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The Twenty-Fourth International Applied  
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William D. Crano

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# The Twenty-Fourth International Applied Military Psychology Symposium

## Introduction

The 24th International Applied Military Psychology Symposium (IAMPS) was held from 30 June-3 July 1988 in Toronto, Canada. The meeting was hosted by the Canadian Forces' Personnel Applied Research Unit (CFPARU), on behalf of the Canadian Forces (CF). Local arrangements were capably handled by Lieutenant-Colonel Richard Zuliani, Major Cheryl Lamerson, Major Claude Hamel, and Lieutenant-Commander Michael Rodgers.

As is becoming characteristic of IAMPS, this year's meeting exceeded all expectations, both in terms of quality of presentations and numbers of participants. Approximately 50 representatives, from 18 countries, attended the Symposium this year. This was one of the largest turnouts ever recorded in the history of IAMPS, and occurred despite the great distances involved between home and conference site for the European, Australian, Israeli, and Turkish attendees. The names and addresses of all of the individuals involved in this year's IAMPS are provided in the appendix included at the end of this report. Because of the sheer number of presentations, I will necessarily report on only the high points of each talk. Readers interested in learning about a specific work in greater detail should contact directly the individual responsible for the presentation.

## Organization

Typically, all representatives at IAMPS are expected to present an address to the conferees. However, as is characteristic of the free and open nature of the Symposium, no restrictions are placed on the topics that may be discussed. Such an open system can become a reviewer's nightmare, with papers spread the length and breadth of the very large field that we call psychology. In practice, however, the papers seem to coalesce into more or less unified groupings. This was the case last year, when five general categories (retention of personnel, stress, selection, organizational development, and technology transfer) subsumed all of the presentations. Much the same occurred in this, the 24th annual IAMPS. In this year's Symposium, the papers again can be classed into one of five general categories, as follows:

- Manpower, with emphasis on retention
- Tests and selection

- Performance and morale
- Treatment, primarily of (but not limited to) psychological problems
- Organizational development.

## Manpower

### Keynote and Overview

The keynote address to the conference was delivered by Major General F. R. Sutherland, Chief of Personnel Development of the Canadian Forces (CF). In his thoughtful and thought-provoking talk, General Sutherland outlined the personnel issues with which the Canadian Forces must contend over the coming years. Today, the Forces consist of 85,000 regular troops and 21,000 reserves, all volunteers. Future plans call for an increase in the regular forces to 90,000, and an equal number in the reserves.

These massive personnel increases are planned despite a series of countervailing pressures on enlistment and retention. These include:

- A decreasing birthrate, common in almost all the developed countries
- Socio-attitudinal changes in the family and schools — a career in the armed forces is no longer seen by some as a desirable option
- Economic changes: higher rates of employment sometimes deplete the pool of potential enlistees
- Technical changes, which call for ever-increasing degrees of technical and intellectual proficiency
- Political changes: it can appear to potential volunteers that the work of the armed services is not appreciated by the political authorities, given constant pressures on military budgets, shrinking allotments and entitlements, etc.

All of these factors can work against the maintenance of a fixed force, much less the massive increase in troop strength that is envisioned. How, then, are the projected personnel goals to be met? A wide-ranging series of recommendations proposed by General Sutherland gives some insight into current Canadian Forces personnel plans.

*Remove Irritants.* Sources of dissatisfaction exist in all organizations. In some, owing to the nature of the organization itself, these problems have few implications for recruitment or retention. Such is not the case in a volunteer army. Accordingly, the first order of business appears to be the identification of factors that cause dissatisfaction, and addressing these problems in a rapid and responsible manner. One obvious problem in today's

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society – of which the Armed Services are merely a part – concerns the family stresses engendered as a consequence of dual careers. In the forces, dual career families can be especially problematic because of the mobility associated with a military career. When both members of the family are members of the armed forces, even greater problems can (but need not necessarily) result. If an informed policy regarding job placement, training, etc., could be developed by the CF, this would put them at a competitive advantage with other sources of demand for manpower.

*Provide standards.* One of the most obvious sources of such demand is industry. There is, and continues to be, competition with industry for military leaders. Generally, industry pays more, and oftentimes is perceived as providing the more interesting career opportunities (see Hodge's discussion in ONRL Report 7-033-C, 1987). This need not be so. A common problem voiced by many in Hodge's sample was the absence of realistic criteria against which good performance could be judged and rewarded. In the absence of standards, performance inevitably falls. The work presented by the Canadian representatives to this year's IAMPS demonstrates an concern for the creation of fair standards by which performance can be assessed.

*Language.* A problem somewhat peculiar to Canada owes to the fact of the linguistic diversity of the Canadian people. English is the first language of 60 percent of the population. This means that English is not the first language of 40 percent of the population. In the past, it was felt in the Forces that language was a barrier to those for whom English was not the mother tongue. The operative outcome of a perception of this type (be it totally accurate or completely invalid) was an effective reduction in the pool of potential volunteers. Given the competitive pressures for manpower today, such a limitation on the pool cannot be sustained.

Various attempts to offset problems such as this have been attempted. Monitored systems which guarantee fair treatment (defined statistically) to linguistic minorities are in place in many linguistically diverse countries, including Canada. Approaches such as these not only enhance the fairness of the system, but also the population's perception of the system's fairness, which also is extremely important, especially from the standpoint of recruitment.

General Sutherland suggested that as a military personnel specialist, it is no longer possible to operate reactively. Problems must be anticipated before they occur, solutions planned long in advance of their necessity. To facilitate this proactive approach, the CF has developed an interesting and powerful survey research capability, which taps a host of regularly (and some irregularly) collected socio-demographic, attitudinal, and economic indicators. With this information, they hope to be able not only to anticipate manpower supply, but the likelihood that the people constituting the pool will see the military

as a desirable career option (see Hamel's contribution in *ONRL Report 7-033-C*, 1987). It is too early to know if the CF information system will operate as hoped, but it is not too early to judge that a system of this type must be developed if rational personnel policies are to be developed and maintained.

### **Attrition in the Canadian Forces**

Perhaps the most important piece of the manpower puzzle is attrition. This issue was discussed in an extremely interesting fashion by Lieutenant C. D. Lyon of the Canadian Forces Personnel Applied Research Unit (CFPARU), who discussed the relationship between voluntary attrition and job performance. The research was concerned with the fundamental question of "Who quits" – the successful or the unsuccessful officer.

The research literature does not provide a clear signal regarding the relationship between performance and attrition (cf. Jackofsky, 1984). In part, this failure is attributable to the wide variety of job types that have been studied (unskilled, skilled, white collar, etc.), the variations in economic conditions during which the performance-attrition relationship was studied, the reliability and validity of the measures of the critical concepts, and the small samples upon which analyses are based.

Aware of these problems, Lyon and his colleagues at CFPARU designed a study that would span multiple time frames (yearly performance ratings from 1980-1983) to offset the variations in the performance-attrition relationship that might have been due to economic fluctuations. In addition, they divided their sample into officer and noncommissioned officer (NCO) samples, since different performances are expected from these groups, and different performance appraisal systems are employed.

To lend stability to the performance measure, performance appraisals over the 3 years of data sampling were averaged for each respondent.

And, to offset a major problem of previous research – restriction of sample size – Lyon and his colleagues surveyed the performance and attrition data of nearly 35,000 members of the Canadian Forces.

The general details of the research can be outlined as follows:

- Divide the sample into officers and NCO's
- Average 3 years of performance scores (each year, 17 ratings were collected on each person)
- Factor analyze the 17 combined ratings, to reduce the data set
- Identify the ratee as a "leaver" or a "stayer" and, on the basis of performance appraisal scores, categorize him or her into one of four performance quartiles – more than 1 standard deviation above the mean performance score, within +1 SD, within -1 SD, and more than 1 SD below the average
- Identify subgroups within the two samples by rank and occupational category (senior officers, senior NCO's, junior officers, junior NCO's; operations, technical, support, and specialist)

- Calculate the voluntary attrition rate for each group
- Within each group, calculate the performance-attrition relationship

*Findings.* The results of Lyon's analysis are interesting, if not yet definitive. For the officers ( $N = 10,422$ ), the analysis of the 17 performance ratings (combined across 3 years) revealed four factors:

1. Intellect (expression in writing, intellect, oral expression, professional knowledge, and analysis of problems or situations)
2. Operational job performance (delegated, directed, and supervised; made decisions and took action; accepted responsibilities, etc.)
3. Professionalism (integrity, loyalty, conduct, dedication, and courage)
4. Fitness and appearance (physical fitness and appearance)

*Correlational findings: Officers.* The pattern of relationships observed between performance (as indicated by the four performance factors) and voluntary attrition were intriguing, and not completely as might be expected. In the sample of Officers, there was no relationship between attrition and fitness and appearance (Factor 4). As might have been hoped, there was a significant negative relationship between Factor 2 (operational job performance) and attrition, and between Factor 3 (professionalism) and attrition; that is, the less effective and the less professional officers were more likely to resign. All of this is as may be expected. However, the final result to be presented is somewhat less than was hoped for: in the officer sample, there was a positive relationship between Factor 1 (intellect) and voluntary attrition; smarter officers were more likely to quit! Before commenting on these results, let us first review the findings obtained in the analysis of the performance-attrition data of the sample of NCO's.

*Findings: NCO's.* Factor analysis of the 17-item performance scores combined over 3 years for the NCO sample ( $N = 24,213$ ) did not succeed in isolating specific factors, as was the case in the sample of officers. This lack of differentiation among the items suggests a halo effect, and comments by Lyon seemed to confirm this possibility. In essence, an older (and now disused) rating form had been employed in the NCO sample, and ratings tended to be quite inflated. Under these circumstances, factor analysis is not likely to isolate specific factors — one global and relatively uninformative factor is likely to emerge in such circumstances, and this is what occurred in this sample. With the replacement of the NCO rating form, it seems likely that future work on the attrition-performance relationship among Canadian Forces NCO's will produce more informative results.

What, then, can we make of the findings of Lyon and his CFPARU colleagues? First, it is clear that as a model of procedure, this study is an excellent example. If we are to study the attrition-performance relationship, all of the

criteria developed in this study must be met, at a minimum.

Secondly, we might begin to wonder about the utility of subjective scores, when objective criteria may be employed in their place. All of the measures used in this study were based on the subjective assessments of the ratees' immediate supervisors. In the absence of the present results, such a strategy might make sense. But given Lyon's results, such a practice should be altered. Why use a proxy for intellect when there are plenty of good objective measures available? Why use a supervisor's ratings of an Officer's physical fitness when there are host of objective rating scales that correlate height, weight, etc., into a meaningful fitness score?

Substantively, the results suggest that the less capable and less professional Officers are voluntarily leaving the forces. This is good news, but it must be tempered in light of the intellect-attrition relationship. And in some ways, even this last result is not as damning as it might appear initially, if we consider the components of the intellect measure (Factor 2), rather than their literary label. In fact, intellect in this study is a reflection of a supervisor's evaluation of the quality of the Officer's writing, oral expression, knowledge, and intelligence. To be sure, some of these factors are related to intelligence, but to say on the basis of this finding that smart officers leave and dumb ones stay would be a gross distortion of the actual data.

### **Attitudes toward the Military in the German Federal Republic**

Unlike the situation in Canada, all male citizens of the German Federal Republic must serve in the Armed Forces, or perform some form of alternate service. Contending with the lowest birthrate in the world, German military planners are becoming increasingly concerned about the ways in which (or the likelihood that) military needs will or can be met in the near future (see ESN 41:10:539). To gauge the extent of the problem, Dr. Heinz-Jurgen Ebenrett of the German Federal Armed Forces (GFAF) conducted a survey of draft-age German youth to determine their attitudes toward the military, their perception of threat from the Eastern block, and their future plans regarding military service versus alternate forms of national service. The data that Ebenrett collected, and their clear departure from earlier findings, are remarkable.

Each year since 1979, the Bundeswehr has polled a sample of 1500 men of draft age, to determine their attitudes toward the military, their perception of East-West relations, etc. These results show a very major shift over the past 2 years in some important attitudes and perceptions. Consider the results presented in Table 1, which summarizes research over the past 5 years on attitudes regarding the extent to which the Federal Republic of Germany is threatened militarily. As shown here, there has been a steady decrease in the proportion of those who see a threat, and a corresponding increase in those who do

not. Part of the reason for these trends may be found in Table 2, which summarizes views of likelihood of a chill or a thaw in East-West relations. Clearly, a major shift for the better in East-West relations is anticipated by the young men of this sample. The perception of threat has diminished appreciably.

**Table 1. Survey results to the question, "Is the German Federal Republic threatened militarily."**

Choice	1983	1984	1985	1986	1987
YES	48%	43%	38%	30%	31%
NO	33%	37%	40%	45%	50%
DON'T KNOW	19%	21%	22%	24%	18%

**Table 2. Survey results to the question, "The relationship between the Western and the Eastern European nations will...."**

Choice	1984	1985	1986	1987
IMPROVE	13%	15%	21%	46%
GET WORSE	15%	13%	12%	4%
STAY AS IS	56%	57%	49%	34%
NO ANSWER	16%	15%	18%	17%

General attitudes toward the military, too, have declined over the years, as shown in Table 3. In part, this might be explained by young German men's views concerning the US and USSR's motives regarding disarmament; these perceptions are summarized in Table 4. As shown, those with positive attitudes toward the military have decreased from 20 percent in 1984 to 12 percent in 1987, a decline of 40 percent; an increase of 60 percent in the numbers of those expressing negative attitudes was found over the same time period.

**Table 3. Survey results on general attitudes toward the military.**

Choice	1984	1985	1986	1987
POSITIVE	20%	19%	15%	12%
NEUTRAL	49%	51%	42%	40%
NEGATIVE	31%	30%	43%	48%

These changes were associated with changes in views regarding the likely culprit in the arms race. As shown in Table 4, 26 percent of the young men sampled in 1984 thought the US had a greater interest (than the USSR) in disarmament, while only 7 percent felt the opposite way. Three years later, the figures are more than reversed. In the 1987 sample, 42 percent of the sample thought the USSR had greater interest in disarmament (vs. 9 percent for the US!). Although these changes are only based on one year's results, they are consistent with the general trend of attitude change observed over the immediate past. If nothing else, it is apparent that Soviet public relations efforts are outstripping those of the US by far. It remains to be seen if current trends in attitude will continue. If they do, and the 1987 results are not anomalous, then it is clear that some fundamental changes in the ways in which the West's position is presented must be contemplated.

**Table 4. Survey results to the question, "A greater interest in disarmament is to be attributed to...."**

Choice	1984	1985	1986	1987
The USA	26%	19%	12%	9%
The USSR	7%	10%	24%	42%
Both	23%	28%	27%	32%
None	34%	31%	26%	9%
No Answer	10%	11%	11%	9%

As a consequence of changes in beliefs and attitudes of this nature, attitudes toward military service also have changed over the past 4 years. In the German Federal Armed Forces, men can volunteer, be drafted, or opt for alternative service as conscientious objectors (CO's). The survey results regarding these prospective decisions are presented in Table 5. As shown, the proportion of those planning to enlist voluntarily has decreased over time, while those opting for conscientious objector status has increased by approximately the same percentage.

Research on those planning to apply for CO status has shown that many young men base their decision not on strongly held conviction, but on rather superficial cost-benefit analyses, in which convenience and job security play a greater role than religious or moral beliefs. Often, the attitudes are based on emotion rather than information, with social relations having a very strong effect on the apparent belief. To offset the use of the conscientious objector status for reasons of convenience (rather than moral conviction), the German Federal Armed Forces plan to reduce the categories of exceptions to military service (thus, the burden is more evenly shared by everyone), to increase the burden of civilian alternative service (prolonging the duty term, thereby affecting the cost-benefit ratio), improving the procedure for selection, placement, and education, by means of computer adaptive testing, and finally, by providing material incentives for volunteers. It is impossible to say how these changes will influence rates of volunteerism, and conscientious objection, but it is clear that if earlier research regarding the reasons for alternative service was correct, then it is likely that there will be a substantial drop in the proportions of young German men who vie for this alternative.

**Table 5. Survey results on prospective personal decision on the military.**

Choice	1984	1985	1986	1987
Volunteer	9%	10%	7%	6%
Volunteer or be Drafted	8%	8%	9%	8%
Draft	53%	56%	55%	53%
Service or C.O.	18%	15%	16%	18%
C.O.	12%	11%	13%	15%

#### **Collaborative Military Manpower Research: The TTCP**

Dr. H. Wallace Sinaiko of the United States described the work of a little known program of exchange

and collaboration of military manpower research, The Technical Cooperation Program (TTCP). TTCP was established 30 years ago to facilitate exchange of military information among defense scientists from Australia, New Zealand, the UK, and the US. Sinaiko's technical panel on manpower trends began work 10 years ago, to deal with factors that influence the quality and numbers of people available for member countries' armed forces. (Other panels focus on training, and ergonomics.)

Specific issues that have occupied the attention of TTCP researchers are:

- Manpower supply (including consideration of socio-demographic trends, use of women, and recruitment advertising effectiveness)
- Personnel selection (educational and sociodemographic predictors, physical standards, computer adaptive testing, physiological approaches, etc.)
- Attrition (use of exit surveys, continuous attitude surveys, family surveys)
- Reserve forces (special problems of part-timers)
- Cohesion and motivation.

TTCP holds week-long meetings annually, in which priorities are set, collaborative arrangements developed, etc. Members typically serve for long terms on the panel, and this helps establish the atmosphere of trust and understanding that facilitates the "research-at-a-distance" which characterizes this organization. TTCP has produced findings that have materially benefited the member nations. Examples of some of these, taken from Dr. Sinaiko's presentation, follow:

- Australian Army psychologists working on a computer model for reserve forces personnel were able to save several man-years by incorporating programs developed in parallel US laboratories.
- Australia, the UK, and the US each contributed technical information used by the CF in the development of a biodata questionnaire.
- A CF instrument designed to monitor attrition was adopted by US Navy and Marine Corps.
- UK researchers developing computer-assisted testing programs saved considerable investment as a consequence of information provided by US laboratories.
- US work on realistic job previews as a counter-attrition method were used as the basis of special training modules in the UK Royal Marines and Royal Navy.
- RAF validation studies of the Defense Mechanism Test (this test is discussed in greater detail later in this report), reporting near-zero correlations between it and flight-training performance, prevented duplication of such research by the US Air Force.

In a climate of shrinking resources and increasing problems of manpower, TTCP seems an excellent idea. It combines the research strengths of a number of countries which, despite variations in size, share similar problems. Rather than waste scarce resources duplicating each other's research, TTCP members contribute to the needs of their own defense establishment and to those of their fellow consortium members.

## Testing and Selection

Assuming that the manpower specialist has succeeded in securing personnel, the next question becomes, What is to be done with them; that is, how do we make the most of the talents that become available through military conscription or volunteers to the armed services. The answer to this question lies in selection and testing, topics to which we now turn our attention.

### Computer-Assisted Testing in the German Federal Armed Forces

There is little doubt that computer-assisted testing (CAT) offers tremendous technical advantages over the more traditional paper and pencil approaches. Among the leaders in the CAT movement are the Germans, who are responsible for some of the best and most comprehensive work on military testing (and training – see my review of Hansen's work in *ONRL Report 7-033-C*, 1987, p. 18). However, the success of CAT hinges not only on technical questions; at issue, too, is the acceptance or rejection of CAT by those who are being assessed by such means. It is to this issue that Dr. Wolfgang Weber of the German Federal Armed Forces' (GFAF) Department of Psychological Affairs directed his research attention.

The advantages of CAT need not be recapitulated here. It seems self-evident (at least to me) that this approach offers so many advantages over traditional methods that its widespread adoption is an inevitability, by those who can afford its development (and hardware) costs. Some of these opinions (or biases) were supported in the research cited by Weber, who detailed some of the highlights of the short but illustrious history of CAT in the GFAF.

To assess attitudes toward CAT, 400 draftees were asked to express their opinions on various aspects of the computer-assisted testing procedure that they had recently undergone. More than 60 percent of the sample expressed positive or very positive attitudes toward the technology in general; 29 percent were strongly and unfavorably impressed. There was no relationship between favorability and test performance, nor did the results depend upon prior experience with computers or video games (indeed, 65 percent of the sample had no experience with computers, and 44 percent had never played a video game). When given a series of paired adjectives with which to characterize their experience, the average respondent found the CAT system to be "interesting (vs. boring), modern, clear, objective, necessary, and pleasant."

These ratings were obtained in response to the CAT II system; in this system, a 1-day medical examination is followed later by a day's CAT testing. Aptitude tests involved in the CAT II include word analogies, figure reasoning, arithmetic reasoning, spelling, mechanical ability, reaction time, radio test, signal test, and auditory discrimination.



Later work suggested that much could be gained by compressing the medical and aptitude testing programs into a single session (called CAT III.) This was accomplished, and over a year's experience, the following results were obtained:

- Good acceptance of the testing approach by all participants
- Increased transparency of military draft procedures
- Time for intervention and counselling for every draftee
- Better organization of tests
- Cost savings.

As a consequence of these field experiences, the appropriate GFAF budget commission approved the establishment of the first of the CAT installations. In parallel, developments aimed at improving CAT management also were established. A CAT central working group was established in Bonn, for item generation, basic sequencing of items, etc; in Cologne, and Bonn, groups were formed to study item calibration and provide technical assistance; selection centers are planned to explore the further application of CAT, to gather data, etc.

By August 1988 the GFAF will have tested more than 15,000 draftees by CAT. The reaction of those subjected to this testing approach is summarized by Weber: "The acceptance within the conscripts is still high; they appreciate the savings in time as does the sending industry, shops, schools, and firms; the young men like the possibility to talk with a psychologist; they feel well treated." It is difficult to argue with results of this kind, grounded, as they are, in real military testing experience. Coupled with the obvious psychometric advantages, it is clear that the acceptance data argue for the more widespread application of CAT in military settings.

### Pilot Selection

Pilot selection is one of the most widely studied aspects of military selection research. This is so because of the costs involved in training pilots, and of the potentially catastrophic costs (both in terms of human life and equipment) should the selection prove invalid. Psychologists have expended considerable efforts in attempting to predict who will succeed, and who will fail, in pilot training. Many different personality measurement systems have been attempted, but in general the results are far from encouraging. For some time now, especially in the Scandinavian countries, attention has been focused on the Defense Mechanism Test (DMT), first conceived by Kragh (1960).

The DMT is a projective test, in which a picture is presented tachistoscopically to the respondent, at first under subliminal conditions. With each succeeding presentation, exposure time is increased, and the respondent must (a) describe what he or she sees, and (b) draw a sketch of the presented picture. The subject's responses are analyzed in terms of the extent to which they deviate from the picture that actually is presented. Some devia-

tions are interpreted in terms of the operation of ego defense mechanisms, as described by Freud (1926; also see A. Freud, 1954). As described here, the DMT would seem to fit well into the "new look" in perception research, and this is exactly the case; when Kragh developed the initial ideas of the test, he was one of a number of psychologists of the University of Lund whose work was influenced by this movement.

The DMT has inspired considerable controversy, owing in part to the claims of some of its proponents that it can validly differentiate successful from unsuccessful flight candidates. At the heart of the controversy is the issue of the psychometric quality of the test. Is the test reliable and valid, and can the evidence bearing on these questions be believed. Two presentations focused on the DMT were delivered at this year's IAMPS. Neither definitively supports, or falsifies, the DMT; both suggest the need for more research, as the following discussion will illustrate.

### Reliability of the DMT

Let us begin with the skeptical view, as presented by Dr. Francois Stoll of the Swiss Army and the University of Zurich. Stoll's critique was broad based, focused on issues of both the reliability and validity of the DMT. He discussed four types of reliability that are of relevance when considering the DMT, and these are considered in the following paragraphs.

*Reliability of test administration.* The DMT may be considered well standardized in terms of administration, when the sample consists of individual subjects. The manual is clear and easy to follow. However, two problems remain: first, there appears no easy way to employ the methodology in a group context, and as such, the test administration is bound to be costly. In addition, no research appears to have been undertaken to determine the effects of age and gender of test administrator. Since the test is grounded in Freudian theory, it is evident that test-administrator factors could (indeed, should, theoretically) have a strong effect on results.

*Reliability of coding.* A claimed advantage of the DMT concerns its objective coding system. Almost no coding need be done during the data collection phase, and this is a distinct advantage. However, Stoll found only one study regarding coding reliability (Westerlundh, 1976), and even this study appeared flawed methodologically, since coders did not independently rate the test protocols, but rather compared them with the original protocols and noted any disagreements that might have occurred. Such an approach is almost bound to inflate apparent reliability of coding.

*Reliability of evaluation of test protocols.* This issue is concerned with the issue, "do others see what I see" when evaluating a specific protocol. The data suggest good intercoder reliability when using the DMT; however, again there is a caveat. It appears that agreement only occurs

when "raters are colleagues and come from the same school," to use Stoll's words.

*Stability over repeated testing.* It is difficult to assess the temporal stability of the DMT since only a single stimulus picture is used in the test, and hence, a parallel forms testing procedure is impractical. Kragh (1985) does report quite impressive test-retest stabilities over 1 and 5 years ( $\rho = 0.81, 0.53$ , respectively); however, these findings are based on very small samples ( $N = 15, 20$ , respectively). At a minimum, a more ambitious sample should be assembled to investigate this critical feature of reliability.

### Validity of the DMT

When considering validity in the context of the DMT, two issues assume paramount importance, criterion validity and construct validity. Stoll considered each of these factors in detail, as will be seen.

*Criterion validity.* Much of the validation work on the DMT has been focused on this aspect of validity, particularly in the context of military pilots. The issue here is, "Does performance on the test have anything to do with flying performance." The answer to this question must be qualified. The results on the trials on which Kragh and his immediate colleagues have been involved have been encouraging, if not completely one-sided. However, when others have made use of the test (e.g., see Stoker, 1982, for work on trials in Britain), the findings give no support whatsoever for the validity of the test. One might argue that Kragh and his group are the more likely to have performed the test correctly, and this probably is so. But the failure of any other group to find support for the validity of the test does not augur well for the test (cf. Crano and Brewer, 1986).

*Construct validity.* Since the DMT is theoretically based on Freudian defense mechanisms, it is reasonable to ask whether the test measures defenses, as Freud envisioned them. A study by Cooper and Kline (1986) was conducted to investigate construct validity by assessing correlations between the DMT and scores on a variety of personality measures, including the Cattell's 16 PF. The overall results were far from encouraging. Based on classic psychoanalytic theory, Cooper and Kline hypothesized 52 significant relationships between 10 DMT defense indicators and the other measures. Although 33 of these correlations were in the expected direction, more than half were smaller than 0.10, and only 5 of 52 reached significance (at  $p \leq .05$ ). Only five correlations (two hypothesized, three not) were greater than 0.30. This pattern of results does not lend much support to the DMT. However, the story is not completely one-sided, as will be suggested below.

### The DMT, the Rorschach, and Fast-Jet Pilots

Dr. Gudrun Haan of the Norwegian Armed Forces Educational Center made use of the DMT in conjunction with the Rorschach, in an exploratory study of applicants

to flight school. Haan's basic question was the relationship between DMT and Rorschach scores in samples of men accepted or rejected for flight school in the Norwegian Air Force. Of a pool of 232 applicants, 117 were screened out by a test battery which included achievement and aptitude tests, psychomotoric tests, and clinical interviews. The remaining 115 were all tested on the DMT, and of these, 63 also were tested with the Rorschach. Two extreme groups were selected on the basis of DMT results, and the ultimate sample consists of 15 applicants with poor DMT scores (and thus, not admitted to flight school), and 17 with good DMT results (admitted to school).

Many hypothesized relationships were examined in this study, but for reasons of time a comprehensive set of results could not be presented. All relationships were in the predicted direction, though not all were statistically significant. The findings that were presented did demonstrate differences between the two groups, in ways that would be expected. For example, high DMT scorers were more likely to process Rorschach pictures as wholes, rather than to focus on details. It can be argued that such a perceptual style is adaptive for the fast-jet pilot.

In Haan's view, the results of this study provide some evidence for the utility for the DMT, and this may be so. At a minimum, the results argue for more study. And if such study is focused on the fundamental psychometric quality of the DMT, then Haan's research has performed a valuable service.

As I see it, the issue at hand is still the fundamental one of the quality of the test. What does it measure, and does it measure well? Stoll has suggested that answers to these questions, at a minimum, are not available. (At worst, they suggest the invalidity of the DMT.) With Stoll, I find it difficult to understand why a test that has been in use for more than a quarter century still must contend with fundamental questions regarding its reliability and validity. If the DMT is reliable and valid, this should be settled once and for all. If it is not reliable or valid, it should be discarded. The stakes at which this game is played, potential careers as fast-jet pilot, success or failure in admission to flight school, etc., are too high to permit the current state of uncertainty. To me, it seems incumbent on those who would make use of the DMT as a selection device first to demonstrate its validity, unequivocally, and before any further use of the test as an instrument of selection is undertaken.

To use the DMT in light of the obvious lack of critical psychometric information (or, indeed, in the face of clearly negative results) is potentially to compromise the careers of otherwise worthy fliers on the basis of little more than whim. Olympian hubris of this type is unworthy of the profession of psychology, belonging more in the realm of black magic than legitimate science. It is very clear to me that the DMT as it is currently constituted could never be used as a selection device in countries where litigation in response to an unsupported barrier to

a chosen career is more the norm. And in my opinion, this is exactly as it should be.

### Aptitude for Flight – The Spanish Approach

A somewhat different approach to that discussed above was adopted in a recent Spanish program of research on flight aptitude, which was described Lieutenant Jose Puente of the Spanish Air Force. Puente's studies were undertaken in collaboration with colleagues from the University of Salamanca, Spain, who include G. Prieto, J. Carro, M. M. Gonzalez-Tablas, R. Fernandez, D. L. Palenzuela, and I. Ochoa de Alda. The approach undertaken in this research makes very creative use of the pair comparison method of evaluating stimuli, one of psychology's oldest and best established methods, to define the most critical components of flight – that is, those features that distinguish the successful pilot from one destined to fail, either in flight school or later in his career.

**Identification and Ordering of Basic Skills.** In their study, the research team tried to pinpoint the component skills that experienced flight instructors use to distinguish, in their own minds, the fliers in training who are destined to succeed or to fail. What of the many flight skills do they implicitly feel are essential? A further question is whether these complex skills order themselves along a single dimension, or if a multidimensional solution is more appropriate. This issue is crucial, because if the judgment of future success is based on skills that fall along a single evaluative dimension, this will allow us to order the various aspects of flight training in some meaningful way. This unidimensionality, in turn, will allow us more easily to determine whether one or another of the multitude of available personality inventories can predict one or another of these skills. The ordering of skills is a very useful first step in the validation of any predictive test of flight capability.

Thirteen critical skills were initially determined as potentially important prognostically (see Table 6), and then every possible pair of skills were presented to 26 experienced flight instructors, who were asked to choose the more important of the two for revealing the capacity of students for flight. This pairing of 13 stimuli resulted in 78 pairs of flight skills, and each instructor was asked to judge, independently, which skill of each pair was the more important in determining the future of the neophyte flyer.

After application of various statistical procedures, the method of pair comparison produces a set of values which summarize the ratings of the judges (in this case, the 26 flight instructors). These ratings have interesting properties: they are interval-level numbers, which allows for the use of very powerful statistical techniques. The data also allow us to determine whether the judgments are unidimensional – are the judges using the same criteria when making each of their ratings (see Guilford, 1954, for a discussion of the statistical treatment of pair comparison ratings).

**Table 6. Ratings of various maneuvers for revealing capacity for flight.**

Basic Flight Maneuvers	Diagnostic Importance
1. Start engines	0.00
2. Takeoff roll and flight start	1.43
3. Constant speed climb out	0.68
4. Turning climb	0.79
5. Level flight and constant speed	0.48
6. Turn and constant speed	0.93
7. Descent maintaining speed	0.54
8. Turning on descent with constant speed	1.19
9. Landing	1.82
10. Landing roll	0.63
11. Stalls	1.24
12. Chandelles	1.85
13. Lazy eight	1.81

The data suggested that the judges could make their ratings reliably, and order the skills along a single dimension of importance for revealing capacity for flight. The ultimate ratings that each of the 13 critical skills received are also presented in Table 6. As shown, the skills deemed most important for revealing the capacity for flight were chandelles (a precision-executed ascending turn of 180 degrees with a maximum gain in altitude), landing, and lazy eight (the craft slowly describes a large figure eight toward the horizon; a change of direction of 360 degrees is made and a continuous variation in the positions of depth and inclination are required).

Having obtained this information, Puente and his colleagues then attempted a very detailed breakdown of the various components of the critical maneuvers. These, in turn, were employed in the development of a flight grading sheet, by which performance of neophyte flyers could be gauged. These performance scores were then investigated in a multiple regression study. The predictor variables in this multiple regression investigation were drawn from standardized tests of (1) perceptual speed, (2) spatial relations, (3) spatial orientation, (4) visualization, and (5) inductive-deductive reasoning.

In combination, these predictors explained 35 percent of the variance in the execution of the chandelles maneuver, 56 percent of the variance in the execution of the lazy eight, and 52 percent of the variance in the execution of the landing maneuver. These are remarkable results, and it is quite conceivable that even greater predictive power might be obtained in future refinements of the methodology, given the careful and thoughtful development of the research approach to this point.

### Factors that Affect Military Performance

In this section are included a series of reports that detail research focused on variables that influence military performance. There is an obvious variability of focus in these reports. In the following pages, emphasis will shift from the effects of early military socialization to a

retrospective study of the effects of battlefield reversals on morale. Other studies considered here detail the performance of troops in two very different battlefield situations—the Falklands and Syria—and still others are focused on the effects of sleep deprivation and military effectiveness. I consider this variety a strength; coupled with the uniform excellence of the works to be summarized, this variation should assure that everyone finds at least something of value or, failing that, of interest.

### Early Socialization

**Naples' Nunziatella Military School.** One of the wars in which England engaged was said (by an Englishman) to have been won on the playing fields of Eton. This is probably a slight exaggeration if for no other reason than that there were lots of other people involved in the conflict who not only had not attended that august school, but probably had never even heard of it. The point of the aphorism, however, is well-taken: there can be little doubt that early socialization into the military way of life can have a profound influence on later military effectiveness. Two papers, by IAMPS representatives from Italy and Portugal, discussed this important aspect of military psychology. The first paper, presented by Lieutenant Colonel Maurizio Laurenti, and coproduced by Lieutenant Colonel Sandro Tomassini and Dr. F. DiCesare, was focused on the social factors that influence adjustment to military life in adolescents.

Nunziatella Military School, founded in the late 16th century, is Italy's Eton. For hundreds of years, alumni from this school have been grossly overrepresented among the scientific, political, artistic, cultural, and military leaders of Italy. Laurenti and his colleagues attempted to determine how Nunziatella had this effect. Of course, the school draws from the very best young men available, and there is a certain inevitability in their later accomplishments. However, preexisting talent and influence is not the whole answer. From Laurenti's description, it is clear that from the very first day of matriculation, Nunziatella imposes its own special training. Behaviors and practices of the new boy's past are shown immediately to be inoperative. The life of the cadet is separated cleanly from previous activities, and the socialization into the Nunziatella way of doing things begins.

This radical separation from established ways creates stress, with which the cadet must cope; he finds support from his cadre, and also from the psychological resources that he can mobilize. It was these psychological resources that were of interest in the investigation of Laurenti and colleagues. Accordingly, 89 new cadets of Nunziatella were tested with the California Personality Inventory (CPI) upon matriculation. The test was readministered after 3 months to 29 of the original 89, to a second group of 31 subjects 15 months after matriculation, and to a third group of 29 cadets after 27 months in the school.

Multivariate analyses disclosed a host of interesting findings in this research, whose explication is beyond the

scope of this report; only the highlights will be reported here. A reasonable summary statement of the results is that it is clear that different coping strategies are adopted as a consequence of predispositions learned before entrance into the school. These different predispositions lead to different, but not necessarily superior or inferior, ways of coping with the socialization stress that is characteristic of most novel settings. Particularly important in the present research were the traits of responsibility and social maturity, self-control and tolerance. These factors seemed to have the greatest say in the ultimate adaptation to the military environment. If a cross-validation of these results reproduces these findings, we will have gained some potentially important insights into the factors that might influence later success in the military.

**Marine Training in Portugal.** A second study, focused on adjustment and socialization, was presented by Dr. Jorge Correia Jesuino and his colleague Dr. Orlindo Gouveia Pereira, both Captains in the Portuguese Navy. In this longitudinal study, whose general format resembles that of the Italian research discussed immediately above, Jesuino and Pereira studied the effect of leadership training (of 18 marine instructors) on the stress levels and job satisfaction of 270 marine recruits.

Half the instructors in this study, all of whom were experienced, were taught various leadership skills whose aim was to provide better, and less stressful, training to the recruits in their unit. The remaining instructors did not receive this training. Measures on the trainees were taken before commencement of training, at the middle of the course of marine basic training, and at the completion of the course. Measures taken included:

- Leadership—including assessment of role clarity, work assignments, rules and procedures, and support
- Stress—on the job, off-job, organizational, and strain
- Job Attitudes—including ratings of work, the boss, colleagues, salary, and career.

The results of the study confirmed the efficacy of the leadership training. A repeated measures multivariate analysis of variance disclosed that stress levels decreased from the first to the second measurement period in the group whose trainers had been exposed to leadership training (the experimental group); in the groups whose leaders received no training (the control group), stress increased from the first to the second measurement session. From the second to the third measurement session, no differences in stress measures were noted between the two groups.

Attitudes were measured at the beginning and end of the training. Data indicated that attitudes toward work and toward the boss improved over time in both experimental and control groups, but at a greater rate in the experimental groups. Positivity of attitudes toward salary and colleagues decreased over time, but at a slower rate in the experimental population. All of these results demonstrate a positive influence of the leadership training. However, one anomalous result also was found: positiv-

ity of attitudes toward career decreased in the experimental group from first to last measure, while it increased in the control condition.

Leadership practices were not differentially perceived by experimental and control group subjects. This suggests either that the treatment itself was not strong and effective, or that the effects of the training made for very subtle, but nonetheless real, differences in leadership behavior. If one entertains the first possibility, then it is difficult to see how the significant results that were discovered could have come about. It seems likely to me that the training of experienced leaders added something to their already established repertoire of skills. This addition mattered, but not as much as it would have had the trainers been inexperienced. Thus, it seems likely that the results, if anything, underestimate the influence of Jesuino and Pereira's approach to leadership training.

### **Sleep Deprivation**

Sleep deprivation is a common experience in every military environment. Almost anyone who has lived through military training has had to cope with demands for performance in the absence of sufficient sleep. Although the experience is common, we do not have a clear idea of the effects of this type of deprivation on military performance. Two studies at this year's IAMPS, very different in design and conception, were focused on this issue. The findings of these studies are complementary, and give some interesting insights into the nature of sleep deprivation on behavior.

**Israeli Field Research on Sleep Deprivation, Behavior, and Leadership.** Major Michael Messinger of the Israeli Defense Forces discussed a field study in which the effects of sleep deprivation on complex social behavior, including leadership style, was investigated. It was his contention that with few exceptions, previous sleep deprivation research has focused almost exclusively on effects on simple mechanical actions, reaction time, etc. In his study, Messinger was concerned with the behavioral and complex cognitive changes that might result from sleep deprivation.

The general form of the study was quite straightforward. All members of two armor companies were kept awake for 72 hours. They performed operational tasks at the beginning of this period and at its conclusion. One of the two experimental companies performed the tasks again, after a sleep period. A third armor company served as a comparison group. Data were collected through techniques of unstructured participant observation (observers, however, worked in 6-hour shifts; they did not partake of the full sleep deprivation experience).

Dependent measures consisted of:

- Cognitive variables (concentration ability, short-term memory, complex cognitive behavior, and logical reasoning)
- Subjective evaluations of task performance and social behavior

- Motivation
- Efforts to keep awake
- General observations, feelings, etc.

Considerable information was collected and discussed, but the analysis of complex social behaviors seem to me the most intriguing. The analysis of social behaviors indicated that sleep deprivation influenced the units' fundamental hierarchical structure, sometimes in negative and unpredicted ways.

Initially, the two experimental groups were characterized by very different styles of leadership. Company A's commander was basically task oriented. He was formal, distant, and cold. He placed great emphasis on high standards of task performance, sometimes without regard to cost, human or otherwise. Company Z's commander was person oriented. Soldiers could speak with him freely and directly. There was no chain of command as such. Performance in this command was not as noteworthy as that in Company A.

Under conditions of sleep deprivation, glaring changes occurred. First, Company A's commander became much more a soldier's commander, sitting with his men, talking with them, etc. He personally encouraged them to keep vigilant, and assisted his staff in this job. He acted this way not because of a fundamental change of leadership style induced by sleeplessness, but in order to meet a prime objective of the test, namely to keep his men awake. His social behavior, in other words, was motivated by considerations of the task.

Company Z's commander continued with his person-oriented style, encouraging his men personally, working directly with soldiers, and practically ignoring his staff officers. After some time, he found that he could not keep up the pace, and would disappear for long periods, sitting alone in his jeep. His staff was not accustomed to taking leadership roles, and were practically ineffective in leading the company. In fact, the soldiers (not the staff) took responsibility of keeping everyone (including the staff) awake.

Two months later, an interesting set of differences was found. The soldiers of Company A were dispirited and performing very poorly. The Commander had reverted to his old, impersonal style of leadership, and the soldiers appeared disappointed by his return to the old style. Company Z's performance was more or less the same as it was before the experiment. Achievement was not affected, and morale was as high as it had ever been.

**Canadian Research on Electrophysiological Concomitants of Sleep Loss.** A very different, but complementary, study on the effects of sleep deprivation was presented by Dr. R. A. Pigeau of the Canadian Forces. In this research, 16 male volunteers from the Canadian Forces were studied individually over 80 hours. Their EEG activity was monitored continuously over the test period, during which they performed a host of cognitive tasks, including tests of complex iterative subtraction (cf. Angus and Heselgrave, 1985) and logical reasoning (Bad-

deley, 1968). In addition, every hour subjects completed two self-report scales on drowsiness (Harris et al., 1971; Hoddes et al., 1973), and a measure of mood (Johnson and Naitoh, 1974). Subjects worked for 105 minutes continuously, and then were allowed a 15-minute rest period, after which the cycle was repeated.

From the electrophysiological data at hand, Pigeau constructed a drowsiness index that correlated very positively with task performance, subjective scales of mood and drowsiness, and cognitive performance. The precise details of the manner in which the index was conducted, along with a more fine-grained discussion of the complicated findings that were obtained may be found in the paper published by Pigeau, Heslegrave, and Angus (1987).

## Performance Under Fire

**Finnish Defense of the Karelian Isthmus, 1944.** Three IAMPS participants discussed research on the reactions of their country's fighting men under fire. One of these was an interesting presentation by Dr. Juhani Sinivu, of the Military Psychology Office of the Finnish Army, of a retrospective study of the morale and recollections of veterans of the Karelian Isthmus campaign (Summer, 1944), which pitted the Finnish Army against a massive Soviet invasion force. The Finns consider the Karelian campaign to be a "defensive victory," and the Soviets apparently agree with them. The Soviet objective in this campaign was both to remove Finland from the war, and to crush it militarily.

The Soviet attack involved nine divisions, against one and one-half Finnish divisions. The attack was supported by 400 tanks and strong air support, involving 170 bombers and an equal number of fighters. Despite the ferocity of the attack, the Finns resisted stoutly; in time, the sheer weight of numbers caused them to retreat to prepared positions. For the major force of Finnish soldiers, the retreat was orderly, and morale was exceptionally high. In light of the desperate military situation in which they found themselves, the question becomes, "Why was morale so high?" In the study presented by Sinivu, veterans of the Karelian Isthmus campaign were solicited to choose from a preset list the most important reasons for the high morale of the Finnish fighters. The results of this study are based on the responses of 2002 veterans, some 2 percent of the surviving soldiers.

At least 60 percent of the sample stated that the following factors influenced their combat morale during the Soviet invasion:

- Obeying orders
- Fear of occupation of their country
- Desire to maintain the trust of their peers
- New weapons (especially, anti-tank weapons).

When these four central motives were cross-tabulated with the other possibilities offered to the respondents, some very interesting relationships were found. For example, those who considered "obeying orders" a central

motivating factor also reported significantly more often than others that they gained morale from the facts that (1) they had become accustomed to new enemy weapons, and (2) they had survived the initial surprise attack.

Those who listed fear of enemy occupation as a central motivating force listed significantly more often than others (1) the desire to avoid unconditional surrender, and (2) trust in their government as central supports to their morale.

Those who found the need to maintain the trust of their peers to be preeminent also were influenced by (1) the fighting image of the Finnish leaders, (2) the effects of their own new weapons, (3) the effects of their artillery, and (4) the success of their defensive campaign.

Some factors that are often seen to influence battlefield morale were reported to have had surprisingly little effect. The veterans reported that more stringent discipline, the fear of being labeled (or punished as) a deserter, and patriotic education and traditions had little significance in the face of enemy fire.

**Britain's Falklands Campaign.** A combat scene of more recent vintage was discussed by the Royal Navy's Surgeon Commander Rick Jolly, who was responsible for the battlefield evacuation and treatment of the onshore casualties during the brief but intense Falklands campaign. Jolly's discussion of the contingencies of day-to-day life (and death) of the combat surgeon in the war zone was enlightening, useful, and absorbing. A flavor of this presentation may be gained by reading his book (cf. Jolly, 1983), which paints a picture of the modern combat surgeon in vivid colors.

The significance of Jolly's presentation for psychologists is to be found in the stress laid on issues of morale, confidence, and trust in one's peers. Throughout his presentation, it became quite clear that officers and men engaged in the Falklands conflict had considerable trust in, and admiration for, one another. The troops were confident that, should they be wounded, they would be cared for. This was not an idle hope: only 3 of the 700 wounded men who entered Jolly's "surgery" could not be kept alive until evacuation to better medical facilities. This remarkable figure owes much to some hoary but rather unorthodox medical approaches: For example, deep wounds were not closed, but rather cleaned and left open, to lower the risks of infection; debridement, as this technique is called, has been practiced since the time of Napoleon, but still is not common even in battle settings, where its utility is obvious.

In another departure from form, each marine and paratrooper was given his own morphine syrette, and instructed on its use in case of injury, etc. In armies in which drug abuse is a problem, such a practice might cause trouble. Nonetheless, some of the unorthodox approaches employed by the British in the Falklands might well be emulated, or at a minimum, studied, by her friends and allies, and it is Jolly's clear motive to force such a consideration.

**The Austrian-UN Peacekeeping Force in Syria.** Austria maintains a battalion on the Golan Heights; the battalion mans 19 permanent observation positions, patrols the northern "area of separation" between Syria and Israel, and controls various checkpoints. Colonel Dr. Ernst Frise of the Austrian Ministry of Defence discussed the psychological situation of the Austrian troops who serve this UN-mandated "Disengagement Observer Force."

The Golan Heights, where the Austrian battalion patrols, has a continental climate (hot days, cold nights); from May to September there is very little rain. All year long there is a strong wind, which usually increases to storm during rain or snowfall (sometimes with wind speeds of 200 km per hour). As such, during winter, soldiers sometimes are forced to stay inside their positions for days at a time. During winter, continuous snow cover can be expected. The Austrian patrol area was the scene of heavy fighting in 1973; much of the terrain is impassable because of the probable presence of land mines, and sometimes even cleared areas become "reinfected" when mines are carried by melting snow or rain into previously secured areas.

The majority of Austrian soldiers serving the UN mission are reservists, whose tour lasts a minimum of 8 months. There are essentially two different types of billet in this assignment: soldiers may find themselves in the main camp, where the personnel in command and staff functions are located, or in the isolated observation positions. Obviously, the camp positions are a good deal more comfortable, but they are also less prestigious than service in the observation positions. It is the observation positions that hold the greatest promise for psychological disruption, for there life is more difficult, often boring, and confined. In attempting to discover possible determinants of problems in the observation posts, Frise surveyed the soldiers before they went to the Golan, to assess the reality of their expectations concerning their mission.

The central reasons for volunteering for duty in the Golan are:

- Spirit of adventure
- To earn money
- To tide over a period of unemployment
- To broaden one's experience
- To work for peace
- And, for regular soldiers, to see action.

Some of these expectations are patently unrealistic, and this can lead to problems. Frise observed that under conditions of strongly disconfirmed expectations, difficulties that might have been dormant can rise to the surface. One of the most common of the presenting symptoms of the admittedly few soldiers who have problems in the Austrian battalion is self-imposed isolation. Soldiers experiencing severe problems of home sickness, boredom, lack of privacy, etc., will isolate themselves from their peers.

**Selection.** Before the volunteer is accepted into the UN force, he is tested on the following: intelligence, ability to resist various forms of stress, ability to integrate socially, and accuracy and concentration. The testing session lasts 24 hours, and is conducted by professional psychologists. Before being sent into the field, the soldier receives ample, and realistic, information about his duties and the general conditions he will experience. The realistic description of duties and conditions has attenuated the already low incidence of adjustment difficulties found in previous groups of Austrian volunteers.

As a final note, Frise suggested that an interesting study would seek to relate motives for volunteering with variations in success of adjustment. This study would have some very interesting potential applications, well beyond the Austrian Golan battalion, and it is my hope that a future IAMPS meeting will be privy to the results of such a study.

## **Treating Psychological Problems in Military Settings**

Despite the care taken in selecting the right military personnel and in assuring the quality of the training they receive, there still occur situations which are beyond the psychological tolerance of the soldier. Examples of such problems have been a part of the literature of military psychology since the first discussion of combat fatigue. Recent emphasis on the treatment of post-traumatic stress also bears witness to the impossibility of insulating all soldiers and sailors from extended battle pressures. Two of the papers presented at IAMPS this year deal with aspects of the treatment problem. They are not concerned with clinical treatment, per se, but with the application of psychological knowledge to military problems.

### **The Turkish Troop Questionnaire**

In his presentation, Dr. Teoman Sohmen of the Gulhane Military Medical Academy in Ankara, Turkey, discussed the use of a standardized questionnaire to gather data from company commanders about the psychological status of their problematic soldiers. The approach employed is as follows: when a soldier becomes psychologically ill, he is sent to a hospital. Part of his baggage is a form completed by his commander, which is forwarded to the psychiatric section responsible for the soldier. The form is meant to assist the psychiatrist understand the conditions surrounding the patient's problem. Sohmen described the nature of the form, and its use.

The Troop Questionnaire, as it is called, is focused on five general areas:

- The soldier's attitudes toward friends and superiors
- His motivation for work
- His level of responsibility with respect to drugs, drinking, supporting his family, and previous disciplinary problems



- Any obvious thinking disorders (e.g., delusions, paranoid suspicions, obsessions, phobias, etc.), including information on previous psychiatric hospitalization
- And finally, the question, can the soldier perform effectively in the military.

In 1986, 256 men (of 800,000 soldiers on duty) were referred. The general diagnostic groups into which these men fell are disclosed in Table 7. In his presentation, Sohmen discussed the analyses by which these diagnostic classifications were cross-tabulated with the commanders' responses to the five central issues tapped in the Troop Questionnaire. In general, the findings are as may be expected on the basis of an understanding of the nature of these three general classifications. The specifics of these cross-tabulations may be obtained from him. For purposes of this report, it is sufficient to state that the questionnaire did appear to facilitate clinical treatment, although there were some remarkable areas of disagreement between the (laymen) commanders' diagnosis and that provided by the psychiatrists.

**Table 7. Diagnostic groups of Turkish military referrals.**

Clinical Diagnosis	%	N
Antisocial Personality	39.8	102
Neurotic	40.6	104
Psychotic	19.5	50

For example, the great majority of soldiers referred psychiatically by the commanding officers were considered by the commanders to be unfit for duty (question 5 of the Troop Questionnaire). Their views were not completely shared by the knowledgeable psychiatric cadre, as shown in Table 8. Clearly, the greatest divergence of opinion regarding fitness for duty lies in the category of men classified as neurotic. Clinicians judged approximately 75 percent of this group to be capable of serving in a military capacity, while the men's commanding officers felt that an equally high percentage should be dismissed.

The data of Table 8 suggest that the commanders do not distinguish between the various clinical categories when deciding about fitness. The result further suggests that men in any of these categories provoke difficulties for the commander, who probably is happier to see them gone. The disagreement, however, should not obviate the clear utility of the Troop Questionnaire as an instrument for assisting the classification and treatment of soldiers who succumb to mental illness.

**Table 8. Commanders' and psychiatrists' views regarding percentage of classified patients who are unfit for duty.**

Clinical Diagnosis	Commander	Psychiatrists	Agreement
Antisocial Personality	82	68	82
Neurotic	77	23	30
Psychotic	92	84	91

## Psychological First-Aid in Italian Units

Organizational problems occur in the military, just as they do in any other complex organization. In some situations, however, there is no established method or group that is responsible for ameliorating such problems. According to Admiral Massimiliano Stracca of the Italian Navy, such is the case in Italy. As such, organizational problems of a psychological nature must be approached on an ad hoc, case-by-case basis. In his presentation, Stracca discussed two situations in which the application of techniques common in organizational psychology proved extremely effective; by implication, he argued for the establishment of a permanent organizational psychology "first-aid" corps to monitor problems and facilitate their solution.

The first case involved difficulties occurring in two recruitment centers, manned by NCO's and reserve officers, and responsible for the recruitment and initial screening of young men on their way to basic training. Not only was the morale of the staff at rock bottom, but the job was not being performed effectively. The reserve officers and NCO's working in the center did not feel justified in giving orders ("I am not able to manage men," "I am only a reservist," "It is absurd to give orders").

In dealing with this problem, Stracca was faced with two major problems: first, he had only a very short period of time to deal with it (3 days!), and the number of men involved was high (40). Two possibilities presented themselves: he could use the standard intervention, where lectures and seminars on leadership, etc., were presented to the probably unreceptive audience; or he could involve the men in a role-playing situation in which they could become actively involved in the problem, as well as hear about it from the strangers sent by headquarters.

He chose the second option by adopting a technique employed typically in the training of physicians, which was developed to foster greater sensitivity to the emotional needs of their patients. The group of 40 recruitment specialists was divided in half. One group (the inner circle) discussed with a group leader the problems that plagued the recruitment center. The other group was arranged outside the inner circle, and merely observed the proceedings. Halfway through the exercise, the roles were reversed. After two sessions of this type, group members wrote their impressions of the problems that they confronted in their work. These impressions were integrated by members of Stracca's team, who used them as a basis for the more traditional lecture-seminar treatment.

Stracca argued that this approach had a number of positive features. First, the group discussion reassured the group members that the intentions of the "outsiders" were constructive. Second, it insured that the appropriate problems — what really was bothering the recruiters — were identified. Finally, it assured the solutions that were suggested were reasonable, and likely to be accepted and put into practice.



A second intervention was conducted in a Navy special unit, with similar positive results. In this situation, the young junior officers found they had great difficulties giving orders to the older and vastly more experienced NCO's, who probably had been part of the units while the officers were still in knee pants. As before, the group was split into two, actors and observers, and the problem hashed-out. Roles were reversed, observations gathered, and solutions offered. As in the recruitment center, the technique had a very positive outcome, for both officers and NCO's.

The examples provided by Stracca make a very strong case for establishing of a group devoted to the handling of organizational problems of the type outlined here. Solutions to difficulties of this type are the stuff of which organizational and group psychology are made. The technology is well developed, and works. To depend upon ad hoc attempts by those involved in the crisis to solve it – when, in fact, it was probably they who created it – is not always completely sensible. It is my hope that the lessons imparted in Stracca's presentation will influence military psychological practice not only in the Italian Navy, but in other military organizations as well.

## **Military-Organizational Psychology: Role and Function**

### **The Organization of the Psychological Services**

**Behavioral research policy in the Netherlands.** As Admiral Stracca demonstrated, social and behavioral research can be undertaken in the military even in the absence of an organization formally charged with the responsibility for research. It is no secret, however, that the existence of a research body that is formally a part of the military establishment can, in most instances, appreciably enhance the quality and the quantity of the social research that is undertaken.

In his presentation, Dr. Harry A. M. Veeren of the Netherlands' Ministry of Defense discussed the institutional structure within which social research is organized in the Dutch military. He began with an observation that might be made of almost all military organizations, "...research and development policy in the Ministry of Defense has traditionally been highly oriented towards projects in the materiel sphere." The importance of hardware in the military is undeniable, but it is equally clear that the quality and effectiveness of the military's "human resources" also are crucial. As has been demonstrated time after time, the people who use the hardware are at least as important a part of the effectiveness equation as the hardware itself. No matter how sophisticated a radar set-up, for example, its information is useless if it cannot be interpreted correctly or, to put it another way, if boundaries on the limits of human cognition and performance are not acknowledged (e.g., is too much information being presented at once, is the operator given enough

time to digest the wealth of available data, are preestablished response contingencies in place in the case of conflicting data, etc.). Yet, current funding practices, not only in the Netherlands but in most other countries as well, would seem to belie this fundamental truth.

The Dutch are attempting to come to grips with the funding imbalance not by throwing money at the behavioral sciences, but organizationally, by locating their behavioral research group in the defense establishment in such a way that it is visible, and thus available in circumstances that call for its expertise. The plan discussed at this year's IAMPS is that the responsibility for behavioral research be placed in the Research and Development (R&D) Directorate to facilitate the more rapid adoption of such research into military planning and practice.

While the particular organizational structure in which the behavioral scientists will be embedded will vary from one defense establishment to another, Veeren's conclusions bear close consideration:

1. Behavioral science research is a complex affair. It takes place within and outside of Defense, it involves laboratory and field research, and is aimed at acquiring knowledge, providing advice for policy purposes, and military training.

2. Experience has taught that the present policy bodies, because of their technological orientation, have only a limited grasp of the developments in behavioral science research. Experience also has taught that a representative in a coordinating body is in itself inadequate for achieving a comprehensive behavioral science research policy.

3. The modeling of behavioral research policy (to MOD policy) may lead to:

- A bigger demand for behavioral science research to support policy within Defense
- An increase in behavioral sciences research carried out by ...external institutes
- A bigger claim on the national science budget.

4. Prerequisite for the successful development of a behavioral science research policy is a policy body which is clearly identifiable to all those involved.

**Behavioral science in the Royal Australian Navy (RAN).** Veeren's blueprints for a behavioral science directorate, its costs and advantages, were predicated on the existence of an established research capability. Its proper placement in the defense establishment, to maximize its utility at the lowest cost, was a central feature of his summary. In the case of the RAN, however, such advice would appear wildly anticipatory. Put most charitably, one gathered from Dr. Allen Twomey, of the Australian Department of Defense (Navy), that little if any research capability existed in his organization, hence, worry about its proper placement to enhance its impact on defense policy was, at best, premature.

In the discussion of the development of a research capability in the RAN psychology directorate, which Twomey tellingly titled "Almost from Scratch," we

learned that although it has been in existence since 1949, for many years only one psychologist has been employed in full-time research. This is not nothing, but it is close to nothing. As a consequence, the directorate cannot possibly have built up the bona fides necessary to ensure a reasonable reaction in response to requests for funding, additional personnel, etc. Nonetheless, Twomey's discussion was valuable because it showed how one can begin to establish a psychological research foothold in a military organization that in the past has shown little concern for psychology.

The first order of business was to establish priorities of the psychology directorate. In part, these priorities were dictated by the conflicting demands placed upon them by RAN recruiters and RAN trainers. Recruiters were impatient with the entry standards imposed by the directorate, which made recruitment difficult, while trainers found the standards too low, allowing too many "untrainables" into their classrooms. Accordingly, the directorate settled upon the following objectives:

- Develop a capacity to monitor selection test validity against course results for all categories of employment
- Conduct routine norming of selection tests
- Improve quality of information provided management, especially with respect to monitoring and reducing attrition
- Determine literacy and numeracy requirements for specific training schools and tasks
- Assist training schools.

These are reasonable plans, and will undoubtedly enhance the perceived necessity of the psychology directorate. Of course, the plans must be translated into reality, and given the dismal starting point of the group (e.g., as yet, they haven't a single computer available for their exclusive use), it is not a foregone conclusion that the objectives will be met. If they do not, it will not be psychology that suffers, but the RAN.

### **Work Psychology in the Swedish Defense Research Department**

Two studies applying principles of organizational psychology were discussed by the Swedish representatives to IAMPS, Drs. Lars Fredholm and Alise Weibull. Both of these contributions give clear examples of the utility of translating research from the organizational laboratory to the military setting.

**Work and attrition.** Weibull was concerned with the application of work psychology to the problem of attrition in the Swedish Air Force. As with the air arm of many other countries, Sweden finds itself in competition with private industry for the fliers and air mechanics it has trained. Oftentimes, the competition is lost. The standard solutions to the problem typically involve throwing money at any airman who reenlists after his tour of duty expires. Solutions of this type are not notably successful. What, then, are the alternatives.

To answer this question, Weibull suggests we search for the real problem. If money is not the root cause

underlying airmen's leaving the service, then it stands to reason that pay enhancements and bonuses will not solve the attrition problem. To understand the problem, Weibull did not assume the cause, but rather started with the fundamental question, "What makes a good job." There is considerable basic research on this issue, but from the perspective of many attempts to stem the flow of attrition, this literature did not exist. West German work on "qualification theory," has specified three central dimensions of a "good job," — qualification, cooperation, and security. The following listing explicates these dimensions in detail.

#### **Characteristics of a Good Job:**

- Qualification
- Use of professional skills
- Opportunity to take initiative
- Learn more
- Broaden the competence for action
- Cooperation
- Provides intellectual exchange
- Opportunity for contact with others
- Social support
- Security
- Physical
- Material
- Emotional.

As can be seen from the work of the West Germans, material security represents only a small piece of the puzzle. By focusing on this feature, and perhaps one or two others in the attempt to attenuate attrition, we are ignoring a host of other equally critical motives which, in fact, may lie at the heart of the problem. In Weibull's research, one of the obvious problems was the very limited amount of flying time that each pilot was allotted. Such a limitation puts stress on at least two, and possibly all three of the central characteristics of a good job, by threatening the pilot's qualification (i.e., his ability to hone his professional skills, to learn more, broaden his competence for action), potentially lessening cooperation (by inducing competition for flying time or slots), and lowers security by impacting negatively on the pilot's flying skills. Solutions based on these insights almost certainly cannot but prove more successful than past attempts to stem the flow of attrition through financial bribes.

**Training tactics.** Fredholm's work was concerned with a very different issue, namely, research on training in tactics and operations, but the emphasis on translation of fundamental psychological research into the real world of the military also characterized his work. At the center of this presentation was the analysis of tactics and tactical training. To train tactics in military or other organizations (Fredholm's work was mostly concentrated on fire fighting and rescue tactics), one needs first to understand the nature of the problems that are likely to be encountered. Problems can vary along a dimension of structure, from completely open, chaotic situations, to relatively closed, structured problems. Variations in the structural features call for different forms of response.

In open, or chaotic, situations, the first order of business is to analyze the situation, ("Structure the reality," in Fredholm's phrasing), then decide what are the goals to be attained, and finally, determine the tasks that must be undertaken to realize the goals. In closed or ordered situations, the setting is largely predefined, and oftentimes defines the aim and the tasks to realize it.

A central task of the commander is to determine whether the real situation is open, closed, or both. If training in tactics is valid, it should provide such capability. And, it should also provide the capacity to operate in either type of setting, if there is a need for competence in both. In Fredholm's opinion,

"If you look at military thinking, it seems as if commanders of operations and of large combat units deal with open problems. They formulate missions for the commanders of the smaller combat units. Those missions are more like closed problems. Most tactical training seems to be directed to train commanders of small combat units to carry out [closed] missions. Two questions can be formulated from this...To what extent is the training for commanders of operations and large combat units directed towards handling open problems. Should the tactical training for commanders for small combat units contain more open problems."

Training in tactics varies from one military establishment to another. Doctrinal differences are sometimes obvious even within the same defense departments. These differences can and do make for variations in tactical training. The advantage of Fredholm's perspective is that it operates at a more fundamental level, providing a framework within which problems of any type might be conceptualized, and allowing for the possibility of a common language through which military tacticians might talk with one another.

### **Total Force Military Occupational Structure (MOS)**

How does one manage an organization as large as the Canadian military? In answer to this question, Major J. McMenemy presented a proposal that, like the previous work, takes advantage of recent developments in organization psychology to argue for a radical restructuring of the Canadian Forces (CF). In the CF today there is strong emphasis on the total force concept; as such, there is now, more than ever, a great need to compare regular force, reserves, and mobilization force occupation specifications, to assess more accurately the duties and tasks that such personnel will be expected to perform.

A new job format for occupational specifications has been developed to meet this need, the central features of which include the following:

- Four qualification levels (apprentice, journeyman, supervisor, manager) for the regular forces (vs. the eight levels that previously existed for NCO's)
- Explicitly stated knowledge and skill requirements for each qualification level

- Regular, reserve, and mobilization military occupations are now to be defined according to the same standards
- The display of all MOS, for all occupations, in one document and in one format
- A format that is amenable to automation
- The opportunity for more effective use of available occupational analysis data to reduce the requirement of training to interpret the occupation specifications.

Such an approach will put all CF personnel on the same footing, organizationally. It should have a very positive impact on the organizational efficiency of the CF, and thereby add to its effectiveness and efficiency.

### **Assessment Center for Combat Arms Officers**

The final paper to be discussed was presented by Captain S.A.T. Evers of CFPARU. In his talk, Evers reviewed the outcome of a validation study of an assessment center approach in the selection of combat arms officers. The assessment center approach consisted of an officer-candidate's interview and file-review by a board of senior officers, a practical leadership assessment by his junior and warrant officers, and a series of tests by personnel selection specialists.

More specifically, the following procedures were followed in the development and testing of the assessment center approach. Initial screening of the officer involves a test of general learning ability. In addition, at the time of the test, two recruiting officers rate the candidate's overall "military potential."

Passing these tests, the candidate moves to the interview, where the following measures (with weighting factors in parentheses) are combined to form his or her "merit score":

- Practical leadership (30%)
- Semistructured blind interview (25%)
- Conducting officer's assessment (15%)
- File review (10%)
- Two leaderless group discussions (5% each)
- In-basket exercise (10%).

The experimental measures included Fiedler's contingency scales (most-preferred and least-preferred co-worker); a mental workload test; expectations questionnaires that assess candidates knowledge of the life of the combat arms officer; peer ratings; a lecture, in which candidates present a brief speech on a subject of their choice; and the conducting officer's assessment of motivation.

The experimental measures, and the merit score measures, were used independently to predict success in the Basic Officer Training Course and in Military Occupation Training which followed. Reliability of the predictive measures varied, of course, but in general was adequate. Validity of prediction was another matter. For the basic officers training course, a validity coefficient of 0.23 was obtained between merit score and performance; the most predictive components of the merit score

measure were the file review, the interview, and the conducting officer's assessment.

For military occupation training, only the interview and file review were related significantly to performance. Merit score did not predict performance in this circumstance.

Study of the validity of the experimental measures presents a mixed picture. Almost all the tests were significantly related to basic officer training performance. However, while significant, the measures accounted for little variance. Although far from overwhelming, it is clear that the data are sufficiently close to being useful to argue for an extension and replication of the assessment center approach. It is to be hoped that the future will witness a more refined and more predictive mechanism in place in the CF. Eyers' discussion of the results of this study suggest that this improvement in predictive validity is highly likely.

## Conclusion of the Conference

At the close of this year's IAMPS, an open meeting was held to determine next year's host. Contrary to the usual situation, in which one (and only one) country appears ready to host the forthcoming meeting, it was clear over the week-long course of meetings that a number of countries were prepared to host IAMPS in their country in 1989, its 25th anniversary. However, by the last day, an informal consensus seemed to have developed, and when bids for the conference were solicited, only Dr. Francoise Stoll, of Switzerland, raised his hand in offer. He proposed that IAMPS meet in the town of Spiez, Switzerland, next year, from the first to the fifth of May. Dr. Stoll's offer of site (and hospitality) in Switzerland was accepted by acclamation. I anticipate a useful, interesting, and pleasant IAMPS in the beautiful Swiss countryside, and wish that I were able to attend the meetings.

However, since this document marks my last IAMPS summary (I am returning to my position as professor of psychology at Texas A&M University), I hope that I might be permitted a personal comment on the proceedings of the last three IAMPS, of which I have been privileged to attend. The field of military psychology is not very large. Indeed, it is probably not much of an exaggeration to see it is a semi-exclusive club, where most of the members know one another, or at least know of one another's work. This is important, because diffusion of information does not always occur in journals, especially when the research is at least potentially proprietary. The information exchanged at IAMPS is truly valuable. The presentations are almost invariably first rate, and the attention of the

audience is noteworthy. IAMPS is the only conference of its type I have ever attended in which the absentee rate from meetings is almost nonexistent.

But the relationships that are created, or grow, at IAMPS strike me as equally important. In this line of research, such relationships are invaluable, and to me, the IAMPS format provides an ideal medium for their culture. I have been immensely impressed with the quality and dedication of the IAMPS participants I have met over the past 3 years, and can only hope that this wonderful tradition of science and positive interpersonal relationships continues to characterize this organization in the coming years.

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