

THE RELATIONSHIP BETWEEN
JOB PERFORMANCE AND VOLUNTARY TURNOVER
IN THE CANADIAN FORCES

BY

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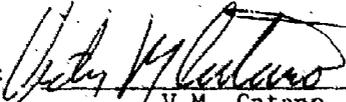
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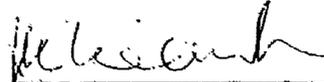
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for the Degree of Master of Applied Science
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Abstract

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25 January 1988

The primary objective of this study is to examine the direct relationship between job performance and voluntary turnover in the Canadian Forces (CF). Principle Components Analysis using a sample of 10,422 Officers uncovered intellect, operational job performance, professionalism and physical fitness and appearance as performance factors. Categorized by four equal interval performance levels, one-way analyses of variance showed a significant negative linear relationship between Operational Job Performance and voluntary turnover. A significant positive linear trend exists between Intellect performance and voluntary turnover. Finally, significant negative linear and quadratic trends exist between Professionalism and voluntary turnover where the highest proportions of voluntary turnover are in the extreme performance intervals. No significant relationships with turnover appear for the Physical Fitness and Appearance performance factor. A sample of 24,213 Non Commissioned Member personnel was subject to the same procedures, however, findings were non-significant. The conclusions are: (1) proportions of Officers who voluntarily leave vary significantly as a function of their level of performance; (2) the importance of the factor and direction of the relationship varies as a function of the type of performance observed

and the type of occupational group studied; (3) the findings suggest that the majority of officer leavers can be described as, poor operational job performers, good intellectual performers, and poor professionals; and, (4) in general, because of the importance of the Operational Performance as a measure of military performance, voluntary turnover is interpreted as having an overall positive impact on the organizational effectiveness.

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My family gave up the most, so that I would have the time to carry out this study. Therefore, it is with great pleasure that I dedicate this work to my wife Lela and my children Elspeth and Colin. I thank you for your love and support.

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INTRODUCTION

Purpose

The Canadian Forces (CF) is in the process of developing an attrition monitoring program to assist senior leaders in personnel planning, program development, and policy making. The CF had determined that turnover was a complex process which involved a number of important variables that contributed to the decision to leave. One recurring factor that emerged in servicemembers' decisions to leave was job performance (Mendes & Lyon, 1984).

The purpose of this Thesis is to examine the relationship between job performance as measured by performance appraisal scores and voluntary turnover in the Canadian Forces (CF). Findings will determine the utility of using performance appraisal scores as a measure in the proposed CF attrition monitoring program.

Background

One of the most interesting challenges for personnel managers today is the problem of voluntary turnover. It is common for individuals to be hired and trained to perform highly complex tasks at great expense to the organization, only to find that they resign prior to management's expectations. For example, in 1981, high voluntary turnover or unscheduled attrition produced problems for the CF. In some occupations personnel were leaving in greater numbers than those recruited. The Assistant Deputy Minister (Personnel) [ADM(Per)] Group

Instruction 6/81 made a statement which related the importance of the issue.

"Voluntary attrition is one of the most significant problems facing the CF today. Every year millions of dollars in recruiting and training costs are wasted because members decide to leave the service prior to their compulsory retirement age. In years to come the problem will become even worse as the anticipated shrinkage in the recruiting pool makes it increasingly difficult to replace members who leave."

It became clear from the onset that the military had no systematic way of identifying the causes of turnover. Prior to 1981, methods for obtaining information on CF turnover had certain limitations which included: reliance on anecdotal information to interpret attrition patterns; policy decisions were inferred from categorical attrition rates; no focal point for attrition monitoring; and, no ongoing program for describing leavers and systematically determining the factors that influence members' requests for voluntary release from the CF (Lyon, 1987).

The concern and long standing need for turnover information resulted in the establishment of an attrition monitoring and analysis cell within the CF personnel management system. Their responsibilities were divided into monitoring turnover rates to produce regular reports of collected data, and providing evaluative interpretations of that data.

The CF Personnel Applied Research Unit (CFPARU) was tasked by CF personnel management to investigate why individuals leave the CF. This involved identifying strategies for addressing attrition related

problems under varying manning conditions, and developing and implementing a monitoring program which would provide turnover information from the leaver. The project was designed to include three phases. The first phase emphasized the development of a basic conceptual framework, preparation of an attrition questionnaire, and its pre-test administration.

In phase two, the questionnaire was revised based on the pre-test results and the administration of a general survey on attrition/retention in the CF. Finally in phase three, based on the results of the general CF survey and related research in other allied countries, the development and implementation of an attrition information questionnaire to provide continuous information on the reasons for unscheduled voluntary attrition. The first two phases were completed in 1984 and a proposal for the third phase was submitted in 1986.

The results of the phase one research produced a conceptual model based on job expectations, attitudes, and intention to leave. This model identified some of the most relevant individual, organizational, and extraorganizational characteristics that are associated with the formation of job attitudes. Examples of these are:

individual characteristics (e.g., age, gender, education, language, and other characteristics the individual brings with him/her into the organization);

organizational characteristics (e.g., military occupation group (MOC), element (land, sea, air), rank (Captain), posting (moves), promotions (based on merit, performance appraisal), and other characteristics that the organization ascribes to its members); and,

extraorganizational factors (e.g., marital status, accommodation, dual career, and other external factors that potentially impact on the individual and the organization).

These characteristics and factors were considered to have an impact on the cognitive process by which individuals formulate attitudes towards working conditions, advancement opportunities, pay and benefits, co-workers, and supervisors (Fournier & Keates, 1975). The attitudes were thought to be influenced, in part by family considerations and other support factors (Salas, 1985). As a result, attitudes may lead to a formulation of an intention to stay or to leave the CF which, in the case of a leave intention, may lead to alternative job search patterns both within (e.g., change military occupation) and outside the military. If the alternative job opportunities were sought outside of the CF, current economic conditions could play an important role. Once the individual was aware of the alternatives available and had formulated some perceptions and expectations about current employment and the alternatives, he/she subsequently would decide whether to leave or remain in the CF (Lissak & Mendes, 1982; Mendes, 1983; and Mendes & Lyon, 1984).

In phase one, a questionnaire was developed and administered to serving members (stayers) and those in the process of voluntarily leaving (leavers) in a preliminary test of the CF Attrition Model. Results indicated that intentions to leave the CF were determined by three major factors: an individual's general attitude toward the CF;

the support s/he received from friends and peers in making the decision to leave; and, the availability of alternative employment outside the CF. The most important factor was the individual's attitude toward the CF (i.e., those who were dissatisfied with the CF were most likely to request release. Lissak & Mendes, 1982; Mendes, 1983). This led to an interest in determining which organizational systems would have an impact on attitudes and the subsequent leave decision.

In early 1983 phase two began with the administration of a revised questionnaire to a representative CF sample. From this phase, seven factors associated with a leave (i.e., in the case of leavers) or potential leave (i.e., in the case of stayers) decision were identified (Mendes & Lyon, 1984):

Postings: (1) undesirable postings; (2) posting without promotion; and (3) posting not requested.

Advancement Opportunities: (1) lack of opportunities for advancement; (2) unfair promotion policies (quota system); (3) unfair promotion system (performance appraisal); and (4) promotion unavailability.

Pay: (1) inadequate income; and (2) pay lower in the military compared to civilian equivalent.

Nature of the Work: (1) lack of a clear idea of the work requirements; (2) lack of skills needed to accomplish the task; (3) employment out of MOC; and, (4) underemployment within MOC.

Benefits: (1) lack of compensation incentives; (2) unsatisfactory fringe benefits; (3) inadequate pension plan; and (4) problematic accommodation.

CF Lifestyle: (1) negative peer and/or family support; (2) non-acceptance of CF rules and regulations; (3) lost pride in the uniform; and (4) military not perceived as a career.

Military Occupation Recognition: (1) not learning new skills; (2) lack of feeling of belongingness to one's MOC; (3) civilian non-recognition of MOC; and (4) concern about the usability of MOC skills.

Data from The second administration of the questionnaire confirmed the importance of management functions as an important issue in the turnover process. More specifically, individuals' perceptions of leaving are related to change or lack of change which may be dictated to the member by the CF management system (e.g., the type of work, postings, training, promotions, etc.). One of the CF management processes mentioned by both stayers and leavers was performance appraisal.

Performance appraisal is an important Canadian Forces (CF) personnel management function. As part of the CF Personnel Management Information System (PMIS), performance appraisal provides information which may be used to validate selection procedures, forecast training requirements, identify candidates for promotion, and formulate posting plans. Performance appraisal can, therefore, have considerable influence upon the effective functioning of the CF.

The CF performance appraisal process (Personnel Evaluation and Reporting-PER) also provides supervisors with information that directly contributes to the efficient development of subordinates. For example, feedback provided to a subordinate during regular

performance guidance and periodic performance reviews, can mold the future behaviour of CF personnel. Therefore, the nature of the feedback from performance appraisal could have an effect on an individual's attitude toward the CF.

Since the performance appraisal is the vehicle by which some important career decisions are made, it is important to examine its relationship with turnover. Performance appraisal scores provide feedback on a variety of factors about one's work. The CF criteria for these scores can range through a variety of individual, organizational and extraorganizational issues (e.g., officers' appraisals of job knowledge, intelligence, professionalism, fitness, and appearance (Saudino, 1981).

The nature of the performance feedback, whether positive or negative is one of many factors which helps formulate rateses' perceptions and expectations about work. These perceptions and expectations help formulate attitudes and job satisfaction levels (Mowday, 1982). Subsequently, the levels of satisfaction and attraction influence both the individual's intention to search for alternative employment as well as the intention to leave the current job (Mobley, 1979). Since performance appraisal had the potential of being an important turnover issue it required closer examination to determine its utility as a measure as part of the proposed CF attrition monitoring program.

The initial step in this investigation was to review previous research to clarify how performance appraisal fits into the turnover

conceptual framework and to review studies which may assist in the development of the focus of this thesis.

Literature Review

The study of employee turnover is a major research area in industrial/organizational psychology. Driven by industries' concern about the costs related to loss and replacement of personnel, many studies have been conducted. A large number of variables have been examined necessitating a general overview to determine if performance is a relevant issue and where it fits into the turnover process. Many findings support the CF research and provide direction with regard to the study of the relationship between performance and turnover.

Job Satisfaction. Early reviews of the employee turnover literature concentrated on the relationship between job satisfaction and turnover. Brayfield and Crockett (1955) concluded that most of the studies up to that time had serious methodological problems due to their failure to obtain reliable and valid independent measures. During those early days, methodological problems were not uncommon when complex research issues were addressed (i.e., poor sampling, confounded variables, etc.). What was interesting to note was that they recognized the requirement for a theoretically based model to understand the attrition process.

March & Simon (1958) proposed the first model of the turnover process. The foundations of the theory came from the Barnard (1938) understanding that "increases in the balance of inducement utilities

over contributing utilities decrease the propensity of the individual participant to leave the organization, whereas decreases in the balance have the opposite effect." For example, an individual would weigh the benefits offered by his/her current job such as salary, promotion opportunities, supervisors, working conditions, geographic location, and performance, against those benefits in other organizations. If the balance was equal or weighted in favour of the current employment, then the individual was more likely to stay. While in contrast, if the balance was in favour of job alternatives then the person may be prone to leaving. This relationship between inducements and contributions balance was adapted to the model as two factors; the perceived desirability of leaving; and the perceived ease of movement from the organization.

The perceived desirability of movement was thought to be influenced by the individual's level of job satisfaction plus the perceived possibility of interorganizational transfer. The primary component that influenced the desirability to leave was the individuals conceptualization and perception of employee satisfaction with the job.

From a second perspective, ease of movement was thought to be influenced by the number of perceived extraorganizational alternatives, which in turn may be influenced by the current state of the economy. This inducements/contributions model was the major theoretical advance that formed the foundation of current-day turnover theory. It would appear that this first turnover theory recognized

the importance of performance as a variable in the turnover decision. Based on this model, if performance was poor, and there were few opportunities for change or reward for the individual within the organization, alternative employment, if available outside the organization, may become attractive.

In 1964, Vroom examined seven turnover studies which supported the relationship between job dissatisfaction and turnover. The results suggested that the probability of someone voluntarily leaving was a function of the balance between the forces to remain and the forces to leave. "The main factor in the force to remain was assumed to be job satisfaction levels. The force to leave, on the other hand was thought to be influenced by the valence of outcomes that an individual cannot attain without leaving his or her present position and by the expectancy that these other outcomes can be attained elsewhere." A CF project in 1975 entitled "Why Do They Leave?" (Fournier & Keates, 1975) used Vroom's theory and indicated that the decision to leave the CF was a combination of two types of factors: "pull" factors which attracted the individual toward some new employment; and, "push" factors which moved the person out of his/her employment. Some of the reasons for attrition identified by leavers in this study were job performance and performance appraisal.

Up to this time, turnover research had a very limited view of the process. Even though a variety of variables were considered there remained a strong tendency to relate these independent measures with job satisfaction. Therefore, job satisfaction measures were intended

to account for an individual's decision to stay or leave. From a clinical psychology perspective, Lefkowitz (1971) generally supported the earlier work, demonstrating that the employee's initial job expectations concerning the nature of the job, job satisfaction, the physical work environment, financial compensation, intrinsic aspects of the job, supervisory style and work-group dynamics were all part of the turnover process.

In the late sixties the variables used to explain the turnover process expanded beyond job satisfaction. For example, a limited look at turnover by Schuh (1967) examined studies that predicted turnover using personality and vocational inventories and biographical information. The relationship between turnover and scores on intelligence, aptitude, or personality tests were not consistent; however, the scaled biographical information blanks and vocational interest inventories predicted some turnover accurately. It is interesting to note that in the process of performance appraisal the rater has the opportunity to include as part of the appraisal an assessment of both intelligence and aptitude. Given that poor performers would be characterized as being less intelligent and have poor aptitude it is possible that individuals who fall into this situation would become dissatisfied and leave. As well, those with high intelligence may experience dissatisfaction because of lack of challenge or little aptitude.

In addition to the psychological components of the turnover process models, Stoikov & Raimon (1968) investigated the role economic

factors played. The major finding from this study was that when business conditions were good, monetary rewards had a large effect on turnover. Mendes & Lyon (1984) supported the theory that economy plays an important role in leave decisions. Independent of performance, attitudes and satisfaction, the availability of alternatives during periods of high and low unemployment had a large effect on attrition rates. This suggested that any study of performance using attrition rates should be viewed in light of the economic conditions of the time.

Comprehensive Conceptual Models. Even though there was an increasing number of significant variables that contributed to the decision to leave, there was still a tendency for researchers to concentrate on job satisfaction issues. However, new directions were in the offing which linked other constructs to the satisfaction/turnover relationship. For example, Porter & Steers (1973) found consistent support for the notion that job satisfaction plays an important part in the employee's decision to participate in the organization. Job satisfaction level was seen as the sum or accumulation of the employee's met expectations on the job. For example, the level of individual satisfaction was seen to increase as a function of the increase in met job expectations. Viewed in this fashion, the organizational influences on turnover such as pay and promotion opportunities, the work environment including leadership/supervisor style, co-worker relations, the job itself or the nature of the work, and the individual characteristics of the

employee such as age and tenure were tied to job satisfaction and turnover.

This convergence of variables to job satisfaction and turnover identified the complexity of the employee turnover process by indicating many new facets. It was suggested that research should go beyond the correlates with turnover, and that efforts should focus on understanding the actual leave decision. In addition, it was suggested that some attention be directed to the role job performance plays in the turnover process.

A conceptual model was introduced by Mobley (1977) which looked at the intermediate linkages in the relationship between job satisfaction and employee turnover. Concentrating on the understanding of how satisfaction does or does not lead to turnover, Mobley introduced the concept that dissatisfaction leads to thinking of quitting, intention to search for a new job, intention to stay or leave, and finally actual turnover.

Mobley (1978) found that behavioral intent was related to actual turnover. Later he (Mobley, 1979) presented an expanded version of the turnover model where individual, organizational and economic factors were introduced. In addition, he concluded that the role expectations played in the turnover process was much more complex than previous theory had suggested. Performance appraisal is one of the formal methods through which employees discover the truth about their expectations. Therefore, the nature of the performance feedback (i.e., high, average or low scores) may lead to an intent to search

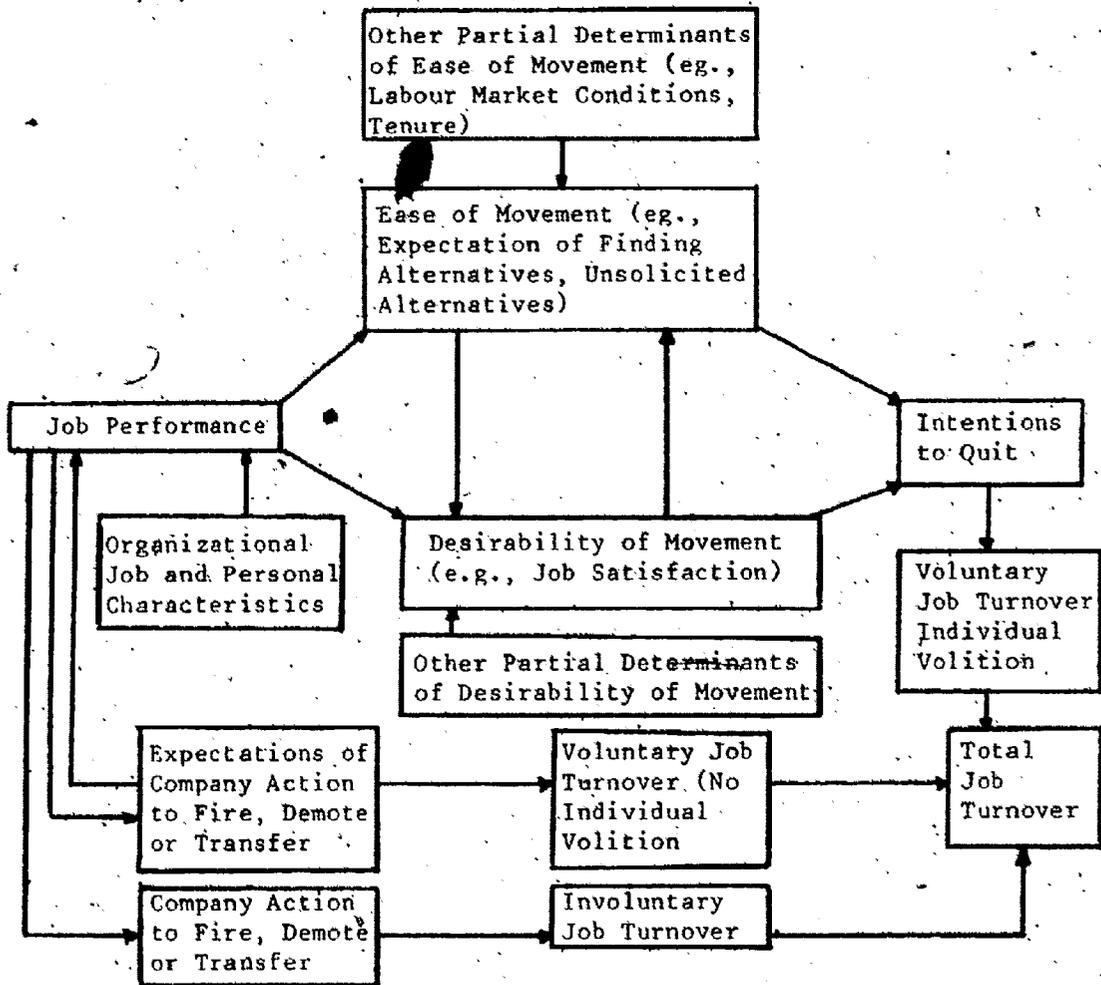
for alternative employment and a final leave decision.

CFPARU's, most recent involvement in attrition was an in-depth study of the attitudinal factors which contributed to the decision to leave, as well as reasons why servicemembers elect to continue serving. The study identified dissatisfaction with postings, pay, benefits, nature of the work, CF lifestyle, classification/trade recognition, and advancement opportunities as contributing to the decision to leave (Mendes & Lyon, 1984). Performance appraisal is the most important input in advancement opportunities in the CF. Therefore, it was selected as the measure of job performance in this study.

A large number of studies have examined many variables that contribute to the conceptual understanding of the turnover process. Evidence suggest that organizational variables such as performance appraisal are an important part of individuals' perceptions, expectations, attitudes, and satisfaction levels. Therefore, a measure of job performance may be an important variable to consider in an attrition monitoring system.

Job Performance And Turnover

Jackofsky (1984) proposed one theoretical approach that offers an explanation of how performance is related to voluntary turnover (see Figure 1). Job performance was conceptualized as a precondition, which appeared to be linked to voluntary turnover through its association with predictors that determined the ease and desirability



* E.F. Jackofsky 1984

Figure 1. Integration of Job Performance into the Process Model of Turnover

of movement for voluntary leavers. Job performance was also related to voluntary turnover through organization-recorded decisions to terminate, demote and transfer, as well as through more subtle forms of involuntary turnover.

The Jackofsky model has been supported in studies which show that job performance affects work attitudes which in turn can influence the desirability to leave. Specifically, Futrell and Parasuraman (1985) demonstrated this relationship where under certain organizational, extra-organizational, and personal conditions, performance as measured by assessments of work performed, and job satisfaction as measured by attitudes about work were found to be positively related and that the link to voluntary turnover was negative. For example, poor performers are less satisfied and have a higher turnover rate than good performers.

A second link between job performance and voluntary turnover in the model is how job performance influences the ease of movement from one job to another. Although ease of movement tends to be closely tied to economic conditions (Mendes & Lyon, 1984), a certain proportion can also be explained by job performance behavior. That is, the quality of past performance, experience and transferability of skills all affect the potential for an individual to change jobs. For example, as the performance level of an individual within an experienced high-demand skill group increases, the ease of making a move increases as well. This phenomenon is exemplified by Dreher's (1982) description of Allison's (1974) data from 2,248 social

scientists. Those social scientists who excelled in their particular discipline and were productive in publishing in scholarly journals had a higher propensity to leave. Given that these findings were taken from academic settings it may point to a specific relationship between performance and turnover using performance measures of intellect (i.e., number of publications). Seeking greater challenges and being in high demand may increase the propensity to leave.

There are also hidden situations that can influence the observed relationships between job performance and turnover. For example, unacceptable performance is one cause for an organization to dismiss an individual (involuntary turnover), but turnover due to poor performance may be recorded as voluntary. In other words, the actual threat, or perceived threat, of dismissal because of poor performance may cause individuals to leave on their own accord. In effect, this type of turnover is as involuntary as actual dismissal. This form of turnover may represent an agreement or pact, as suggested by Kraut (1975), which appears on official records as voluntary withdrawal. In these circumstances, moderating variables that may be expressed as reasons for leaving (e.g. lack of promotion) are considered suspect. However, presuming that a link between performance and voluntary turnover exists, some proportion of voluntary leavers who are identified as poor performers who may be threatened with dismissal may be given the opportunity to leave voluntarily in lieu of being fired.

Some researchers have studied performance as a variable that influences the association between a person's evaluation of the job

and the decision to leave that job. Jackofsky's conceptual understanding of the performance/turnover relationship provides the theoretical framework for this study. Very few studies have examined the relationship between job performance and turnover.

A negative relationship, where turnover increased as performance decreased, has been observed among such diverse groups as mail-order-house employees (Giese & Ruter, 1949), sewing machine operators (Lefkowitz & Katz, 1969), scientists and engineers in a pharmaceutical company (Farris, 1971), US Navy enlisted personnel (La Rocco, Pugh & Gunderson, 1977), electric company employees in Japan (Marsh & Manaari, 1977), nurses (Seybolt, Pavett, & Walker, 1978), bank tellers (Stumpf & Dawley, 1981), managerial, professional, and technical employees (Dreher, 1982), and; sales-people (Futrell & Parasuraman, 1985).

At the same time a positive relationship between performance and turnover has been found among scientists (Allison, 1974), non-union personnel employed by General Electric's Missile Space Division (Basset, 1967), and university employed social scientists (Greenhalgh & Jick, 1979 and Lazarsfeld & Thielens, 1958).

Finally, several studies have reported no relationship between job performance and turnover with scientists and engineers in an electronics firm (Farris, 1971), production workers (Leviatan, 1978), nurses (Martin, Price & Mueller, 1981 and Sheridan & Vredenburgh, 1979), and clerical workers (Bluedorn & Abelson, 1980). This review shows that the direct relationship between job performance and

turnover is neither strong nor consistent.

The question remains: What are some of the obvious differences in these studies which could account for the varying results? The most striking ones are (1) the nature of the samples; (2) the performance measures used; (3) the turnover measures used; and, (4) the economic conditions under which the turnover occurred.

One readily apparent contradiction in the literature findings may be attributed to the differences in the occupational groups examined. The positive relationship is prevalent in occupational groups where academic/intellectual skills are required; e.g., university employed social scientists (Greenhalgh & Jick, 1979), while the negative relationships are dominant in occupations demanding operational skills; e.g., US Navy enlisted personnel serving aboard ships at sea (La Rocco, Pugh and Gunderson, 1977). This points directly to the requirement for an attrition study to clearly define its sample in terms of occupation.

A second discrepancy in the literature is in the operational definition of job performance. For example, in some studies, objective measures were used, e.g., till balance error rates for bank tellers (Stumpf & Dawley, 1981); in others measures were less objective, e.g., overall ratings by supervisors (Greenhalgh & Jick, 1979) or ratings from performance appraisals (Martin, Price & Mueller, 1981; La Rocco, Pugh and Gunderson, 1977). In any case, performance is a very complex concept in its own right. This variability in the performance measures can be made clearer through careful definition of

the performance. To be able to compare different occupational groups it is necessary to identify performance measures that are common to all occupational groups and are specific in terms of measuring different aspects of their performance.

Definitions for voluntary turnover also vary throughout the literature. For example, in some cases separation rates are used (Mendes & Lyon, 1984); while in some other circumstances cohort survival rates are examined (Price, 1977). Each provides a completely different view of attrition/turnover. It is necessary to identify a turnover measure which is relevant to the understanding of attrition in the CF. Therefore, turnover groups must be well defined so that there will be no doubt as to the nature of turnover being examined.

Finally, specific statements about the nature of the economy at the time will be reported so that one will be able to understand the circumstances under which this turnover occurred. For example, during the 1979/80 timeframe there was relatively low unemployment in Canada (6-7%). At that time attrition from the CF was high (12%). In contrast, during 1984/85, there was a down-swing in the economy and unemployment rose to nearly 10%. A corresponding decrease (3-4%) in CF attrition rates occurred (Mendes & Lyon, 1984).

Summary

This review points to the requirement for a study which examines a wide variety of occupational groups where there are clear and consistent definitions for the performance and turnover

variables. A study of this nature should identify potential sources of discrepancy. This step is necessary before any attempt can be made to successfully integrate job performance as a variable in the CF attrition monitoring system. ✓

The CF offers an excellent opportunity for examining the performance/turnover relationship. Its wide range of identifiable occupational groups cannot be met anywhere else in Canada (e.g., technical, electronics, medical, pilots, administrators, clerical, etc.). Secondly, a common performance appraisal system is used which measures a variety of important aspects of job performance. Thirdly, the CF keeps excellent records with regard to attrition, with regard to both the number of leavers and the kind of leaver (e.g., compulsory/involuntary versus unscheduled/voluntary leavers). Finally, attrition information is available from large samples collected across time decreasing the potential for economic issues to influence the relationship between performance and turnover.

With the complexity of issues involved in the turnover process, it is difficult to isolate the effect solely accounted for by any performance measure. This is an exploratory study to determine the nature of the relationship between turnover and job performance. Therefore, all of the following outcomes of this study are possible.

Job performance and voluntary turnover could be positively related. That is, the higher the performance score, the greater likelihood of voluntary turnover. This may occur in occupational groups which demand high intellect performance. For example, the

direction suggested in this hypothesis could be moderated or enhanced by additional variables such as military occupation (MOC) (e.g., Operational vs Specialist) and Rank (e.g., Major vs Lieutenant).

In contrast, job performance could be negatively related to turnover. Some occupations where poor performance occurs could lead to high turnover. For example, soldiers who are not performing practical field skills well may find it particularly difficult to survive the combat training. These circumstances could lead to physical and mental discomfort, dissatisfaction, and a possible leave situation.

A curvilinear relationship may also describe two independent groups of individuals whose characteristics may influence the direction of the relationship between job performance and turnover. For example, among the more highly skilled and demanding occupational categories, that require more experienced and intellectual employees, only the better ones would be considered by other employers. Therefore, for these skill occupational groups a positive relationship would hold true. In contrast, the jobs that are unique to the organization, that train employees internally, are more likely to see poorer performers leave, because the good ones would not find rewards through change and the poor ones would be forced out. The ease of movement for the good performers in the less transferable skill MOCs would, thus, contribute much less to the negative trend. This interpretation points to the possibility of different linear or possible nonlinear relationships across MOCs and Ranks.

A second group of findings could also emerge. Performance/turnover relationships may be different because of the performance measure used. The nature of the performance measure may impact on the direction of the relationship. Negative relationships could emerge in performance measures related to knowledge and skills and to occupations similar to the operational military trades found in La Rocco et al (1977). In contrast, those measures that emphasize mental capacity and intellectual output in occupations similar to the social scientists in the Allison (1974) study should produce a positive relationship between performance and turnover.

Therefore, the complexity of the possible relationships requires that a study examine individually, as well as collectively, a wide range of occupational groups and managerial levels using common but varied performance dimensions. By examining each relationship separately one can closely look at the attrition patterns within groups and the commonalities between groups. Specifically, each study participant would be identified by occupation and managerial level. Then participants would be classified by each performance measure as being high, above average, below average, or low. Then each participant would be categorized as a stayer or leaver.

Rates of attrition would be calculated for each performance level and the relationship between attrition rates and performance level then could be examined. Based on the differences in performance measures used and occupation groups examined, different attrition patterns may emerge.

The Canadian Forces is considered to be the best organization for conducting such a study. The CF has the largest variety of occupations (i.e., operational, technical, support and specialists) of any one organization in Canada. In addition, the CF uses common appraisal forms and keeps excellent database records on turnover.

To examine the relationship between job performance and attrition in the CF a formal request was made to the Department of National Defence. They staffed the request through the Directorate of Personnel Selection Research and Second Careers (DPSRSC). DPSRSC found sponsorship for the study from the Directorate of Personnel Careers Administration Officers (DPCAO) and the Directorate of Personnel Careers Administration Other Ranks (DPCAOR). This sponsorship allowed access to the Personnel Management Information System (PMIS) which contained extensive performance, demographic, biographic data on all members of the CF. All data was compiled and analyzed by the author at the Canadian Forces Personnel Applied Research Unit (CFPARU) in Toronto.

METHOD

Data Base

The Canadian Forces Personnel Information System (PMIS) provided the data for this Study. This system is very large and holds in excess of 150,000 active files. Yearly statistics in this system, describe biographical information (e.g., Rank and Occupation) about past and present servicemembers, performance evaluation scores, training results, and employment status (i.e., whether they are stayers or leavers by a variety of specific categories), to name just a few. Performance appraisal scores, turnover information and biographic characteristics were placed on a separate active file for this study.

Procedure

The strategy for evaluating the relationship between performance and turnover in this data base consisted of the following approach:

- a. Divide the data set into Officer and Non-Commissioned Members (NCMs) groups since different performance appraisals are used for each.
- b. Identify the performance variables for the officer and NCM groups. Three years of performance scores were averaged for each servicemember. Then, from the scores on all items factor analyses were conducted separately on the officer and NCM performance data to reduce the scores into factors with common themes for each type of performance appraisal.

- c. Identify servicemembers as either stayers or voluntary leavers and, based on their performance appraisal factor scores, categorize them on a performance hierarchy for each dimension.
- d. Identify subgroups within the Officer and NCM groups by rank and occupational categories.
- e. Calculate the turnover rate (i.e., the proportion of leavers) for each performance level for all rank groups and occupational categories.
- f. Within each rank and occupational subgroup determine the relationship between performance level and turnover rate for each performance dimension.

The details for this procedure follow.

Sample

Servicemembers who received annual PER assessments during the years 1980, 1981 and 1982 were identified as either stayers or leavers in 1983. Stayers were defined as those officers and NCMs who remained in the military past 31 Dec 1983; voluntary leavers were those who left the military voluntarily (QR&O 15.1) between 1 Jan 1983 and 31 Dec 1983. Voluntary leavers were specifically defined by three categories.

- a. Those who left on request when entitled to an immediate annuity.
- b. On completion of a fixed period of service.
- c. On request for other causes.

Also, most involuntary turnover situations can be eliminated from the study because of the leaver definition. Those individuals who

were classified according to the following categories of release were left out of the samples and are as follows.

- a. Misconduct.
- b. Unsatisfactory service.
- c. Medical.
- d. Service completed.

Rank Level. Servicemembers who qualified for the study were then categorized according to their rank level in order to examine if the job performance turnover relationship varies with level of responsibility. This was necessary as each rank group has different levels of responsibility; not unlike the manager, supervisor, foreman, and worker in a civilian setting. The nature of their differing employment situations could have an impact on the way they are rated. Their expectations about their current job and alternatives may differ substantially. This could result in different relationships between turnover rates and performance levels within the different rank levels. The CF has fourteen ranks which denote different levels of responsibility. However, there is similarity in the responsibilities assigned to some of those ranks. Based on knowledge of duties and requirements, these fourteen rank levels were classified into the following four categories which were used in this study as Rank groups:

- a. Senior Officer. Major and above;
- b. Junior Officer. Captain and below;
- c. Senior Other Rank. Sergeant and above; and,
- d. Junior Other Rank. Master Corporal and below.

Occupational Groupings. Various occupations were also grouped together according to their general function. Problems related to supply and demand, the nature of the work, the environment, necessitates the requirement to examine the performance/turnover relationship for these different occupational groups. A specific listing assigned to each of the four overall groups are contained in Appendix A. The following definitions were used to categorize groups:

- a. Operations. Those occupations where special skills and employment are directly related to the combat function (e.g., Artillery Officers, Infantry Soldiers);
- b. Technical. Those occupations where technical, electrical and mechanical skills are dominant in their employment (e.g., Aerospace Engineers, Hull Technicians);
- c. Support. Those occupations that perform logistical and administrative skills (e.g., Supply Officers, Administration Clerks); and,
- d. Specialist. Those occupations that provide specialist skills that are not combat related (e.g., Doctors, Dentists).

Sample Size. The PMIS data bank was used to construct the samples required for this study. Data was gathered on a total of 34,635 servicemembers. The breakdown of this sample over the various groupings necessary for the analyses is given in table 1.

Performance Measures. In this study, Job Performance was examined using a rating scale performance evaluation procedure called the Canadian Forces Personnel Evaluation Report (PER). While other CF reporting systems exist, e.g., training course reports, and serve as measures of effectiveness, the PER was selected because it is the only standardized measure of individual effectiveness that can be applied Forces-wide (Saudino, 1984). Moreover, and perhaps most importantly,

Table 1

Samples Drawn From PMIS Data Base

	Officers	Non Commissioned Members
Overall	10,422	24,213
Senior	3,586	12,920
Junior	6,530	11,293
Operations	5,033	16,475
Technical	2,339	8,764
Support	1,794	7,693
Specialist	1,185	NA

Note. Subgroup totals do not add up to the main Officer and NCM totals because of missing categorical data.

the PER assessment for both Officers and Non-Commissioned Members plays a critical role in the determination of a servicemember's career opportunities. It is used in the selection of members for promotion, selection of members for career courses and remusters, reclassifications, planning posting plots, assessment of performance patterns for corrective career action, and effective utilization of personnel resources in an emergency. The performance Review process is presented in greater detail in Appendix B. The CF evaluation system is given considerable importance as a measure of personnel effectiveness. Accordingly, it represents the most obvious signal given servicemembers regarding their effectiveness to the CF and is substantiated as the performance variable for this study.

The CF uses different PER measures for Officer and Non-Commissioned Members PER measures in order to evaluate their different job requirements. A brief outline of the items in the Officer and NCM Performance Evaluation Report (PER) together with an explanation of its rating levels is presented in Appendix B.

Reliability of PERs. A special monitoring organization at NDHQ monitors all PERs to ensure that:

- a. PERs are properly completed;
- b. a common standard of reporting is maintained; and,
- c. exceptionally high or low ratings assigned are adequately substantiated.

The monitoring organization also carries out a statistical analysis of the PERs submitted to ascertain whether any particular Unit's range of ratings is abnormally high or low in relation to the CF average for any one MOC or rank group. When a Unit is discovered to have an unexplainably high or low rating tendency, its identity is made known to members of the year's promotion boards as well as career managers which then must pay particular attention during their deliberations to the PERs prepared by such Units. A briefing team may also visit Units on request where they can make supervisors aware of possible rater biases. Monitoring and education provide the foundation for the basic reliability of the performance variable in the CF and for this study.

Validity of the PERs. The PER provides the only standardized

performance measure that can be applied across job classifications, trade groups and military ranks. The performance ratings on the individual performance items are based directly on military performance behaviors and are exemplified by the NCM performance criteria in Canadian Forces Publication (CFP) 123. Shields (1984) by examining historical PER records also found predictive validity for NCM performance as measured by the PER to the next highest rank.

Analysis

Between one and three PER records were available for each individual. Each Officer PER contained 21 items; each NCM PER 17. Where more than one record was available, composites were developed by taking the mean score for each item. The use of average PER scores helped to minimize possible differences due to raters, employment factors (isolated, field, base, sea) and/or experience in the job.

In a previous study, Saudino (1984) showed that the 21 items on the Officer PER could be reduced to six factors. The underlying structure of the 17 item NCM PER has not been explored. Rather than using Saudino's factors, which were limited by the fact that they were developed by using all Officers PER scores and did not take into account possible subgroup differences, the more specific components underlying the officer and NCM performance were identified through a Principal Components Analysis (PCA). The identical components were used as performance variables in the study. Factor scores were derived for each Officer and NCM group that was investigated by using

an eigen value of one for the combined average PER data. The computer program describing both the sampling procedure and factor analysis is presented in Appendix E.

For each performance dimension that emerged from the PCA, four equal-interval categories across the performance range for each dimension were created so that performance groups could be compared. The performance levels were named to describe a given interval in the performance distribution (i.e., Low, Below Average, Above Average, High). Low represents those individuals whose ratings on a given dimension fell at least one standard deviation unit below the mean. The below Average interval represents those individuals whose ratings were within one standard deviation unit below the mean. The above average term represents those individuals whose ratings fell within one standard deviation unit above the mean. Finally, high interval personnel are those whose scores were at least one standard deviation unit above the mean.

Random samples without replacement ($n = 100$) were taken at each interval and the proportion of voluntary leavers calculated. Depending on the number of personnel in each interval, these steps were replicated from five to ten times. The repeated sampling without replacement produced a statistical sample mean and variance which allowed examination of the performance-turnover relationship through use of Analyses of Variance (ANOVA). By following this procedure, the average proportion of leavers at each performance interval was calculated for each performance variable uncovered by the principle

components analysis for each independent group studied.

Since the study was intended to answer specific questions about the form of the relationship that existed between performance and voluntary turnover, linear and quadratic trends were examined using one-way analysis of variance.

RESULTS

The results are presented separately for the Officer and NCM performance appraisals. The Officer PER results are presented by rank group, followed by occupational category. The groups are then summarized by performance dimension. The NCM results follow those for the Officers.

Officers Overall

Three performance factors emerged from the factor analysis of CF members who held officer rank (n=10,422). These Factors accounted for 60.9 percent of the variance in performance ratings (Table 2).

Table 2

Summary of Principal Components Analysis on
All Items of the Officers Performance Evaluation
Report for Officers Overall

Factor Description	Eigenvalue	Percentage Variance
Job Performance	8.31900	41.6%
Intellct	1.50646	7.5%
Professionalism	1.25905	6.3%
Fitness and Appearance	1.09795	5.5%

Notes: Total variance accounted for was 60.9%
Sample size was 10,422.

The proportions of voluntary leavers for each of these four factors, across the four equal-interval categories of performance, are shown in Table 3. Using a sample of 4,000 officers, one-way analyses

of variance showed significant differences between the mean proportions of voluntary leavers who received differing PER ratings for the Operational Job Performance (Factor 1), Intellect (Factor 2), and Professionalism (Factor 3) factors. The associated trend analysis produced a significant negative linear trend ($F(3,36)=17.127$, $p < .0002$) for the Operational Job Performance factor, a significant positive linear trend ($F(3,36)=10.4252$, $p < .0027$) for the Intellect factor, and a significant negative linear trend ($F(3,36)=14.7273$, $p < .0005$) for the Professionalism factor. The Appearance and Physical Fitness factor showed no significant differences between groups for any of the officer analyses.

Table 3

Percentages of Voluntary Leavers
as a Function of Performance Level
for Officers Overall

Performance Level	Factor 1* (Job Perf.)	Factor 2** (Intellect)	Factor 3* (Prof.)	Factor 4 (Fitness/Apear.)
Low	4.5%	1.8%	4.6%	2.3%
Below Average	1.9%	2.1%	2.4%	2.5%
Above Average	2.3%	3.1%	1.9%	2.2%
High	1.2%	3.5%	1.7%	2.3%

Notes: 1. Sample Size (n=4000); ** $p < .005$ * $p < .0005$.

2. The performance level descriptors in the proportions tables throughout the results section are intended as titles that verbally describe a given interval in the performance distribution. low, represents those individuals whose ratings on a given dimension fell at

least one standard deviation unit below the mean. The below average interval represents those individuals whose ratings were within one standard deviation unit below the mean. The above average term represents those individuals whose ratings fell within one standard deviation unit above the mean. Finally, high interval personnel are those whose scores were at least one standard deviation unit above the mean.

3. The percentages in the proportions tables represent independent mean proportions of voluntary leavers determined from each performance interval group. In Table 3, for example, 4.5% of all Officers rated below average on PER items which combined to indicate Operational Job Performance from 1980 to 1982 (Factor 1) voluntarily left the CF in 1983. The * shows which trend analyses were significant.

Junior Officers

The same four performance factors reported above emerged in a specific PCA of Junior Officers (n=6,530) and accounted for 60.5% of the variability in performance scores (Table 4).

Table 4

Summary Results of Principal Components Analysis
on All Items of the Officers Performance Report
for Junior Officers

Factor Description	Eigenvalue	Percentage Variance
Job Performance	8.25391	41.3%
Intellect	1.49521	7.5%
Professionalism	1.26286	6.3%
Fitness and Appearance	1.98868	5.4%

Notes: Total variance accounted for was 60.5%.
Sample Size was 6530. Missing 82 Rank Identification causes discrepancies in the addition of senior and junior officers to equal the overall officer sample size.

Using a representative sample of 2,000 junior officers,

one-way analyses of variance showed significant differences between the equal-interval categories of performance for the Operational Job Performance, Intellect and Professionalism factors. A significant negative trend ($F(3,16)=9.6$, $p < .0069$) was found for Operational Job Performance (Factor 1). Intellect (Factor 2) showed a significant positive trend ($F(3,16)=6.1714$, $p < .0244$). Professionalism (Factor 4) showed a significant quadratic trend ($F(3,16)=7.8053$, $p < .0130$) where the extreme performance intervals had higher mean proportions of voluntary turnover. The mean proportions for all factors are presented in Table 5.

Table 5

Percentages of Voluntary Leavers
as a Function of Performance Level
for Junior Officers

Performance Level (Job Perf.)	Factor 1* (Job Perf.)	Factor 2** (Intellect)	Factor 3** (Prof.)	Factor 4 (Fitness/Appear.)
Low	3.8%	1.6%	4.2%	1.8%
Below Average	1.6%	2.2%	1.6%	2.6%
Above Average	2.2%	2.8%	1.4%	2.6%
High	1.2%	3.8%	3.8%	2.8%

Note: Sample Size (n=2000). * $p < .01$ ** $p < .05$.

Senior Officers

The PER scores of 3,586 Senior Officer were also subjected to a factor analysis to determine if the same or different underlying dimensions described ratings given to senior officers. Again, the

same four factors emerged from the analysis accounting for 56.8% of the variance in performance scores (Table 6) except that the Intellect and Operational Job Performance factors reversed in their order of extraction. Using a sub-sample of 2,000 senior officers, one-way analyses of variance revealed significant differences between the mean proportions of voluntary leavers across the four intervals of performance for Intellect (Factor 1) and Professionalism (Factor 3).

Table 6

Summary Results of Principal Components Analysis
on All Items of the Officers Performance Report
for Senior Officers

Factor Description	Eigenvalue	Percentage Variance
Intellect	7.13447	35.7%
Job Performance	1.68082	8.4%
Professionalism	1.32332	6.6%
Fitness and Appearance	1.22752	6.1%

Notes: Total variance accounted for was 56.8%
Sample size was 3,586

Table 7 shows the significant positive linear trend ($F(3,16)=4.86$, $p < .0425$) for the Intellect factor and a significant negative linear ($F(3,16)=11.52$, $p < .0037$) and quadratic trend ($F(3,16)=8.7111$, $p < .0094$) for the Professionalism factor. The Operational Job Performance and Physical Fitness/Appearance factors were not significant.

Table 7

Percentages of Voluntary Leavers as a
Function of Performance Levels for
Senior Officers

Performance Level	Factor 1* (Intellect)	Factor 2 (Job Perf.)	Factor 3** (Prof.)	Factor 4 (Fitness/Appear.)
Low	1.6%	3.2%	4.2%	3.2%
Below Average	1.8%	1.8%	2.0%	1.8%
Above Average	1.8%	2.0%	1.4%	2.2%
High	3.0%	1.6%	2.0%	2.4%

Note: Sample Size (n=2,000), * $p < .05$ ** $p < .005$.

Technical Officers

A specific factor analysis for Technical Officers (n=2,339) uncovered four underlying components of performance accounting for 58.2% of the variance in performance scores (Table 8).

Table 8

Summary of the Principal Components Analysis
on All Items of the Officers Performance Report
for Technical Officers

Factor Description	Eigenvalue	Percentage Variance
Intellect	7.54998	37.7%
Job Performance	1.61500	8.1%
Professionalism	1.37432	6.9%
Fitness and Appearance	1.10962	5.5%

Notes: Total variance accounted for was 58.2%
Sample Size was 2,339

Of interest, few officers received extreme ratings resulting in unequal sampling for the one-way analysis of variance. Despite this unequal distribution, significant differences were found between the four intervals for the Intellect and Operational Job Performance factors. Linear trends were significant ($F(3,12)=10.0207$, $p < .0081$) for the Intellect factor in a positive direction. A significant negative trend was also evident for the Operational Job Performance factor ($F(3,12)=15.1258$, $p < .0022$). The mean proportions for the four performance factors at each interval are presented in Table 9.

Table 9

Percentages of Voluntary Leavers
as a Function of Performance Level
for Technical Officers

Performance Level	Factor 1* (Intellect)	Factor 2** (Job Perf.)	Factor 3 (Prof.)	Factor 4 (Fitness/Appear.)
Low	1.6%	6.0%	4.2%	4.0%
Below Average	1.8%	2.6%	1.2%	2.8%
Above Average	3.4%	1.2%	3.4%	2.8%
High	5.8%	1.6%	3.2%	3.0%

Note: Sample Size (n=1600), * $p < .01$ ** $p < .005$.

Operations Officers

The four performance factors from a sample pool of 5,033 Operations Officers accounted for 60.7% of the variance in job performance (Table 10).

Table 10

Summary Results of Principal Components Analysis
on All Items of the Officers Performance Report
For Operations Officers

Factor Description	Eigenvalue	Percentage Variance
Job Performance	8.32160	41.6%
Intellect	1.48002	7.4%
Professionalism	1.26286	6.3%
Fitness and Appearance	1.08610	5.4%

Notes: Total variance accounted for was 60.7%
Sample size was 5,033

The voluntary turnover patterns are represented in Table 11,

Table 11

Percentages of Voluntary Leavers
as a Function of Performance Level for
Operations Officers

Performance Level	Factor 1* (Job Perf)	Factor 2 (Intellect)	Factor 3 (Prof.)	Factor 4 (Fitness & App.)
Low	1.8%	0.8%	1.4%	0.8%
Below Average	0.8%	0.4%	1.0%	0.8%
Above Average	0.6%	0.8%	1.2%	0.2%
High	0.0%	1.4%	0.2%	1.0%

Note: Sample Size (n=2,000), * $p < .005$.

Using a sample of 2,000 Operations Officers, one-way analyses of variance demonstrated significant differences in the mean proportions of voluntary leavers depending upon the performance interval ratings for the Operational Job Performance Factor ($F(3,16)=13.8857$, $p < .0018$).

Specifically, as job performance ratings increased, voluntary turnover decreased. No other factors showed significant trends.

Specialist and Support Officers

There were no significant differences found between the mean proportions of voluntary leavers and performance intervals for either the Specialist or Support officer groups because officers' PER scores did not vary substantially.

Officers

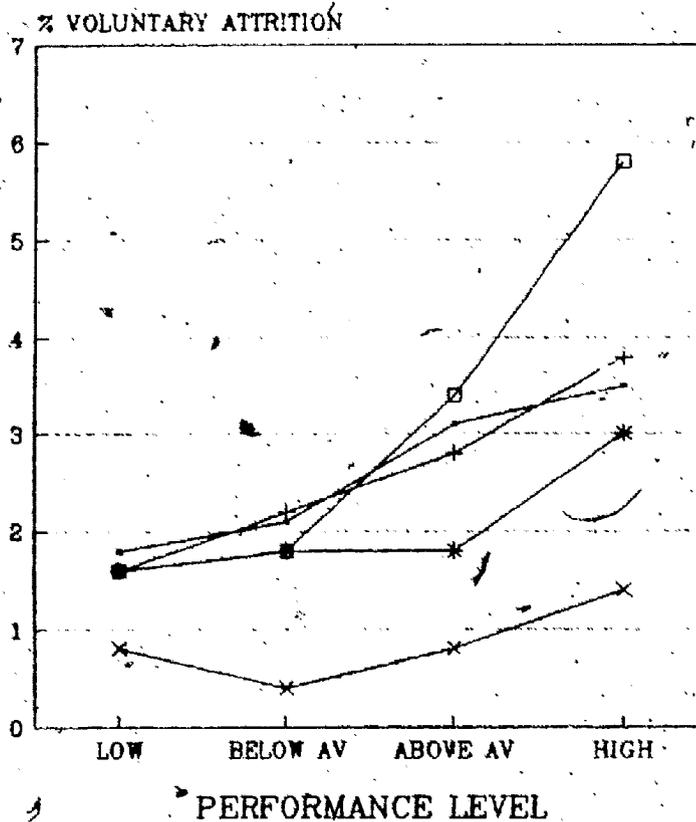
As previously mentioned, the Officers PCA uncovered four performance factors that were generally consistent across all officer rank levels and classifications. These were Operational Job Performance, Intellect, Professionalism and Physical Fitness and Appearance.

The one-way analyses of variance found significant differences in the proportion of voluntary leavers for the intellect, operational job performance and professionalism factors. No significant relationships were found for either the Physical fitness and Appearance factor for the support and specialist classifications. The following summarizes the findings so that groups can be examined across performance factors.

Intellect Factor

The one-way analysis of variance showed significant positive linear trends between the mean proportions of voluntary leavers who

received differing PER ratings on the Intellect factor for Officers Overall (n=4000) ($F(3,36)=10.4252$ p.<.0027), Junior Officers (n=2000) ($F(3,16)=6.1714$, p.<.0244), Senior Officers (n=2000) ($F(3,16)=4.86$, p.<.0425), and Technical Officers (n=1600) ($F(3,12)=10.0207$, p.<.0081). The voluntary turnover patterns for the intellect factor are represented in Figure 2.



● Officers Overall + Junior Officers * Senior Officers
■ Technical Officers x Operations Officers

Note: Symbols for each officer group are the same for Figures 2,3 & 4.

Figure 2: Percentages of voluntary Leavers as a function of the intellect performance factor

Operational Job Performance Factor

The one-way analyses of variance showed significant negative linear trends between the mean proportions of voluntary leavers who received differing PER ratings on the Operational Job Performance factor for Officers Overall (n=4000) ($F(3,36)=17.127$, $p < .0002$), Junior Officers (n=2000) ($F(3,16)=9.6$, $p < .0069$), Technical Officers (n=1600) ($F(3,12)=15.1258$, $p < .0022$) and Operations Officers (n=2000) ($F(3,16)=13.8857$, $p < .0018$). The voluntary turnover patterns are represented in Figure 3.

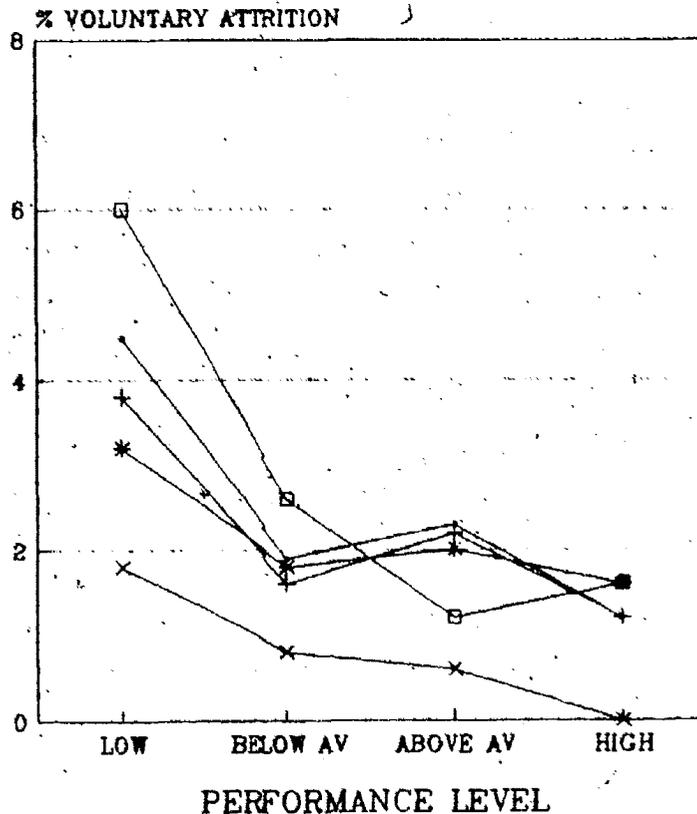


Figure 3: Percentages of voluntary leavers as a function of the operational job performance factor

Professionalism Factor

The one-way analyses of variance showed significant negative linear trends between the mean proportions of voluntary leavers who received differing PER ratings on the professionalism performance factor for Officers Overall (n=4000) ($F(3,36)=14.7273$ p.<.0005), and Senior Officers (n=2000) ($F(3,16)=11.52$, p.<.0037). A significant quadratic trend was found for Junior Officers (n=2000) ($F(3,16)=7.8053$, p.<.0130) and Senior Officers (n=2000) ($F(3,16)=8.7111$, p.<.0094). The voluntary turnover patterns are represented in Figure 4.

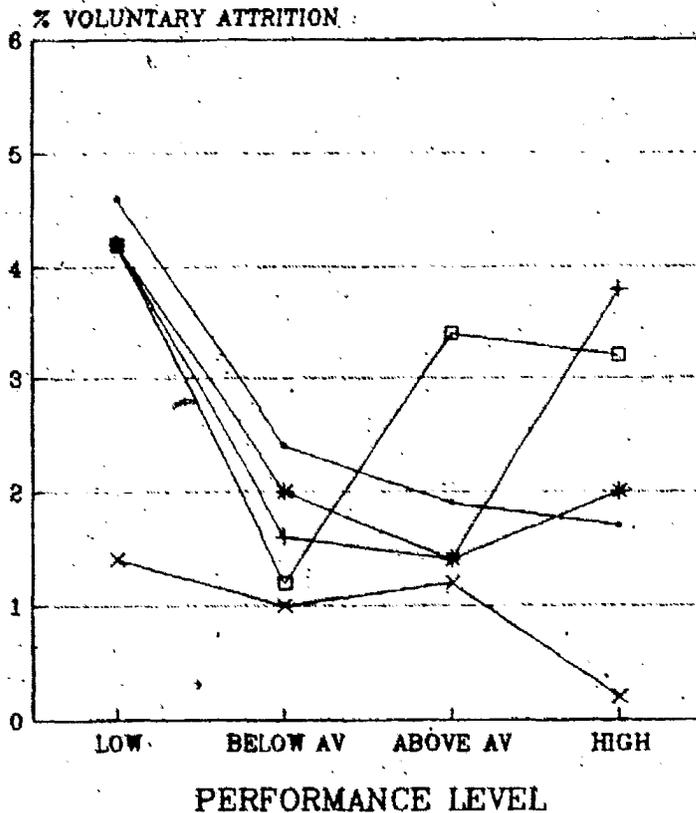


Figure 4: Percentages of voluntary leavers as a function of the professionalism factor

NCMs Overall

The results of the factor analysis using NCMs PER scores did not uncover any underlying components of performance for NCMs overall; senior NCMs; operations trades members or technical trades members. That is, based on a subject pool of 24,213 NCMs, one factor alone (Overall Job Performance) accounted for 69 percent of the variance in performance scores. The results of the factor analysis using NCMs PER scores provided a one factor solution for most trade and rank groups. The exceptions were the Junior NCMs (n=11,293) and Support Trades (n=7,683) where two factors emerged (Leadership and Professionalism).

One-way analysis of variance of the single factor solution groups produced no significant relationships between job performance and voluntary turnover. However, significant findings occurred in the two factor groups (Table 12).

Table 12

Summary Results of the Principal Components Analysis on All Items of the Non Commissioned Member Performance Evaluation Report for Junior NCMs and Support Trade Groups

Factor Description	Eigenvalue	Percentage Variance
Junior NCMs		
Leadership	11.69363	68.8%
Professionalism	1.04527	6.1%
Support Trades		
Leadership	11.54854	67.9%
Professionalism	1.03953	6.1%

Notes: Junior NCMs sample (n=11,293)
Support trade sample (n=7,683)
Total variance accounting for Junior NCMs 74.9%
Total variance accounting for Support Trades 70%

The total variance of performance scores accounted for by the two factors for the junior NCM group was 74.9 percent and for the support group, 74 percent.

Junior NCMs

Using a sub-sample of 4,000 junior NCM personnel, one-way analyses of variance did not show significant differences between the mean proportions of voluntary leavers by performance intervals for the Leadership factor. However, the Professionalism factor trend analysis produced a significant negative linear relationship ($F(3,36)=4.3531$, $p < .0441$) in which the mean proportions of voluntary leavers slightly decreased as performance increased. Table 13 shows the mean proportions of voluntary leavers as a function of performance level for both factors.

Table 13

Percentages of Voluntary Leavers
as a Function of Performance Level
for Junior NCMs

Performance Level	Professionalism*	Leadership
Low	1.9%	1.8%
Below Average	1.9%	2.3%
Above Average	1.7%	1.9%
High	1.5%	1.0%

Note: Sample Size (n=4,000), * $p < .05$.

Support Trades

One-way analyses of variance of the support trade sample (n=4,000) produced a significant difference between the mean proportions of voluntary leavers who varied in their performance on the Leadership and Professionalism factors. A negative linear trend existed for the Professionalism factor ($F(3,36)=4.1744$, $p < .0484$) in which the mean proportion of support trade voluntary leavers decreased as performance increased. In contrast, a positive trend existed for the Leadership factor ($F(3,36)=7.8618$, $p < .0081$) where the mean proportion of voluntary leavers increased as performance increased. A list of the mean proportions of voluntary leavers as a function of performance level for support trades is shown in Table 14.

Table 14

Percentages of Voluntary Leavers as a
Function of Performance Levels
for Support Trades

Performance Level	Professionalism *	Leadership **
Low	3.8%	2.0%
Below Average	3.8%	1.8%
Above Average	1.3%	2.3%
High	2.4%	3.9%

Note: Sample Size (n=4,000), * $p < .05$ ** $p < .01$.

DISCUSSION

Voluntary turnover is and always will be a subject of concern to organizations. The CF determined that turnover is a complex process which involves a number of important variables that contribute to the leave decision. From an attitudinal perspective, previous research has identified that the perception of job performance is one of the dimensions in the turnover decision. The purpose of this Thesis was to examine the relationship between job performance and voluntary turnover. The intent was to determine the feasibility of using performance measures as part of a proposed attrition monitoring system.

The findings of the study show that a significant negative linear relationship exists between operational job performance and voluntary turnover. A significant positive relationship was found between intellect performance and voluntary turnover. Significant negative linear and quadratic trends were found between the professionalism performance factor and voluntary turnover where the highest proportions of voluntary turnover are in the extreme performance intervals. No significant relationships with turnover appeared for the Physical Fitness and Appearance performance factor. The NCM PER findings were not significant.

It is interesting to note the consistencies in the relationships between performance factors and voluntary turnover that were observed between Officer subgroups. For example, the analyses

showed that the nature and direction of the relationships between performance levels and voluntary turnover are consistent within performance dimensions across officer rank levels and to a certain degree across officer occupational groupings. The direction of the relationships between performance levels and turnover were determined by the performance variable used (i.e., intellect positive, operational job performance negative). The findings of this study demonstrated that the mean proportions of voluntary attrition among officers in 1983 varied significantly as a function of their rated level of performance. The direction of the relationship varied as a function of the type of performance variable being examined.

The direction of the relationships between performance and turnover were hypothesized to be determined by the nature of the occupation being studied. For example, in occupational groups which demand high intellect performance such as senior management and technical classifications, the relationship between performance and turnover should be positive. More practical occupations (e.g., Infantry) and lower rank levels (e.g., Captain) may place more emphasis on practical or operational job performance and the poorer performers in these groups should have high turnover. The results of this thesis only partially support this hypothesis. Senior Officers showed a positive relationship between intellect and turnover while showing no significant differences on the operational job performance factor. Since there was some discrimination between low versus high leaver groups on intellect, one could speculate that executive

turnover behaviour could be related to intellect performance. Another consideration for the lack of differences found between occupations in the turnover behaviour may be the notion that only one occupation was actually examined: Officers. It is plausible that all Officers irrespective of occupation may have the same balance of practical, intellectual and professional performance demands placed on them. When scores on the performance appraisal are given the rater must consider each dimension as it applies to the occupation. However, the dimensions may be measuring different aspects of officership, each having equal importance in the final outcome of the evaluation. Unidimensional occupations which may be more common in civilian settings may emphasize only one performance dimension such as practical job skills (e.g., Bank Teller), thus allowing for possible direct performance turnover relationships. However, complex jobs may require closer examination of the performance measures used. Therefore, the results of this study may be better explained by examining the actual performance measures used.

The nature of the performance measure has an impact on the direction of the relationship found between performance and turnover. It was hypothesized that negative relationships could emerge in performance measures related to applications of job knowledge and skills. Also, positive relationships may emerge when measures of intellectual output and mental capacity are used. The findings of this study support these hypotheses.

Measures of application of skills and knowledge show negative

relationships with turnover. An important aspect of Officer performance, the Officer must be able to carry out practical skills related to the job. For example, an Infantry Officer must know tactics and be able to drill subordinates on field exercises to achieve military objectives. Failure or poor performance could place the officer in a difficult situation in terms of advancement and acceptance by superiors, peers and subordinates. These expectations and perceptions based on poor performance could lead to a search for alternative employment and a leave decision.

A second type of performance turnover relationship could emerge when considering the intellect factor. In organizations which demand practical as well as intellectual performance, such as the military, an individual who mostly values the intellectual aspect of performance may not find the work satisfying. Consequently, if an individual cannot find a way to pursue intellectual interests they may look elsewhere for work that is more compatible with their needs.

Let's now look at how the findings of this study directly relate to previous performance/turnover research. First of all, the Intellect performance factor from the the officers' PER which mostly represents ratings on writing, and speaking ability, revealed an overall positive relationship with voluntary turnover. This supports previous findings where studies have used academic production as a measurement of performance. For example, Allison (1974), found positive relationships between performance and turnover where performance was measured using scientific productivity and the number of publications in scholarly journals.

Secondly, another specific finding has emerged which supports previous research where a negative relationship between job performance level and voluntary turnover was found for the Operational Job Performance and Professionalism factors. The performance ratings that contribute to the operational job performance and professionalism factors were very similar to those used in the US Navy attrition study, e.g., professional performance, military behavior, and adaptability (La Rocco et al., 1979) and the relationship between job performance and attrition was also reported as negative. In this Thesis, Officers overall, Junior Officers, and Operations occupations results showed a higher voluntary turnover for poor performance groups using the operational job performance factor scores. The results could be explained in terms of satisfaction or dissatisfaction theory, suggesting that poor performers leave due to their lack of practical performance success resulting in high dissatisfaction levels (Futrell and Parasuramen 1984).

At the same time, the higher numbers of poor performers leaving could also be attributed to a proportion of individuals who have decided to leave on their own accord rather than waiting to be fired (Kraut 1975) or face organizational moves. Possibly poor performers may also represent individuals who have aptitude but who are dissatisfied with the nature of their employment. They may also be those who lack ability, or incentive, and who may be "pushed" into leaving by their peers, supervisors or their own desire to remove themselves from an unpleasant situation.

At the opposite end of the spectrum, good operational performers may also experience dissatisfaction to the point where they may consider release. The proportion of good performing leavers in 1983, however, seems to have been small. This may have occurred as a result of the economic conditions. At the time, the recession economy simply may not have encouraged job turnover (Mendes & Lyon 1984). However, this reason is conjecture at this point and suggest the requirement for further research.

Finally, Jackofsky's theory states that voluntary turnover will vary with performance only insofar as it affects the ease and desirability of movement out of an organization, showed some evidence in the higher incidence of turnover of individuals who were rated either high or low on the Professionalism factor in this thesis. For the most part, however, low performers showed the highest percentage of turnover for this factor as demonstrated in the results for Officers overall, Junior Officers, Senior Officers and Technical Officers. PER items measuring Integrity, Loyalty, Conduct, Dedication, and Working with Others, contributed to this factor. Typically defined as "Officer-Like Qualities" they are intended to truly attest to an officer's proper disposition.

The incidence of turnover among individuals who scored highly on the Professionalism factor may have been individuals who have demonstrate these qualities but were not satisfied with remaining in the CF. Gabriel (1981) in a presentation to an international

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symposium on military leadership suggested that these types of individuals may have encountered persons or situations which threatened their ethical or professional standards, thus forcing them to resign. This partially supports the model proposed by Withey (1985) which attempts to link exit (turnover decision), voice (ability to voice desire for change), loyalty (commitment to the organization), and neglect (on the job absenteeism) to declining job satisfaction. For an individual faced with a situation which threatens to compromise his or her professional standards, the cost of exiting may be less than the cost of voicing a change. Or, it may be the only alternative left after voicing dissatisfaction and failing to resolve problem issues.

Attrition Theory Applications

From a theoretical perspective the examination of the performance turnover relationship using different performance measures revealed important findings. Following the Jackofsky Model, individuals who are having difficulty carrying out their job tasks are more likely to leave than those who can. Individuals who are not finding their military work intellectually challenging, who are good performers and may be more easily transferred from one job to another, are more likely to leave than those who do not. This would suggest that from a performance perspective the individual who has a good person/job fit, is more than likely going to stay (i.e., one who can carry out duties and responsibilities well and who is intellectually satisfied is more likely to stay).

The results of this study also fit the framework of the Mobley (1979) Expanded Turnover Process Model. Let us first examine the model using the operational job performance results. An organizational factor, operational job performance appraisal scores provide the individual with actual performance feedback on practical duties and responsibilities. Perceptions are generated based on personal knowledge and this feedback which could create expectations about the future. If the individual and organization values practical operational job performance and performance has been poor, then other dimensions of the job will also be affected. These include supervisor, peer and subordinate relationships. Also, the potential for advancement, increased wages, new jobs are also determined by these organizational measures of performance. Ultimately, all these factors will lead to a level of satisfaction or dissatisfaction with the job and the organization. This may lead to the search for alternatives. If alternatives are available which may provide a better lifestyle, or a better job/person fit, the individual may leave.

A more complex explanation is required when fitting the intellect factor results to the Mobley Model, given that high performance in their jobs could be positively related to turnover. Less tangible in comparison to practical application of skills, intellect also has a great impact on the person at the job. High intellect cannot always be practically demonstrated. It may be impossible to show in certain occupations. Also, the individuals'

values play an important role in the effect of the intellect impact on turnover. For example, if a worker does not value intellect he or she may get on very well at a job which does not demand such capacity even though the individual may have high intellect abilities. However, if the person values the use of intellect, in a job that does not demand it, then the job/person fit may be poor. Without the intellectual satisfaction or rewards for intellectual performance, the individual may perceive the job negatively. If expectations are that there will be no change in the future in terms of intellectual satisfaction the person may become extremely dissatisfied and search for alternatives. Then, if the opportunity to leave presents itself that will meet the intellectual needs then the decision to leave may occur. In addition to this possibility, there may be those who are poor practical performers who have high intellect. Whether intellect is valued by the individual or not, there may be the same job/person missfit based on failure at the job resulting in dissatisfaction and turnover.

Research Implications

The implications of this thesis are very important when considering performance as a variable in an attrition study. First of all, the researcher must be aware of the performance measure in terms of what particular dimension is being tapped. Multiple well defined measures of specific aspects of performance are required if the information is to be integrated with other aspects of the attrition process. Performance is deeply tied to a large number of

organizational issues, as well as, individual concerns and values. Without well defined measures, chances are that performance will be confounded with error to the point where it explains very little variance in turnover behaviour.

A second concern is the nature of the population being studied. In the CF, the performance of others may have an over-riding influence on an individual's performance evaluation. For example, the performance of a company Commander may be influenced by the performance of his platoon officers and the troops. A poor commander with excellent platoon leaders may appear to be a good performer. What is seen by the evaluator may be team effort rather than the individual's actual occupational performance. Socialized to this situation, raters may be looking for the same qualities in an Officer or NCM irrespective of occupational performance. The results of this study suggest that researchers look closely at the dimensionality of the job and the organizational/individual values context when considering performance in the turnover group being examined.

Finally performance/attrition cannot be looked at in isolation from the rest of the turnover process. Performance is tied closely to many individual, organizational and extraorganizational concerns. These have to be examined in relation to perceptions, expectations, satisfaction levels and intentions. Attrition rates and performance measures may be able to identify significant relationships; however, they do not provide enough information to explain the findings.

In summary, the findings of this study contributed to the understanding of how job performance and voluntary turnover are

directly related. In the past global performance scores were used to identify the direction of the relationships while this study identified specific job performance factors. The discriminating characteristics of the performance items were shown to influence the results in terms of the factors that emerged for different rank and occupational groups. Specifying the job performance measures for each group when studying voluntary turnover can have many beneficial applications when studying job related perceptions, expectations, satisfaction, and expected utility of the job. The performance of an individual when clearly specified can also provide an index of the members utility to the organization and a way to evaluate the cost or benefit of his/her loss to the organization.

CF Applications

The findings have important implications in terms of understanding Officers attrition. Not only is there descriptive value in the findings in terms of monitoring those who leave, but specific value in understanding the nature of the leaver and the impact leavers have on operational effectiveness can occur. Remember the positive relationship between intellect and turnover? It was consistent for Officers overall, and for Junior Officers, Senior Officers and Technical officers. Such a finding may suggest that Officers who are rated highly on intellect may have a greater ease and desirability to move from one occupation to another as was suggested by the Jackofsky

model. From the CF perspective it is important for the organization to identify these individuals early and determine whether they are being challenged and rewarded or whether they are stagnating in their jobs. Those who are rated higher on the Intellect performance factor may have encountered dissatisfaction due to a reward structure which may emphasize operational job performance as the most important aspect of performance overall. This was suggested by Kitchen (1985) when describing why top operational officers do not apply for post graduate training. Apparently, there was reported beliefs that attending graduate school for two years would keep them out of competition for promotion.

In contrast to the positive relationship found between intellect scores and turnover, negative relationships emerged from other performance factors. For example, when considering the consistent negative relationship found between operational job performance and attrition, the military is actually losing greater proportions of poor practical skills performers. The CF stresses the importance of good operational performance qualities because it relates directly to fighting efficiency. If operational job performance is considered to be a valued aspect of an Officer's contribution and effectiveness to the CF, voluntary turnover in 1983 (which occurred most often among poor performers) did not have a negative impact on CF effectiveness.

The relationship between professionalism and turnover was negative and curvilinear where the extreme intervals of performance

experienced the greater proportions of turnover. Overall, since the largest proportions of leavers are from the low performance group for the Professionalism factor, voluntary turnover in 1983 is seen as not having a detrimental effect on the professional integrity of the CF. (i.e., higher proportions of good professionals stayed).

In contrast to the officers' PER which had four factors emerge, the NCMs PER turned out to be a poor measure of voluntary turnover trends. One explanation for the lack of factors is that there were high inflation in the scores and little variance within individual member's performance item ratings. The factor analysis as a consequence could not uncover multiple underlying components of performance in the majority of cases. The exceptions to this were the Junior NCMs and Support trade groups ratings which revealed two factors (Leadership and Professionalism) that contained a great deal of item overlap. For all other NCM tradesmembers, performance as measured by the older NCMs PER did not appear to be related in any way to the proportions of NCMs who left the CF.

Notwithstanding, Junior NCMs' performance as measured on the Leadership factor, showed that poor performers are more likely to leave. By their leaving, the CF can be said to have maintained its effectiveness with regard to Junior Personnel. In contrast, the Support trade results indicate a loss in effectiveness as those who were assessed highly in Leadership tended to leave the CF. Possibly, the exit questionnaire developed for use as part of the CF release proceedings may provide information to understand why these good

support leaders are choosing to leave. On the other hand, ratings given to support trades personnel on the NCM PER Professionalism factor indicates that those who were less reliable were more prone to voluntarily leave. Thus, the CF in 1983 appeared able to retain positively motivated NCMs in the support trades. For this reason, voluntary turnover in 1983 is interpreted as having had a positive effect on organizational effectiveness.

Limitations

A word of caution is required about the generalizability of the results. The occupational nature of a group being studied has a bearing on the direction of the relationship between performance and voluntary turnover. Additional research is necessary to study the relationship between voluntary turnover and performance for occupational groups not represented in this study.

The economic conditions in Canada during 1983 had a direct impact on the ease and desirability of movement for CF members. Overall, attrition from the CF was low (Mendes & Lyon, 1984). Longitudinal studies that provide ongoing feedback on the performance of voluntary leavers could provide a continuing source of information on overall turnover trends and show how voluntary turnover can impact on organizational effectiveness. An attrition information system could possibly look at economic labour market effects and their relationships with predictors of turnover such as performance variables.

Performance variables named in this study played the key role in the findings that showed the relationship between performance and turnover in this study. That is, the factors that emerged from the Principal Components Analysis can only be considered to be descriptive performance groupings of items from the PERs. This was sufficient for the purpose of this study as the factor identification was being used as a data reduction method of categorizing the items under a common heading. However, this may be difficult to replicate in other organizations unless similar performance measures are used.

Recommendations for Future Research

This study was aimed at providing an understanding of how job performance is directly linked to voluntary turnover. The results point to the requirement to control for performance variables by ensuring that operating definitions are specific to reduce the potential for confound. In addition, studies should be extended to include different aspects of performance within the new process models, (e.g., Mobley, 1979). Other individual, organizational and extraorganizational variables, that were not measured in this study may be important moderators that may influence the performance turnover relationship outcomes. For example, the nature of the work, aspects of trade or occupational classification, and civilian equivalents should be examined (Lyon, 1987).

Performance must also be clearly defined in order to determine the direction of the performance/turnover relationship. Future

research requires an evaluation of NCM voluntary turnover trends using the new Non-Commissioned Member PER which may have a number of different performance factors.

Additionally, the results point to the need to identify, other moderating variables such as geographic region, national representation group, sex, age, marital status, length of service and period of service (contract) with performance variables, in order to examine a more complete picture of the CF voluntary turnover process.

These and other variables are now in the process of being examined on a continuous basis by the CF through the CFAIQ and PMIS information. The PER scores of leavers should now be considered as an important aspect of the attrition information system.

An important option for personnel managers in the CF to consider is examining current officer career progression in order to determine if individuals who excel in specific performance dimensions measured by the PER are being rewarded differently for their achievements.

Job performance, has an influence in the prediction of voluntary turnover. For example, using job performance could serve as a method of identifying sub-groups of employees when looking at job satisfaction surveys. A good performance appraisal system will allow the applied researcher to clearly identify performance criterion measures against which hypothesized voluntary turnover factors could be tested. This would provide the manager with information that would determine how to design more effective programs to reduce voluntary

turnover through the identification of variables which cue the organization to the more salient issue in the withdrawal decision.

Finally, researchers should consider examining the long-term trends in individual's job performance. Many different events occur that could influence job performance evaluations, such as promotion or lack of promotion, occupational transfers, and postings. By examining performance evaluation factors over long periods of time, and their relationships to promotions, transfers and postings, trends may emerge that predict turnover well.

Conclusion

The primary objective of this thesis was to examine the direct relationship between job performance and voluntary turnover in the CF. Factor Analyses identified four consistent performance factors for the Officers' performance evaluation; Operational Job Performance, Intellect, Professionalism, and Physical Fitness/Appearance. Subjects were categorized into one of four equal interval performance categories on each performance factor. The findings showed that the proportions of Officers who voluntarily leave vary significantly as a function of their level of performance; the importance of the factor and the direction of the relationship varies as a function of performance observed and the type of occupational group studied. The findings suggest that the majority of officer leavers can be described as poor operational job performers, good intellectual performers, and poor professionals. In general, because of the importance of the

operational performance of officers and the point that greater proportions of those who leave are poor operational performers, voluntary turnover is interpreted as having an overall positive impact on organizational effectiveness. This is especially true at a time when turnover is low and the actual numbers of leavers are not creating manning shortfalls.

The most significant contribution this study can make to turnover research is showing that the strategy of clearly defined performance variables and controlled for samples will help to eliminate some of the discrepancies in the performance/turnover research. By taking these issues into consideration, the utility of using a performance measure as part of an attrition information system can be enhanced and will go along way to improve our current knowledge about what causes turnover and what can be done about it.

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APPENDIX A

MOC AND RANK GROUPINGS USED IN ANALYSIS

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MOC AND RANK GROUPINGS USED IN ANALYSIS

Officer Classification and Rank Groups

The officer classification groupings used by Saudino (1984) provided the guidelines for the Officer classification breakdowns in this study.

- a. OPERATIONS: Armour, Artillery, Infantry, Maritime Surface and Sub-Surface, Pilot, Navigator, Flight Engineer, Air Traffic and Air Weapons Controller.
- b. ENGINEERING: Aerospace Engineer, Communications and Electronics Engineer, Land Ordnance Engineer, Maritime Engineer, and Military Engineer.
- c. SUPPORT: Dental Associate, Medical Associate, Personnel Administration, Logistics, Music, Physical Education and Recreation, and Security.
- d. SPECIALIST: Medical, Dental, Legal, Social Work, Personnel Selection, Training Development.

Rank groupings also used in this study were as follows:

- a. SENIOR OFFICERS - Major to General; and,
- b. JUNIOR OFFICERS - Lieutenant to Captain.

NCM Trade And Rank Groups

Based on Canadian Forces Administrative Order 2-10 which lists the branch groupings of the non commissioned members trades, the following trade groups were classified in this study.

- a. LAND OPERATIONS: Crewman, Artilleryman, Infantryman, Intelligence Operator, Field Engineer.
- b. SEA OPERATIONS: Boatswain, Clearance Diver, Electronic Warfare Operator, Firecontrolman, Naval Signalman, Radar Plotter, Radioman, Sonarman.

- c. AIR OPERATIONS: Airborne Electronic Sensor Operator, Air Defence Technician, Air Traffic Control Assistant, Air Traffic Controller, Search and Rescue Technician.
- d. SUPPORT: Administrative Clerk, Postal Clerk, Musician, Dental Clinical Assistant, Physical Education and Recreation Instructor, Military Police, Cook, Accounting and Finance Clerk, Mobile Support Equipment Operator, Teletype Operator, Construction Procedures Technician, Fire Fighter, Oceanographic Operator.
- e. TECHNICAL: Aero Engine Technician, Air Frame Technician, Aviation Technician, Communication Systems Technician, Flight Engineer, Instrument Electrical Technician, Integral Systems Technician, Machinist, Metals Technician, Meteorological Technician, Photographic Technician, Radar Systems Technician, Weapons Technician Air, Communications Technician, Lineman, Radar Technician, Radio Technician, Teletype and Cypher Technician, Terminal Equipment Technician, Dental Equipment Technician, Dental Laboratory Technician, Dental Hygienist, Electro-Mechanical Technician, Fire Control Systems Technician Land, Fire Control Technician Electronic, Fire Control Optronic, Vehicle Technician, Weapons Technician Land, Ammunition Technician, Aeromedical Technician, Medical Laboratory Technician, X-ray Technician, Construction Engineering Technician, Construction Maintenance Technician, Electrical Generating Systems Technician, Electrician, Map Reproduction Technician, Mechanical Systems Technician, Plumber Gas Fitter, Refrigeration and Mechanical Technician, Stationary Engineer, Structures Technician, Topographical Surveyor, Water Sanitation and POL Technician, Clearance Diver Technician, Communications Technician Sea, Electrical Technician, Electronic Warfare Technician, Fire Control Technician, Hull Technician, Marine Electrician, Marine Engineering Artificer, Marine Engineer Mechanic, Marine Engineering Technician, Naval Weapons Technician, Radar Technician, Sonar Technician.

NCM Groups

Non Commissioned Member personnel were also divided into two rank groupings. The Senior Ranks group consisted of the following ranks:

- a. Sergeant, Warrant Officer, Master Warrant Officer and Chief Warrant Officer.

The Junior Ranks group consisted of:

- a. Privates, Corporals, and Master Corporals.

APPENDIX B
PERFORMANCE MEASURES FOR OFFICERS
AND NCMS.

APPENDIX B

PERFORMANCE MEASURES FOR OFFICERS AND NCMs

Performance Review Process

The CF is not any different from most large organizations in that it too has formal policies and systems requiring the rating of individual employee effectiveness. Created largely as a function of a central management system, the performance appraisal serves a variety of important purposes. For the most part the performance appraisal system is a communication system in which provides information about individuals upwards resulting in action (e.g., promotion), and feedback downwards. The upward flow of information to the central management system, in this case National Defence Headquarters (NDHQ), is input that usually takes the form of a performance appraisal document. The downward flow of information can take the form of advice or draft directives by staff management in terms of career management, transfer and training, and of directives by line management in areas such as individual promotions. In order to accomplish these objectives the performance appraisal system meets certain requirements at various levels.

The whole system has: stability (it does not change frequently), usefulness of information in decision-making, good organizational attitudes toward the appraisal system (widely and

positively accepted), benefits exceeding the costs (valuable information outweighs the cost of implementation and maintenance), and a system that satisfies the requirements of the law (it is legal). For Senior Staff at NDHQ, valid merit lists must be derived so as to fill supervisory and promotion vacancies as they occur, as well as to select personnel for training, occupational reassignment, and to extend contract of employment. Accordingly, staff action requires information for career planning that is easily and accurately interpreted and translated into merit lists, and allows follow-up analysis to ensure that the system is functioning as expected. The system also requires monitoring with clear policy statements and scoring distribution guidelines. The PER meets these requirements.

Given the importance of the PER in deciding an individual service member's career progression, training, and postings, it is perhaps not surprising that the PER has a strong potential to influence servicemembers'

attitudes about remaining in or leaving the CF. Moreover, direct and specific information is communicated to the member via the PER, leaving little in doubt as to how the individual is regarded. For example, instructions provided to all supervisors, strongly advise that all subordinates be kept aware of the progress they are making in their careers and specifically during the period of observation. Supervisors must inform their subordinates frankly on how they are measuring up to their job requirements, and give them special direction in identifying and correcting deficiencies so they will know

exactly what and how to improve. Ideally, servicemembers are to be advised on a regular basis throughout the reporting period both formally and informally when details of job specific incidents are fresh in mind.

When a PER is completed, a performance interview that provides feedback to the servicemember is also carried out. This interview is accomplished by having the member read the supervisor's narrative that describes the member's performance, and by discussing its contents. In particular, the member must be informed of any shortcomings which are within his or her power to correct. Discussion can serve as encouragement to those whose endeavours are being recognized. It can also act as a spur to those who are rated as average performers. Last but not least, it provides an opportunity to point out to those individuals performing unsatisfactorily that their efforts have been noted as well as to provide encouragement and guidance to improve or correct performance. An employee receiving feedback regarding the quality of his or her work effort is an essential component between performance and attitudes about work.

Officers PER

Items for the Officers' Personnel Evaluation Report are listed below with a description of, and explanation for the rating scales used by supervisors when evaluating the performance of Officers.

- a. PERFORMANCE ITEMS
- PE1 Acceptance of Responsibility;

PF2 Application of Knowledge;
PF3 Problem Analysis;
PF4 Decision-Making;
PF5 Preparation and Planning;
PF6 Delegation;
PF7 Oral Expression;
PF8 Written Expression;
PF9 Performance Under Stress;
PF10 Cooperation; and,
PF11 Development of Subordinates.

b. - PROFESSIONAL ATTRIBUTES

PA1 Professional Knowledge;
PA2 Appearance;
PA3 Physical Fitness;
PA4 Conduct;
PA5 Intellect;
PA6 Integrity;
PA7 Loyalty;
PA8 Dedication; and
PA9 Courage.

Rating Scales Officer PER

The categories and rating levels used in the Officer PER are:

- a. UNSATISFACTORY. Performance of a very low quality which is very clearly inferior in relation to other Officers in the same rank and would be viewed as such by others;
- b. WEAK. Performance consistently falls short of the level of performance typical of most Officers in the same rank by a wide margin. May be due to a lack of training or experience, a minor deficiency, or lack of ability or desire to improve;
- c. LOW NORM. Performance slightly but measurably below the level achieved by the majority of Officers in the same rank;
- d. NORM. Performance of the level achieved by the majority of Officers in the same rank, hence the performance norm, it must be the most commonly used rating;
- e. HIGH NORM. Performance slightly but measurably above the level achieved by the majority of Officers in the same rank;

- f. SUPERIOR. Performance consistently exceeds the level achieved by most Officers in the same rank by a wide margin; and,
- g. OUTSTANDING. Performance of a rare high quality which is clearly outstanding in relation to other Officers in the same rank and would be viewed as such by others. A level seldom achieved.
- h. NOT OBSERVED For those categories not observed because of rank or position.

NCM PER

Items for the Non Commissioned Members' Personnel Evaluation Report are listed below with a description of, and explanation for the rating scales used by supervisors when evaluating the performance of NCMs.

a. PERFORMANCE ITEMS

- PF1 Preparation and Planning;
- PF2 Delegation;
- PF3 Performance Under Stress/Pressure;
- PF4 Co-operation;
- PF5 Command and Self Assertion;
- PF6 Support of Subordinates;
- PF7 Briefing Others;
- PF8 Knowledge of the Trade/Knowledge of the Job when Out of Trade;
- PF9 Ability to Apply Knowledge;
- PF10 Adaptability;
- PF11 Initiative;
- PF12 Appearance and Bearing;
- PF13 Supervision;
- PF14 Ensuring Understanding of Assignments;
- PF15 Responsibility;
- PF16 Conduct; and,
- PF17 Learning from Experience.

Rating Scales Non Commissioned Members PER

The definitions of the seven levels of performance used to assess an NCM servicemember's performance are:

- a. **BELOW STANDARD.** Performance below standard required for a rank; may indicate a single incident with grave consequences (which may be overcome or a persistent weakness);
- b. **MET MINIMUM.** Performance was acceptable but just met the minimum requirement. Sometimes showed a lack of experience or minor deficiency which can be corrected. Also indicates a lack of ability;
- c. **PERFORMANCE MET THE REQUIREMENT OF RANK.** This is the standard for acceptable performance and should be the most common rating used;
- d. **OCCASIONALLY EXCEEDED.** Performance fully met the required standard in this performance requirement and occasionally exceeded the requirement for rank and trade;
- e. **FREQUENTLY EXCEEDED.** Performance frequently exceeded the requirement in this performance requirement for the rank and trade;
- f. **CONSISTENTLY ABOVE STANDARD.** Performance greatly exceeded the requirement, consistently much higher than the standard required for the trade and rank; and,
- g. **RARE HIGH STANDARD.** Performance of a rare high standard which far exceeds the requirement and is considered as exceptional. It may apply to a single meritorious incident or consistently outstanding performance.

A composite score was usually used by career managers for overall performance information and was calculated by adding the scores of each performance requirement rated and dividing the total by the number of performance variables observed. However, for this study an exploratory examination of possible underlying components in the NCM PER using a similar factor analytic strategy as in the officer PER may uncover different performance dimensions to examine the relationship between performance and turnover. The NCM PER in this

study had been used for quite along time and has been replaced. Inflated scores had made it increasingly difficult to discriminate between members. This could have the effect of reducing the potential of finding underlying components in the PER and finding differences between turnover rates and performance levels. However, certain efforts are made to insure that the officers and NCMs PERs are reliable and valid. By monitoring and providing direct feedback to the raters the system is considered to be as good as any in use today.

APPENDIX C

UNDERLYING FACTORS OF THE OFFICER
AND OTHER RANKS PERFORMANCE EVALUATION REPORTS

APPENDIX C

UNDERLYING FACTORS OF THE OFFICER
AND OTHER RANKS PERFORMANCE EVALUATION REPORTS

Table C1

PER Items in Each Factor
Officers Overall

Factor Description	Item	Beta
Job Performance:	Delegated, Directed, Supervised	.75411
	Made Decisions, Took Action	.70814
	Accepted Responsibilities	.66959
	Subordinate Development	.66959
	Applied Knowledge and Skills	.65193
	Performance Under Stress	.62938
	Made Plans and Preparations	.61220
	Analysed Problems or Situations	.59297
	Worked with Others	.57514
	Dedication	.45582
	Professional Knowledge	.41839
Loyalty	.32327	
Intellect:	Expression in Writing	.75092
	Intellect	.71790
	Oral Expression	.67635
	Professional Knowledge	.57911
	Analysed Problems or Situations	.57601
	Applied Knowledge and Skills	.50328
	Made Plans and Preparations	.46001
	Made Decisions, Took Action	.39301
Accepted Responsibilities	.37709	
Professionalism:	Integrity	.78301
	Loyalty	.76407
	Conduct	.70500
	Dedication	.58516
	Courage	.49112
	Working with Others	.37165
Fitness and Appearance:	Physical Fitness	.84019
	Appearance	.75672

Note: Sample size (n=10422)

Table C2

PER Items in Each Factor
Junior Officers

Factor Description	Item	Beta
Job Performance:	Delegated, Directed, Supervised	.75461
	Made Decisions, Took Action	.73208
	Accepted Responsibilities	.68486
	Subordinate Development	.67609
	Applied Knowledge and Skills	.65341
	Performance Under Stress	.64687
	Made Plans and Preparations	.64067
	Analysed Problems or Situations	.63262
	Worked with Others	.57326
	Dedication	.48262
	Professional Knowledge	.44054
Loyalty	.32327	
Intellect:	Expression in Writing	.75167
	Intellect	.69770
	Oral Expression	.69319
	Professional Knowledge	.55946
	Analysed Problems or Situations	.52411
	Applied Knowledge and Skills	.47103
	Made Plans and Preparations	.41785
	Made Decisions, Took Action	.34768
	Accepted Responsibilities	.34707
Professionalism:	Integrity	.77575
	Loyalty	.75095
	Conduct	.70679
	Dedication	.52046
	Courage	.48940
	Working with Others	.37416
Fitness and Appearance:	Physical Fitness	.84761
	Appearance	.73998

Note: Sample size (n=6530)

Table C3

PER Items in Each Factor
Senior Officers

Factor Description	Item	Beta
Intellect:	Expression in Writing	.72240
	Intellect	.71565
	Analysed Problems or Situations	.66921
	Oral Expression	.62801
	Professional Knowledge	.61436
	Applied Knowledge and Skills	.58144
	Made Plans and Preparations	.52317
	Made Decisions, Took Action	.46330
Job Performance:	Accepted Responsibilities	.42695
	Performance Under Stress	.32874
	Delegated, Directed, Supervised	.73674
	Subordinate Development	.67621
	Made Decisions, Took Action	.62105
	Accepted Responsibilities	.59970
	Performance Under Stress	.55900
	Applied Knowledge and Skills	.53329
Professionalism:	Worked with Others	.49933
	Made Plans and Preparations	.49012
	Analysed Problems or Situations	.43873
	Dedication	.34551
	Integrity	.80206
	Loyalty	.79998
Fitness and Appearance:	Conduct	.68604
	Dedication	.54586
	Courage	.49324
	Working with Others	.37517
	Physical Fitness	.79824
	Appearance	.77932

Note: Sample size (n=3586)

Table C4

PER Items in Each Factor
Operations Officers

Factor Description	Item	Beta
Job Performance:	Delegated, Directed, Supervised	.74966
	Made Decisions, Took Action	.71407
	Subordinate Development	.67672
	Performance Under Stress	.64811
	Accepted Responsibilities	.64605
	Applied Knowledge and Skills	.64234
	Made Plans and Preparations	.60619
	Analysed Problems or Situations	.58165
	Worked with Others	.54841
	Dedication	.46343
Professional Knowledge	.40878	
Intellect:	Expression in Writing	.75656
	Intellect	.72785
	Oral Expression	.67553
	Analysed Problems or Situations	.58614
	Professional Knowledge	.57607
	Applied Knowledge and Skills	.49489
	Made Plans and Preparations	.48352
	Accepted Responsibilities	.40868
Made Decisions, Took Action	.38134	
Professionalism:	Integrity	.78381
	Loyalty	.77091
	Conduct	.69682
	Dedication	.51704
	Courage	.46138
	Working with Others	.36550
Fitness and Appearance:	Accepted Responsibilities	.30789
	Physical Fitness	.84064
	Appearance	.73619

Note: Sample Size (n=5033)

Table C5

PER Items in Each Factor
Technical Officers

Factor Description	Item	Beta
Intellect:	Intellect	.72422
	Expression in Writing	.71297
	Analysed Problems or Situations	.66957
	Professional Knowledge	.66416
	Oral Expression	.62818
	Applied Knowledge and Skills	.61963
	Made Plans and Preparations	.52538
	Made Decisions, Took Action	.48677
	Accepted Responsibilities	.43064
	Performance Under Stress	.36258
Job Performance:	Delegated, Directed, Supervised	.74948
	Subordinate Development	.66744
	Made Decisions, Took Action	.62818
	Accepted Responsibilities	.62470
	Worked with Others	.57084
	Performance Under Stress	.55849
	Applied Knowledge and Skills	.53208
	Made Plans and Preparations	.50323
	Analysed Problems or Situations	.45855
	Dedication	.42313
Loyalty	.31319	
Professionalism:	Integrity	.77451
	Loyalty	.76428
	Conduct	.70106
	Courage	.50170
	Dedication	.46984
	Working with Others	.34405
Fitness and Appearance:	Physical Fitness	.81144
	Appearance	.78264

Note: Sample size (n=2339)

Table C6

PER Items in Each Factor
Specialist Officers

Factor Description	Item	Beta
Job Performance:	Delegated, Directed, Supervised	.73503
	Accepted Responsibilities	.69310
	Made Decisions, Took Action	.67708
	Subordinate Development	.67544
	Applied Knowledge and Skills	.63478
	Worked with Others	.61355
	Made Plans and Preparations	.61056
	Performance Under Stress	.60258
	Analysed Problems or Situations	.59993
	Dedication	.36071
Professional Knowledge	.35972	
Intellect:	Expression in Writing	.75901
	Intellect	.69206
	Oral Expression	.68290
	Professional Knowledge	.65694
	Analysed Problems or Situations	.55882
	Applied Job Knowledge	.53290
	Worked with Others	.40453
	Made Decisions, Took Action	.38169
	Courage	.34236
Accepted Responsibilities	.33055	
Professionalism:	Integrity	.78177
	Loyalty	.75994
	Conduct	.72356
	Dedication	.64733
	Courage	.52688
	Working with Others	.43859
	Accepted Responsibilities	.33281
Fitness and Appearance:	Physical Fitness	.85866
	Appearance	.74395

Note: Sample size (n=1,185)

Table C7
 PER Items in Each Factor
 Support Officers

Factor Description	Item	Beta
Job Performance:	Delegated, Directed, Supervised	.75866
	Applied Knowledge and Skills	.71188
	Made Decisions, Took Action	.69930
	Accepted Responsibilities	.69138
	Subordinate Development	.68799
	Analysed Problems or Situations	.62127
	Made Plans and Preparations	.61562
	Performance Under Stress	.61096
	Worked with Others	.59976
	Professional Knowledge	.53995
	Dedication	.46419
	Loyalty	.32006
Intellect:	Expression in Writing	.77391
	Oral Expression	.71563
	Intellect	.69745
	Analysed Problems or Situations	.55666
	Made Plans and Preparations	.44526
	Applied Job Knowledge	.44422
	Professional Knowledge	.44099
	Made Decisions, Took Action	.41556
	Accepted Responsibilities	.34354
Professionalism:	Integrity	.78008
	Loyalty	.76626
	Conduct	.69212
	Courage	.54557
	Dedication	.54487
Fitness and Appearance:	Working with Others	.31789
	Physical Fitness	.83582
	Appearance	.77448
	Conduct	.33867

Note: Sample size (n=1794)

Table C8

PER Items in Each Factor
Support Trades

Factor Description	Item	Beta
Professionalism:	Conduct	.78474
	Cooperation	.75572
	Responsibility	.72111
	Learning from Experience	.71199
	Ability to Apply Knowledge	.71050
	Initiative	.69799
	Performance Under Stress	.68208
	Adaptability	.67418
	Appearance and Bearing	.67136
	Preparation and Planning	.66257
	Trade Job Knowledge	.63723
	Ensuring Understanding	.40716
	Briefing Others	.39629
	Command and Self Assertion	.39450
	Support of Subordinates	.37760
Supervision	.36198	
Delegation	.34896	
Leadership:	Supervision	.84422
	Delegation	.83798
	Ensuring Understanding	.80664
	Support of Subordinates	.80534
	Briefing Others	.79731
	Command and Self Assertion	.78292
	Preparation and Planning	.57166
	Performance Under Stress	.54569
	Trade Job Knowledge	.53478
	Ability to Apply Knowledge	.51325
	Adaptability	.50885
	Responsibility	.49870
	Learning From Experience	.47250
Cooperation	.34535	

Note: Sample size (n=7693)

6
Table C9

PER Items in Each Factor
Junior Non Commissioned Member

Factor Description	Item	Beta
Leadership:	Delegation	.83724
	Supervision	.83715
	Support of Subordinates	.81425
	Briefing Others	.80463
	Ensuring Understanding	.79824
	Command and Self Assertion	.78068
	Preparation And Planning	.57850
	Trade Job Knowledge	.54869
	Initiative	.53406
	Ability to Apply Knowledge	.53342
	Adaptability	.51597
	Responsibility	.50723
	Conduct	.48002
Cooperation	.39562	
Professionalism:	Conduct	.79218
	Cooperation	.75206
	Responsibility	.72023
	Learning from Experience	.71661
	Adaptability	.70716
	Ability to Apply Knowledge	.70283
	Initiative	.69704
	Appearance and Bearing	.69111
	Performance Under Stress	.67552
	Preparation and Planning	.65854
	Trade Job Knowledge	.64194
	Ensuring Understanding	.40876
	Briefing Others	.39280
	Command and Self Assertion	.38001
	Support of Subordinates	.36367
Supervision	.36170	
Delegation	.34327	

Note: Sample size (n=11293)

APPENDIX D
SUMMARY TABLES FOR
ONE-WAY ANALYSES OF VARIANCE
FOR OFFICERS AND NCMS

APPENDIX D

SUMMARY TABLES FOR
ONE-WAY ANALYSES OF VARIANCE
FOR OFFICERS AND NCMS

Table D1

Analysis of Variance Officers Overall
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	61.3000	20.4333	7.6149	.0005
Linear Term	1	46.0800	46.0800	17.1727	.0002
Dev from Linear	2	15.2200	7.6100	2.8360	.0718
Quad. Term	1	6.4000	6.4000	2.3851	.1312
Dev from Quad	1	8.8200	8.8200	3.2870	.0782
Within Groups	36	98.6000	2.6833		
Total	39	157.9000			

Note: Sample Size (N=4000).

Table D2

Analysis of Variance Officers Overall
Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	19.2750	6.4250	4.7691	.0067
Linear Term	1	14.0450	14.0450	10.4252	.0027
Dev from Linear	2	5.2300	2.6150	1.9410	.1583
Quad. Term	1	3.0250	3.0250	2.2454	.1427
Dev from Quad	1	2.2050	2.2050	1.6367	.2090
Within Groups	36	48.5000	1.3472		
Total	39	67.7750			

Note: Sample Size (N=4000)

Table D3

Analysis of Variance Officers Overall
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	45.4000	15.1333	5.5030	.0032
Linear Term	1	40.5000	40.5000	14.7273	.0005
Dev from Linear	2	4.9000	2.4500	.8909	.4191
Quad. Term	1	4.9000	4.9000	1.7818	.1903
Dev from Quad	1	.0000	.0000	.0000	1.0000
Within Groups	36	99.0000	2.7500		
Total	39	144.4000			

Note: Sample Size (N=4000)

Table D4

Analysis of Variance Officers Overall
Appearance and Physical Fitness Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.4750	.1583	.0710	.9751
Linear Term	1	.0450	.0450	.0202	.8878
Dev from Linear	2	.4300	.2150	.0964	.9083
Quad. Term	1	.0250	.0250	.0112	.9163
Dev from Quad	1	.4050	.4050	.1816	.6726
Within Groups	36	80.3000	2.2306		
Total	39	80.7750			

Note: Sample Size (N=4000)

Table D5
 Analysis of Variance
 Junior Officers
 Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	19.6000	6.5333	4.8395	.0139
Linear Term	1	12.9600	12.9600	9.6000	.0069
Dev from Linear	2	6.6400	3.3200	2.4593	.1171
Quad. Term	1	1.8000	1.8000	1.3333	.2652
Dev from Quad	1	4.8400	4.8400	3.5852	.0765
Within Groups	16	21.6000	1.3500		
Total	19	41.2000			

Note: Sample Size (N=2000)

Table D6
 Analysis of Variance
 Junior Officers
 Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	13.2000	4.4000	2.0952	.1411
Linear Term	1	12.9600	12.9600	6.1714	.0244
Dev from Linear	2	.2400	.1200	.0571	.9447
Quad. Term	1	.2000	.2000	.0952	.7616
Dev from Quad	1	.0400	.0400	.0190	
Within Groups	16	33.6000	2.1000		
Total	19	46.8000			

Note: Sample Size (N=2000)

Table D7

Analysis of Variance
Junior Officers
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	25.7500	8.5833	3.0383	.0595
Linear Term	1	3.6100	3.6100	1.2779	.2750
Dev from Linear	2	22.1400	11.0700	3.9186	.0412
Quad. Term	1	22.0500	22.0500	7.8053	.0130
Dev from Quad	1	.0900	.0900	.0319	.8606
Within Groups	16	45.2000	2.8250		
Total	19	70.9500			

Note: Sample Size (N=2000)

Table D8

Analysis of Variance
Junior Officers
Appearance and Physical Fitness Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	2.9500	.9833	.7867	.5187
Linear Term	1	2.2500	2.2500	1.8000	.1984
Dev from Linear	2	.7000	.3500	.2800	.7594
Quad. Term	1	.4500	.4500	.3600	.5569
Dev from Quad	1	.5000	.2500	.2000	.6607
Within Groups	16	20.0000	1.2500		
Total	19	22.9500			

Note: Sample Size (N=2000)

Table D9

Analysis of Variance
Senior Officers
Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	8.5500	2.8500	1.9000	.1703
Linear Term	1	7.2900	7.2900	4.8600	.0425
Dev from Linear	2	1.2600	.6300	.4200	.6641
Quad. Term	1	1.2500	1.2500	.8333	.3749
Dev from Quad	1	.0100	.0100	.0067	.9395
Within Groups	16	24.0000	1.5000		
Total	19	32.5500			

Note: Sample Size (N=2000)

Table D10

Analysis of Variance
Senior Officers
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	7.7500	2.5833	.9226	.4523
Linear Term	1	5.2900	5.2900	1.8893	.1882
Dev from Linear	2	2.4600	1.2300	.4393	.6520
Quad. Term	1	1.2500	1.2500	.4464	.5136
Dev from Quad	1	1.2100	1.2100	.4321	.5203
Within Groups	16	44.0000	2.8000		
Total	19	52.5500			

Note: Sample Size (N=2000)

Table D11
 Analysis of Variance
 Senior Officers
 Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	22.8000	7.6000	6.7556	.0037
Linear Term	1	12.9600	12.9600	11.5200	.0037
Dev from Linear	2	9.8400	4.9200	4.3733	.0305
Quad. Term	1	9.8000	9.8000	8.7111	.0094
Dev from Quad	1	.0400	.0400	.0358	.8528
Within Groups	16	18.0000	1.1250		
Total	19	40.8000			

Note: Sample Size (N=2000)

Table D12
 Analysis of Variance
 Senior Officers
 Appearance and Physical Fitness Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	5.2000	1.7333	1.5758	.2342
Linear Term	1	1.0000	1.0000	.9091	.3545
Dev from Linear	2	4.2000	2.1000	1.9091	.1805
Quad. Term	1	3.2000	3.2000	2.9091	.1074
Dev from Quad	1	1.0000	1.0000	.9091	.3545
Within Groups	16	17.6000	1.1000		
Total	19	22.8000			

Note: Sample Size (N=2000)

Table D13
 Analysis of Variance
 Operations Officers
 Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	8.1500	2.7167	5.1746	.0109
Linear Term	1	7.2900	7.2900	13.8857	.0018
Dev from Linear	2	.8600	.4300	.8190	.4585
Quad. Term	1	.0500	.0500	.0952	.7616
Dev from Quad	1	.8100	.8100	1.5429	.2321
Within Groups	16	8.4000	.5250		
Total	19	16.5500			

Note: Sample Size (N=2000)

Table D14
 Operations Officers
 Analysis of Variance
 Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	2.5500	.8500	.9714	.4305
Linear Term	1	1.2100	1.2100	1.3829	.2568
Dev from Linear	2	1.3400	.6700	.7657	.4813
Quad. Term	1	1.2500	1.2500	1.4286	.2494
Dev from Quad	1	.0900	.0900	.1029	.7526
Within Groups	16	14.0000	.8750		
Total	19	16.5500			

Note: Sample Size (N=2000)

Table D15
 Analysis of Variance
 Operations Officers
 Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	4.1500	1.3833	2.0494	.1475
Linear Term	1	2.8900	2.8900	4.2815	.0551
Dev from Linear	2	1.2600	.6300	.9333	.4136
Quad. Term	1	.4500	.4500	.6667	.4262
Dev from Quad	1	.8100	.8100	1.2000	.2895
Within Groups	16	10.8000	.6750		
Total	19	14.9500			

Note: Sample Size (N=2000)

Table D16
 Analysis of Variance
 Operations Officers
 Appearance and Physical Fitness

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.9500	.3167	.5758	.6382
Linear Term	1	.0100	.0100	.0182	.8944
Dev from Linear	2	.9400	.4700	.8545	.4440
Quad. Term	1	.4500	.4500	.8182	.3791
Dev from Quad	2	.4900	.4900	.8909	.3593
Within Groups	16	8.8000	.5500		
Total	19	9.7500			

Note: Sample Size (N=2000)

Table D17

Analysis of Variance
 Technical Officers
 Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	37.6042	12.5347	3.3691	.0448
Unweighted	1	33.3062	33.3062	9.6696	.0090
Weighted Linear	1	34.5156	34.5156	10.0207	.0081
Dev from Linear	2	3.0885	1.5443	.4483	.6490
Unweighted Quad	1	3.0885	3.0375	.8819	.3662
Weighted Quad	1	3.0375	3.0375	.8819	.3662
Dev from Quad	1	.0510	.0510	.0148	.9051
Within Groups	12	41.3333	3.4444		
Total	15	78.9375			

Note: Sample Size (N=1600)

Table D18

Analysis of Variance
 Technical Officers
 Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	37.8833	12.6278	6.9299	.0058
Unweighted	1	28.9000	28.9000	15.8598	.0018
Weighted Linear	1	27.5625	27.5625	15.1258	.0022
Dev from Linear	1	10.3208	5.1604	2.8319	.0983
Unweighted Quad	1	8.8167	8.8167	4.8384	.0482
Weighted Quad	1	8.8167	8.8167	4.8384	.0482
Dev from Quad	1	1.5042	1.5042	.8255	.3815
Within Groups	12	21.8667	1.8220		
Total	15	59.7500			

Note: Sample Size (N=1600)

Table D19

Analysis of Variance
 Technical Officers
 Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	22.7944	7.5981	2.0394	.15646
Unweighted	1	.6250	.6250	.1678	.6883
Weighted Linear	1	.3049	.3049	.0818	.7790
Dev from Linear	2	22.4896	11.2448	3.0187	.0813
Unweighted Quad	1	9.6694	9.6694	2.5958	.1295
Weighted Quad	1	9.6694	9.6694	2.5958	.1295
Dev from Quad	1	12.8201	12.8201	3.4416	.0847
Within Groups	14	52.1500	3.7250		
Total	17	74.9444			

Note: Sample Size (N=1800)

Table D20

Analysis of Variance
 Technical Officers
 Physical Fitness and Appearance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	6.4375	2.1458	.8583	.4890
Unweighted	1	1.8062	1.8062	.7225	.4120
Weighted Linear	1	1.8906	1.8906	.7562	.4016
Dev from Linear	2	4.5469	2.2734	.9094	.4288
Unweighted Quad	1	4.5375	4.5375	1.8150	.2028
Weighted Quad	1	4.5375	4.5375	1.8150	.2028
Dev from Quad	1	.0094	.0094	.0037	.9522
Within Groups	12	30.0000	2.5000		
Total	15	36.4375			

Note: Sample Size (N=1600)

Table D21

Analysis of Variance
Support Officers
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	1.0937	.3646	.6642	.5806
Unweighted	1	.8097	.8097	1.4754	.2340
Weighted Linear	1	.7268	.7268	1.3242	.2589
Dev from Linear	2	.3669	.1834	.3342	.7185
Unweighted Quad	1	.1548	.1548	.2821	.5992
Weighted Quad	1	.1586	.1586	.2890	.5949
Dev from Quad	1	.2083	.2083	.3795	.5425
Within Groups	30	16.4652			
Total	33	17.5588			

Note: Sample Size (N=1700)

Table D22

Analysis of Variance
Support Officers
Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.5667	.1889	.1972	.8973
Unweighted	1	.0658	.0658	.0687	.7953
Weighted Linear	1	.0364	.0364	.0380	.8470
Dev from Linear	2	.5303	.2652	.2769	.7604
Unweighted Quad	1	.4167	.4167	.4351	.5153
Weighted Quad	1	.4167	.4167	.4351	.5153
Dev from Quad	1	.1136	.1136	.1187	.7333
Within Groups	26	24.9000	.9577		
Total	29	25.4667			

Note: Sample Size (N=1500)

Table D23

Analysis of Variance
Support Officers
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	3.2602	1.0867	1.0141	.4018
Unweighted	1	.0457	.0457	.0427	.8379
Weighted Linear	1	.0185	.0185	.0173	.8963
Dev from Linear	2	3.2417	1.6208	1.5125	.2384
Unweighted Quad	1	.5020	.5020	.4684	.4495
Weighted Quad	1	.4335	.4335	.4045	.5301
Dev from Quad	1	2.8082	2.8082	2.6206	.1171
Within Groups	27	28.9333	1.0716		
Total	30	32.1935			

Note: Sample Size (N=1550)

Table D24

Analysis of Variance
Support Officers
Fitness and Appearance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.9667	.3222	.3420	.7952
Unweighted	1	.7605	.7605	.8071	.3772
Weighted Linear	1	.5818	.5818	.6124	.4391
Dev from Linear	2	.3848	.1924	.2042	.8166
Unweighted Quad	1	.0167	.0167	.0177	.8952
Weighted Quad	1	.0167	.0167	.0177	.8952
Dev from Quad	1	.3682	.3682	.3907	.5374
Within Groups	26	24.5000	.9423		
Total	29	25.4667			

Note: Sample Size (N=1500)

Table D25

Analysis of Variance
Specialist Officers
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	10.1726	3.3909	1.9833	.1548
Unweighted	1	5.2422	5.2422	3.0661	.0980
Weighted Linear	1	5.9121	5.9121	3.4579	.0803
Dev from Linear	2	4.2605	2.1302	1.2460	.3126
Unweighted Quad	1	4.2042	4.2042	2.4590	.1353
Weighted Quad	1	4.1693	4.1693	2.4386	.1368
Dev from Quad	1	.0912	.0912	.0533	.8201
Within Groups	17	29.0655	1.7097		
Total	20	39.2381			

Note: Sample Size (N=1050)

Table D26

Analysis of Variance
Specialist Officers
Intellect Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	10.1726	3.3909	1.9833	.1548
Unweighted	1	5.2422	5.2422	3.0661	.0980
Weighted Linear	1	5.9121	5.9121	3.4579	.0803
Dev from Linear	2	4.2605	2.1302	1.2460	.3126
Unweighted Quad	1	4.2042	4.2042	2.4590	.1353
Weighted Quad	1	4.1693	4.1693	2.4386	.1368
Dev from Quad	1	.0912	.0912	.0533	.8201
Within Groups	17	29.0655	1.7097		
Total	20	39.2381			

Note: Sample Size (N=1000)

Table D27

Analysis of Variance
Specialist Officers
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	61.3350	20.4450	9.3746	.0006
Unweighted	1	44.6510	20.4450	20.4738	.0003
Weighted Linear	1	41.3526	44.3526	18.9614	.0004
Dev from Linear	2	19.9824	9.9912	4.5812	.0246
Unweighted Quad	1	19.8752	19.8752	9.1133	.0074
Weighted Quad	1	19.9227	19.9227	9.1351	.0074
Dev from Quad	1	.0597	.0587	.0274	.8705
Within Groups	18	39.2560	2.1809		
Total	21	100.5909			

Note: Sample Size (N=1140)

Table D28

Analysis of Variance
Specialist Officers
Fitness and Appearance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	11.1468	3.7156	1.0220	.4075
Unweighted	1	2.9171	2.9171	.8024	.3829
Weighted Linear	1	.1440	.1440	.0396	.8446
Dev from Linear	2	11.0028	5.5014	1.5132	.2484
Unweighted Quad	1	6.7755	6.7755	1.8637	.1900
Weighted Quad	1	6.2827	6.2827	1.7281	.2061
Dev from Quad	1	4.7201	4.7201	1.2983	.2703
Within Groups	17	61.8056	3.6356		
Total	20	72.9524			

Note: Sample Size (N=1050)

Table D29

Analysis of Variance
Non Commissioned Member Overall
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.4750	.1583	.0757	.9727
Linear Term	1	.2450	.2450	.1171	.7342
Dev from Linear	2	.2300	.1150	.0550	.9466
Quad Term	1	.2250	.2250	.1076	.7448
Dev from Quad	1	.0050	.0050	.0024	.9613
Within Groups	36	75.3000	2.0917		
Total	39	75.7750			

Note: Sample Size (N=4000)

Table D30

Analysis of Variance
Senior Non Commissioned Member
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	2.2750	.7583	.1954	.8988
Linear Term	1	1.8050	1.8050	.4651	.4996
Dev from Linear	2	.4700	.2350	.0606	.9413
Quad Term	1	.2250	.2250	.0580	.8111
Dev from Quad	1	.2450	.2450	.0631	.8030
Within Groups	36	139.7000	3.8806		
Total	39	141.9750			

Note: Sample Size (N=4000)

Table D31

Analysis of Variance
Junior Non Commissioned Member
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	9.8000	3.2667	2.4603	.0784
Linear Term	1	5.7800	5.7800	4.3531	.0441
Dev from Linear	2	4.0200	2.0100	1.5138	.2337
Quad Term	1	1.6000	1.6000	1.2050	.2796
Dev from Quad	1	2.4200	2.4200	1.8226	.1854
Within Groups	36	47.8000	1.3278		
Total	39	57.6000			

Note: Sample Size (N=4000)

Table D32

Analysis of Variance
Junior Non Commissioned Member
Leadership Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	.8750	.2917	.1878	.9040
Linear Term	1	.6050	.6050	.3896	.5364
Dev from Linear	2	.2700	.1350	.0869	.9169
Quad Term	1	.0250	.0250	.0161	.8997
Dev from Quad	1	.2450	.2450	.1578	.6936
Within Groups	36	55.9000	1.5528		
Total	39	56.7750			

Note: Sample Size (N=4000)

Table D33

Analysis of Variance
Support Trades
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	33.2750	11.0917	2.6602	.0628
Linear Term	1	17.4050	17.4050	4.1744	.0484
Dev from Linear	2	15.8700	7.9350	1.9031	.1638
Quad Term	1	9.0250	9.0250	2.1646	.1499
Dev from Quad	1	6.8450	6.8450	1.6417	.2083
Within Groups	36	150.1000	4.1694		
Total	39	183.3750			

Note: Sample Size (N=4000)

Table D34

Analysis of Variance
Support Trades
Leadership Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	22.1000	7.3667	3.6936	.0204
Linear Term	1	15.6800	15.6800	7.8618	.0081
Dev from Linear	2	6.4200	3.2100	1.6095	.2141
Quad Term	1	6.4000	6.4000	3.2089	.0816
Dev from Quad	1	.0200	.0200	.0100	.9208
Within Groups	36	71.8000	1.9944		
Total	39	93.9000			

Note: Sample Size (N=4000)

Table D35

Analysis of Variance
 Technical Trades
 Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	6.9000	2.3000	1.1468	.3434
Linear Term	1	.3200	.3200	.1596	.6919
Dev from Linear	2	6.5800	3.2900	1.6404	.2081
Quad Term	1	6.4000	6.4000	3.1911	.0825
Dev from Quad	1	.1800	.1800	.0898	.7662
Within Groups	36	72.2000	2.0056		
Total	39	79.1000			

Note: Sample Size (N=4000)

Table D36

Analysis of Variance
 Land Operations Trades
 Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	3.8459	1.2820	.8490	.4785
Unweighted	1	.1993	.1993	.1320	.7190
Weighted Linear	1	.3491	.3491	.2312	.6342
Dev from Linear	2	3.4968	1.7484	1.1579	.3283
Unweighted Quad	1	3.4344	3.4394	2.2777	.1421
Weighted Quad	1	3.4173	3.4173	2.2431	.1433
Dev from Quad	1	.0795	.0795	.0526	.8201
Within Groups	29	43.7905	1.5100		
Total	32	47.6364			

Note: Sample Size (N=3300)

Table D37

Analysis of Variance
Sea Operations Trades
Job Performance Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	16.7619	5.5873	6.2857	.0827
Unweighted	1	4.6254	4.6254	5.2035	.1068
Weighted Linear	1	8.2286	8.2286	9.2511	.0558
Dev from Linear	2	2.5098	2.5098	2.8235	.1162
Unweighted Quad	1	2.5098	2.5098	2.8235	.1915
Weighted Quad	1	1.7965	1.7965	2.0211	.2503
Dev from Quad	1	6.7368	6.7368	7.5789	.0706
Within Groups	3	2.6667	.8889		
Total	6	19.4286			

Note: Sample Size (N=700)

Table D38

Analysis of Variance
Air Operations Trades
Professionalism Factor

SOURCE	D.F.	SS	MS	F RATIO ^c	F PROB.
Between Groups	3	3.2143	1.0714	1.2857	.4206
Unweighted	1	.4544	.6504	.7805	.4420
Weighted Linear	1	.9143	.9143	1.0971	.3718
Dev from Linear	2	2.3000	1.1500	1.3800	.3759
Unweighted Quad	1	2.2059	2.2059	2.6471	.2022
Weighted Quad	1	2.2737	2.2737	2.7284	.1971
Dev from Quad	1	.0263	.0263	.0316	.8703
Within Groups	3	2.5000	.8333		
Total	6	3.7143			

Note:^a Sample Size (N=700)

Table D39

Analysis of Variance
Air Operations Trades
Leadership Factor

SOURCE	D.F.	SS	MS	F RATIO	F PROB.
Between Groups	3	3.0476	1.0159	.6531	.6326
Unweighted	1	.3776	.3776	.2427	.6560
Weighted Linear	1	.2893	.2893	.1860	.6954
Dev from Linear	2	2.7583	1.3792	.8866	.4983
Unweighted Quad	1	2.5098	2.5098	1.6134	.2936
Weighted Quad	1	2.3373	2.3373	1.5025	.3073
Dev from Quad	1	.4211	.4211	.2707	.6388
Within Groups	3	4.6667	1.5556		
Total	6	7.7143			

Note: Sample Size (N=700)

APPENDIX E

AN EXAMPLE OF THE SPSS-X DATA
ANALYSIS PROGRAM

APPENDIX E

AN EXAMPLE OF THE

SPSS-X DATA ANALYSIS PROGRAM

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1  TITLE PER ANALYSIS FACTOR 2
2  DATA LIST FILE= OFFICERG/
COMMENT LINES TWO TO SIX DECLARE THE VARIABLES TO BE DRAWN FROM
THE MASTERFILE OFFICERG AND INDICATE WHAT COLUMNS THE DATA ARE
LOCATED ON AND WHETHER THE DATA IS ALPHANUMERIC OR NOT.
3  RANKA 61 (A) PF8001 TO PF8020 66-85 (A)
4  RANKB 240 (A) PF8101 TO PF8120 245-264 (A)
5  RANKC 420 (A) PF8201 TO PF8120 424-443 (A)
6  MOC 561-562 STATUS 591
7  VARIABLE LABELS
8  RANKA "RANK 1980"
9  RANKB "RANK 1981"
10 RANKC "RANK 1982"
11 MOC "MILITARY OCCUPATION CLASSIFICATION"
12 PF8001 "ACCEPTED RESPONSIBILITIES/DUTIES 1980"
13 PF8101 "ACCEPTED RESPONSIBILITIES/DUTIES 1981"
14 PF8201 "ACCEPTED RESPONSIBILITIES/DUTIES 1982"
15 PF8002 "APPLIED JOB KNOWLEDGE AND SKILLS 1980"
16 PF8102 "APPLIED JOB KNOWLEDGE AND SKILLS 1981"
17 PF8202 "APPLIED JOB KNOWLEDGE AND SKILLS 1982"
18 PF8003 "ANALYSED PROBLEMS OR SITUATIONS 1980"
19 PF8193 "ANALYSED PROBLEMS OR SITUATIONS 1981"
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20 PF8203 "ANALYSED PROBLEMS OR SITUATIONS 1982"
21 PF8004 "MADE DECISIONS/TOOK ACTION 1980"
22 PF8104 "MADE DECISIONS/TOOK ACTION 1981"
23 PF8204 "MADE DECISIONS/TOOK ACTION 1982"
24 PF8995 "MADE PLANS AND PREPARATIONS 1980"
25 PF8105 "MADE PLANS AND PREPARATIONS 1981"
26 PF8205 "MADE PLANS AND PREPARATIONS 1982"
27 PF8006 "DELIGATED/DIRECTED/SUPERVISED 1980"
28 PF8106 "DELIGATED/DIRECTED/SUPERVISED 1981"
29 PF8206 "DELIGATED/DIRECTED/SUPERVISED 1982"
30 PF8007 "ORAL EXPRESSION 1980"
31 PF8107 "ORAL EXPRESSION 1981"
32 PF8207 "ORAL EXPRESSION 1982"
33 PF8008 "EXPRESSION IN WRITING 1980"
34 PF8191 "EXPRESSION IN WRITING 1981"
35 PF8208 "EXPRESSION IN WRITING 1982"
36 PF8009 "PERFORMANCE UNDER STRESS/PRESSURE 1980"
37 PF8109 "PERFORMANCE UNDER STRESS/PRESSURE 1981"
38 PF8209 "PERFORMANCE UNDER STRESS/PRESSURE 1982"
39 PF8010 "WORKED WITH OTHERS 1980"
40 PF8110 "WORKED WITH OTHERS 1981"
41 PF8210 "WORKED WITH OTHERS 1982"
42 PF8011 "SUBORDINATE DEVELOPMENT/WELL-BEING 1980"
43 PF8111 "SUBORDINATE DEVELOPMENT/WELL-BEING 1981"
44 PF8211 "SUBORDINATE DEVELOPMENT/WELL-BEING 1982"
45 PF8012 "PROFESSIONAL KNOWLEDGE 1980"

46 PF8112 "PROFESSIONAL KNOWLEDGE 1981"
47 PF8212 "PROFESSIONAL KNOWLEDGE 1982"
48 PF8013 "APPEARANCE 1980"
49 PF8113 "APPEARANCE 1981"
50 PF8213 "APPEARANCE 1982"
51 PF8014 "PHYSICAL FITNESS 1980"
52 PF8114 "PHYSICAL FITNESS 1981"
53 PF8014 "PHYSICAL FITNESS 1982"
54 PF8015 "CONDUCT 1980"
55 PF8115 "CONDUCT 1981"
56 PF8215 "CONDUCT 1982"
57 PF8016 "INTELLECT 1980"
58 PF8116 "INTELLECT 1981"
59 PF8216 "INTELLECT 1982"
60 PF8217 "INTEGRITY 1980"
61 PF8117 "INTEGRITY 1981"
62 PF8217 "INTEGRITY 1982"
63 PF8018 "LOYALTY 1980"
64 PF8118 "LOYALTY 1981"
65 PF8218 "LOYALTY 1982"
66 PF8019 "DEDICATION 1980"
67 PF8119 "DEDICATION 1981"
68 PF8219 "DEDICATION 1982"
70 PF8020 "COURAGE 1980"
71 PF8220 "COURAGE 1982"

COMMENT ALL BLANKS ON THE DATA FILE ARE CODED 999.

72 SET BLANKS =999

COMMENT THE PURPOSE OF THE RECODE IS TO CONVERT ALPHANUMERIC
DATA INTO NUMERIC FOR THE ANALYSIS

73 RECODE PF8001 TO PF8011 ('U','N'=0) ('A'=1) ('B'=2)
('C'=3) ('D'=4) ('F'=6) ('G'=7)
(CONVERT) INTO P8001 TO P8011

74 RECODE PF8012 TO PF8020 ('L'=1) ('C'=2) ('D'=3)
('E'=4) ('H'=5) ('U','N'=0) (CONVERT) INTO P8012
TO P8020

75 RECODE PF8101 TO PF8111 ('U','N'=0) ('A'=1) ('B'=2)
('C'=3) ('D'=4) ('E'=5) ('F'=6) ('G'=7)
(CONVERT) INTO P8101 TO P8111

76 RECODE PF8112 TO PF8120 ('L'=1) ('C'=2) ('D'=3)
('E'=4) ('H'=5) ('U','N'=0) (CONVERT) INTO P8112
TO P8120

77 RECODE PF8201 TO PF8211 ('U','N'=0) ('A'=1) ('B'=2)
('C'=3) ('D'=4) ('E'=5) ('F'=6) ('G'=7)
(CONVERT) INTO P8201 TO P8211

78 RECODE PF8212 TO PF8220 ('L'=1) ('C'=2) ('D'=3)
('E'=4) ('H'=5) ('U','N'=0) (CONVERT) INTO P8212
TO P8220

79 MISSING VALUES P8001 TO P8020 (999,0)

80 MISSING VALUES P8101 TO P8120 (999,0)

81 MISSING VALUES P8201 TO P8220 (999,0)

82 RECODE MOC (74,72,67,55,56,57,58,61,62,51,52=1)
(31,63,64,65,73,32,21,22,23,82,71=2)
(53,66,81,69,68,75=3) (45,42,43,41,44=4)
INTO MOCSUBGP

83 VARIABLE LABELS MOCSUBGGP "CLASSIFICATION GROUPINGS"
84 VALUE LABELS MOCSUBGP 1 'SPECIALIST' 2 'OPERATIONS'
3 'SUPPORT' 4 'TECHNICAL'

85 RECODE RANKC ('P','M','L','K','JJ'=1)
('H','F','G','E','D','C','B','A'=2)
INTO RANKGPS

86 VARIABLE LABELS RANKGPS "OFFICER RANK GROUPINGS"
87 VALUE LABELS RANKGPS 1 'JUNIOR OFFICERS'
2 'SENIOR OFFICERS'

COMMENT CONDESCRIPTIVE PROVIDES SOME BASIC SUMMARY STATISTICS
ON THE RAW DATA AND PRODUCES STANDARDIZED Z-SCORES FOR THE
ANALYSIS

88 CONDESCRIPTIVE P8001 TO P8020
89 STATISTICAL ALL
90 OPTIONS 3 4 6 7

91 CONDESCRIPTIVE P8101 TO P8120
92 STATISTICAL ALL
93 OPTIONS 3 4 6 7

94 CONDESCRIPTIVE P8201 TO P8220
95 STATISTICAL ALL
96 OPTIONS 3 4 6 7

COMMENT THE NEXT SECTION OF THE PROGRAM PRODUCES THE AVERAGE
STANDARDIZED SCORES ACROSS THREE YEARS OF DATA THUS INCREASING
THE RELIABILITY OF THE DATA

97 COMPUTE PF1=MEAN(ZP8001,ZP8101,ZP8201)
98 COMPUTE PF2=MEAN(ZP8002,ZP8102,ZP8202)
99 COMPUTE PF3=MEAN(ZP8003,ZP8103,ZP8203)
100 COMPUTE PF4=MEAN(ZP8004,ZP8104,ZP8204)
101 COMPUTE PF5=MEAN(ZP8005,ZP8105,ZP8205)
102 COMPUTE PF6=MEAN(ZP8006,ZP8106,ZP8206)
103 COMPUTE PF7=MEAN(ZP8007,ZP8107,ZP8207)
104 COMPUTE PF8=MEAN(ZP8008,ZP8108,ZP8208)
105 COMPUTE PF9=MEAN(ZP8009,ZP8109,ZP8209)
106 COMPUTE PF10=MEAN(ZP8010,ZP8110,ZP8210)
107 COMPUTE PF11=MEAN(ZP8011,ZP8111,ZP8211)
108 COMPUTE PF12=MEAN(ZP8012,ZP8112,ZP8212)
109 COMPUTE PF13=MEAN(ZP8013,ZP8113,ZP8213)
110 COMPUTE PF14=MEAN(ZP8014,ZP8114,ZP8214)
111 COMPUTE PF15=MEAN(ZP8015,ZP8115,ZP8215)
112 COMPUTE PF16=MEAN(ZP8016,ZP8116,ZP8216)
113 COMPUTE PF17=MEAN(ZP8017,ZP8117,ZP8217)
114 COMPUTE PF18=MEAN(ZP8018,ZP8118,ZP8218)
115 COMPUTE PF19=MEAN(ZP8019,ZP8119,ZP8219)
116 COMPUTE PF20=MEAN(ZP8020,ZP8120,ZP8220)

COMMENT PRINCIPLE COMPONENT ANALYSIS REDUCES THE NUMBER OF
PERFORMANCE VARIABLES AND FOR EACH FACTOR THAT EMERGES A FACTOR
SCORE IS SAVED/ VARIMAX ROTATION IS THE DEFAULT

117 FACTOR VARIABLES PF1 TO PF20/
118 PRINT ALL/
119 FORMAT=SORT BLANK (.3)/
120 PLOT=EIGEN/
121 SAVE REG (ALL FS)/

COMMENT STEPWISE REGRESSION USING EACH FACTOR AS PREDICTORS OF
VOLUNTARY TURNOVER.

122 REGRESSION DESCRIPTIVES=DEFAULTS/
123 VARIABLES=STATUS FS1 FS2 FS3 FS4/
124 DEPENDENT=STATUS/
125 STEPWISE/ENTER/

COMMENT RECODE OF THE STANDARDIZED Z-SCORES FOR FACTOR TWO INTO
FOUR PERFORMANCE LEVELS.

126 RECODE FS2 (LO THRU -1.0=1) (-1.0 THRU 0=2)
127 (0 THRU 1.0=3) (1.0 THRU HI=4) INTO FLEVEL
128 SELECT IF (FLEVEL GE 1)
129 CONDESCRIPTIVE MOCSUBGP
130 STATISTICAL ALL
131 OPTIONS 6 7
132 CONDESCRIPTIVE RANKGPS
133 STATISTICS ALL
134 OPTIONS 6 7

COMMENT LINE 135 CREATES A RANDOM NUMBER FOR EACH CASE

135 COMPUTE SORT=UNIFORM (15000)

COMMENT LINE 136 SORTS ALL THE CASES BY THEIR RANDOM NUMBER AND
BY PERFORMANCE LEVEL.

136 SORT CASES FLEVEL SORT

COMMENT LINE 137 TO 140 CREATES A SEQUENCE NUMBER FROM 1 TO 1000 FOR EACH PERFORMANCE LEVEL THUS CREATING AN N OF 1000 THAT WAS RANDOMLY DRAWN FROM THE ORIGINAL DATA.

137 IF (FLEVEL NE LAG(FLEVEL)) N1000=0

138 COMPUTE N1000=N1000+1

139 LEAVE N1000

140 SELECT IF (N1000 LE 1000)

COMMENT LINE 141 TO 142 PRODUCES TEN SAMPLES OF N= 100 FOR EACH PERFORMANCE LEVEL.

141 IF (FLEVEL NE LAG(FLEVEL)) COUNT=0

142 IF (COUNT=100) COUNT=0

COMMENT LINE 143 TO 146 CREATES A VARIABLE THAT COUNT THE NUMBER OF VOLUNTARY LEAVERS THAT OCCUR FOR EACH SAMPLE OF 100 FOR EACH PERFORMANCES LEVEL.

143 IF (COUNT=0) NSTATUS=0

144 COMPUTE COUNT=COUNT+1

145 IF (STATUS=3) NSTATUS+NSTATUS+1

146 LEAVE COUNT NSTATUS

147 EXECUTE

COMMENT THIS LINE CHECKS TO SEE IF THE COUNT VARIABLES WERE WORKING PROPERLY

148 LIST VARIABLES FLEVEL SORT COUNT NSTATUS

STATUS/CASES=4000

COMMENT THIS LINE DELETES ALL THE COUNT NUMBERS EXCEPT FOR
THE 100TH THUS LEAVING IN THE VARIABLE (NSTATUS) THE
PROPORTIONS OF LEAVERS FOR EACH SAMPLE OF N=100 FOR EACH
PERFORMANCE LEVEL

149 . . . SELECT IF (COUNT=100)

COMMENT THE NEXT LINE IS A CHECK THAT PROVIDES THE PERCENTAGES
OF VOLUNTARY LEAVERS AT EACH PERFORMANCE LEVEL FOR FACTOR 3
THIS PRECEDING PROCEDURE HAS PRODUCED A RANDOM SAMPLING
STRATEGY WITHOUT REPLACEMENT WHICH IS NOT NORMALLY AVAILABLE
FOR SPSSX.

150 . . . PRINT /COUNT NSTATUS FLEVEL

COMMENT A ONEWAY ANALYSIS OF VARIANCE OF THE PROPORTIONS OF
VOLUNTARY LEAVERS BY PERFORMANCE LEVELS WILL UNCOVER WHETHER
THERE ARE ANY SIGNIFICANT DIFFERENCES BETWEEN GROUPS AS DEFINED
BY PERFORMANCE LEVEL. IN ADDITION ORTHOGINAL COMPARISONS (LINE
152) . . . WILL SHOW THE TYPE OF RELATIONSHIPS THAT EXISTS BETWEEN
VOLUNTARY TURNOVER AND PERFORMANCE LEVELS. THESE PARTICULAR
PLANNED COMPARISONS ARE FOR LINEAR AND QUADRATIC TRENDS.

151 . . . ONEWAY NSTATUS BY FLEVEL (1,4)/

152 . . . POLYNOMIAL=2

153 . . . FINISH