Review of Attrition and Retention Research for the Canadian Forces

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Abstract

This report consists of a review of research concerning attrition and retention in the Canadian Forces (CF) that has been carried out since 1990. The studies reviewed are categorized into five main areas: CF-wide research, research on subgroups of the CF, research on measuring and forecasting attrition, modelling and simulation research, and research on strategies to improve retention.

Based on this review, it was found that there is a large degree of consistency in factors impacting retention, both over time and using different assessment tools, despite the changes that have occurred in the CF population. Meanwhile, methods for measuring and forecasting attrition have improved, and continue to evolve.

Topics for future research are identified. An important recommendation is that a strong link be made between social science research that looks into the reasons why people choose to leave the military and research directed to subjects such as improving methods for measuring and forecasting attrition.

Sommaire

Le présent rapport consiste en un examen des recherches concernant l'attrition et le maintien de l'effectif des Forces canadiennes, qui ont été effectuées depuis 1990. Les études examinées sont classées en cinq grands domaines : la recherche à l'échelle des FC, la recherche sur les sous-groupes des FC, la recherche sur la mesure et la prévision de l'attrition, la recherche sur la modélisation et la simulation ainsi que la recherche sur les stratégies visant à améliorer le maintien de l'effectif.

En se fondant sur cet examen, les auteurs du rapport ont constaté beaucoup d'uniformité dans les facteurs qui influent sur le maintien de l'effectif, tant au fil du temps que dans les différents outils d'évaluation utilisés, et ce, en dépit des changements survenus dans le personnel des FC. Entretemps, les méthodes de mesure et de prévision de l'attrition se sont améliorées et continuent d'évoluer.

Les auteurs identifient les sujets des futures recherches et recommandent principalement d'établir un lien solide entre la recherche en sciences sociales qui analyse les raisons pour lesquelles les gens choisissent de quitter l'armée et la recherche orientée vers des sujets tels que l'amélioration des méthodes de mesure et de prévision de l'attrition.

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Executive Summary

Over the past two decades, a great deal of research has been done for the Canadian Forces (CF) on the subject of retention. This document represents a review of this research. It starts by putting the research in context by summarizing the accomplishments to date in terms of CF retention activities, tools, strategies, and policy. The review touches on many different subject areas, and describes studies that were done using a variety of methods. Examples include survey and focus group-based studies to try to identify why personnel are leaving/staying, calculations to identify trends in attrition behaviour based on certain characteristics (e.g. Years of Service (YOS)), and studies aimed at improving attrition forecasting techniques. In addition to the research review, potential avenues for retention strategies are discussed by reviewing past recommendations, review papers, and initiatives in the CF. Applications of attrition data are also described. Finally, areas for future work are recommended.

CF Retention Activities, Tools, Strategies, and Policy

This paper first documents the progress made so far regarding CF retention activities. These activities started with a set of policy principles to ensure that CF personnel were treated well and fairly. Then, these developed into the CF retention strategy of "strengthening the social contract", with supporting documents that stated how the strategy was to be executed. Effective tools were developed to monitor attrition and gain an understanding of the reasons why people stay in the CF (Retention Survey) and leave the CF (the CF Attrition Information Questionnaire – Revised (CFAIQ-R) survey and its replacement, the Exit Survey). The CF has developed its own definition of a retention culture and a strategic retention framework. Key policies related to retention are also presented in this document.

CF-Wide Research

Looking at the historical attrition rates for the CF Regular Forces, it was found that attrition has increased since the mid-2000s, in part due to higher recruiting. A decrease in medical releases was observed in 2007/2008. This may be partly attributable to increased opportunities for personnel who do not meet all medical standards to continue to serve with the CF.

A review of CF-wide attrition and retention research looking at factors that may influence stay/leave decisions identified consistent trends. Survey results from the CFAIQ-R Survey and the Exit Survey, covering the 2001-2007 period, revealed that family issues and (a related factor) dissatisfaction with postings are the main reasons why members leave. The CF Retention Survey results from 2003 to 2006 showed that the most consistent and influential factors in determining turnover intentions are CF fairness, CF future, and to a lesser extent, confidence in senior leadership and perceived organizational support. A CF Retention Model incorporating these factors was developed and statistically validated in an effort to explain the process through which turnover intentions can be reduced. Further, CF fairness and concerns about leadership were reported as dissatisfiers by both members who were considering leaving and those who had actually left.

Research on Subgroups of the CF

Many past studies have addressed the influence of demographic factors on attrition. This document addresses gender, age, First Official Language (FOL), ethnic group, and education. Of these, most of the research looked at gender and FOL, presumably because these were areas of greater concern.

While gender was an important factor in the past, with female attrition being significantly higher than male attrition, this no longer appears to be the case. However, retention of women is still important since they remain underrepresented in the CF.

With regards to FOL, at one time Francophone attrition was much higher than Anglophone attrition for Non-Commissioned Members (NCMs) in the hard sea occupations. Several intervention strategies were recommended, and attrition rates for the two groups are now comparable, as they are for other CF occupation groups.

Studies dealing with the influence of military factors are also addressed in this document. This category includes service, occupation, commissioning plan, and most importantly, YOS.

Looking at data from the past few years, there are no consistent identifiable trends when the data are broken down by service. Currently, attrition rates for the Army, Navy, and Air Force are comparable when the data for all YOS groups are considered. However, when the data are broken down further by YOS, some differences are revealed; for example, first term attrition is lower for Air Force NCMs than for Army or Navy NCMs.

Some retention research has been done for most, if not all, occupations in the CF. However, more research has been done for pilots and the hard sea occupations than any others. Much of this work focused on identifying dissatisfiers that were influencing personnel to leave the CF. In the past, attrition rates in these occupations was very high; now, perhaps as a result of targeted retention strategies, the attrition rates for these occupations are no longer higher than for the CF as a whole. Attraction and retention of personnel in health occupations remains a challenge for the CF. Recent studies exploring retention issues for this specific group are discussed.

To a limited extent, attrition rates of officers who entered the CF under different commissioning plans have been studied according to YOS and Years of Commissioned Service (YCS). Attrition patterns are related to several factors including the number of years of obligatory service associated with the different plans.

It has been known for years that attrition behaviour is closely related to YOS. Attrition rates are highest at the 0 and 20 YOS points for both officers and NCMs. Attrition at the 3 YOS point, corresponding to the length of the Basic Engagement (BE), is also significant for NCMs. Early career attrition, comprising first year, first term, and Basic Training List (BTL) attrition, is a particular concern. The CF can recover the investment made in an individual's training if that individual continues to serve for some time after reaching the Operationally Functional Point (OFP). A 2008 study showed a recent increase in first year attrition for NCMs.

Measuring Attrition Rates

New methods of measuring attrition have recently been developed. In comparison to the previous method, the most significant differences occur at the YOS points where attrition tends to be high. Further to these methods, more tailored techniques such as cohort analysis and data aggregation are suitable for certain applications.

Forecasting Attrition

Forecasting methods have also been improved in recent years. An important challenge in this area is finding the optimal volume of historical data on which the forecasts will be based. Recommendations have been made in the past to help the analyst in selecting a suitable historical volume; research in this area is ongoing.

Reporting Attrition Rates

Attrition rates, both measured and forecast, are reported in several places within the Department of National Defence (DND). The methods used for measuring and forecasting are highly variable, leading to inconsistent results. This is an issue that must be resolved.

Applications of Attrition Data

In addition to reporting, attrition data has several applications in the field of modelling and simulation. Three of the main modelling and simulation tools that have been developed include the Arena Career Modelling Environment (ACME), the Production Management Tool (PMT), and the Production & Strategic Intake Model (PSIM). ACME is a career progression model that can help decision-makers to understand the likely short- and long-term effects of proposed HR initiatives. PMT is used for modelling training pipelines – it is useful for identifying existing or future scheduling problems in a training pipeline, and can help to find ways of alleviating these problems. PSIM helps the user to identify future intake requirements for an occupation.

Improving Retention: Strategies

In a number of CF papers, more concrete means pertaining to what can be done to address dissatisfiers were suggested. These papers included, for instance, suggestions regarding the use of bonuses and suggestions made by CF members. Recent successful strategies used by the CF Health Services Group to improve retention of Medical Officers are also discussed.

Recommendations

Several potential areas for future work are noted. Of particular importance, as noted above, there is a need to work toward consistency of attrition measuring and forecasting methods across DND. Finally, it is recommended that better linkages be developed between the work directed at examining the reasons why people leave the CF, and the work done on subjects such as modelling and simulation and methodological development for measuring and forecasting attrition.

Résumé

Au cours des deux dernières décennies, beaucoup de recherches ont été faites en ce qui concerne les Forces canadiennes (FC), sur le maintien de l'effectif. Ce document représente un examen de ces recherches. Les auteurs commencent par placer la recherche en contexte en résumant les réalisations faites jusqu'ici en termes d'activités, d'outils, de stratégies et de politique en matière de maintien de l'effectif. Dans cet examen, ils abordent de nombreux sujets différents et décrivent des études qui ont été réalisées à l'aide de diverses méthodes. À titre d'exemple, citons les recherches axées sur les sondages et les groupes de discussion qui essayent de déterminer pourquoi le personnel quitte ou reste, les calculs visant à déterminer les tendances du comportement de l'attrition selon certaines caractéristiques (p. ex., années de service), et les études visant à améliorer les techniques de prévision de l'attrition. En plus d'examiner les recherches, les auteurs explorent les orientations éventuelles des stratégies de maintien de l'effectif en passant en revue les recommandations passées, les articles de synthèse et les initiatives prises dans le FC. Ils décrivent également les applications des données sur l'attrition. Pour finir ils recommandent les secteurs sur lesquels il faut travailler à l'avenir.

Activités, outils, stratégies et politique de maintien de l'effectif des FC

Cet examen commence par documenter l'évolution des activités de maintien de l'effectif des FC. Celles-ci ont commencé par un ensemble de positions de principe garantissant un traitement juste et équitable au personnel des FC, puis elles sont devenues une stratégie de maintien de l'effectif des FC se traduisant par le « renforcement du contrat social », avec des documents à l'appui énonçant le mode d'exécution de la stratégie. Des outils efficaces ont permis de contrôler l'attrition et de comprendre les raisons pourquoi les gens restent dans les FC (sondage sur le maintien de l'effectif) et quittent les FC [(le questionnaire sur les causes des départs des Forces canadiennes (QCDFC-R)] et le document qui le remplace (Sondage de départ des FC). Les FC ont établi leur propre définition d'une culture de maintien de l'effectif et un cadre stratégique de maintien de l'effectif. Les principales politiques touchant le maintien de l'effectif sont également présentées dans ce document.

Recherche à l'échelle des Forces canadiennes

En examinant les taux d'attrition historiques dans les Forces régulières, les auteurs ont constaté que l'attrition est en augmentation depuis 2005 environ, en partie à cause du taux de recrutement plus élevé. Une diminution des libérations pour raisons de santé a été observée en 2007-2008, attribuable peut-être en partie à l'augmentation des possibilités qui s'offrent au personnel qui ne répond pas à toutes les normes médicales imposées pour continuer de servir dans les FC.

L'examen de la recherche sur l'attrition et le maintien de l'effectif des FC dans le but d'analyser les facteurs qui peuvent influencer les décisions de rester ou de partir a révélé des tendances constantes. Les résultats du sondage QCDFC-R et du Sondage de départ des FC, couvrant la période 2001-2007, ont montré que les questions familiales et le mécontentement (facteur secondaire) à l'égard des affectations constituent les principales raisons de départ. Les résultats du sondage sur le maintien de l'effectif des FC, de 2003 à 2006, ont indiqué que les facteurs les plus constants et les plus importants dans la détermination des intentions de mouvement sont l'équité dans les FC, l'avenir dans les FC et, dans une moindre mesure, la confiance dans les

hauts dirigeants et la perception quant au soutien organisationnel. Les auteurs de l'examen ont essayé d'expliquer le processus qui pourrait réduire les intentions de mouvement en élaborant et validant sur le plan statistique un modèle de maintien de l'effectif des FC, qui intègre l'ensemble de ces facteurs. De plus, l'équité dans les FC et les préoccupations que soulèvent les dirigeants ont été signalées comme des facteurs de mécontentement tant par les membres qui envisagent de quitter que par ceux qui ont effectivement quitté.

Recherche sur les sous-groupes des FC

De nombreuses études ont étudié l'influence des facteurs démographiques sur l'attrition. Le présent document aborde les questions du sexe, de l'âge, de la première langue officielle (PLO), du groupe ethnique et de l'éducation. En ce qui concerne ces facteurs, le gros de la recherche a porté sur le sexe et la PLO, peut-être parce que ces deux facteurs préoccupaient le plus.

Bien que le sexe ait été un facteur important par le passé, l'attrition chez les femmes étant significativement plus élevée que chez les hommes, cela ne semble plus le cas aujourd'hui. Toutefois, le maintien en poste des femmes est encore important puisqu'elles demeurent sous-représentées dans les FC.

En ce qui concerne la PLO, à un certain moment, l'attrition chez les francophones était beaucoup plus élevée que chez les anglophones pour ce qui est des militaires du rang (MR) dans les groupes professionnels de la Marine. Plusieurs stratégies d'intervention ont été recommandées, et les taux d'attrition pour les deux groupes sont désormais comparables comme c'est le cas pour les autres groupes professionnels des FC.

Des études traitant de l'influence des facteurs militaires sont également analysées dans le présent document. Cette catégorie comprend le service, les groupes professionnels, le programme d'attribution de commission et surtout les années de service.

En examinant les données des dernières années, on constate qu'il n'y a pas de tendances identifiables uniformes lorsque les données sont ventilées par service. Actuellement, les taux d'attrition pour l'Armée de terre, la Marine et la Force aérienne sont comparables lorsque les données de tous les groupes d'années de service sont prises en compte. Toutefois, lorsque les données sont encore ventilées par année de service, il apparaît quelques différences; par exemple, le taux d'attrition pendant la première affectation est moins élevé pour les MR de la Force aérienne que pour les MR de l'Armée de terre ou de la Marine.

On a fait un peu de recherche sur le maintien de l'effectif pour la plupart, sinon la totalité, des groupes professionnels des FC. Toutefois, la recherche a été davantage orientée vers les pilotes et les groupes professionnels de la Marine que vers les autres. Ces travaux consistaient surtout à identifier les facteurs de mécontentement qui poussaient le personnel à quitter les FC. Par le passé, les taux d'attrition dans ces groupes professionnels étaient très élevés; aujourd'hui, peut-être à cause des stratégies ciblées en matière de maintien de l'effectif, les taux d'attrition pour ces groupes professionnels ne sont guère plus élevés que ce n'est le cas dans l'ensemble des FC. L'attraction et le maintien en poste du personnel dans les groupes professionnels de la santé restent un défi pour les FC. De récentes études portant sur les questions du maintien de l'effectif dans le cas de ce groupe précis font actuellement l'objet de discussions.

Dans une certaine mesure, les taux d'attrition chez les officiers qui sont entrés dans les FC dans le cadre de programmes de commission différents ont été étudiés selon les années de service et les années de service commissionnées (ASC). Les modèles d'attrition sont liés à plusieurs facteurs, notamment le nombre d'années de service obligatoires associées aux différents programmes.

On sait depuis des années que le comportement de l'attrition est étroitement relié aux années de service. Les taux d'attrition sont très élevés aux points 0 année de service et 20 années de service, tant pour les officiers que pour les MR. L'attrition au point 3 années de service, qui correspond à la durée de l'engagement initial de durée variable (EIDV), est aussi importante chez les MR. L'attrition en début de carrière, qui comprend l'attrition au cours de la première année, l'attrition au cours de la première affectation et l'attrition dans les effectifs en formation élémentaire (EFE), est particulièrement préoccupante. Les FC peuvent recouvrer l'investissement consacré à l'entraînement d'une personne, si celle-ci continue de servir pendant un certain temps après avoir atteint le niveau opérationnel de compétence (NOC). Une étude réalisée en 2008 a indiqué une augmentation récente de l'attrition au cours de la première année chez les MR.

Mesure des taux d'attrition

De nouvelles méthodes de mesure de l'attrition ont été mises au point récemment. Comparativement à la méthode antérieure, les différences les plus significatives surviennent aux points des années de service où l'attrition tend à être plus élevée. En plus de ces méthodes, des techniques plus adaptées, telles que l'analyse de cohortes et l'agrégation de données, conviennent pour certaines applications.

Prévision de l'attrition

Les méthodes de prévision ont été améliorées au cours des dernières années. Dans ce domaine, c'est tout un défi de trouver le volume optimal de données historiques sur lesquelles seront fondées les prévisions. Des recommandations ont été faites par le passé pour aider l'analyste à sélectionner un volume historique convenable; les recherches se poursuivent dans ce domaine.

Rapport des taux d'attrition

Les taux d'attrition, tant mesurés que prévus, sont présentés à plusieurs endroits au ministère de la Défense nationale (MDN). Les méthodes utilisées pour la mesure et les prévisions sont très variables, d'où l'inconsistance des résultats. Cette question doit être réglée.

Applications des données d'attrition

En plus de faire l'objet de rapports, les données d'attrition ont plusieurs applications dans le modèle de la modélisation et de l'assimilation. Parmi les principaux outils de modélisation et de simulation mis au point, on peut en citer trois : l'Arena Career Modelling Environment (ACME) qui permet de modéliser l'avancement professionnel, l'Outil de gestion de le Production & Strategic Intake Model (PSIM) (modèle de production et d'admission stratégique). L'ACME est un modèle d'avancement professionnel qui peut aider les décideurs à comprendre les effets très probables à court et à long terme des initiatives proposées en matière de ressources humaines. Le PMT sert à modéliser des dispositifs d'instruction – il est utile pour identifier les problèmes d'échéanciers actuels ou futurs dans un dispositif d'instruction et peut aider à trouver des moyens

d'atténuer ces problèmes. PSIM peut aider son utilisateur à prévoir l'admission dont un métier aura besoin dans le futur.

Amélioration des stratégies de maintien de l'effectif

Dans un certain nombre de documents des FC, on a proposé des moyens plus concrets quant aux possibilités de faire face aux facteurs de mécontentement. Ces documents comprenaient, par exemple, des suggestions quant à l'utilisation des primes de rendement ainsi que des suggestions faites par les membres des FC. On y discute également des récentes stratégies couronnées de succès qui ont été utilisées par le groupe de santé des FC pour améliorer le maintien en poste des médecins militaires.

Recommandations

Les auteurs de l'examen notent plusieurs points qui pourraient faire l'objet de travaux futurs. Comme il est indiqué plus haut, il faut tout particulièrement travailler à améliorer l'uniformité des méthodes de mesure et de prévision de l'attrition dans l'ensemble du MDN. Enfin, les auteurs recommandent d'établir des liens plus étroits entre le travail visant à étudier les raisons pour lesquelles les gens quittent les FC et le travail effectué sur des sujets tels que la modélisation et la simulation ainsi que le développement méthodologique de la mesure et des prévisions de l'attrition.

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1 Introduction

1.1 Background

Employee retention is an important issue for most organizations with today's strong job market and aging workforce. Job opportunities are good for talented employees. Consequently, these employees will be quick to look elsewhere if they are dissatisfied with their current job. It is therefore important for organizations to implement retention policies and practices, and foster an environment that encourages current employees to remain employed for a maximum period of time.

1.2 Aim and Scope

Recently, retention issues have been identified by the Chief of Military Personnel (CMP) as a top priority issue. In the face of the Canadian Forces' (CF) high operational tempo, force expansion, and transformation, the need to retain members is not only desirable but represents an operational requirement. However, this focus on retention is not new and dates back to the early 1990s (Syed & Morrow, 2003). It began with a 1991 Armed Forces Council (AFC) meeting where the concept of a "social contract" between the CF and its members was first discussed. The idea behind this contract was that the CF would treat its members well with the expectation that the members would return the favourable treatment by being more affectively committed, resulting in better performance. Since then many reports on various aspects of retention (and its opposite, attrition) have been published. These studies span a wide range of topics using various approaches, and were conducted over a period of time in which many changes in human resource practices, both within and outside the CF, have occurred. To date, there have been no publications summarizing CF attrition and retention research.

This report is meant to fill this gap by serving as a review and synthesis of attrition and retention research done within the Department of National Defence (DND)/CF in the last two decades. It covers qualitative and quantitative research. International strategies are mentioned to a limited extent where appropriate. Unless otherwise noted, the information presented here refers to the Total Paid Strength (TPS) of the CF Regular Force.

It is hoped that this work will inform policy/program considerations and will guide further research and methodological developments on retention.

1.3 Report Outline

This report comprises several chapters. Chapter 2 is an overview of CF retention activities, tools, strategies, and policies. Chapters 3 and 4 present a summary of research on CF attrition and retention for the CF as a whole and for sub-groups of the CF. Chapters 5 and 6 describe current methods used for measuring and forecasting attrition, while Chapter 7 is concerned with the various places that these attrition data are reported. Chapter 8 outlines important applications of attrition data in the field of modelling and simulation. Chapter 9 presents ideas for retention

strategies. Finally, in Chapter 10, the authors make concluding remarks and recommendations for future work.

1.4 Definition of Retention, Attrition, Turnover, and Commitment

Retention generally refers to the absence of employee attrition, or turnover. In this report, the term attrition and turnover are used interchangeably. In past DND/CF reports, there has been a tendency to use the term "attrition" when reporting actual loss of people and forecasting future loss, while the term "turnover" has been used mostly in reports looking at reasons why people leave.

It is important to point out that not all turnover is problematic. The distinction between voluntary and involuntary turnover was introduced in order to account for the difference between an employee who is laid off because of poor performance and a high performer who leaves for another job. Voluntary turnover is said to occur when employees freely choose to leave their job while involuntary turnover occurs when employees are required to leave for reasons such as employer-initiated termination (dismissals or layoffs) and mandatory retirement (Griffeth & Homs, 2001).

Voluntary turnover can be subsequently divided into two subcategories: functional and dysfunctional turnover. Functional turnover is related to the exit of an employee whom the organization judges as a standard or low performer. Dysfunctional turnover occurs when a high performing or not easily replaceable employee leaves the organization and the organization would prefer to retain the individual (Dalton, Krackhard, & Porter, 1981; Griffeth & Homs, 2001). Functional turnover is beneficial to the organization as it creates space for the entry of new employees with new ideas, and can replace a poor performer with a more effective employee. However, functional turnover is not exempt from the administrative cost of hiring and training a new employee. Research found that teasing out the amount of functional turnover from overall turnover allows for making a more accurate estimate of undesirable turnover on the organization. (Dalton, Krackhard, & Porter, 1981).

To further analyze turnover, dysfunctional turnover can be categorized in avoidable and unavoidable turnover. Unavoidable quits represent reasons for leaving for which organizations can do little to intervene (e.g., family moves, childbirth, family commitments). In sum, subtracting involuntary, functional, and unavoidable quits from overall turnover is one way to draw up the boundaries of problematic turnover. In practice, most organizational research focuses on voluntary turnover and is interested in predicting antecedents of turnover. The functional/dysfunctional distinction is not always easy to make. Concerning the avoidable/unavoidable distinction, most of the avoidable and unavoidable turnover is identified using exit surveys; however, there is the possibility that employees will not always report the real reasons why they leave.

In many DND/CF reports, voluntary and total attrition rates are reported. Total attrition comprises voluntary attrition as well as attrition for other reasons such completed Terms of Service (TOS), medical reasons, administrative reasons, inability to meet occupational standards, and mortality. Voluntary attrition represents those who freely chose to leave. The CF uses different codes to

represent the various release categories; voluntary releases are codes 4a (On Request – When Entitled to an Immediate Annuity), 4b (On Completion of a Fixed Period of Service), and 4c (On Request – Other Causes). The focus of the CF retention policy is on avoidable voluntary turnover (Assistant Deputy Minister (Human Resources – Military) (ADM (HR-Mil)) Instruction 08/03). Retention efforts are thus directed toward members who could stay but choose not to, and whose reasons for leaving are internal to the organization.

Critical to the understanding of retention/turnover is the concept of organizational commitment. The most predominant conceptualization of organizational commitment is the three-component model of affective, normative, and continuance commitment proposed by Meyer and Allen (1991). This model proposes that there are three types of psychological states associated with the decision to remain in an organization.

Affective commitment is defined as an emotional bond with the organization. Affectively committed employees identify with the organization's goals and values, and they truly want to remain a part of the organization. Normative commitment refers to a perceived obligation to remain in the organization. These feelings of obligation can come from an employee's work ethic, sense of duty, and the belief than one should be loyal to one's organization. Continuance commitment holds that employees stay in an organization because leaving would result in a high personal cost, such as a sense of loss from quitting after investing a great amount of time and personal resources in an organization (e.g. pension accruals, specialized job skills), a perceived lack of alternatives, and losing good colleagues.

These three types of commitment have been consistently related to employees' decisions to stay in an organization and are among the most studied concepts by current researchers interested in retention (Allen & Meyer, 1996). Further, the negative relationship between turnover and affective and normative commitment was found to be stronger in military occupations than in civilian occupations (Griffeth, Hom, & Gaertner, 2000). For these reasons, many CF surveys (e.g. CF Retention Survey and the Unit Morale Profile (UMP) Survey, discussed later) measure organizational commitment as conceptualized by Meyer and Allen.

2 Overview of CF Retention Activities, Tools, Strategies, and Policy

2.1 CF Retention Activities: From Past to Present

The current situation with regards to retention activities, tools and strategies in the CF is the result of many events and processes outlined in a recent paper (Marum, 2007b). It started at an AFC meeting in 1991 where the idea of a social contract between members and the CF was first introduced. While a "written social contract" was rejected due to legal concerns and its possible contradiction to military ethos, a decision was made to create a "global framework" of policy principles based on the CF commitment to put their people first. This framework was further developed, and the "Personnel Policy Framework" was published in 1995. Meanwhile, the CF Attrition Information Questionnaire (CFAIQ) was developed in 1989 and administered on a continuous basis to Regular Force members releasing voluntarily from the CF. Qualitative analyses were performed on the CFAIQ from 1988 to 1999. These analyses were used to inform "get well" interventions for Military Occupations (MOCs) (now called Military Occupational Structure Identifications (MOSIDs)) with shortages in manning level. They represented, in a way, the first version of the current Retention Intervention Process (RIP). The CFAIQ was revised in 2001 and renamed the CFAIQ-Revised (CFAIQ-R), and then replaced in 2005 with the CF Exit Survey.

The retention strategy, created in response to the Defence Planning Guidance of 2000, was a stepping stone to greater retention efforts in the CF. It was developed at a time of heightened concern about members' welfare and the anticipated human resource crisis that the CF was about to face. Indeed, the Standing Committee on National Defence and Veterans Affairs (SCONDVA) published a report in March 1997 revealing the poor living conditions of some CF members and the widespread "poor morale" and "sense of abandonment" evident across the CF membership[1]. The review of Regular Force TOS (TOS Project), started in 1998, was aimed at retaining personnel longer (e.g. by extending the Intermediate Engagement (IE) to 25 Years of Service (YOS) and the Compulsory Retirement Age (CRA) to 60 years of age) to alleviate the unstable demographic profile of the CF caused by the Force Reduction Program (FRP).

The CF retention strategy was approved by AFC in June 2001 (AFC Record of Decision 5-01). The strategy is "strengthening the social contract" between the CF and its members. The process of strengthening the social contract involves transactional (i.e. monetary aspects) and relational (i.e. quality of life issues) approaches. AFC also approved retention as a three-tiered responsibility, the three tiers being the CF, the Career Field & Occupation Authorities (CFOAs)[2], and the unit commanders. The CMP/Personnel system is responsible for CF-wide issues such as CF monitoring and analysis. Military occupation managers are responsible for occupational level issues such as occupation monitoring, and are involved with developing solutions for occupational "get well" programs. The role of the unit commander is to manage individual intervention (Howe, 2007).

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[1] See section 3.3 for more information on the SCONDVA report.
[2] CFOAs were previously known as Managing Authorities (MAs).

Three documents supporting the retention strategy have been published. The first document, "The CF Retention Strategy, ADM (HR-Mil) Group Action Plan 23 Oct 2001" tasked the Directorate of Military Employment Policy (DMEP) to "monitor attrition from a corporate level and to provide support to the Managing Authorities (MAs) for the development of MOC-specific retention strategies." The second document, "The Canadian Forces Retention Intervention Process, ADM (HR-Mil) Instruction 08/03" details how DMEP's Attrition/Retention Team (A/RT) will achieve the two tasks set out in the Group Action Plan. In response to this instruction, the CF Retention Survey was developed as a tool to identify MOC-specific dissatisfiers. Finally, in the third document, "Military HR Strategy 2020", retention is identified as a strategic human resource objective for the CF.

The National Retention Team (NRT) was created in 2004 to work in collaboration with the A/RT. The NRT is composed of CF researchers knowledgeable in retention issues as well as members from the Air Force, Navy, Army, Health Support, Provost Marshal, and Recruitment. Based on CF Retention Survey data and other research, the NRT's role is to identify, develop and implement retention ideas, strategies, and policies as well as to provide a forum to discuss retention policy options and initiatives. The NRT was quite active until it activities were suspended in 2006 for a variety of reasons (e.g. competing priorities, personnel changes). The NRT was restored in November 2007 and its role and mission to "Build and Sustain a Retention Culture in the CF" was reconfirmed.

2.2   CF Retention Tools

The A/RT has developed many tools to monitor attrition, identify specific causes of attrition, and attempt to address them. More specifically, the Attrition Monitoring System (AMS) refers to the continuous monitoring of total and occupational attrition trends (voluntary and involuntary), and of several variables including rank, age, YOS, gender, release reason, and First Official Language (FOL). This enables the A/RT to identify occupations with attrition problems, to investigate whether any measured variable helps to explain the cause of these high or unusual attrition levels, and finally to develop interventions – "get well" programs – by working with the CFOAs.

The "get well" programs are also informed by survey data. The A/RT created the CF Retention Survey in 2003. This survey, developed after an extensive review of the organizational literature, includes various questions that explore individual and organizational factors that could be a source of dissatisfaction among members. The CF Retention Survey was designed to measure the extent to which members intend to stay in the CF, or leave within the next three to five years. Since its development, it has been administered four times (2002/2003, 2003/2004, 2005/2006, and 2007/2008) to members in occupations with problematic attrition patterns.

A CF Retention Model was developed in 2003 based on aggregate analyses of the CF Retention Survey data[3]. The aim was to provide a full model of turnover intentions in the CF; that is, a model that shows the relationships between different direct and indirect predictors for turnover intentions. It was intended to be a useful tool for selecting, developing and implementing retention strategies. Other retention models were developed to reflect the data collected in 2006. These models differ only slightly from the original CF Retention Model. A hypothesized CF

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[3] The CF Retention Model is discussed further in section 3.6.1.

Retention Culture Model was recently proposed which includes the new retention culture outcomes that have been added to the most recent version of the CF Retention Survey.

Another important survey that informs retention interventions is the Exit Survey 2005 (the first CF web-based survey). The Exit Survey is administered to all Regular Force members who voluntary leave the CF before completing their TOS[4]. The Exit Survey identifies reasons (push and pull factors) for which members voluntarily resign and the thought processes they go through when deciding to leave the CF. Other non-retention focused CF surveys contain information that are relevant to retention issues, such as the Quality of Life (QoL) Survey, and the UMP survey.

2.3   CF Retention Culture and Strategic Retention Framework

CF retention tools and processes are helpful in order to reach the goal of the retention strategy – "strengthening the social contract". However, the NRT recognized the need to go beyond these processes by developing a more overarching concept, "a retention culture", that would illustrate the organization's commitment toward supporting retention. The definition of the CF Retention Culture was meant to reflect the literature on organizational culture, but also to reflect the values, beliefs, and assumptions found in CF Strategic documents that touch on retention issues. The working definition of the CF Retention Culture is as follows: "an environment that encourages members to stay, to contribute, feel satisfied with their careers and valued by the organization" (Howe, 2006, p.29). It is based on two strategic documents. The first document, "Canadian Forces Military Human Resource Strategy 2020: Facing the People Challenges of the Future (HR 2020)", emphasizes key HR concepts (i.e. participation and voice, fair treatment, support for personal goals and high-consideration leadership and personnel management) that are consistent with taking a relational approach toward retention. The second document, "Duty with Honour: The Profession of Arms in Canada" states Canadian military values (i.e. duty, loyalty, integrity, and courage) and the importance of the military to regulate their conduct in accordance with these values.

The strategic retention framework, as presented at an AFC meeting in May 2008 (Hidiroglou, 2008), uses the following lines of operation: recruit to retain, invest in our personnel, build trust, leadership responsibility, career management/flexibility and addressing members' concerns. Each line has its effects to be achieved. The strategic retention framework is intended to provide guidance for the development of future retention initiatives.

2.4   Policy Related to Retention

This section presents key policies that have been put in place in part with the aim of reducing attrition and retaining members' military expertise for a longer period of time.

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[4] The Exit Survey is not administered to personnel who leave the CF after the end of their TOS, even though these releases may also be considered voluntary.

2.4.1 The New CF Regular Force TOS

The objectives of the new CF Regular Force TOS as summarized in ADM (HR-Mil) Instruction 05/05 are "to enhance flexibility and adaptability of Regular Force TOS, enhance retention, retain an occupation management capability, and support member career expectations." For instance, it was hoped that the replacement of the Basic Engagement (BE) and the Short Service Engagement (SSE)/Short Engagement (SE) with the Variable Initial Engagement (VIE) would increase the propensity of potential applicants to join an occupation by providing a variable length of initial engagement. (The length of a VIE varies between three and nine years depending on the occupation, and excludes time dedicated to subsidized university training.) The instruction further states that one of the purposes for the change in IE from 20 YOS to 25 YOS is to retain more experienced members in order to lessen the experience gap in YOS created by the past FRP. However, this will only be effective if these members choose to convert to the new TOS.

2.4.2 CF Retirement Policy

The CRA in the CF has been extended to age 60 for Regular Force members and members of the Reserve Force joining on or after July 1, 2004. (See ADM (HR-Mil) Instruction 14/04 for more details). Personnel already serving on that date have the option of remaining on CRA 55 or electing CRA 60. For those requesting to serve to 60, the delegation of approving authority for continuing engagements is outlined in CANFORGEN 045/05 issued by ADM (HR-Mil) in February 2005.

This CANFORGEN states that "the Minister of National Defence (MND) has signalled his intent to increase flexibility by exercising his regulatory authority and discretion to extend service for individuals beyond age 55 when it is in the best interests of the CF. This increased flexibility will benefit the CF in situations where there is a critical shortage of an essential skill set and there are serving qualified members who are willing to serve beyond age 55."

2.4.3 Pension Benefits

New pension benefits for reservists are part of the Canadian Forces Superannuation Act that took effect on 1 March 2007. The CANFORGEN 121/05 issued by the Chief of Defence Staff (CDS) in July 2005 states two main reasons for enhancing benefits for reservists: to facilitate the transformation of the CF, and to reaffirm the government's commitment to the quality of life of CF personnel. The Reserve Force pension plan provides Reserve Force Members who serve on a full-time basis for extended periods of time, a pension plan similar to, and in many ways identical to, the one for the Regular Force.

As part of the Canadian Forces Superannuation Act, the pension benefits were also improved for the Regular Force. CF members now have a pension plan comparable to other arrangements found in the federal public service. The changes included a decrease in the vesting period and an increase in the range of benefits. Worthy of particular mention is the portability of the CF pension, which makes it possible for members to transfer their pension entitlements from the CF pension plan to another employer's registered pension plan (under specified circumstances). This benefit was meant to increase the quality of life of CF members by giving them more financial

flexibility and security, and thereby provide an incentive for people to join/remain in the CF[5]. However, some have voiced concerns about the potential negative effect of this benefit. Given that pension portability facilitates professional mobility, it could impact attrition rates, especially at certain TOS points, in the future.

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[5] The news release on CF pension modernization can be found at:
http://www.mdn.ca/site/Newsroom/view_news_e.asp?id=2208

3   Attrition and Retention Research – Pan-CF

This section describes research that has been done on the CF Regular Force population. The main focus is on findings from tools used by researchers to examine the reasons why members choose to leave the CF.

3.1   Attrition Rates in the CF

Figure 1 shows the attrition rates of the CF Regular Force for past 20 years. The high attrition rates from fiscal year (FY) 1994/1995 to 1996/1997 are a reflection of the FRP. Attrition rates were quite stable from the late 1990's to the mid 2000's, but have been increasing since then. This is in part due to the large number of recruits that have joined the CF in the past few years. (As will be discussed later, attrition is high in the first several YOS; thus, high attrition rates are to be expected during times of high recruiting.) The large number of personnel who have left with 20 YOS is also a contributing factor.
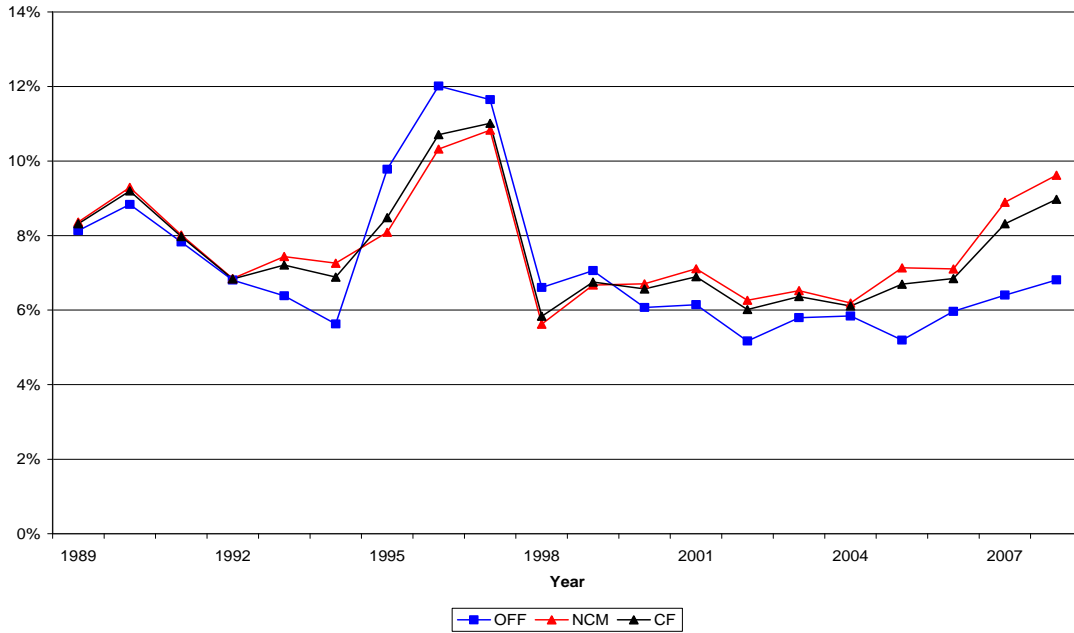
Figure 1: Historical Attrition Rates, 1988/1989 to 2007/2008[6]

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[6] Attrition rates were calculated according to Okazawa's (2007) method, described in Section 5.1.

3.2   Medical Release

As noted above, much of this document concentrates on voluntary attrition; however, medical attrition is also worth mentioning. Figure 2 shows the number of medical releases as a percentage of the total releases from the CF Regular Force for the past 20 years.
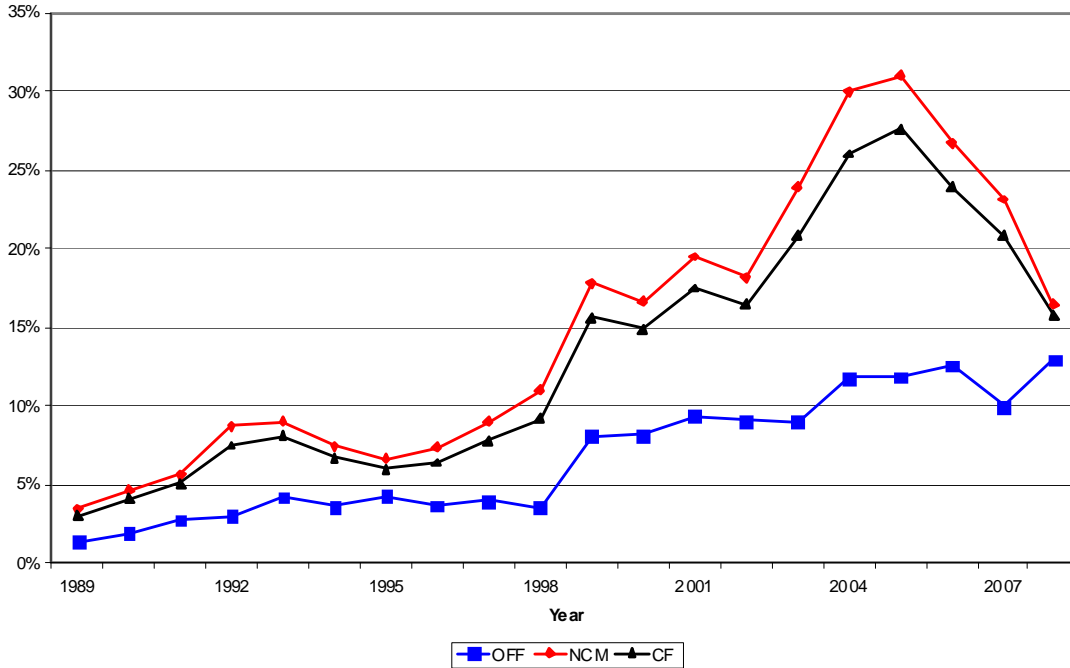
Figure 2: Medical Releases as a Percentage of Total Releases, 1988/1989 to 2007/2008

As a percentage of total releases, medical releases increased until 2004/2005, when they began to decline. 2007/2008 saw a particularly large decrease in medical release rates as a percentage of total releases for NCMs; the absolute number of these releases also fell. (However, it should be noted that these results are preliminary.) Medical release rates for officers have been much more stable in comparison to those for NCMs in recent years.

To a limited extent, some of the variations in these patterns can be explained by the CF's policies on medical release. During the 1980s, the CF had a fairly liberal accommodation policy, so personnel with medical restrictions could remain employed if they met a certain level of employability. In the 1990s, the Universality of Service (U of S) policy was instated. Under this policy, CF members were required to be fit to serve anywhere at any time. This unpopular policy was modified in 2000 so that it became possible for more members to meet the U of S standards; also, accommodation became possible for a period of three years for some of those who did not meet the standards. The increase in medical releases beginning in 2002/2003 may be related to the expiration of these 3-year accommodation periods (Ainslie, 2006b).

In December 2007, the CDS directed that the U of S policies be applied more flexibly so that injured personnel could remain in the CF. Further, no personnel injured in operations in Afghanistan were to be released without CDS's authority. These factors may have contributed to the recent decrease in medical release rates (Agrell, 2008).

Ainslie (2006b) noted that the rate of medical release is affected not only by policy, but also by concrete factors such as the aging of the CF and the operations with which the CF is involved. Medical release rates are also affected by more subjective factors such as the inconsistent way in which medical categories are assigned by physicians and the fact that illness or injury will affect different people in different ways. Developments in medical science also contribute to the medical release rate.

Smith (2006a, 2006b) found several factors that are correlated with medical attrition, the most significant factor being chronological age. As a member's age increases, his/her risk of medical release also increases.

3.3   Findings from the QoL Survey

In October 1998, the SCONDVA made 89 recommendations aimed at improving the quality of life of CF personnel. These were categorized in five pillars:

- pay and allowance – compensation for work (20 recommendations);

- the housing crisis – accommodations (21 recommendations);

- the injured, retired and veterans – care of the injured (16 recommendations);

- military family (16 recommendations); and

- transition including conditions of service and work expectations (14 recommendations such as providing earlier notice of next posting, access to academic upgrading for NCMs, and suitable operational clothing).

Two recommendations were related to the monitoring of members' quality of life, and of the progress made with respect to the initiatives. A number of initiatives were implemented to address the SCONDVA recommendations, including the QoL Survey[7].

The QoL Survey was developed to assess the quality of life of members and their families and to evaluate initiative effectiveness. Table 1 presents the initiatives that were assessed in the 2001 QoL Survey. The results of this survey concerning members' evaluation of initiatives were judged relevant for this retention report since these initiatives are consistent with the principles underlying the CF retention strategy (i.e. invest in our members, and take care of them and their families). Further, it can be safely assumed that members with high quality of life are more likely to stay in the CF.

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[7] See http://hr.ottawa-hull.mil.ca/hr/scondva/engraph/2002AnnexB_e.asp?cat=1#AnxB for a list of all initiatives and their progress as of 2002.

Military Family Resource Centres-Emergency Childcare Service

Provision of the Family Care Assistance Program.

Assistance to help spouses find new employment when they are posted to a new location

Accessibility of CF programs and services in members' First Official Language

Second language training for spouses

Services to support families facing violence or abuse

Compassionate travel assistance

Military Quarters Repair Program (housing)

Royal Lepage relocation services

Medical benefits and entitlements

A series of pay raises

Post Living Differential Program

Centre for injured and retired CF personnel

Service Personnel Holding List (SPHL)

Creation of Operational Trauma and Stress Support Centres

Priority hiring by the Canadian Public Service Commission for injured CF members

The QoL Survey was administered in February 2001 to CF members and CF spouses. The QoL Survey generated six reports (three on members' results and three on spouses' results). The first set of reports presented the quantitative results for questions on members and spouses' satisfaction with their overall quality of life and specific life domains (e.g. residence, health, and job) as well as questions about their experience in the CF (Dowden, 2001a; Dowden, 2002a). Qualitative findings for the same questions were presented in a second set of reports (Jefferies, 2001a; Jefferies, 2001b). Essentially, these reports found that members and spouses rated their overall quality of life as somewhat positive. Few members agreed with the statement that leaders care about their well-being. Members were satisfied with most of their life domains but reported less satisfaction with their income/standard of living and career domains. Several actions that the CF could take to improve members' quality of life were identified, including increasing pay, involving members in choosing postings, and reducing workload.

Interestingly, pay emerged from the QoL Survey as a significant issue, but it didn't emerge as a problem during previous focus groups on reasons for leaving the military (Dunn & Morrow, 2002). In the latter focus groups, pay issues (i.e. fair compensation) came to light only in the context of discussion among all ranks about feeling overwhelmed with work and having too much responsibility. This discrepancy in results may be attributable to the different questions used to probe members' comments. Reasons-for-leaving focus groups' participants were asked "*If you are thinking of leaving the CF now, what are your reasons or if you are not thinking of leaving, what would cause you to think of leaving?",* whereas quality-of-life focus groups' participants

were asked *"In your opinion, what are the three main areas that the Canadian Forces should change, modify, or adjust in order to improve your quality of life?"* Thus, it could be that increase in pay is always desirable, but is not often the reason why personnel choose to leave.

Responses of CF spouses concerning satisfaction with life domains were similar to those of the CF members. They reported dissatisfaction with income and standard of living but also with leisure and recreation. Generally, CF spouses were more satisfied with each of the domains compared to CF members.

The third set of reports presented the results for satisfaction with initiatives (Dowden, 2001b; Dowden, 2002b). In brief, CF members and spouses rated all initiatives as "at least somewhat important" to enhance their quality of life. For both members and spouses, the two initiatives that were viewed as the most important were:

- the Post Living Differential Program, which serves to stabilize the cost of living of CF members and families with respect to regional differences, and

- the Compassionate Travel Assistance, which provides transportation at public expenses for Regular Force members and their spouse due to the serious illness or death of an immediate family member.

3.4   Findings from the CFAIQ-R (2001-2004)

Changes in the demographic and social make-up of CF personnel prompted the revision of the CFAIQ. The CFAIQ-R was developed to assess new and different reasons for leaving the CF based upon focus groups findings (Dunn & Morrow, 2002; Morrow & Dunn, 2003). The CFAIQ-R was composed of 43 possible reasons for leaving the CF, and members were asked to indicate the extent to which each influenced their decision to leave. The CFAIQ-R also included two open-ended questions that asked members whether they had left for reasons other than those listed, and what the CF could have done to change their decision. Jenkins' (2003a) report presents the quantitative findings obtained with the CFAIQ-R during the 2001-2003 period. Consistent with previous findings obtained with the CFAIQ, the main reasons that influenced a member's decision to leave were dissatisfaction with postings (i.e. separation from family, need for stability); lack of recognition for their work (i.e. do not feel appreciated); and to take advantage of their pension after 20 YOS with the possibility of taking a civilian job or joining the Reserve Force. New questions added to the CFAIQ-R allowed for the identification of dissatisfaction with leadership and poor decision-making, and the associated misuse of limited CF resources as the most important reasons why members were leaving the CF.

Qualitative findings of the CFAIQ-R covering the period from August 2001 to June 2002 were presented in another report by Jenkins (2003b). In line with the above quantitative results, the topics that emerged the most frequently from members' comments were concerned with postings and CF leadership. Members had a lot to say about how postings and relocation negatively affected their children's education and their spouse's career. They also expressed the desire to have more control over where they were posted. Members' comments revealed that dissatisfaction with leadership has to do with the perception that leaders act more like managers than leaders. Members repeatedly commented that leaders are so preoccupied with their career

and advancement opportunities that they will not make tough and controversial decisions that would risk their chance of promotion.

3.5   Findings from the Exit Survey (2005-2007)

A briefing note presented the overall results for the CF Exit Survey from its implementation in June 2005 until February 2007 (Howe, Peddie, & Toussaint, 2007). Results indicated family issues as the primary factor influencing members' decisions to leave the CF. Family issues encompass the time CF members have available to spend with their family, and the effect their postings have on their ability to maintain family stability and on their partner/spouse's employment. "Family issues" was also the most popular answer to "what first prompted you to think about leaving the CF?" Other areas of dissatisfaction identified were: CF fairness (i.e. the CF merit system and career management system), how the CF deals with poor performers, and job dissatisfaction (especially, not enough challenge). Members reported the most satisfaction with their pay and benefits, followed by the availability and quality of personnel administration services, and by working climate.

So far, the Exit Survey results for different bases, wings and units have been presented in six separate interim reports. These group analyses are performed to gain more specific information on why members who are part of a particular group are voluntarily leaving the CF[8], thereby facilitating the development of specific intervention strategies.

An exit survey, namely the Cadet Instructor Cadre Exit Survey, was specifically designed to assess cadet instructor cadre reasons for leaving (Powers, 2007). The first administration revealed several reasons for leaving, from family and job/professional obligations to reaching CRA. However, no recommendations were made due to a low response rate. The survey is ongoing.

3.6   Findings from the CF Retention Survey (2003-2006)

Data collected with the CF Retention Survey have been used to generate numerous reports. Most of these are occupation-specific reports that looked at unique factors affecting members' intentions to leave the CF. In fact, a quantitative report has been written for each occupation surveyed to date, which total up to 53 occupations over the last three survey administrations (2002/2003, 2003/2004, 2005/2006). Qualitative analyses of the CF Retention Survey for specific occupations were also the focus of more than 25 reports[8].

To look for trends in dissatisfiers for the CF as a whole, Villeneuve, Dobreva-Martinova, and Currie (2004) combined the data for all of the occupations surveyed in 2002/2003. They identified areas of dissatisfaction that were common to all respondents regardless of their occupation. These areas were: Career Management, CF Fairness, Civilianization of the CF, Bureaucracy in the CF, Senior and Branch Leadership, and CF Future. Civilianization of the CF was the only factor that members identified as influencing them to leave or stay in the CF. It refers to the sense that the CF is losing its military values, culture, and traditions, and becoming too political. Working Climate was commonly identified as source of satisfaction.

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[8] Some of these results are discussed in Section 4.

Similar analyses were conducted on the 2005/2006 survey data and synthesized in a recent briefing note (Howe, Peddie, & Toussaint, 2007). Looking at areas of concern, members were still dissatisfied with CF Fairness. Civilianization of the CF still emerged as an influence to leave factor. However, mean responses were less negative than in the 2002/2003 administration. While members were not dissatisfied with CF Future, they neither agreed nor disagreed with the statement that the CF has a good future. Specific to this survey administration, the subject of access to Second Language Training emerged as an important dissatisfier. Because the 2006 version of the Retention Survey included for the first time questions on Cynicism, it allowed analysts to discover that members are somewhat cynical towards the organization. In line with past findings, members reported the most satisfaction in the areas of Working Climate, but also reported satisfaction with Pay, Health Care, Job Satisfaction, and Career Training.

No published report presented the synthesized results for 2003/2004. However, the issues were generally the same as in the year before.

3.6.1   Retention Model

Based on the results outlined above, Villeneuve, Dobreva-Martinova, and Currie (2004) developed and empirically tested a predictive model of turnover intentions in the CF (which is now referred to as the CF Retention Model). They used structural equation modelling to estimate the strength and direction of the relationships among the various factors related to turnover intentions, as well as to identify which of them are direct or indirect predictors of turnover intentions. Four sets of results are worth noting.

First, concerning direct predictors, lower intentions to turnover are predicted directly by high organizational commitment, high continuous commitment, and high confidence in senior leadership. The second set of results concerns antecedents of direct predictors. Organizational commitment was found to be affected by high perceived organizational support of members, and job satisfaction. In turn, job satisfaction can be increased by improving work-life balance and increasing satisfaction with career. This latter concept also has a positive influence on perceived organizational support. Concerning predictors of high confidence in senior leadership, it is highly influenced by members' perception of procedural justice[9]. Confidence in senior leadership also has an impact on perceived organizational support. Third, the following three factors are interrelated: procedural justice, career opportunities and work-life balance. Thus, changes (increases or decreases) in one factor similarly affect the other two factors. Fourth, cynicism was revealed as an outcome of both lack of procedural justice and lack of organizational commitment. Cynicism also has a detrimental impact on job satisfaction. A simplified depiction of the model is illustrated below.

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[9] Procedural justice is defined as "the perceived fairness of means used to determine the amount and distribution of resources among employees" (Greenberg, 1990). Fairness is ensured by giving employees, for example, adequate notice before implementing decisions, communicating accurate information, treating employees with dignity and respect, and providing information concerning how outcomes are determined.
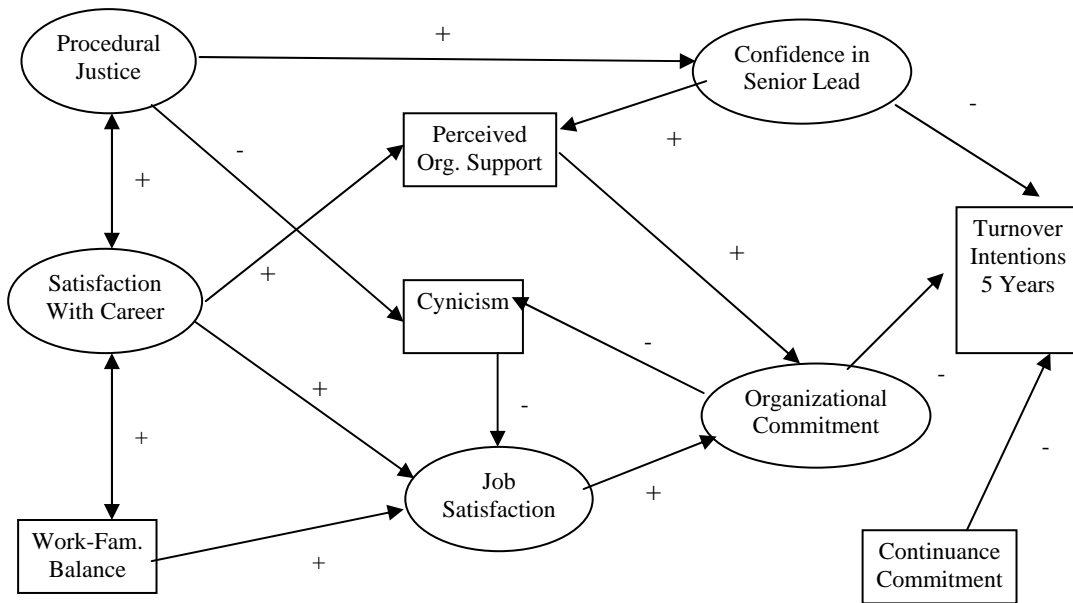
Figure 3: Simplified Retention Model.

The value of this model resides in its ability to provide a more systematic and holistic understanding of how various individual and organizational factors affect turnover intentions. This model can be used to guide intervention strategies. Since the model specifies the relative importance of the various factors and the sequence of actions needed to influence turnover intentions, and since past research has linked turnover intentions to actual turnover (Griffeth, Hom, & Gaertner, 2000)[10], more informed choices about which factor(s) to target for intervention strategies can be made.

A slightly different model was presented at the 2004 International Military Testing Association (IMTA) conference (Dobreva-Martinova et al., 2004). Rather than using confidence in the future of the CF as a sub-dimension of confidence in leadership, it was treated as another, separate factor influencing turnover intention. According to this revised model, confidence in senior leadership influences organizational commitment through CF Future. Peddie (2007) further tested the Retention Model with the 2005/2006 data set. The link between the various factors remained the same with the exception that confidence in senior leadership was no longer linked directly to turnover intentions. The replication of the CF Retention Model with another data set speaks to its reliability.

Following Villeneuve, Dobreva-Martinova, and Currie's (2004) work, it was hypothesized that organizational cynicism could be an alternative negative outcome contributing to attrition. This hypothesis is presented in Peddie's paper (2005). In brief, it suggests that members who have low organizational commitment and job satisfaction could decide to stay in the organization because it would be too costly to leave (e.g. lack of alternative employment options, or loss from

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[10] The study did not look at the CF in particular. Determining the link between turnover intentions and actual turnover in the CF may be an interesting area for future research.

quitting after investing a great amount of time and personal resources in the organization). They would then develop work cynicism, which involves withdrawal from their job and less enthusiasm about their work because of doubts about the significance and relevance of their work. Work cynicism in the situation where members have no intentions to leave is detrimental to both the organization's and the members' well-being. Statistical analyses performed on data collected as part of the 2003/2004 CF Retention Survey revealed that job satisfaction is the best predictor of cynicism (Peddie, 2005). While it was also found that low organizational commitment exacerbates the negative relationship between job satisfaction and cynicism, the effect was weak. Therefore, it was recommended that job satisfaction be targeted (especially by augmenting feelings of accomplishing meaningful work and by increasing the perception that the organization is according importance to one's work), in order to reduce and/or prevent work cynicism.

3.6.2   Survey Trends

Analyses of time trends over the last three CF Retention Survey administrations were presented in a much-needed briefing note (Marum, 2007a). Concerning levels of agreement and satisfaction with positive retention factors (i.e. organizational commitment, job satisfaction, confidence in CF future, confidence in senior leadership, and perceived organizational support), findings revealed that all of these factors remained stable or improved over time, but none decreased. However, confidence in senior leadership (38% disagreement) and perceived organizational support (42% disagreement) still remain low and could be further improved. Confidence in CF Future is a factor that has improved significantly over time, but it received a 31% disagreement rate in 2006. Consistent trends over time include: civilianization of the CF as the only factor that is influential for leave intentions; CF fairness as the factor with the highest dissatisfaction score; satisfaction with working climate as the factor with the highest satisfaction score; and transactional issues (pay, benefits, and health care) as factors with high satisfaction scores.

3.6.3   Specific Retention Issues

A series of reports used data from the CF Retention Survey to examine specific retention issues. The relationship between job satisfaction, organizational commitment and turnover intentions was examined more closely in a conference paper by Bernard, Villeneuve and Laberge (2003). Results showed that three types of organizational commitment (affective, normative, and continuance commitment, described in section 1.4) are completely mediating the relationship between job satisfaction and turnover intentions. In other words, job satisfaction does not have a direct impact on turnover intentions but does have an indirect impact on turnover intentions through organizational commitment. According to the authors, an explanation of these results is related to the nature of a military career (i.e. frequent job changes and patriotic reasons to join the military). The decision to stay in the military might relate more to a sense of attachment and loyalty to the organization than to overall satisfaction with the job.

3.6.3.1   Transformation

Career dissatisfiers related to the CF transformation initiative were examined with the help of three questions that were added to the 2004/2005 Retention Survey. Results for the first question showed that members "somewhat agreed" with the statement: "I have confidence in the senior leadership to effectively transform the CF" (De Carufel & Marum, 2006). Results for the second

question indicated that they "somewhat agreed" with the statement: "The CF's current transformation initiatives have been effectively communicated". The third question was a qualitative question asking those members who disagreed on the second question to elaborate further. Analyses of these comments revealed high levels of cynicism toward the transformation initiative. For example, many members felt that the current initiative was not different from past initiatives, which have had few positive effects.

3.6.3.2   Pension Benefits

To gain more information about Regular Force members' attitudes toward CF pension benefits, Marum and Howe (2007) conducted quantitative and qualitative analyses on all three Retention Surveys administered to date (2002/2003, 2003/2004, 2005/2006). A generally consistent pattern of responses was found across years. Quantitative analyses revealed that members are "somewhat satisfied" with their pension benefits. Qualitative analyses indicated that there is room for improvement. In particular, members mentioned that they were dissatisfied with the changes in TOS from IE 20 to IE 25, and how the Canada Pension Plan (CPP) clawback reduced their pension benefits after age 65.

3.6.3.3   Succession Planning

The 2004/2005 Retention Survey was examined for questions related to succession planning in the CF (De Carufel & Marum, 2007). Findings revealed that members have a good understanding of the merit list, Personnel Evaluation Report (PER), and posting processes. They are "somewhat dissatisfied" with the fairness of the personnel appraisal process (i.e. Personnel Development Review (PDR), PER), and to a lesser extent with the fairness of merit processes that lead to promotions. Though members are negative about the personnel appraisal process, they are more positive (i.e. somewhat satisfied) about the fairness of career course selection, posting decisions, as well as with the fairness in resolving grievances. Analyses of participants' written comments on the personnel appraisal processes and succession planning revealed that these issues are perceived as very interrelated, and that participants' dissatisfaction could be attributed to perceived favouritism and lack of objectivity.

3.7   Climate and Culture

A recent paper suggested that organizational and cultural differences in the way personnel are treated (e.g. differences in pay and allowances) among allied nations in international operations could be a factor affecting CF members' retention during deployment and upon their return to Canada (McKee, 2005). The paper reviews the literature on the subject and can help guide future research efforts on the link between intercultural issues in international operations and retention.

3.8   PERSTEMPO

Personnel tempo (PERSTEMPO) can be defined as the sum of the demands made by military service upon individual members (deployment load, time away, and workload) (Dunn, Ford, & Flemming, 2005).

Focus groups conducted by Dunn and Morrow (2002) revealed that many members believe that high PERSTEMPO is leading some members to leave the CF, often because of issues related to family life.

In later focus groups with CF members, participants commonly said that if the current tempo of operations is maintained, they will leave the CF. Members also indicated that "retention will become increasingly difficult if the CF does not cease to do more with less" (Dunn, Ford, & Flemming, 2005). While currently there are concerns with high PERSTEMPO, Dunn, Ford, and Flemming (2005) noted that the impacts of a low PERSTEMPO could also cause people to consider leaving the CF. Findings were similar in research based on focus groups with service providers including (but not limited to) social workers, psychiatrists, psychologists and counsellors, and medical doctors and nurses (Dunn, Ford, & Flemming, 2006).

3.8.1   Deployments

A specific aspect of PERSTEMPO pertains to deployments. Preliminary research analyzed attrition (for any reason) of members who served on Task Force Afghanistan (TFA) ROTO 1. The data were analyzed from six months after the members' return until November 2007. The analysis did not find a significant difference in attrition between those who served on TFA ROTO 1 and a matched non-TFA group (Bender & Fang, 2008). This does not necessarily mean that deployments do not have an effect on attrition at the individual level. There may be a number of contributing factors that offset each other in the overall analysis, such as individuals' desire or lack of desire to deploy. Further, the post-deployment respite period may result in a delay of voluntary releases.

At this time, the available data are still quite limited. Similar analyses will be done as more data become available. The results will be updated for ROTO 1 and the later ROTOs; additionally, an analysis will be done to determine whether there are differences between the ROTOs.

Apart from analysing the retention implications of serving on a particular deployment, there is a need to determine the impact of several characteristics of a deployment on retention. A recent review (Morrow, 2007) revealed that deployments that are perceived as repetitive and boring and/or take place in a hostile environment adversely affect retention. Conversely, deployments in the early stages of a mission, where members are exposed to new and unique challenges in non-hostile areas, can actually increase members' likelihood to stay in the military. The impact of deployment is also influenced by where members are in their career life cycle – for example, a deployment may be viewed postively if participation in a mission is necessary to get promoted. A last important conclusion for this review is that a curvilinear relationship potentially exists between the number of deployments and retention, indicating a negative impact of too few or too many deployments on retention.

This last finding was echoed in a recent literature review done by the U.S. Army Research Institute for the Behavioral and Social Sciences (Wisecarver, Cracraft, & Heffner, 2006). It was also concluded that deployments longer than five to six months are associated with less satisfaction, and less willingness to reenlist in the military. In addition to the number and length of deployments, several other characteristics of a deployment were found to influence members' reenlistment decisions, including the perceived fairness of decisions and the effect of deployment on family separation, morale, finances, and members' health.

4 Attrition and Retention Research – Sub-Groups of the CF

In contrast to the previous chapter, this chapter addresses attrition and retention research addressing subgroups of the CF. Many issues are common to many groups within the CF, but there are some differences. This chapter highlights the similarities and differences in attrition when the CF Regular Force population is analyzed according to different subgroups.

4.1 Demographic Factors

4.1.1 Gender

As indicated in the Annual Report on Regular Force Personnel, until the mid-2000's the overall CF attrition rate for females was higher than for males[11]. This was especially true for certain occupations such as the combat arms and the hard sea occupations; however, for a few occupations, especially in the medical and dental categories, the opposite was true (Bender, Tanner, & Tseng, 1995a, 1995b). Bender, Tanner, and Tseng (1995a, 1995b) found that there were also gender differences in attrition rates by rank: for both officers and NCMs in the 10-year period beginning in September 1984, female attrition was higher than male attrition in the junior ranks, and lower in the senior ranks.

For NCMs across the CF, first year and first term attrition rates were slightly higher for women than for men during the 1990s (Wentzell & Jesion, 2001; Dewar, 2001). Over a five-year period beginning in 1997/1998, female NCMs were found to have higher release rates than men during the first year and the first term only in the Navy (Carrick, 2003a; Carrick, 2003b).

Because of the previous (and, to a lesser extent, ongoing) concern about female attrition, a great deal of research was done not only to determine how the attrition rates of women compared to those of men, but also to determine the reasons why women chose to leave the CF. Most of these studies were based on information collected from surveys such as those described in the previous chapters, or from interviews or focus groups. Some studies were concerned with the CF as a whole (Lucas, 2001), while others dealt exclusively with some subset of the CF (often for an occupation group in which the female population experienced much greater attrition rates than the male population at the time, such as the combat arms or the hard sea occupations) (Parker et al., 1993; Thomas, 1997).

Even so, generally speaking the conclusions between these studies were consistent. While men and women cited many of the same reasons for leaving the CF, women tended to cite social or familial reasons more often, while men tended to cite work-related reasons more often. Several studies (Thomas, 1997; Lucas, 2001) noted that more women indicated that they were leaving the CF because they were going back to school.

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[11] Unless otherwise noted, statistics reported in this document from the Annual Report on Regular Force Personnel are based on attrition for any reason.

It is worth adding that, at least in recent years, it does not appear that gender discrimination or harassment are major factors influencing women's decisions to leave the CF. As an example dealing with the hard sea occupations in particular, Parker et al. (1993), Thomas (1997), and Hinton and White (2000) found that these issues did contribute to some women's decisions to leave, but it was not the primary factor in most cases. In a pair of studies by Jenkins (2004a, 2004b), still concerned with members who left the hard sea occupations, the majority of study participants did not feel that gender discrimination was a problem. In the combat arms, Davis and Thomas (1998) found that women faced many challenges with integration into a masculine environment; however, the study was not concerned with assessing the extent to which these challenges influenced the women's stay/leave decisions. Encouragingly, interviews held with people who left the Regular Officer Training Program (ROTP) at the Royal Military College (RMC) indicated that men and women felt that they were treated equally (Environics, 1998a).

The Annual Report on Regular Force Personnel indicates that in recent years, gender does not appear to play a role in overall CF attrition rates. Even when the data are broken down according to career field or CFOA, it is difficult to identify any areas where gender is clearly related to attrition. (This may be due in part to the small female representation in some cases.) Similarly, there no longer appears to be an influence of gender on attrition rates by rank.

These findings are in agreement with Goldenberg's (2006c) finding that women do not report having greater intentions of leaving the CF, and in fact may have slightly lower intentions.

Concerning international findings, an early 2000s TTCP paper reported a higher attrition rate for women than men (Holden & Tanner, 2001) but a later NATO paper did not report such a difference (Bowser et al., 2004). However, the attrition rate was not the focus of these papers. The main points made in these papers were that female representation in the military is still low and thus it is important to attract more women to the military and to examine barriers that prevent full integration of women within the militaries to ensure that they have the most successful career possible. For example, it has been reported that women can suffer negative consequences (i.e. be perceived less favorably and be considered less often for promotion) from taking advantage of family-friendly policies such as flexible work schedules, part time work options, and career breaks. This could be an interesting area for future work.

4.1.2 Age

Relatively little research has been done on the subject of how age is related to attrition. This is presumably because a member's YOS is loosely related to the member's age, and YOS is a far better predictor of attrition. Even so, the CF is concerned with the rising age of its members; there is a need to achieve a balance between young members who are able to meet the physical demands of service with older members who have a wealth of experience (Parker, 1991). Latchman and Bender (2006) noted that this experience may be especially important during, and shortly after, the current CF expansion.

Parker (1991) investigated why personnel of different age groups chose to leave the CF. The study was based on survey results. While some reasons that people cited were common across all age groups, there were some differences amongst the different groups. The CF has undergone many changes since the time of the study, so some of the reasons given may no longer be relevant. However, other reasons would quite plausibly be commonly cited again if the same

survey were administered today. For example, the top response from the youngest group was "going back to school"; from the oldest group, it was "take advantage of pension and pay".

More recently, Carrick (2003b) studied first year attrition of NCMs and found that younger recruits were more likely to leave during their first YOS than were older recruits.

Jesion and Kerzner (1999) predicted that removing the CRA would have a minimal effect on the CF, with the exception of a limited number of occupations at certain rank levels. In 2004, the CRA was raised from 55 to 60 years of age; indeed, this has not had a significant impact on attrition in the CF, as few members serve to that point (Latchman & Bender, 2006).

It may be worthwhile to take a closer look at how age is related to attrition, and to observe how attrition behaviours have changed over time.

4.1.3 FOL

The Annual Report on Regular Personnel provides statistics on attrition by FOL for the past 20 years. Attrition rates appear to be independent of FOL at this time.

In a survey-based study by Lucas (2001), it was found that Francophones and Anglophones had similar responses when asked for their reasons for leaving the CF, with one exception: more Francophones than Anglophones said they were leaving because of "compassionate circumstances".

More work has been done in this area with regards to Naval occupations in particular. Oakes (1993) concentrated on attrition of Francophone students undergoing Naval Qualification Level (QL) 3 training, as this had previously been identified as an area of concern. The author identified a number of precursors to attrition, falling into the categories of organizational characteristics, workplace issues, individual characteristics, and societal considerations, and further suggested that these factors ultimately led to a lack of Francophone trainees' motivation and desire to succeed.

Similarly, Bender et al. (1992) noted an area of concern with regards to attrition rates for Francophone NCMs in the hard sea occupations. This finding led to a study by Farley (1994), which indicated that the most important reasons for choosing to leave the CF were different for Anglophone and Francophone Naval NCMs. While Anglophones cited job-related perceptions as their top reason for leaving, Francophones cited individual values, specifically related to family issues. Farley recommended several intervention strategies; since that time, attrition rates for Francophone NCMs in the hard sea occupations have fallen to levels comparable to those of Anglophone NCMs.

A more recent study (Carrick, 2003b) looking at statistics over a five-year period found that in the first YOS, Anglophone and Francophone NCMs had similar release rates. When the statistics were analyzed for different groups of occupations, they found that this result also held true for first year NCMs in the Navy, support, and health services occupations. However, in the Army and Air Force occupations, Anglophones had slightly higher rates of release than Francophones in the first YOS.

Relatively little research has been done in this area in more recent years, aside from the monitoring of statistics. This is presumably because attrition by FOL does not appear to be a significant area of concern at this time.

4.1.4   Ethnic Group

The Human Resource Management System (HRMS), which tracks a variety of information on CF personnel, does not track information on the ethnic groups to which CF members belong. Because of this lack of data, it is difficult to accurately compare attrition rates across ethnic groups.

In 1995, Davis examined attrition by candidates of the Northern Native Entry Program (NNEP). She found that while the majority of NNEP candidates completed recruit school, a large proportion of them, in comparison to the total CF population, left the CF before completing the QL3 training period. She identified three main themes related to early attrition of NNEP candidates: individual decision-making processes; the cumulative stress of cultural, organizational, and occupational learning; and the organizational environment. She proposed several recommendations for future work, including the application of similar research to different ethnic groups within the CF. However, to the authors' knowledge, this work has not been carried out.

In an analysis of the Spring 2005 administration of the Your-Say survey, it was found that visible minority and Aboriginal members of the CF do not report having greater intentions to leave than white members (Goldenberg, 2006b). This was consistent with analyses comparing the actual rates of release among self-identified visible minority and Aboriginal members (Goldenberg, 2006a).

4.1.5   Education

Carrick (2003b) found that NCMs with lower education levels were more likely to leave the CF in their first YOS than their more educated counterparts. She suggested that this may be a function of individuals' desire to see a task through to completion, adding that those who entered the CF with less than a high school education had already demonstrated a tendency not to see a task through to completion.

It is recommended that this area be explored further, looking at all YOS groups. Statistics of attrition rates by education level should be calculated and reported, possibly in the upcoming Annual Report on Attrition[12]. Data on CF members' education level are readily available[13], so doing so would be reasonably straightforward. Several analyses could be done in this area. For example, it may be interesting to determine whether attrition rates are lower for personnel with less than a high school education, whose career options in the private sector are very limited. (Such a finding would not necessarily contradict Carrick's (2003b) finding above, as she only looked at first year attrition.)

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[12] The Annual Report on Attrition is currently in the planning stages; it is discussed in Section 10.
[13] There is however some concern regarding the quality and completeness of the data on education recorded in HRMS. One could still derive initial statistics from these data.

HRMS also collects information on CF members' field of education (although there may be some data quality issues). It may be interesting to examine attrition of members with an education in certain fields in relation to economic variables. For example, one might surmise that during the "dot com" boom of the 1990's, attrition was higher for members with post-secondary education in a high-tech field. Studies could also be done to determine to what extent personnel work in a field related to their educational background, and if this has an impact on turnover in any way. Because of the limitations of HRMS, conducting such studies could be quite time-consuming.

4.2   Military Factors

4.2.1   Service

This section addresses research that directly compares retention across the different services. Some studies considered the Army, Navy, and Air Force as defined by the members' Distinctive Environmental Uniform (DEU), while others divided personnel according to their MA/CFOA. (It should be noted that some studies examined issues such as gender or FOL within one service. These studies are discussed in the appropriate sections within this report.)

The data in the Annual Report on Regular Force Personnel 2006/2007 do not reveal any trends that hold true year after year when attrition rates are broken down by MA. However, it was found that first term attrition was lower for Air Force NCMs than for Army or Navy NCMs (as defined by DEU) throughout the 90s (Dewar, 2001). This was found to hold true in later years by Carrick (2003a). For first year attrition in particular, Carrick (2003b) and Fang and Latchman (2008) found that attrition was highest among Army members and lowest among Air Force members. (Both studies by Carrick (2003a, 2003b) compared results across MAs; Fang and Latchman (2008) compared results across CFOAs.)

In a survey-based study, Lucas (2001) examined reasons why personnel left the CF voluntarily and compared the results across the three services (as defined by DEU). There were many areas of commonality across the CF, but a few differences. In comparison to Army and Air Force personnel, more Navy personnel selected "spending too much time away from home" or, to a lesser extent, "going back to school" among the most important factors in their decision. Air Force personnel were more likely to indicate that they were taking full advantage of their pension and potential civilian salary. This is in line with Currie's (2004) finding that NCMs in Aviation occupations have the highest voluntary release rate at or after the 20 YOS point.

Based on statistical analysis of survey responses, Desmarais et al. (1997) examined the reasons that personnel chose to leave the CF and compared the results between personnel who served in Army, Air, Sea, and Support environments. (Not all occupations were considered; for example, only combat arms occupations were considered in the Army environment.) The reasons for leaving were grouped into four categories: Working Conditions/Supervision; Career/Family Conflict; Advancement/Recognition; and Civilian Opportunities. For NCMs, it was found that Working Conditions/Supervision was more important to personnel from the Army and Sea environments than to those in the Air and Support environments. Members in the Army and Air environments found Career/Family Conflict to be less important than did those in the Sea environment. In comparison to the other environments, those in Support felt that Advancement/Recognition was more important. Army personnel identified Civilian

Opportunities as being more important than did Support personnel. For officers, the findings were similar; one difference was that personnel in the Air and Sea environments identified Civilian Opportunities as more important reasons for leaving in comparison to personnel in the Support occupations.

Jenkins (2004a) held a series of focus groups with personnel who transferred out of hard sea occupations. Members were concerned about inequitable treatment due to rank; for example, some junior members did not feel that they were respected by their superiors, or they felt that they were being treated like children. Although the study was concerned specifically with certain Navy occupations, it is worth noting that personnel who transferred to the Army or Air Force found the rank hierarchy to be less pronounced in these services. More specifically, some participants in the Air Force appreciated being called by name instead of by rank; some in the Army felt that their superiors often put their subordinates before themselves. When interpreting these findings, it is very important to keep in mind that the focus groups were conducted with members who chose to leave their occupations, and therefore may not reflect the views of the overall population. In fact, a similar study concerning members serving in the hard sea occupations found that these members were not as dissatisfied with the way they were treated by their superiors (Jenkins, 2004b).

4.2.2   Reserve Force

Few recent studies have looked at retention issues in the Reserve Force. The bulk of research on reservists was conducted during the late 1980s and early 1990s. These studies were all part of a major sociological study of the Reserves (Truscott, 1989) that looked at diverse issues including the characteristics and opinions of those interested in joining the Reserves and factors influencing attrition in the Reserves. The only recent studies that looked at retention in the Reserve Force focused on Naval Reservists. This two-phase study involved a series of interviews and focus groups as well as a questionnaire (Jenkins, 2005a, 2005b). The same conclusions were obtained using the different methodologies. While the attrition rate in the Naval Reserve is not preoccupying, reducing attrition even by a small amount (excluding the cases where a Reservist transfers to the Regular Force) would result in significant savings, especially in the context of the current force expansion and high operational tempo. In general, Naval Reservists intended to leave either to join the Regular Force or to work in the civilian world. The most important drivers of dissatisfaction were the amount of bureaucracy, the logic of policies and regulations, the quantity and availability of equipment, and the long wait to hear whether they were awarded a Class B or C contract or extension. Recommendations included reinforcing policy about the maximum number of nights per year that can be spent at sea, since half of the members serving on Maritime Costal Defence Vessels reported being dissatisfied with having been away from home for 200 or more 24-hour days in the previous year.

4.2.3   Occupation

Many studies have addressed attrition for a particular occupation or occupation group. As in the case of research for the CF as a whole, these studies span a variety of subjects (e.g. measuring and forecasting attrition or examining factors influencing stay/leave decisions), using various methods.

A literature review revealed that while work has been done for many different occupations or occupation groups, a disproportionately large amount of work has been done on pilots, the hard sea occupations, and the Military Police (MP) branch. (It should be noted that while these occupations have been problem areas in the past, and therefore worthy of more study than some other occupations, they are not necessarily the *most* problematic occupations, either in the past or present.)

The following discussion is limited to the retention-related research done for these three occupations, as well as for the health occupations as this has been, and continues to be, an area of considerable concern.

4.2.3.1   Pilots

Before September 1993, pilots were subject to a restricted release period of five years (meaning they were not eligible for voluntary release during this time). This period was extended to seven years in September 1993. Desmier (1998) conducted a system dynamics simulation study to examine the potential impact of extending the restricted release policy further to 12 years while setting up a Pilot Retention Program (PRP). The study showed that a restricted release extension would not be an effective near-term solution.

In response to a perception of increased attrition rates of CC130 pilots in the mid-1990s, Fournier (1997) measured the attrition rates of these pilots to determine the extent of the problem, and examined the reasons for which they were leaving. The intent was to provide guidance for the PRP. Fournier found that attrition had indeed increased during the mid-1990s, and that most of the pilots who were leaving had between 8 and 20 YOS. He noted that the combination of experience and (generally) young age made them prime candidates for jobs as commercial airline pilots. Examining the pilots' reasons for leaving, based on CFAIQ responses he found that the top reasons given were to "increase family stability by establishing roots in one community", and to "enjoy their pension and a potential civilian salary".

In 1998, a bonus program called the Pilot Terminable Allowance (PTA) was instituted as a way of reducing the high attrition rates in the occupation. Members who took part in this program were subject to a restricted release period of five years. Several years after the PTA was instituted, Pelchat (2002) conducted a survey-based study to investigate factors influencing pilot attrition, with particular interest in determining whether pilots under the PTA program had different career intentions than non-PTA pilots. Interestingly, it was found that pilots had similar responses to the survey, regardless of whether or not they participated in the PTA.

Between 1999/2000 and 2000/2001, the pilot attrition rate dropped from 7.5% to 3.9%[14]. The attrition rate remained low for several years. For 2007/2008, the rate was 5.6%. This improvement could be a result of the pilot retention initiatives, but could also be related to economic factors such as the availability of job opportunities as pilots with commercial airlines.

Pelchat (2002) identified several factors that had or could influence pilots to leave the CF, including lack of choice over postings, lack of control over personal futures, quality of life

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[14] These figures were calculated according to the method presented in Okazawa (2007), discussed in Section 5.1. Only releases from the CF Regular Force were considered.

concerns, and the effect of work on home life. These findings are similar to findings of other studies that deal with CF members in other occupations.

More detailed information on the subject of pilot retention can be found in Ploughman (2002). Largely based on a literature review, the main conclusions included that an increase in recruiting alone would not solve the pilot shortage problem, and that a reduction in the operational tempo would reduce pilot attrition. He also suggested that retention bonuses would be a suitable near-term solution.

4.2.3.2   Hard Sea Occupations

In the past, turnover in the hard sea occupations was higher than for most other occupations (particularly for NCMs), presumably because of the relatively difficult conditions of service (e.g. time spent away from home, long work hours, tight quarters). This is no longer the case.

In 2004, focus groups were conducted with members serving in the hard sea occupations (Jenkins, 2004b), and with members who transferred out of hard sea occupations (Jenkins, 2004a) to determine the factors influencing the stay/leave decisions of these personnel. Similar results were found in both studies, and were also fairly consistent with an earlier study by Hinton and White (2000).

Members were largely satisfied with the travel and camaraderie associated with serving on ships, and with the pay and benefits of the job.

The dissatisfiers identified by this pair of studies were more diverse, and varied according to occupation and rank. However, the biggest dissatisfier, with few exceptions, was the amount of time spent away from home. (Interestingly, this is associated with travel, which was considered a positive aspect of the job.) Time away from home was said to have a negative impact on interpersonal relationships and prevented single members from forming new relationships and starting a family. Other common dissatisfiers were poor or inequitable treatment, poor prospects for career progression, and misemployment (e.g. undesirable secondary duties).

4.2.3.3   Military Police (MP)

Based on survey results (2003), Currie found that many MP officers were dissatisfied with the effects of their job on family life. More specifically, 75% of survey respondents expressed some level of dissatisfaction with the effect of a military career on a spousal career; 66% indicated that it was influencing them to leave the CF. Currie identified this as an area where Branch Leadership could contribute to retention of these members. Toussaint (2004) also found that spouse's employment was a possible area of concern among NCMs in the MP branch.

Toussaint's (2004) analysis further indicated that improving salary/benefits could persuade members who were considering leaving to stay. She noted that while members are not dissatisfied with earnings, there is a perceived disparity in comparison to the salaries of their civilian counterparts. In a similar study concerned with MP officers (Toussaint, 2003), she found that work conditions, rather than salary/benefits, was the most commonly cited area for potential improvement for retention purposes.

In an analysis of MP officers' responses to the CF Retention Survey, Dobreva-Martinova and Villeneuve (2003) found that just over half of those who indicated that they intended to leave the CF in five years cited reasons internal to the CF. (27.7% cited eligibility for pension benefits, and 21.3% pointed to reasons external to the CF.) The top five factors that were reported as influencing MP officers to leave were: civilianization of the CF, satisfaction with CF structure, satisfaction with the fairness of the CF, satisfaction with work-life balance, and satisfaction with accommodation (housing). Based on the survey results, Dobreva-Martinova and Villeneuve identified four areas for intervention: leadership issues; job-related issues; work-life balance; and civilianization of the CF.

Toussaint (2007) used the UMP Survey to predict turnover intentions in the MP branch. The aim of the UMP Survey is to provide Commanding Officers (COs) with a glance into the effectiveness of their unit in static/garrison environments. While the UMP Survey has a different goal than the Retention Survey discussed previously, these two surveys share common scales such as: the job satisfaction scale, the perceived organizational support scale, and the turnover intentions scale. Among the main findings of Toussaint's (2007) report was that junior MP branch members, and junior Non-Commissioned Members (NCMs) in particular, reported higher intentions to leave their job to accept employment with a civilian police force in comparison to senior MP branch members. Apart from affective and normative commitment, satisfaction with compensation had a direct influence on turnover intentions of junior MP branch members and junior NCMs while satisfaction with equipment had a direct influence on turnover intentions of senior branch members. Geographic stability was also identified as a key factor that could possibly increase retention of both junior and senior MP branch members.

4.2.3.4   Health Occupations

Many positions in the health occupations are to be filled in the near future. Demands for mental health care are currently exceeding the available resources, as noted in the 2007 October Report of the Auditor General of Canada. Attraction and retention of health professionals in the CF is further complicated by the high salaries offered in the civilian market, which the CF is often not capable of matching. Retaining members in health occupations is therefore crucial. The 2005/2006 Retention Survey was administered to Medical Officers and to Medical Technicians – Physician Assistants, two occupations that were identified as having attrition problems by their respective occupation authorities (Howe & Peddie, 2007; Sharp & Howe, 2007). Statistical analysis of survey results showed that the top three issues that need to be addressed to improve retention of Medical Officers are opportunities for gaining and maintaining civilian qualifications, career progression, and deployments. The top three issues for Medical Technicians – Physician Assistants are work-life balance, career progression, and role overload. The reports presented specific action items for each issue.

4.2.4   Commissioning Plan

A 1993 study (Bender et al., 1993) indicated that retention by officers commissioned through the Officer Candidate Training Plan (OCTP) was generally higher than for the ROTP or the Direct Entry Officer (DEO) plan. Since the CF decided to move towards a degreed officer corps in

1998, the OCTP was discontinued. For this reason, retention of members commissioned under the OCTP will not be discussed further[15].

Comparing attrition rates of personnel who came through the ROTP and the DEO plan revealed that retention of ROTP members was better than for DEO members in the first five Years of Commissioned Service (YCS). This is related to the five years of obligatory service required after commissioning through the ROTP. After this point, retention was better for DEO members. This changed again after 20 YOS, at which point retention was better for ROTP members. (Note that these results are based on an analysis of the total population under study; there was some variation in the results when the population was broken down by occupation group or individual occupation.) Similar patterns were observed by Audet (2004).

Bender et al. (1993) also found that retention of members who came through the ROTP through a Canadian Military College (CMC) was generally higher than those who attended a civilian university, although the difference was not statistically significant.

A 1998 survey of ROTP cadets at RMC found that roughly four in ten of the students indicated that they intended to remain in the CF after completing their obligatory service. A roughly equal number indicated that they intended to leave. Those who felt that the education subsidy was important to them were most likely to indicate that they intended to leave the CF after the period of obligatory service (Environics, 1998b).

A more recent study indicated that only 9% of ROTP officers left immediately upon completion of obligatory service. (This is in sharp contrast to the percentage who, years before, indicated that they intended to leave at this point.) This figure can be compared to 6% for UTPNCM officers (Audet, 2004).

The same study indicated that most officers from the Commissioning from the Ranks (CFR) and University Training Plan – Non-Commissioned Member (UTPNCM) plans stayed in the CF until at least 20 YOS – far more than for the ROTP or DEO officers. This is not surprising, as the CFR and UTPNCM officers would have had a number of YOS before being commissioned.

4.2.5   YOS

It has long been known that YOS is the most important predictor of attrition. This is because members are most likely to leave at or shortly after the exit gate of an engagement, i.e. the end of a TOS. (Most engagements have a length of a set number of YOS.)

Figure 4 shows the historical attrition rates by YOS for the CF Regular Force. It should be noted that with the recent changes to the TOS, the attrition patterns will change to reflect the new TOS conversion points.

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[15] The Continuing Education Officer Training Plan (CEOTP) was introduced soon after (ADM (HR-Mil) Instruction 01/00).
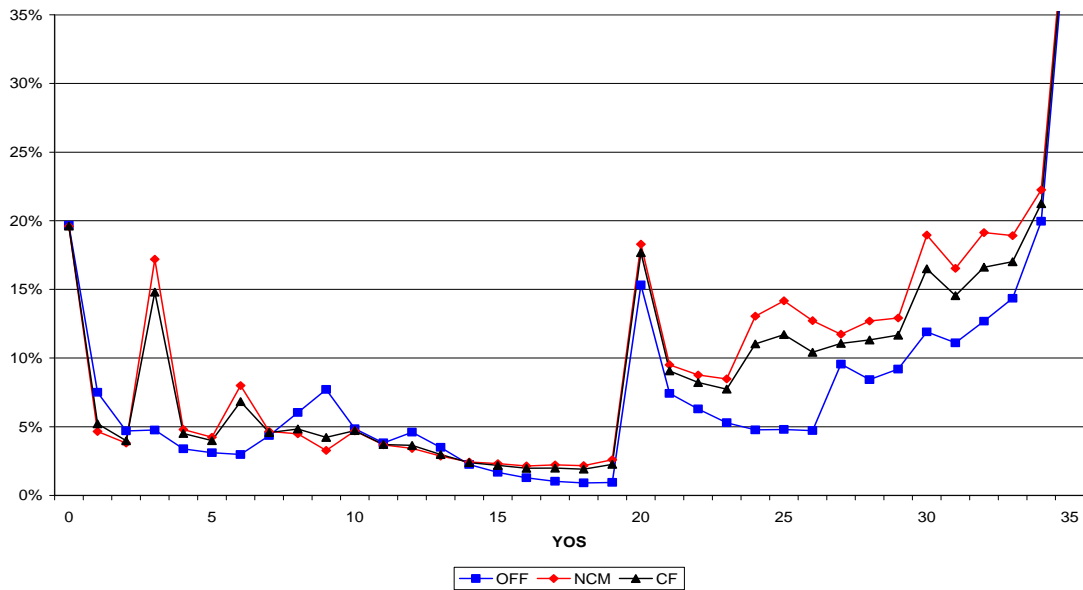
Figure 4: Historical Attrition Rates by YOS, 1988/1989 to 2007/2008 Excluding FRP Years

In general, attrition rates are lower for officers than for NCMs. The highest attrition rates occur at the 0 YOS point and at the 20 YOS pensionable service point (at which members are entitled to an immediate annuity) for both officers and NCMs. The pattern at the 20 YOS point will change in the future as we begin to see the effects of the change to the IE from 20 to 25 YOS. The points at which members can receive a non-penalized pension are also reflected by the spikes at 24 YOS for NCMs, 27 YOS for officers at the Lieutenant-Colonel (LCol) rank and below, and 29 YOS for officers at the Colonel (Col) rank and above.

Figure 4 also shows that NCMs have a high attrition rate at 3 YOS. This corresponds to the length of the BE. As stated earlier, in 2005 the BE was replaced by the VIE. The VIE is between 3 and 5 YOS for most NCM occupations (ADM (HR-Mil), 2005). Because of this change, it is expected that the peak at 3 YOS will "flatten out" over the 3 to 5 YOS range within the next few years.

The following sections summarize studies on early career/Basic Training List (BTL) attrition and attrition at the 20 YOS point. Relevant studies concerned with factors such as age, gender, service, etc. are addressed in the other sections of this report as appropriate.

4.2.5.1 Early Career/BTL Attrition

For decades, there has been particular interest in examining attrition during the first year, the first term, and while on BTL. Obviously, since training generally occurs early in a person's career[16], there is considerable overlap between these three phases.

Retaining personnel beyond their first few YOS is important to the CF. It is costly to recruit and train an individual; the investment can be recovered only if the person continues to serve for some time after reaching the Operationally Functional Point (OFP). Furthermore, it has been shown that once people have completed their first BE and accepted a second TOS, they are much more likely to continue to serve for many more years (Carrick, 2003a).

A study by Carrick (2003b) found that first year attrition occurs more often during basic recruit training than during occupational (QL3) training. Releases occurred at several other points, but much less frequently. (For the Army and Health Services branches, however, attrition rates were nearly equal at these two main release points.) The same study also examined how age, gender, FOL, education, and branch of service were related to first year attrition. (As stated above, these results are discussed in the other sections of this report as appropriate.)

Recently, Fang and Latchman (2008)[17] found that there is no increasing trend in first year attrition for officers. They did observe an increase in first year attrition rates for NCMs.

In 1998, a series of interviews was held with students who left the ROTP at RMC for non-academic reasons (Environics, 1998a). The main reasons for leaving the ROTP fell into three categories: military culture, education experience, and military occupation. Some respondents did not feel that the military culture was right for them. For example, they felt that too much time was spent on military training to the detriment of the academic component of the program. Some interviewees indicated that they were not comfortable with having to respect or treat people differently on the basis of rank. Related to the education experience, some felt that the curriculum at RMC was too limited, and they had to study a subject in which they were not interested. Several respondents found the academic program too difficult, particularly because of the challenge in balancing academics with the other requirements such as military training and inspections. Finally, some participants reported having difficulties choosing an occupation, or getting into their occupation of choice. To a large extent, these findings were consistent with the findings of an earlier study concerned with attrition of preparatory year cadets (from recruit camp to the beginning of the Basic Officer Training Course (BOTC) at Collège militaire royal de St-Jean (CMR) (Zuliani, Spinner, & Iannicca, 1991).

A 1992 study on naval officer trainees found that their decision to voluntarily withdraw was influenced largely by social pressure (from significant others) (Stouffer, 1992). A similar study of officer trainees in the combat arms found the same result (Curry, 1993). It is unknown if these results would hold true today.

The significance and underlying cause(s) of the recent increase in early attrition have not been examined (Marum, 2007c). A hypothesis suggested at a recent NRT meeting was that the quicker

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[16] Personnel will also be on BTL after an occupational transfer.

[17] More information on the methodology used for this study is given in Section 5.3.

and less thorough personnel selection process (e.g. "15 minute interview") that the CF now uses could lead to poor selection decisions, which in turn could partly explain the increased attrition rate during recruits' first year. Therefore, research on selection in the context of retention is recommended for the future. Specifically, research aimed at reviewing selection standards for each occupation and validating the selection tests by examining early career attrition patterns is recommended. Better selection decisions will result in reduced attrition.

For more on this subject, the interested reader is referred to a document by Carter and Bradley (1991). Although the paper concentrates on Naval officer selection and training, it refers to a number of other documents on the subject.

4.2.5.1.1 Attrition of Infantry Trainees

NCM trainees in the infantry have one of the highest attrition rates of all occupations in the CF. This has been observed since the mid 1990s. Reasons why infantry trainees leave in the first 12 months of their service were investigated through surveys of infantry trainees and infantry instructors, and through a phone survey of former infantry candidates (Charbonneau & Bradley, 2004 a,b,c).

Infantry trainees' responses allowed for the identification of a number of important differences between stayers and leavers. The desire to stay was a function of a sense of identification with the CF and a sense of belonging (a sense of pride and accomplishment, making a contribution, and experiencing good relations with peers), perceiving the advantages of employment (personal development, staying fit, opportunities to travel, financial security), and satisfaction with leadership style. The desire to leave was a function of several factors (e.g. perceived lack of ability to succeed and lack of physical ability, lack of adequate feedback/help to improve, and lack of recognition or direction from leadership) for which the authors proposed possible interventions.

Key findings from the infantry instructors survey were that the instructors do not have enough time to spend extra time with trainees who need special help, and that they are dissatisfied with the general fitness levels of recruits and with fitness standards for all training courses. Related recommendations included hiring more instructors to support trainees with difficulties and giving adequate support to recruits with lower fitness aptitudes.

Analyses of former infantry NCM candidates' reasons for quitting led to a number of recommendations for policy and practices. The most popular reason for quitting was related to a lack of lifestyle fit. While attrition related to lack of fit is expected as many trainees discover in their first year that the CF is not for them, several practices that could increase fit were recommended. These included: increasing support to those who feel they lack fitness ability; increasing the amount of freedom on course; and increasing encouragement from trainers to those who are considering leaving. The second most popular quit reason was family obligations/crisis (e.g. illness, death, concern for significant others). A related recommendation concerned offering greater flexibility in leave policy so that temporary family issues would not necessary lead to permanent quits.

In sum, a common recommendation that emerged from all three surveys is to give more attention and support to trainees who are weak in physical training, and/or unmotivated.

4.2.5.2   Attrition at 20 YOS

While early career attrition has been an area of greater concern in recent years, attrition at 20 YOS has also received attention in the past.

Collin and Bender (2002) estimated the volume of releases near the 20 YOS point (between 19 and 23 YOS) for each occupation group over the ten years following the time of the study. They showed that the annual number of releases among officers in this group was expected to increase by 36% over the following five years (in comparison to pre-FRP release numbers), and that the annual number of releases among NCMs was expected to increase by over 100%. The underlying reason for this was the high concentration of members having between 15 and 20 YOS (a result of the FRP), and an increase in attrition rate near the 20 YOS point in comparison to the pre-FRP rate. The trends forecast by Collin and Bender (2002) turned out to be reasonably accurate for the most part. However, they found that the number of officer releases would peak in 2002 and diminish by 2011; in fact, the number of releases was substantially higher in 2006 and 2007 than in 2002. The same was true for NCMs, but the discrepancy between the forecast pattern and the actual release pattern was not as significant.

This will continue to be the case. Irvine (2007) noted that the FRP resulted in a large shortage of personnel with the experience level to be able to replace the CF members who will soon be eligible for retirement. Irvine's (2007) study focused on retention of senior NCMs in the army. He noted that a literature review found little research on this subgroup. Even so, from the results of exit surveys he was able to deduce the main reasons that senior NCMs leave the army; namely, for financial reasons, and to a lesser extent, to provide stability for their families. He also identified soldier commitment, senior leadership, and quality of life policies as the foremost issues affecting the retention of senior Army NCMs. It is reasonable to assume that some of these findings would apply to senior NCMs of the Air Force and Navy as well.

5   Measuring Attrition Rates

This chapter outlines research that has been done by the Workforce Modelling Section (DSMPRA 4) [18] within the Director Strategic Military Personnel Research and Analysis (DSMPRA) on measuring attrition rates for the purposes of reporting.

5.1   Population Attrition Rate

For many years, DSMPRA 4 (and some other organizations within DND/CF) calculated the attrition rate simply as a ratio of those who leave during the year to the population present in that period. When calculated in this way, it can be interpreted as the proportion of the population that was present at any time in the year that was released before the end of the year. This method was applied in a wide variety of studies, pertaining to not only the CF Regular Force as a whole, but also to sub-populations that could include women, pilots, recruits, or any other sub-group of the CF Regular Force.

Okazawa (2007) noted that this method assumes that all recruits arrived at the beginning of the year. In reality, however, recruits arrive at different points during the year, and are only able to leave during the fraction of the year for which they are present. Attrition rates calculated using the traditional method, then, underestimate the "true" rates.

Okazawa (2007) went on to derive an equation for calculating the attrition rate that assumes that the recruits arrive at a constant rate throughout the year. This method defines attrition rate as the proportion of individuals in a given population at a point in time who will be released within the next year. The population attrition rate calculated using this new method is quite close to the result obtained using the traditional method. Generally, the numbers vary only by a fraction of a percent. Since the difference between the two methods is concerned with the treatment of recruits, the differences are more pronounced in times of high recruitment. Despite the remaining assumptions, the results from the new method show almost perfect agreement with the "exact" rate calculated without making any assumptions (Okazawa, 2007).

It is worth noting that these are not the only ways of calculating attrition. While these are the most common within DND/CF, other nations may use different methods. Regardless of the method used, transparency is important when reporting these rates so that the results can be properly interpreted. While the method proposed by Okazawa (2007) treats the new recruits in a more accurate way than the traditional method, it has the disadvantage of being slightly less intuitive to interpret. Both methods will illustrate the same trends – for example, if overall attrition rates are increasing, this will be apparent regardless of the method used.

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[18] Also currently known as the Personnel Operational Research Team (PORT) within Defence Research and Development Canada – Centre for Operational Research and Analysis (DRDC CORA).

5.2   YOS-Based Attrition Rate

It is often useful to determine CF attrition rates according to the members' YOS, because as noted earlier, attrition is closely related to YOS. Okazawa (2007) derived equations for the calculation of attrition rates by YOS, which can be applied to the total CF population (as shown in Figure 4 above) or to a sub-population of interest.

The attrition rates by YOS calculated according to this new method yield different results than those obtained using the traditional method (i.e. in which it is assumed that all recruitments and occupational transfers occur at the beginning of the year), particularly at the YOS points where attrition tends to be high (e.g. at the 0 and 20 YOS points). The attrition peaks at these points are substantially more pronounced when Okazawa's (2007) method is used. It is as though the traditional method has a "smoothing" effect on the YOS-based attrition behaviour.

5.3   Measuring Attrition Rates for the First YOS

As mentioned earlier, there is particular interest in analyzing attrition in the first YOS. Examining attrition at 0 YOS can have an impact on recruiting, both in terms of the target recruiting numbers and in the personnel selection process (Fang & Latchman, 2008).

Fang and Latchman (2008) performed a cohort analysis to examine first YOS attrition. For a period of seven years (2001/2002 to 2007/2008), they followed each individual for a year to determine whether he/she was released in his/her first YOS, and then determined the attrition rate as the ratio of releases to recruitments. As stated earlier in Section 4.2.5.1, they found that for officers, there is no evidence of an increasing trend in first year attrition; for NCMs, however, an increase has been observed.

This technique gives a more accurate assessment of attrition in the first YOS because it is not affected by the start dates of new recruits. However, it cannot simply be applied in cases where attrition must be reported on a year-by-year basis (which is usually the case). Future work may be done to find a way of integrating this approach with Okazawa's (2007) approach described previously. A similar cohort analysis could be used to analyze the attrition trends for other important YOS at the end of various TOS (e.g. BE, SE/SSE, VIE, IE, IE25, etc.).

5.4   Measuring Attrition Rates in Small Populations

The approach described by Okazawa (2007) is most accurate for large populations. However, as mentioned previously, attrition is often reported not only for the CF Regular Force as a whole, but also for sub-populations. For example, attrition may be reported by YOS for a small occupation. In these cases, the calculation of the YOS-based attrition rate could lead to some unreliable results due to the small number of observations available for the calculations, especially at high YOS. Because of the mathematics behind the method used, it is not unusual to see large fluctuations of attrition rates from year to year – from zero to 100% to 50%.

Clearly, these attrition rates do not reflect reality. One approach that has been used in the past to address this issue is to aggregate YOS that show similar historical attrition patterns. This can provide a larger data sample from which to calculate attrition. A similar approach is to combine

sub-populations as appropriate. This approach is described below for the case of grouping related occupations.

An alternative approach that has been suggested (but not yet developed at the time of writing this document) is to use a regression model with few parameters. Another possible approach is to examine the attrition rates at all YOS to detect outliers. Future work in this area could include developing a tool to automatically identify and flag these outliers; the analyst could then address each of these cases in consultation with a Subject Matter Expert (SME).

5.5   Modelling Occupation Groups

Attrition patterns can vary widely between different occupations. Therefore, when attrition patterns are examined at the CF level, details for particular occupations cannot be observed. However, analyzing each occupation individually is undesirable for small occupations for the reasons described above. Sometimes, as a compromise between these two options, groups of related occupations are analyzed together. (It is worth pointing out that there are various other ways of grouping data; for example, by CFOA, or by DEU (Bender, 2005).)

The idea of grouping related occupations was first documented by Berthiaume et al. (2000). They proposed occupation groups, and used a modelling tool to forecast attrition[19]. After comparing their results using an occupation group to the results obtained by using a weighted average of the individual occupations within that group, they were able to validate their approach. They concluded that modelling groups of occupations is a reasonable alternative to modelling each occupation individually.

Currently, occupations are often grouped according to the Military Occupational Structure Analysis, Redesign and Tailoring (MOSART) career fields.

It should be noted that when analyzing occupations (whether individually or in groups), the analysis is complicated by the fact that the losses to a group comprise not only the releases from the CF, but also occupational transfers and losses of NCMs to officer occupations under the CFR and UTPNCM plans. Similarly, the intake comprises the external recruits as well as internal intake from occupational transfers, and the CFR and UTPNCM programs. These additional losses and intakes are accounted for in some (but not all) studies, depending on the requirements of the study.

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[19] Forecasting is discussed further in the following chapter.

6   Forecasting Attrition

Methods for forecasting attrition rates and attrition volume have existed for decades. In this report, only the latest methods used by DSMPRA 4 will be discussed as these are the most mathematically rigorous methods, and are thought to produce the most accurate forecasts (Fang & Okazawa, 2008). Different methods are used elsewhere in DND to produce reports such as the Production, Attrition, Recruiting, Retention and Analysis (PARRA) report and the Projected Status Report (PSR).

Within DSMPRA 4 (and elsewhere), forecasting of attrition volume is done by calculating the expected future attrition rates, and applying these rates to the latest available population data to estimate the future changes to the population.

6.1   Measuring Attrition Rates Over Several Years

The preceding chapter discussed the method for calculating attrition rates for a single year of data, which is suitable for reporting purposes. For forecasting, a method of calculating an expected attrition rate is required. The expected attrition rate can be based on a single year or a number of years of historical data. Determining the optimal historical data set that should be used for forecasting is a subject of ongoing research in DSMPRA 4.   This subject is addressed in Section 6.3.

Okazawa (2007) proposed methods of calculating the Weighted Average Attrition Rate (WAAR) and Least Squares Attrition Rate (LSAR) (which apply for any number of years of historical data), for both the population (or sub-population) as a whole and for the population (or sub-population) broken down by YOS. The technique was further refined shortly thereafter by Fang and Okazawa (2008).

6.2   Forecasting of Attrition Volume and Future Population

Once the expected attrition rate has been determined, and given the planned number of recruits (YOS = 0) and net occupational transfers (YOS > 0), it is fairly straightforward to calculate the predicted volume of attrition during the following year and the population at the end of that year. Of course, the predicted data for one year can be propagated to the next, and so on to provide longer-range forecasts.

The reader is referred to Forecasting Attrition Volume (Fang & Okazawa, 2008), which details the procedures to use to determine the historical attrition rate upon which forecasts will be based (i.e. WAAR or LSAR), the predicted attrition volume by YOS, and the predicted population by YOS.

6.3   Optimal Volume of Historical Data

The previous sections noted that the WAAR or LSAR used for forecasting purposes is often based on several years of historical data. Determining the optimal volume of data to be used for

forecasting remains a challenging problem. The best solution is dependent on the population being examined, and therefore will be different for different analyses.

Many studies in the past, regardless of the method used for forecasting, have required estimates of future attrition rates as input data. However, as it has generally been left up to the analyst to decide how many years of historical data should be used as the basis for these estimates, there has been little consistency. Some studies used as much data as was available at the time; others used a period of a few years (e.g. two, five, 10, or 15 years before the time of the analysis); still others did not specify this information.

This decision is important because it can have a strong impact on the estimate of the expected attrition rate. To minimize the influence of "noise", it is best to use a large volume of historical data. However, there is a risk associated with using too much data, because attrition rates will change over time. Thus, if the historical period includes a time during which attrition rates were different from the attrition rate being estimated, the estimate will be biased.

Knowing this, in many cases analysts excluded the FRP years from their choice of historical data. Jesion and Sidhom (2000) recommended this approach after examining attrition patterns in the CF and noticing that the FRP years had a strong impact on attrition rates, as was expected. Even so, there was not always consistency on which years, specifically, were to be excluded. Moorhead and Zegers (2003) were more specific in recommending that the years 1993-1997 be excluded, based on the patterns they observed.

Despite these recommendations, which came about while studying related issues, no research was done specifically for the purpose of advising analysts on this subject until recently (Okazawa, 2008). Okazawa (2008) noted that the optimal number of years of history to be used is dependent on the size of the population and the forecast length. He designed an experiment to try to determine the best solution as a function of these two factors and recommended the following: in order to obtain sufficient accuracy when estimating attrition rates for short-term forecasts (five years or less), the historical period should be selected such that the sum total population (i.e. the population for all years of history) is between 2000 and 8000. For long-term forecasts, a longer historical period should be used; how much longer, however, is unclear.

It is important to note that these recommendations are very general, and may not apply in all cases. For example, if it is known that attrition has changed recently due to a policy change, it may be better to use only recent data that was affected by the policy change. As a more specific example, some occupations were not strongly affected by the FRP – in these cases, using a historical period that includes the FRP years would be quite acceptable. Therefore, while this work went some way toward assisting the analyst in selecting the historical period, it remains up to the analyst's judgment.

This subject remains an active area of research in DSMPRA 4. They recently initiated a research project in order to find statistical methods to assist the analyst in identifying the historical periods during which attrition has changed (and, by extension, in determining the optimal historical period to use for forecasting). As an initial result of this research, DSMPRA 4 has started to analyze the potential applications of the theory of Change Point Analysis (CPA) for detecting changes in historical attrition patterns (Larochelle, 2008). In particular, they are currently testing

a tool that can perform CPA on attrition data. It is hoped that this research will lead to a rigorous technique that the analyst can consistently apply whenever estimating future attrition rates.

Current research by Fang (2008), still in the early stages, proposes several steps that an analyst can apply to determine the best historical data set to use for forecasting. The process involves a combination of objective and subjective considerations. The objective part of the process involves the application of several statistical techniques to find change points in the data, as well as any points that differed from the others. These results can be used to select the historical period(s) that will provide as much high-quality data as possible. This process is supplemented by a subjective process of working with SMEs to determine why attrition rates changed at the points identified using the objective process. SMEs would typically help to identify times that were affected by a policy change, or to provide insights into issues pertaining to a particular occupation. Finally, a sensitivity analysis should be done using several historical data sets to ensure that the results are robust.

Currently, in light of recent changes in attrition patterns, forecasts for the next three to five years are based exclusively on the most recent years of data. For large population groups (e.g. the CF, NCMs, or officers), only the previous year of data is used to build the forecasting model. For smaller groups, it is better to base the model on the last few years of data as required to provide a total data set of approximately 2000 observations.

6.4   Steady-State Population Profiles

Moorhead and Zegers (2003) proposed the use of steady-state population profiles (also referred to as stable population profiles) as a useful tool for comparing observed and predicted population profiles.

Using the technique described by Moorhead and Zegers (2003) and further developed by Moorhead (2006), both YOS-based and age-based steady-state population profiles can be produced. These profiles indicate the percentages of a given population that are at each YOS or age. The steady-state population profile therefore indicates how the population would be distributed if attrition patterns (by YOS or age) were to remain constant indefinitely. The technique relies on historical attrition data; therefore, the concerns regarding the historical time period to use, described previously, are applicable.

Steady-state population profiles are useful for assessing the long-term impacts of policy decisions (assuming that attrition patterns resulting from these policy decisions are known or can be estimated). When plotted along with an observed profile, they may also be used to illustrate how an observed population compares to the steady-state profile.

Figure 5 illustrates the steady-state population profile based on the attrition rates observed in 2007/2008 for the CF Regular Force. The impact of the FRP is clearly visible.
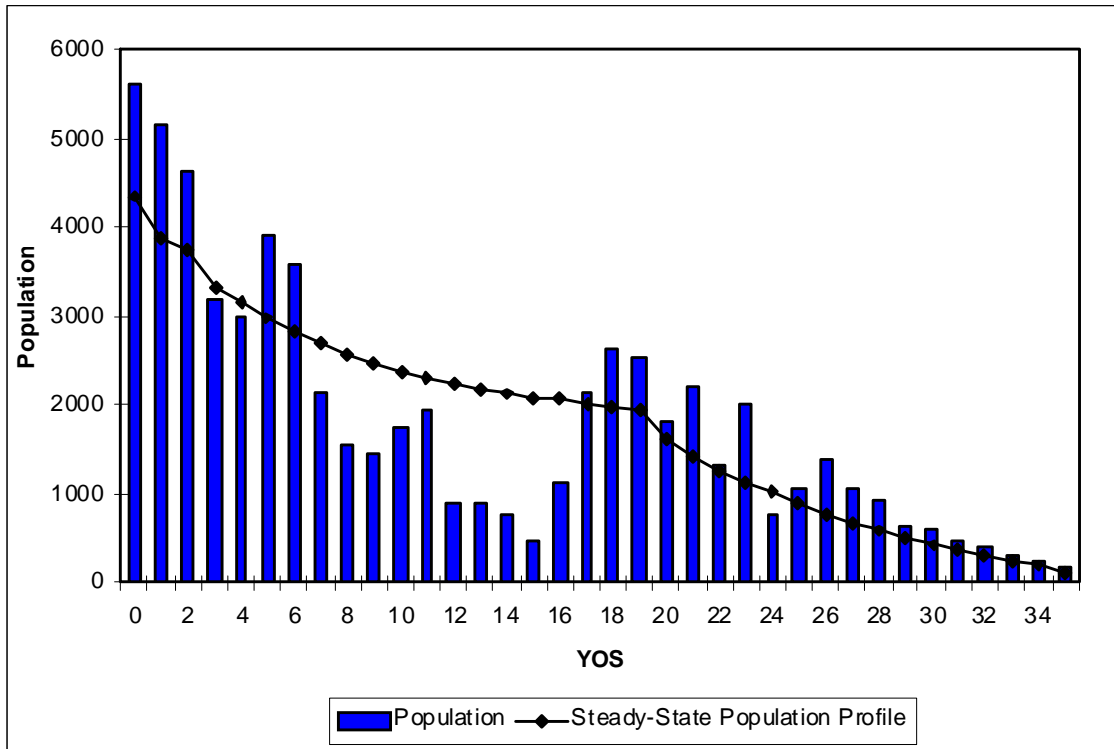
Figure 5: Steady-State Population Profile and Current Population Profile, 2007/2008.

7   Reporting Attrition Rates

Several organizations within DND/CF report attrition statistics, but they do not all do so using the same method. While DSMPRA 4 normally uses the method proposed by Okazawa (2007) for measuring attrition, and by Fang and Okazawa (2008) for forecasting attrition, other organizations use other approaches. Furthermore, different organizations may have different interests in attrition data. For example, while some prefer to look at the total attrition rate of a particular population or sub-population, others may have a strong interest in only voluntary attrition. Additional sources of uncertainty arise from the fact that the CF population is dynamic, in the sense that military members can be recruited, released, or transferred to a different occupation at any time in between the "snapshots" being analyzed.

This lack of consistency was noted in the 2002 April Report of the Auditor General of Canada. Since that time, few (if any) improvements have been made. Okazawa (2007) further emphasized the need for a consistent methodology across the various organizations within DND/CF. Based on the extent of the inconsistency at this time, it appears that it will take a great deal of time and effort for full consistency to be achieved. As a starting point to solving this problem, it is recommended that a document be prepared to detail exactly where attrition is measured and forecast, and how it is done in each case. Calculating and forecasting attrition based on a common dataset using each method would help to determine the extent of the differences between methods. Methods used by The Technical Cooperation Program (TTCP) allies could also be considered for inclusion in the document.

The following sections summarize the various places that attrition data, both observed and forecast, are reported on a regular basis.[20] (Note that in some cases these descriptions are greatly simplified. They are not intended to give the reader a full understanding of the subject.)

7.1   Annual Report on Regular Force Personnel

The Annual Report on Regular Force Personnel has been produced by DSMPRA 4 each year since 2003/2004. It presents a large variety of demographic information on the CF Regular Force, including the following on the subject of attrition:

- historical attrition rates for officers, NCMs, and the CF;

- historical attrition rates by FOL for officers and NCMs;

- historical attrition rates by gender for officers and NCMs;

- historical attrition rates by YOS for officers, NCMs, and the CF;

- releases by release reason code (misconduct, unsatisfactory service, medical, voluntary, service completed, or death);

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[20] Attrition data are used for other purposes (e.g. ad-hoc analyses, M&S studies) by several organizations within DND/CF, but these activities are not addressed here.

- current and projected population proportions for officers and NCMs; and

- projected attrition rates.

In the annexes of the Annual Report, many of these statistics are further broken down by MA (or CFOA beginning in the 2007/2008 report), career field, and rank.

The data for the report come from HRMS extracts. The first three editions of the Annual Report used the traditional method of measuring attrition rates, while the 2006/2007 report used the new method (i.e. that developed by Okazawa (2007)). The 2007/2008 report will also use the new method, as will future reports unless another, more accurate method is found.

Similarly, earlier reports used the traditional approach to forecasting. The new method (i.e. that developed by Fang and Okazawa (2008) was used for the 2006/2007 report, and will be used in the future until replaced by an alternative method.

7.2   AMORs

DSMPRA 4 plays a role in the Annual Military Occupational Reviews (AMORs) by assisting with the determination of production targets for the upcoming year, as well as the intake requirements necessary to meet those targets.

Each CFOA manages the AMORs for the occupations falling under that branch. There is little consistency between the CFOAs in terms of how the AMORs are handled. Different CFOAs focus on different pieces of information, and treat the data differently. For example, in many cases attrition rates are based on the total strength of the occupation; for the Chief Air Staff (CAS) AMORs, attrition is broken down according to whether the released members were part of the Trained Effective Strength (TES) or the BTL.

To complicate matters further, data are supplied by both DSMPRA 4 and DPGR in some cases. These data do not always agree, since the two organizations use different forecasting methods.

It is unrealistic to expect that full consistency will be achieved between the AMORs in the near future. To reiterate the recommendation proposed previously, the methodology used for each AMOR should be documented in a separate report.

7.3   PARRA

The PARRA report is produced by the Director Personnel Generation Requirements (DPGR) on a monthly basis. Data are presented for the following: force level establishment, recruiting intake, attrition, Trained Effective Strength (TES), and paid strength (DPGR/PARRA website, 2008).

The raw data used in the PARRA report differs from that used for the Annual Report. Even though both reports use HRMS as the primary data source, the data are extracted in different ways. The differences can be quite significant on a month-by-month basis, although the differences over a longer time period tend to "balance out" to a large extent. Furthermore, while

the Annual Report uses data from HRMS, the PARRA report also uses data from the CFOAs, and the Canadian Forces Recruiting Group (CFRG) (DPGR/PARRA website, 2008).

Currently, DPGR uses the traditional method of measuring attrition for the PARRA report (i.e. calculated as the ratio of releases to the sum of the population at the beginning of the time period and the recruits). This is likely to change in the future, as they have consulted DSMPRA 4 in the past and have recently expressed interest in adopting DSMPRA's latest measuring and forecasting methods.

7.4　CF Personnel Management Report

The CF Personnel Management Report is produced by Director Military Personnel Strategy and Coordination (DMPSC) on a monthly basis. Attrition rates are calculated as a 12-month rolling average based on data from the PARRA report.

7.5　PSR

The PSR is published by DPGR twice per year. For each occupation, it indicates the difference between the TES and the Preferred Manning Level (PML). Forecasts are done for up to three consecutive years from the date of the report. The PSR uses a multi-year average to forecast attrition. The forecast volume of attrition for the subsequent years is determined using this average value, adjusted based on SME input. This volume is then split based on rank and MOSID weightings derived from the multi-year average statistics. (Of course, since the PSR is only concerned with the TES, only TES attrition is considered. Personnel on the BTL are not reflected in the PSR.) The data for the PSRs are mainly from HRMS, augmented by inputs from the CFOAs, CFRG, and DPGR.

8 Applications of Attrition Data – Modelling and Simulation Tools

For many years, DSMPRA 4 (and its predecessors) has been carrying out simulation studies on a variety of human resource-related subjects. Modelling and simulation can assist military planners in the decision-making process by helping them to understand the long-term impacts of, for example, proposed changes to the TOS, changes to recruiting numbers and attrition rates, or to the way in which a training program is structured. These types of studies can be used to investigate concepts at a CF-wide level, or at a lower level such as for a specific occupation or occupation group.

Along with other information, these simulation studies often require predicted attrition rates as input data. Inaccuracies in these data can have a significant impact on the final results of the study. The fact that simulation results are affected by these predicted attrition rates illustrates the importance of accurate forecasting, and highlights one reason why DSMPRA 4 continually strives to improve its forecasting methods. It should be noted that sensitivity analysis on the attrition rates can mitigate these risks and provide bounds on the forecasts.

Many models have been developed and used by DSMPRA 4 and its predecessors, and by other organizations within DND, over the years. Some of these models became obsolete and were replaced by newer ones. (Some of these older models are described by Bender (1996)[21].) To give the reader an idea of ways in which attrition data are applied, three of the models that were recently developed by DSMPRA 4 are described below. In addition to these, DSMPRA 4 has developed a number of other attrition-related models (e.g. the model used for forecasting attrition in the Annual Report on Regular Force Personnel), as have other organizations within DND. These models are based on tools such as Excel, @Risk, and VBA.

8.1 Arena Career Modelling Environment (ACME)

The Arena Career Modelling Environment (ACME) was developed in 2004 as a replacement for the Generic Modelling Utility (GeM). (Although GeM was well-respected as an effective and flexible modelling tool, it was eventually abandoned. Its main shortcomings were that it was very difficult to learn, and the runtime was too slow for larger studies (Mason & Emond, 2000).) ACME has been further developed since that time.

The aim of ACME (and other career progression tools) is to "provide a comprehensive representation of military occupational structures, rules, and flows, to better understand how the many aspects work together" (Isbrandt & Zegers, 2006). In doing so, it can help decision-makers to understand the likely short- and long-term effects of proposed HR initiatives, or the effectiveness of possible solutions to existing problems.

As its name suggests, ACME is based on Arena, which is an environment for building entity-based Monte Carlo simulations. In an entity-based model, each entity is assigned certain

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[21] The document is recommended reading for those unfamiliar with HR modelling and analysis. Although the report is over ten years old, many of the author's points are still relevant today.

attributes that can be changed as the simulation progresses. So, in ACME, each entity represents an individual with attributes such as age, YOS, rank, TIR, etc. The model will update that individual's attributes on a yearly cycle according to a set of rules (which are based on promotion criteria, TOS, CRA, etc.) and the results of "coin flips". For example, at each simulation year, attributes such as the member's age and YOS will be incremented. Also, some members who are eligible for promotion, according to the rules that have been defined, will be promoted to a new rank. Of course, individuals can enter or leave the system (representing recruitment or occupational transfer and attrition, respectively).

In addition to the rank-oriented career progression described above, the ACME Individual Training & Education (IT&E) Projection Tool models the training that each individual goes through. This allows for analysis of not only the rank structure, but also the training system.

ACME serves as a generic framework that typically is customized for different analyses. Individual occupations or occupation groups can be modelled.

8.2   Production Management Tool (PMT)

While accurate attrition forecasting is particularly important for career progression models such as ACME, it is also necessary for other types of models such as PMT.

PMT is used for modelling training pipelines. It can be used for viewing and analyzing the current and future state of a training pipeline, and identifying existing or arising scheduling problems (i.e. bottlenecks, empty seats, etc.). "What if" analyses can be performed by changing pipeline parameters such as course capacities, the number or timing of course serials, or the intake into the training system. This can assist decision-makers in improving the efficiency of the training pipeline.

PMT consists of four main components:

- an Access-based database, which contains information on past, current, and future courses, and CF members' training history;

- an Arena-based simulation environment;

- Excel-based templates for producing charts and reports that can display a wide variety of information (e.g. course wait times, course demand/attendance ratios, number of pipeline graduates); and

- a Graphical User Interface (GUI).

PMT continues to be developed. It is currently undergoing testing and validation.

8.3   Production & Strategic Intake Model (PSIM)

PSIM is an Excel-based model that was first developed for the 2007 CAS AMORs. It has been refined since then. The model allows the user to test various production and recruiting scenarios in an interactive environment. It is customized for an occupation by specification of the current TES by YOS, and by historical intake and attrition data. Several variables can then be adjusted to

investigate different scenarios; these include the current and future PML, prospective production by FY, and percentage of intake attributed to each intake plan (e.g. ROTP, DEO, etc). The key outputs generated using PSIM include projections of attrition out of the occupation, the resultant manning gap, and the total number of recruits for each entry plan required to meet the specified production values.

9 Improving Retention: Strategies

This section describes research on the subject of possible future strategies to improve retention.

A number of CF review papers, each addressing a salient issue related to retention strategies, were recently published. These papers could inform decisions concerning future retention strategies.

Several of these reports proposed specific means to improve retention in the CF (Gagné, 2007; Gatherton, 2002; McCabe, 2006). These means included improving job satisfaction through job design, reinforcing the importance of leadership and HR management for the Reserve Force, and developing and implementing flexible initiatives supportive of work-family balance.

9.1 Retention Bonus

The focus of Howe's (2005) CF Review paper was the role of retention bonuses in the CF. Howe (2005) reviewed psychological, sociological, and business and management literature to inform the readers about the transactional nature of retention bonuses. Positive impacts (i.e. short-term fix to resolve critical personnel shortages) and negative impacts (i.e. disengaged employees, fairness and equity issues, managing expectations and the entitlement culture, and escalating financial costs) of retention bonuses are described, as well as how bonuses are commonly used in the civilian market, and the United States, Australian, and British militaries.

Howe (2005) ends the paper by making strong recommendations about how the CF should use retention bonuses. These recommendations include: maintaining an emphasis on building organizational commitment through a relational strategy, developing a retention bonus policy, and conducting evaluation research on existing and future bonus programs in the CF (Howe, 2005, p.ii). Howe (2005) notes that the use of retention bonuses is not the best solution to retain personnel but they can be used carefully when critical personnel shortages would otherwise jeopardize CF operational capability. The use of bonuses must be seen as a short-term solution that helps the organization to buy time to fix its retention problems.

Zegers (2003) presented a methodology to help perform a cost/benefit analysis of a retention bonus. He noted that the cost or benefit of a retention bonus is determined by the cost savings resulting from reduced attrition and the expenditures of paying out the bonus. The cost savings of reduced attrition are affected by the total training costs for each occupation, the amount by which attrition is reduced, pre-existing attrition levels, and the discount rate (which is dependent on economic conditions). While his methodology can help provide an assessment of the financial impact of a bonus, it would need to be used in conjunction with expert opinion on issues such as the relationship between the size of the bonus and the amount of attrition reduction. A sensitivity analysis on the attrition rate could help assess the potential savings and risks of implementing a retention bonus.

9.2 Strategies for Retention of Early-Career Members

A briefing note for the NRT reviewed CF early-career release policies and their application, as well as the early-career voluntary release policies of the armed services of Australia, New Zealand, and the United Kingdom (Ainslie, 2006a). The aim of this review was to inform the readers about the utility of imposing a restrictive release policy during Basic Military Qualification (BMQ) training, initial occupational training, and/or the first few YOS. The review revealed that CF policies lacked clarity and information. It urged clear communication of the early-career voluntary release policy to the general public, recruits, trainers, and anyone else involved in the release decision.

9.3 Strategies for Retention of Members with 10 to 22 YOS

Grant (2002) suggested several retention strategies for members having between 10 and 22 YOS. This specific group of members was identified as a critical group to retain since they are composed of the experienced members and the "leaders of tomorrow", and they will soon approach the 20 YOS pensionable service point. In terms of numbers, they represented half of the Regular Force at the time the study was done. The proposed retention strategies were based on a review of findings from surveys that were in place before the implementation of the CF Retention Survey (i.e. QoL Survey, CFAIQ, focus groups on CFAIQ, the CF/DND Work-Life Balance Study, and the TOS Survey).

Grant (2002) found that the most frequently reported concerns by members of this specific cohort fell into the categories of family issues and career issues. Thus, many of the suggested retention strategies were aimed at resolving concerns about work-life issues, such as more flexible work hours and a focus on task accomplishment (output) instead of hours spent at work. A substantial number of recommendations were related to career concerns, for example: a "lateral progression" career path, consisting of career advancement opportunities within a specific job/occupation (with salary increases reflecting skills development). Grant (2002) also proposed other retention strategies related to members' sense of control over work, concerns about postings and educational opportunities, and awareness of CF programs, to cover all concerns identified in her review.

9.4 Strategies for Retention of Land Force LCols

In one study a group of LCols was asked to come up with realistic suggestions to improve their overall job satisfaction (McCreary et al., 2006). The study was conducted as a follow-up to the earlier Army Climate and Culture Study (Capstick et al., 2005) to determine reasons behind LCol job dissatisfaction. Approximately 50 Army LCols in the four Combat Arms (Armoured, Infantry, Artillery, Combat Engineering) and Logistics occupations completed a short job satisfaction survey and participated in a focus group or, if unable to attend, answered the same questions that were asked in the focus group by e-mail. Results from the job satisfaction survey revealed that LCols were highly engaged and had higher overall job satisfaction compared to the US norms. The main source of job satisfaction was found in the job itself (i.e. having fun doing their job, enjoying meeting the challenges of their job, and valuing their job), as well as in the opportunity to command, to influence the CF/Army, and to be a mentor to less experienced soldiers. Despite

these areas of satisfaction, respondents expressed dissatisfaction over a wide area of issues and offered many suggestions related to these.

The most frequent suggestion was that the CF should improve resources available to LCols. Respondents commented that they were experiencing excessively high requirements with limited resources. They urged matching resources to requirements (either by increasing resources, especially personnel, or by decreasing requirements) and setting priorities for activities in accordance to the Army vision. This leads to other concerns that LCols have about the potential negative psychological consequences of this high workload and the present high operational tempo on themselves and their families. Participants suggested addressing these negative effects, reducing operational tempo, and enhancing quality of life initiatives (e.g. better pay, pension/benefits, and housing).

Many respondents provided suggestions for improving the promotion and reward system. While many of them commented that the new Army Succession Planning Process (ASPP) is better than the one it replaced, many were displeased with the slow implementation of the system. Respondents also expressed concern about the role of regimental tribalism in the promotion system, and about language, academic, and job requirements for promotion. Specifically, respondents recommended reducing or eliminating the importance of language requirements for promotion; increasing opportunities to work in the second official language; and adding awards directed to individuals who are not in line for promotion but who deserve recognition for their hard work and contributions.

Some recommendations were related to organizational culture change. For example, many reported that the CF has a risk-averse, micromanagement culture (i.e. being told how to do one's job) and that efforts should be made to build a culture in line with the doctrine of mission command (i.e. responsible for accomplishing a mission while having the resources and the liberty to decide how to do it). Recommendations related to leadership were similar to the ones Capstick et al. (2005) proposed. These consist of organizing meetings between senior CF/Army staff and LCols during which LCols could share their views and opinions about current issues, and fully express their frustration without fear of career retribution. Other suggestions included improving leadership at the senior level by fostering leadership qualities such as caring about the welfare of subordinates, managing career expectations and ensuring clear top-down leadership; and empowering LCols by giving a bigger role to COs in personnel decisions and reducing bureaucracy.

9.5   Strategies for Retention of Medical Officers (MOs)

CF Health Services Group recently developed a relational approach to the retention of MOs with initiatives in seven areas: Salary and Benefits, Quality of Life, Community, Maintenance of Clinical Skills, Value and Respect, Military Medicine, and Mentorship (Jung, 2007). Specifically, MOs are offered pay that is competitive with the civilian sector, as well as participation in the CF pension plan. Greater attention is given to geographical preference, and parental leave and other benefits are provided in accordance with government-wide provisions to increase MOs' quality of life. Some individuals join the CF for adventure, and thus more effort is directed toward meeting their deployment expectations. In order for MOs to feel that they are part of the military community, the CF leverages the Basic Medical Officer Course (BMOC) and the BOTC so they

can learn about principles of leadership, regulations and customs of the service, history of the Canadian Forces Medical Service, and military medicine. This training was sometimes skipped in the past due to an urgent need to fill positions; this was found to cause sub-optimal adjustment to military culture. To foster a sense of community among their fellow MOs, MOs are encouraged to attend selected medical conferences in groups, wearing their uniforms, each year.

CF Health Services Group has increased its commitment to the Maintenance of Clinical Skills Program (MCSP) which allows MOs to be spared their regular duties to spend up to twenty percent of their professional life at civilian facilities practicing clinical skills in all aspects of medicine. This prevents skill fade and thus minimizes the urge to leave the CF to maintain their diverse clinical competencies. Another initiative is to provide MOs more opportunities to practice military medicine through specialized training and operational tours/exposure to satisfy the desire for adventure and to further reinforce that which makes them unique as physicians. To show more value and respect for MOs, a dual track career progression has been recommended to allow more opportunities for them to advance in rank. (Unfortunately, this is "stuck in red tape" at this time; this delay is becoming a significant dissatisfier.) Finally, more emphasis is put on mentorship which involves the presence and participation of senior medical officers at the BMOC, BOTC, and Advanced Medical Officer Course (AMOC).

CF Health Services' approach to retention has been quite successful. The attrition rate for MOs has decreased substantially in the recent years as a result.

10   Recommendations

A number of possible future research areas have been identified in this report. To summarize, they include the following:

- Examine barriers to women staying in the CF, and also to achieving a successful career in the CF. Recent initiatives in the civilian market center on women's connectivity and work-life harmony. Concretely it means for example, providing network opportunities and exposure to senior women, formal mentoring programs, and using technology to connect women (e.g. webcast for interactive presentations, blogs, ways to share "bookmarks").

- Investigate how age and life stage are related to attrition, and how age-based attrition behaviours have changed over time.

- Examine the effect of education level, and possibly field of education, on attrition.

- Examine the impact of pension portability on the attrition rate at 20 YOS.

- Continue to examine the effect of deployment on attrition rates.

- Work towards improving early career/BTL retention. This could involve reviewing the selection standards for each occupation, and validating the selection tests by examining early career attrition patterns.

- Improve the method of calculating attrition in the first YOS.

- Improve the method of calculating attrition rates for small populations.

- Develop a method to help the analyst identify the best historical volume of data to be used for forecasting.

- Produce a report to identify the various places in which attrition data are reported, and how it is done in each case, with the aim of achieving consistency in the future.

- Produce an Annual Report on Attrition. DSMPRA 4 is currently in the early stages of planning this document. It will be similar in design to the Annual Report on Regular Force Personnel, but will deal exclusively with attrition. It will discuss methodology for calculating and forecasting attrition, similar to what is done in this report, but with some additional material. Similar to the Annual Report on Regular Force Personnel, historical and predicted attrition data will be presented for the CF, and for subgroups of the CF. The Annual Report on Attrition will show data broken down as it was in the Annual Report on Regular Force Personnel and in several other ways, such as by DEU, education level, and entry/commissioning plan. Important trends and warnings (i.e. areas where attrition is exceptionally high, or where a drastic change is observed) will also be identified.

Further to the above, several other areas for future work are recommended, including:

- Determine the effectiveness of recently implemented retention strategies and a complete assessment of retention strategy options. For example, it will be important to assess the impact of the recent changes to TOS through a type of post-evaluation. This will help to gauge the success of the new TOS in achieving their objective of reducing attrition, and (in the case of the VIE) possibly increasing the propensity of potential applicants to join an

occupation. The assessment of current practices makes it possible to document their impact and extract lessons learned.

- Explore in detail each of the areas of dissatisfaction that were identified as recurrent, actionable, and of top priority for retention efforts by participants at the most recent NRT meeting (Marum, 2007c). It was decided to take actions to reduce dissatisfaction with:

  ◆ Senior Leadership – Leading the Organization;

  ◆ Career Progression (i.e. Fairness of the Appraisal System);

  ◆ Career Management (i.e. Succession Planning);

  ◆ Posting (i.e. trust in career managers, consideration of members' input and aspirations, and impact on family and spousal employment); and

  ◆ The overall fairness of the CF.

  These are generally the same factors that consistently emerged from the present review of literature. The career management/progression factor stood out slightly less from CF-wide survey findings, but was strongly present in suggestions for reducing mid- and late-career attrition and for reducing attrition rates for health occupations. The evidence so far all converges to the same conclusion: the above factors are persistent problems in the CF that need addressing.

  Existing policies related to these issues should be reviewed and analyzed to determine whether they reflect what the CF wants to achieve. Each factor should be examined in depth with respect to what has been done outside of the CF to address these issues (by other militaries and the civilian market), what can be done to improve each factor, and the assessment of policy options.

- Improve the link between research on recruitment and retention. Factors responsible for early attrition are often different from those for mid- and late-career attrition. The present literature review highlighted very important factors for early retention such as fit into the military culture and perceived ability to succeed. It is also widely acknowledged that early attrition has much to do with non-realistic job preview, mismatch between personal expectations and the military culture and needs, and inadequate socialization. Therefore, more research is suggested on the impact of recruiting practices and early experience on first-term retention.

- Examine how mental health affects retention of members returning from deployments. Australia and the U.S. have linked psychiatric disorders and retention (Creamer et al., 2006; Hoge et al., 2005). The majority of personnel diagnosed with a psychiatric disorder were found to leave involuntarily (i.e. were discharged) within six months to one year after symptom onset. The CF could benefit from investigating factors that increase the probability of personnel diagnosed with an operational stress injury to return to active duty. The CF should also conduct a full analysis of the range of mental health problems that can occur after military deployments and their linkage with both involuntary and voluntary turnover.

- The CF is increasingly reliant on reservists, and therefore needs to understand retention in the Reserve Forces.. If reservists do not have adequate support and consequently leave in large numbers, it would be catastrophic for the CF. As shown in the present review of

literature, most CF studies on reservists are outdated. Because reservists and their families are less likely to be accustomed to deployments and integrated into a military social support system, and since their training and conditions differ from the Regular Force, factors influencing attrition in the Reserves might be different from those of the Regular Force. Future research is recommended on the following topics: the link between various factors (i.e. workload, uncertainty, frequency of deployments) and retention; the identification of the special needs of reservists and their families; reservists' and their families' perceptions of how well they are supported; reservists' experiences on deployment, the stress of call-up, the stress associated with change from the Reserve to active duty; and the stress of homecoming.

While carrying out this research, it became obvious to the authors that there is a "missing link" between the sorts of studies generally carried out by social scientists (e.g. examinations of why people choose to leave the CF), and the type of work done by those who usually have a more mathematical or scientific background (i.e. methodological development for measuring and forecasting attrition, modelling and simulation studies, etc.). All of the documents reviewed in this study fell quite clearly into one category or the other; no reports appeared to represent a joint effort between the different types of researchers. Improving coordination of efforts between the traditionally distinct fields of work would help to advance the knowledge of retention (and many other) issues. This report, co-written by personnel with very different backgrounds, represents a first step in that direction.

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List of Abbreviations

A/RT	Attrition/Retention Team
ACME	Arena Career Modelling Environment
ADM(HR-Mil)	Assistant Deputy Minister (Human Resources - Military)
AFC	Armed Forces Council
AMOR	Annual Military Occupational Review
AMS	Attrition Monitoring System
AMOC	Advanced Medical Officer Course
ASPP	Army Succession Planning Process
BE	Basic Engagement
BMOC	Basic Medical Officer Course
BMQ	Basic Military Qualification
BOTC	Basic Officer Training Course
BTL	Basic Training List
CAS	Chief Air Staff
CDS	Chief of Defence Staff
CEOTP	Continuing Education Officer Training Plan
CF	Canadian Forces
CFAIQ	Canadian Forces Attrition Information Questionnaire
CFAIQ-R	Canadian Forces Attrition Information Questionnaire - Revised
CFOA	Career Field and Occupation Authority
CFR	Commission From Ranks
CFRG	Canadian Forces Recruiting Group
CMC	Canadian Military College
CMP	Chief of Military Personnel
CMR	Collège militaire royal de St-Jean
CO	Commanding Officer

Col	Colonel
CPA	Change Point Analysis
CPP	Canada Pension Plan
CRA	Compulsory Retirement Age
DEU	Distinctive Environmental Uniform
DGMPRA	Director General Military Personnel Research and Analysis
DMEP	Directorate of Military Employment Policy
DMPSC	Director Military Personnel Strategy and Coordination
DND	Department of National Defence
DPGR	Director Personnel Generation Requirements
DRDC CORA	Defence Research and Development Canada – Centre for Operational Research and Analysis
DSMPRA	Director Strategic Military Personnel Research and Analysis
FOL	First Official Language
FRP	Force Reduction Program
FY	Fiscal Year
GeM	Generic Modelling Utility
GUI	Graphical User Interface
HRMS	Human Resource Management System
IE	Intermediate Engagement
IMTA	International Military Testing Association
IPS	Indefinite Period of Service
IT&E	Individual Training & Education
LCol	Lieutenant-Colonel
LSAR	Least Squares Attrition Rate
MA	Managing Authority
MCSP	Maintenance of Clinical Skills Program
MO	Medical Officer
MOC	Military Occupation

MOSART	Military Occupational Structure Analysis, Redesign and Tailoring
MOSID	Military Occupational Structure Identification
MP	Military Police
NCM	Non-Commissioned Member
NNEP	Northern Native Entry Program
NRT	National Retention Team
OCTP	Officer Candidate Training Plan
OFP	Operationally Functional Point
PARRA	Production, Attrition, Recruiting, Retention and Analysis
PDR	Personnel Development Review
PER	Personnel Evaluation Report
PERSTEMPO	Personnel Tempo
PML	Preferred Manning Level
PMT	Production Management Tool
PORT	Personnel Operational Research Team
PRP	Pilot Retention Program
PSIM	Production & Simulation Intake Model
PSR	Projected Status Report
PTA	Pilot Terminable Allowance
QL	Qualification Level
QoL	Quality of Life
RIP	Retention Intervention Process
RMC	Royal Military College
ROTP	Regular Officer Training Plan
SCONDVA	Standing Committee on National Defence and Veterans Affairs
SE	Short Engagement
SME	Subject Matter Expert
SPHL	Service Personnel Holding List

SSE	Short Service Engagement
TES	Trained Effective Strength
TFA	Task Force Afghanistan
TOS	Term(s) of Service
TPS	Total Paid Strength
TTCP	The Technical Cooperation Program
U of S	Universality of Service
UMP	Unit Morale Profile
UTPNCM	University Training Plan - Non-Commissioned Member
VIE	Variable Initial Engagement
WAAR	Weighted Average Attrition Rate
YCS	Years of Commissioned Service
YOS	Years of Service

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This report consists of a review of research concerning attrition and retention in the Canadian Forces (CF) that has been carried out since 1990. The studies reviewed are categorized into five main areas: CF-wide research, research on subgroups of the CF, research on measuring and forecasting attrition, modelling and simulation research, and research on strategies to improve retention.

Based on this review, it was found that there is a large degree of consistency in factors impacting retention, both over time and using different assessment tools, despite the changes that have occurred in the CF population. Meanwhile, methods for measuring and forecasting attrition have improved, and continue to evolve.

Topics for future research are identified. An important recommendation is that a strong link be made between social science research that looks into the reasons why people choose to leave the military and research directed to subjects such as improving methods for measuring and forecasting attrition.

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