend upon receiving a degree of understanding and support from our civilian colleagues that has not been available up to now. This symposium is one attempt to achieve that goal.

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MILITARY PSYCHOLOGY AND ITS DISCIPLINARY NEIGHBORS

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Quite some time ago, a soldier, detailed to temporary additional duty as a communications technician, reported to his nation's capital the successful outcome of a critical battle. This, the earliest example I can think of offhand of the relationship between stamina, zeal, and performance in a militarily assigned task was run by Pheidippides, whose feat in racing the 42 kilometers from Marathon to Athens is still commemorated quadrennially in the Olympic games and annually in Boston and now almost everywhere else.

The points I wish to make during the discussion of the place and scope of military psychology are related to the areas suggested by the example of Pheidippides--but with emphasis on the physiology of work as it applies to military life and military tasks and the problem and rewards of using physiological and psychophysiological methods and techniques to supplement the use of psychology in planning, monitoring, and evaluating the effects of military life and work on the individuals who do it.

My theme today is not a new one and some of you may have heard me comment on it before. It grows out of my experience of 18 years directing a laboratory where the principal effort was addressed to the problem of man under stress, especially where the stress had some observable physiological components. My feeling is that most workers in military psychology pay too little attention to the physiological side of military psychology. They do this for easily understandable reasons. First, they are already very busy, and this helps Lubin's Law[1] to operate. Second, they think--and with pretty good reason--that the payoff from physiological studies has been less than previously touted and so they reject or postpone such difficult, time consuming, expensive research as unpromising.

A few years ago I experienced vividly how frustrating it is to try to wean military psychologists away from a comfortable routine. I was fortunate enough to be a delegate from the U.S.A. to the annual meeting of the Applied Military Psychology group, which meets each year with two delegates from each country--an excellent group with very competent and experienced psychologists who participate forthrightly and whose meetings are uniformly useful. I had attended during the previous week in Amsterdam a symposium on the topic, "Psychological versus Physiological Criteria in the Man-Machine System," a meeting which illustrated, for me at least, some differences between American

1. A rough paraphrase of Lubin's Law is: If I thought that your research were really more important than mine, I'd quit what I'm doing and do what you are doing.

"human factors engineering" and European ergonomics. As the chairman, Professor W.T. Singleton, had asked me to summarize the trends of the physiological papers, I of course paid close attention to them and took notes (Wilkins, 1971).

The point is that I went to Sweden with my head full of the research I had just paid such close attention to (and found to be congenial to the point of view of myself and my colleagues) that I spent part of the Swedish week proselytizing for a fuller and franker effort in psychophysiology and physiology as the positions of these disciplines relate to military psychology. I found, as I presume I should find in this country, that the leaders of military psychology were poorly acquainted, if at all, with the research workers in the disciplines I wanted to promote. Parenthetically, I must emphasize that only a small part of the discipline of physiology has much relevance for military psychology, even though a good bit more than just work physiology can be included. Scrutiny of the last half dozen volumes of the Annual Review of Physiology will not provide a surfeit of data important to work psychology. For example, more than half of the materials on human physiology deal with the body at rest. Work physiology deals with activity and the body under stress, not the body at rest. So while I draw attention to work physiology as important to military psychology I do not claim any central position for this point of view.

A wise appraisal of the possible place of such part-disciplines in the field of military psychology has already been provided to this Division by S.B. Sells, who applied his acknowledged synoptic view and taxonomic approach to the problem. In "Psychophysiological Parameters of Skill Maintenance" Sells and Findikyan review the problem of maintaining performance "in the face of extreme environmental conditions, threatening situations, and fluctuations in individual stages" and point to the difficulty of providing univariate solutions of multivariate problems. Sells and Findikyan list acceptable approaches to maintenance of performance in areas central to traditional military psychology, such as selection, adaptation, training, task system engineering, and organizational management. But they also emphasize psychophysiological monitoring and nutritional and psychopharmacological parameters and stress the real interdependence of all these approaches.

If we presume that military training and service can be (and ought to be) stressful, then selection procedures would do well, in the view of Sells and Findikyan (1967), to pay close attention to individual differences in the ability to tolerate stress. It seems obvious that if we are selecting volunteers for a long-time Antarctic study that we might profitably assess tolerance to cold, to difficult working conditions, to prolonged isolation, and to enforced socialization. If we are selecting volunteers for a mountainous campaign we might test for ability to function at altitude. There are wide differences in the rate and the extent to which individuals can adapt

to different working conditions, such as heat, cold, humidity, etc., and these differences can be taken into account. Sells mentions also the enhancement of performance through drugs, by insuring alertness, postponing the effects of fatigue, facilitating sleep, and preventing motion sickness. Sells' points, made a dozen years ago, need re-stressing and applying to an even wider range of problems than his topic of skill maintenance.

We can profitably incorporate into our training programs a set of monitoring schemes which will allow maximal training, with appropriately lessened risk to the trainee. At the present time we have some extraordinarily advanced techniques to allow the monitoring of performance in hazardous training situations. Some used in the Air Force and in Naval aviation allow appraisal of reaction times and of actual judgments quite impossible without the sensors used. Others, like those used in maintaining divers at 300 meters undersea or deeper are simple but allow observers other than the participants to keep an eye on vital signs, on brain functioning, and on the general adaptation of the individuals and the crew involved. Extensions of such approaches to a much wider range of military tasks seems not only feasible but also desirable.

The simple appraisal of aerobic capacity would also seem to be a desirable addition to our military training programs, which currently feature psychology. When appraising human effort, we must consider what human capacity might be expected. The strenuousness of physical effort is most readily assessed by the measurement of oxygen consumption, which reflects any change in cardiac output and oxygen extraction by the tissues. Heart rate is easily used to estimate the strenuousness of work or exercise, as you will have noticed in the popular aerobic dancing, where the girls take their pulse rates immediately after each exercise. Since heart rate is affected by age, sex, presence of disease, or level of training, one must construct an age- and sex-related set of figures and then relate these tables to the particular task the trainee is engaged in.

A parenthetical comment on the debate a couple of years ago on whether women in the armed forces might be assigned to the same jobs and tasks as men: After puberty, the maximal aerobic power of women is about 70% to 75% of that of men. For lots of jobs in the armed forces this significant difference makes no real difference, but for some it must be an overriding consideration. An inventory of task demands already exists and can be readily augmented with data of relevance to the question.

The age factor in aerobic capacity is of lesser account, because the vast majority of the personnel are young enough that the inevitable decline in capacity with age is trivial. A useful rule from one's middle twenties to the seventies is a loss of about one percent per year. While this generalization is based on data from

competitive swimmers, it gives a rough approximation of the declines expected. This does not mean, of course, that your golf score is necessarily subject to such declines, as training in physical as in mental tasks slows the declines (Rahe & Arthur, 1975).

What sorts of occupations should have routine or episodic assessment of the physical and psychophysiological components of performance? In ordinary work life, very few. But I'm inclined to think that military life, with physical demands on stamina, must include a variety of occupations where the monitoring of such performance is desirable--any, for instance where the success of the mission would be jeopardized by the lack of stamina of an individual or a few of the crew.

The relation between general physical fitness and job performance is one that had been debated as well as investigated over many decades, but without neat prescription for general use on all sorts of jobs. The general principles of preconditioning, true of any job situation, include physical conditioning as being of patent usefulness in military jobs, training in adaptation to stress and isolation to avoid illness in the weeks before a special mission--most dramatically illustrated by the astronauts and various special training regiments for environments needing such preparation.

As you can readily see, all I'm pleading for is the pertinence of the sort of research done by the Canadians at Downsview, by the Army at Natick, or by the Navy at San Diego, different as these labs are. In my view this will not infrequently call for interlaboratory cooperation, for no lab has the resources to cover every measurement of human endeavor. We should, I think, more often frankly ask for advice from the labs that contain the additional competence and even collaborate with them when we are embarking on a new assessment of the technique of a program of a stress-filled task.

Within the broad confines of military psychology, those of us who are primarily involved with aptitudes and measurement should extend our study and research toward the interests of Division 5; those of us in organizational psychology, towards Division 14; those of us with ergonomics interests, toward Division 21; and those of us with clinical interests, toward Division 12. Likewise those focused on psychophysiology should keep our lines open to Division 6.

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