Sniper Well-Being:

Results of the 2010 Survey

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Abstract

This report describes the results of a study into the well-being of Canadian Army snipers. In 2010 and early 2011, 114 snipers completed a paper-and pencil survey measuring combat exposure, concern with (or trouble resulting from) this combat exposure, non-traumatic stress, non-operational stress, family stress, present health, psychological distress, posttraumatic stress disorder (PTSD), depression, utilization of mental health resources, alcohol misuse, anger, encounters with the law, barriers to care, posttraumatic growth, self-efficacy, attitudes toward the mission, cohesion, sniper identity, and reaction to killing in combat. The results of this survey showed that although the snipers had been exposed to many combat experiences, they had little post-combat trauma. For the most part, they appeared to be physically and mentally healthy, although two mental health concerns emerged. First, depending on which cut-off score is employed, almost 10% of the snipers who had served in combat may be vulnerable to developing posttraumatic stress disorder. Second, alcohol consumption levels reported by Army snipers in this study appear to be high in comparison to reports from other CAF studies. Analyses of survey responses revealed that there was some stigma about mental health treatment in the sniper community. Most of the 67 snipers who had killed in combat reported no post-combat trauma from this experience. Further research should be conducted on the issues of PTSD and alcohol consumption in the sniper community.

Résumé

Le présent rapport décrit les résultats d'une étude sur le bien-être des tireurs d'élite de l'Armée canadienne. En 2010 et au début de 2011, 114 tireurs d'élite ont rempli un sondage sur papier portant sur le degré d'exposition au combat, les préoccupations relatives à cette exposition et les problèmes découlant de celle-ci, le stress non-traumatique, le stress non-opérationnel, le stress familial, l'état de santé actuel, la détresse psychologique, l'état de stress post-traumatique (ESPT), la dépression, le recours à des ressources de santé mentale, les problèmes d'alcool, la colère, les démêlés avec la justice, les obstacles aux soins, la croissance personnelle après un traumatisme, l'auto-efficacité, l'attitude face à la mission, la cohésion, l'identité de tireur d'élite et la réaction à l'acte de tuer au combat. Les résultats de ce sondage montrent que bien que les tireurs d'élite aient été exposés à de nombreuses expériences de combat, ils ont subi peu de traumatismes liés au combat. Ils semblent pour la plupart en bonne santé physique et mentale, même si deux problèmes de santé mentale sont ressortis de l'étude : d'abord, selon le seuil utilisé pour le calcul, près de 10 p. 100 des tireurs d'élite ayant servi en situation de combat pourraient être exposés à l'état de stress post-traumatique; et ensuite, les niveaux de consommation d'alcool signalés par les tireurs d'élite de l'Armée dans cette étude semblent élevés en comparaison avec ceux qui figurent dans les rapports d'autres études des Forces armées canadiennes. L'analyse des réponses au sondage révèle qu'il y a chez les tireurs d'élite des stigmates associés au recours à des soins de santé mentale. Parmi les 67 tireurs d'élite ayant été appelés à tuer au combat, la majorité indique n'avoir subi aucun traumatisme lié à cette expérience de combat. Il serait bon de mener des études plus poussées au sujet de l'ESPT et de la consommation d'alcool chez les tireurs d'élite.

Executive summary

Sniper Well-Being: Results of the 2010 Survey

Peter Bradley; Royal Military College of Canada; July 2013

In the first decade of the 21st Century the Canadian Armed Forces (CAF) deployed troops to Afghanistan in what became the most intense combat Canadian soldiers had experienced since Korea in the 1950s. This provided a valuable opportunity for researchers to study the effects of combat on soldiers and a number of studies were conducted along this vein.

Two of these studies focused exclusively on snipers. The first was an interview-based study of 19 Canadian Army snipers who had served in combat in Afghanistan (Bradley, 2010). The results of this initial study showed that the snipers were generally coping well, but there were some suggestions of potential mental health issues and a broader examination was launched with a larger sample of snipers. This document reports the results of the second study.

In 2010 and early 2011, 114 snipers in Canadian Army units completed a paper-and pencil version of the Sniper Well-Being Survey 2010 which assessed the following variables: combat exposure, concern with (or trouble resulting from) this combat exposure, non-traumatic stress, non-operational stress, family stress, present health, psychological distress, posttraumatic stress disorder (PTSD), depression, utilization of mental health resources, alcohol misuse, anger, encounters with the law, barriers to care, posttraumatic growth, self-efficacy, attitudes toward the mission, cohesion, sniper identity, and reaction to killing in combat. The demographic characteristics of the sniper sample are summarized in Table 1.

The snipers who completed the 2010 Survey had considerable combat experience by Canadian Army standards. One hundred and nine respondents (96% of the entire sample) reported being in combat, 60% of the sample had deployed abroad in the sniper role and 58% of the sample reported killing an enemy combatant. Although the sample had been exposed to many combat experiences, they reported very little concern or trouble (i.e., stress) as a result of these experiences.

One of the scales included in the Sniper 2010 Survey was a measure of non-traumatic stressors (i.e., stress below the trauma threshold) developed by the Australian military. The Canadian sniper respondents scored slightly higher on this measure than groups of Australian soldiers who completed the same survey while on peacekeeping duties.

The sniper respondents scored high on measures of physical health and most of the mental health measures, but a few areas of concern emerged on the mental health side. For the most part, sniper scores on the mental health measures were lower than the scores researchers typically find in surveys of CAF enlisted personnel suggesting good mental

health. For example, scores on the survey's depression and anger scales were relatively low; however, depending on which cut-off score is used on the posttraumatic stress disorder (PTSD) scale, up to 10% of the sniper respondents who had been in combat may be susceptible to PTSD. Given that mental health issues can take some time to manifest, the sniper community might benefit from some mental health education, particularly those who are combat veterans.

Alcohol consumption is another area of concern to arise from the survey results. Sniper responses on the Alcohol Use Disorders Identification Test (AUDIT), a well-known and much-used device in screening for alcohol problems, which was included in Sniper 2010 Survey, revealed that the sniper respondents consume alarming levels of alcohol. Alcohol consumption levels reported in the survey were noticeably higher than published levels of other CAF personnel as well as levels reported in several studies of U.S. combat soldiers. Sniper misuse of alcohol seems confined to consumption however, as their scores on measures of alcohol dependence and harm experienced (as a result of their drinking) were much lower.

British and American researchers have found some evidence that combat veterans appear disproportionally in U.K. and U.S. judicial and penal systems; however, this does not appear to be an issue of concern for the Canadian Army sniper community at this time. In response to survey questions on this topic, only a few of the sniper respondents reported having had any recent encounters with the law.

Analysis of survey responses showed that there is some social stigma towards mental health illness in the sniper community. Social stigma refers to the perception of prejudice and discrimination directed at individuals who seek out mental health treatment and is a significant barrier to injured soldiers receiving the care they need. Stigma is insidious in that it affects those suffering from mental health problems more than those with no problems. Along this vein, survey respondents who reported that they were concerned with a stress, emotional, alcohol, drug or family problem also perceived greater stigma associated with seeking mental health treatment. On a more positive note, those with more combat experience perceived less stigma.

A recent line of research shows that some individuals can experience personal growth from their traumatic experiences and this finding has been replicated with samples of combat veterans in the U.S. No such research has been conducted in the CAF yet, but measures of posttraumatic growth were collected in this study for possible comparison with future CAF studies.

A number of measures were included in the survey to assess attitudes which might serve as protection against operational stress. These measures included self-efficacy, attitudes toward the mission and cohesion. The sniper respondents scored high on all these measures and subsequent correlational analyses showed that many of the measures were inversely related to mental health outcomes (i.e., respondents who scored high on the measures generally scored lower on the mental health measures), but the correlations were not strong. This is a positive finding which should be examined further.

The survey included several items examining the effect that killing has on combat veterans. Responses revealed that most of the 67 snipers who killed in combat had little post-combat trauma in this regard. There was virtually no difference between those who had killed in combat and those who had not on the measures of psychological distress, depression, PTSD, and anger. But those who had killed in combat had slightly lower alcohol consumption, dependence and harm experienced scores as well as lower levels of perceived stigma (towards mental health treatment).

Overall, the results of this research show that the sniper community is generally comprised of healthy individuals, although a small percentage of the combat veterans may be at threat of developing PTSD. An area in which the entire sniper community seems to be engaging in unhealthy behavior however is alcohol consumption.

Résumé

Résultats du Sondage sur le bien-être des tireurs d'élite 2010

Peter Bradley, Collège militaire royal du Canada, juillet 2013

Au cours de la première décennie du XXI^{e} siècle, les Forces armées canadiennes (FAC) ont déployé des troupes en Afghanistan, dans le cadre d'une campagne qui s'est avérée le théâtre des combats les plus intensifs qu'aient connus les soldats canadiens depuis la Corée dans les années 1950. Cette campagne a donc fourni aux chercheurs l'occasion d'examiner les effets du combat sur les soldats, au moyen d'un certain nombre d'études.

Deux de ces études portaient exclusivement sur les tireurs d'élite. La première était fondée sur les entrevues de 19 tireurs d'élite des FAC ayant participé aux combats en Afghanistan (Bradley, 2010). Les résultats de cette étude initiale montraient que les tireurs d'élite s'en sortaient en général plutôt bien, mais qu'il y avait des signes suggérant l'existence possible de problèmes de santé mentale. Une seconde étude, plus large, a donc été réalisée auprès d'un plus grand échantillonnage de tireurs d'élite. Le présent document rapporte les résultats de cette seconde étude.

En 2010 et au début de 2011, 114 tireurs d'élite d'unités des FAC ont rempli une version papier du Sondage sur le bien-être des tireurs d'élite 2010. Le sondage portait sur les variables suivantes : le degré d'exposition au combat, les préoccupations relatives à cette exposition et les problèmes découlant de cette exposition, le stress non traumatique, le stress non opérationnel, le stress familial, l'état de santé actuel, la détresse psychologique, l'état de stress post-traumatique (ESPT), la dépression, le recours à des ressources de santé mentale, les problèmes d'alcool, la colère, les démêlés avec la justice, les obstacles aux soins, la croissance personnelle après un traumatisme, l'auto-efficacité, l'attitude face à la mission, la cohésion, l'identité de tireur d'élite et la réaction à l'acte de tuer au combat. Les caractéristiques démographiques des participants du sondage sont résumées dans le tableau 1.

Les participants du sondage ont une expérience de combat considérable pour les normes des FAC. Cent neuf participants (soit 96 pour cent du total) indiquent avoir été au combat, 60 pour cent disent avoir participé à des déploiements à l'étranger dans un rôle de tireur d'élite, et 58 pour cent affirment avoir tué un combattant ennemi. Bien que, dans l'ensemble, les participants aient été exposés à de nombreuses expériences de combat, ils ne rapportent que peu de préoccupations ou de problèmes (c.-à-d. stress) découlant de ces expériences.

L'une des parties du sondage visait à mesurer les facteurs de stress non-traumatique (c.-à-d. sous le seuil du traumatisme) selon des indicateurs élaborés par l'Armée australienne. Les participants du sondage canadien ont obtenu un chiffre légèrement plus élevé à cet indicateur que les groupes de soldats australiens qui ont répondu au même sondage dans le cadre de fonctions de maintien de la paix.

Les participants du sondage ont obtenu de bons résultats aux indicateurs de santé physique et à la plupart des indicateurs de santé mentale, même si quelques points préoccupants sont apparus sur le plan de la santé mentale. Pour la plupart, les tireurs d'élite ont une côte plus basse aux indicateurs de santé mentale que les côtes habituellement relevées dans le cadre de sondages auprès du personnel enrôlé dans les FAC, ce qui suggère une bonne santé mentale. Les côtes des indicateurs de dépression et de colère étaient relativement basses dans le sondage notamment. Toutefois, selon le seuil utilisé pour l'indicateur de l'état de stress post-traumatique (ESPT), près de 10 pour cent des participants du sondage ayant été au combat seraient susceptibles d'être touchés par l'ESPT. Étant donné que les problèmes de santé mentale peuvent prendre un certain temps à se manifester, il pourrait s'avérer bénéfique pour les tireurs d'élite, en particulier ceux qui ont été au combat, d'être sensibilisés à la santé mentale.

La consommation d'alcool est une autre question préoccupante d'après les résultats du sondage. Les réponses des tireurs d'élite au test de dépistage des troubles liés à la consommation d'alcool (test AUDIT), un test très connu et très utilisé pour le dépistage des problèmes d'alcool, et qui faisait partie du Sondage sur le bien-être des tireurs d'élite 2010, ont révélé que les participants du sondage consomment une quantité alarmante d'alcool. La consommation d'alcool rapportée dans le sondage était sensiblement plus élevée que celle qui est rapportée par le reste du personnel des FAC ainsi que celle de plusieurs études sur des soldats américains ayant été au combat. Les abus d'alcool semblent toutefois se limiter à une consommation excessive, puisque les côtes des indicateurs sur la dépendance à l'alcool et sur les préjudices subis (en raison de cette consommation) étaient beaucoup plus faibles.

Des chercheurs britanniques et américains ont constaté que les anciens combattants paraissent en nombres disproportionnés devant les tribunaux judiciaires et pénaux en Grande-Bretagne et aux États-Unis; toutefois, la situation ne semble pas préoccupante pour les tireurs d'élite de l'armée canadienne à l'heure actuelle. En réponse aux questions du sondage à ce sujet, seuls quelques-uns des participants du sondage indiquent avoir eu des démêlés récents avec la justice.

L'analyse des réponses au sondage a montré qu'il y a un certain stigmate social associé aux problèmes de santé mentale au sein de la communauté des tireurs d'élite. Ce stigmate social se rapporte à une perception de préjugés et de discrimination envers les personnes qui ont recours à des soins de santé mentale, et constitue un obstacle important au recours aux soins nécessaires par les soldats touchés. Le stigmate est insidieux en ce qu'il touche ceux qui souffrent de problèmes de santé mentale plus que ceux qui n'en souffrent pas. De même, les participants du sondage qui se sont dits préoccupés par un problème lié au stress, aux émotions, à l'alcool, à la drogue ou à la famille percevaient aussi un plus grand stigmate associé au recours à des soins de santé mentale. Sur une note plus positive, ceux qui avaient une plus grande expérience de combat percevaient un stigmate moindre.

Des études récentes montrent que pour certaines personnes, un traumatisme peut donner lieu à un épanouissement personnel, conclusion qui a été corroborée par une étude auprès d'anciens combattants aux États-Unis. Il n'y a pas eu d'étude similaire dans les FAC pour l'instant, mais des indicateurs de croissance post-traumatique ont été prélevés dans le cadre de la présente étude aux fins d'éventuelle comparaison avec de futures études dans les FAC.

Un certain nombre d'indicateurs a été intégré au sondage aux fins d'évaluation des comportements qui pourraient aider à protéger du stress opérationnel. Ces indicateurs sont notamment l'auto-efficacité, l'attitude face à la mission et la cohésion. Les participants du sondage ont attribué des côtes élevées à tous ces indicateurs, et les analyses corrélationnelles subséquentes ont montré que bon nombre de ces indicateurs étaient inversement proportionnels aux résultats de santé mentale (c.-à-d. que les participants qui ont attribué des côtes élevées à ces indicateurs ont généralement attribué des côtes plus faibles aux indicateurs de problèmes de santé mentale), mais la corrélation n'était pas très solide, aussi serait-il bon d'approfondir les études au sujet de cette découverte positive.

Le sondage comportait diverses questions liées aux répercussions de l'acte de tuer sur les anciens combattants. Les réponses ont révélé que la majeure partie des 67 tireurs d'élite ayant tué au combat ont peu souffert de traumatismes liés à cet acte. Il n'y avait pour ainsi dire aucune différence entre ceux qui avaient tué au combat et ceux qui n'avaient pas tué au combat en ce qui concerne les indicateurs de détresse psychologique, de dépression, d'ESPT et de colère. En revanche, ceux qui avaient tué au combat avaient des côtes légèrement plus basses à la consommation d'alcool, à la dépendance à l'alcool et aux préjudices subis en raison de cette consommation, et des niveaux plus faibles de perception de stigmate (lié au recours à des soins de santé mentale).

Dans l'ensemble, les résultats de cette étude montrent que la communauté des tireurs d'élite est généralement composée de personnes en bonne santé, bien qu'un faible pourcentage des anciens combattants puisse être à risque en ce qui concerne l'ESPT. Toutefois, la consommation d'alcool est un comportement nuisible pour la santé qui semble toucher toute la communauté des tireurs d'élite.

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1 Introduction

1.1 Background

Shortly after the Canadian Armed Forces (CAF) deployed to Afghanistan in 2002 it was apparent that snipers would play an important part in that mission. Indeed, throughout that campaign snipers contributed to the operation's success in critical roles like observing enemy activity, sniping enemy combatants, and directing the fire of artillery and aircraft. During combat, snipers are often positioned some distance from their main unit and are therefore more vulnerable to enemy threat than conventional soldiers. As a result, they are subject to a unique variety of combat stress. Given the need to understand better how combat affects Canadian soldiers and the intensity of sniper operations in Afghanistan, research into sniper well-being was initiated in 2008.

1.2 Initial Study

The sniper well-being research project began in 2008 with a study of 19 snipers from Canadian Army regiments. Each participant had served in Afghanistan in recent years and most had killed in combat. There were two parts to this study, a 90-minute interview covering a range of well-being topics, after which the snipers were asked to complete several short validated questionnaires. The results revealed that the snipers in this study experienced no adjustment difficulties on returning to Canada from their most recent deployment. They expressed a mix of attitudes on seeking mental health services, with 3 of the 19 reporting they were currently in counselling. Some participants described some dehumanization of the enemy, but not much, and most felt justified about the enemy they had killed in combat, expressing little or no regret for their actions.

Sniper scores on the Kessler Psychological Distress Scale (Kessler, Barker, Colpe, Epstein, et al., 2003), also called the K10 (because it consists of 10 items), showed that although most of the 19 snipers were at little risk of acquiring a major mental health disorder, almost a third of the sample scored in the moderate and high risk categories, suggesting that they were more likely to develop a major disorder in the future. Additionally, a number of the respondents expressed some concern with some of their combat experiences and several of the snipers with higher K10 scores stated that they had already begun seeing a counsellor.

Overall, the results of this initial study of sniper well-being, which were presented in a Defence Research Development Canada (DRDC) contractor's report (Bradley, 2010), showed that this sample of snipers was coping well, but several of the study's findings (mentioned above) suggested that a more in-depth examination of sniper well-being was warranted. This led to the Sniper Well-Being Survey 2010, the subject of this report.

2 Research Methods

2.1 Overview

The Sniper Well-Being Survey 2010 was developed to measure a range of variables known to be, or hypothesized to be, related to sniper well-being, defined in this study as an absence of mental health symptoms. In the interest of brevity, the survey will be called the Sniper 2010 Survey or just "the survey" throughout this report. The Sniper 2010 Survey was funded by the DRDC Applied Research Program 14cb (Psychological Resilience).

2.2 Procedure

The Sniper 2010 Survey was administered in paper-and-pencil format to Canadian Army snipers at their home garrisons in Canada in 2010 and early 2011.

2.3 Ethics Review

Sponsored by the Canadian Army and authorized by National Defence Headquarters, this research was approved by the research ethics boards of Defence Research and Development Canada (DRDC) and the Royal Military College of Canada. The ethics review procedures of both of these institutions follow the guidelines of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (1998).

2.4 Subjects

On being advised of the aim of this research (i.e., to study sniper well-being), 114 snipers volunteered to complete the survey. These 114 participants came from all regular force battalions of Canada's infantry regiments and represented a sizeable portion of the sniper community.[1] Because there were no officers or females serving as snipers at the time of this study, the survey sample consisted of non-commissioned male members only. The research participants were relatively young with slightly more than 80% of the subjects reporting their age as between 22 and 31. As for length of military service (in the CAF), the participants ranged from two to 24 years of service – the average was 8.8 years (SD=4.3). Survey respondents had slightly less experience as a sniper, 3.6 years (SD=2.9), as most snipers spend their early years as a soldier in a rifle company before joining their sniper cell. Over 80% of the sample had deployed abroad as a sniper, mostly in Afghanistan. The demographic characteristics of the survey respondents are displayed in more detail in Table 1.

[1] Research reports usually state what percentage of the total population the study sample represents, but the high level of turnover in the Canadian Army sniper community at the time of this study made it difficult to assess this percentage with precision. It is estimated that the sample of 114 snipers represented about half of the total sniper community in the Canadian Army at the time of the research.

2.5 Measures

The Sniper 2010 Survey included many scales, some of which were taken word-for-word from published studies. Other scales were adapted from other studies to measure sniper well-being and still others were developed specifically for this study. Each scale is described in Section 3 of this report (e.g., citation, content) along with the results found for each scale. Listed below are the scales included in the survey and the section of the survey in which they appear:

Combat exposure – Section 1
Concern with (or trouble resulting from) this combat exposure – Section 1
Non-traumatic stress – Section 1
Non-operational stress – Section 2
Family Stress – Section 2
Present health – Section 3
Psychological distress – Section 3
Posttraumatic stress – Section 4
Depression – Section 5
Utilization of mental health resources – Section 6
Alcohol misuse – Section 7
Anger – Section 8
Encounters with the law – Section 9
Barriers to care – Section 10
Posttraumatic growth – Section 11
Self-efficacy – Section 12
Attitudes toward the mission – Section 13
Cohesion – Sections 14 and 15
Sniper identity – Section 16
Reaction to killing in combat – Section 17
Demographic information – Section 18

2.6 Missing Data

Although the Sniper 2010 Survey was completed by 114 snipers, readers will notice that the data depicted in some of the tables of this report do not add up to 114. This can be attributed to several reasons such as clerical errors in transcribing the responses from paper-and-pencil surveys into electronic databases. The most common reason however is that respondents occasionally miss some items when completing surveys and these data gaps then carry over to the calculation of scale scores because scale scores are obtained by aggregating the responses of individual items. Missing data substitution or imputation was not used in this study.

2.7 Comparison with Other Studies

Readers are usually interested in how the findings of a particular study compare with results from other similar studies, so, where possible, results from other studies have been

included in this report to provide additional perspective on sniper well-being. Such comparisons must be made with caution however. Studies can appear similar at first glance, but very often unique aspects of each study such as characteristics of the research participants and the research methods employed can introduce errors that make cross-study comparisons problematic. It was difficult to find studies which might be considered suitable for comparing with this study of Canadian Army snipers. After all, the sniper sample was somewhat unique, being all male, rather young, and mostly combat veterans. Moreover, it was difficult to find comparable samples that had completed the same measures as those included in the Sniper 2010 Survey, but a few were found and their results are reported in this document, with the above-mentioned caveat that such comparisons must be cautiously interpreted.

Table 1
Demographic Characteristics of the Sniper 2010 Well-Being Survey Respondents

Variable	Response Categories	n	%
Age group	17 to 26 years	41	36
	27 to 31 years	37	33
	32 to 36 years	25	22
	37 to 41 years	5	4
Rank	Private	5	4
	Corporal	53	47
	Master Corporal	28	25
	Sergeant	22	19
	Warrant Officer	3	3
First official Language	English	83	73
	French	28	25
Regiment	Princess Patricia's Canadian Light Infantry	32	28
	Le Royal 22^{e} Régiment	28	25
	The Royal Canadian Regiment	50	44
Education	Some high school	16	14
	Completed high school	53	47
	Some university / Some college	34	30
Deployments as a sniper	0 deployments	18	16
	1 deployment	55	48
	2 deployments	16	14
	3 Deployments	4	4
	4 Deployments	2	2
	5 Deployments	1	1
Total Deployments	0 deployments	6	5
	1 deployment	31	27
	2 deployments	34	30
	3 Deployments	16	14
	4 Deployments	13	11
	5 Deployments	9	8

Note. Because of missing responses, not all data points in Table 1 add to 100%.

3 Variable Measurement and Findings

3.1 Combat Exposure

Background. Combat can have a significant impact on soldiers and others caught in its grasp. Studies have shown that combat veterans can suffer from a range of mental health problems like posttraumatic stress disorder (PTSD; King, King, Foy, & Gudanowski, 1996; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Boulos & Zamorski, 2013), depression (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009), traumatic brain injury (Hoge, McGurk, Thomas, Cox, Engel, & Castro, 2008), alcohol abuse (Wilk, Bliese, Kim, Thomas, McGurk, & Hoge, 2010), and other ailments as a result of their war experiences. On the other hand, some studies have shown that combat can also lead to positive outcomes like posttraumatic growth (Maguen, Vogt, King, King, Litz 2006; Gallaway, Millakan, & Bell, 2011).

Combat exposure is typically measured in research surveys by asking respondents the extent to which they experienced specific combat stressors such as receiving incoming artillery or rocket fire. There are a number of such measures in the scientific literature [see Keane, Street, and Stafford (2004) for an overview], but because the nature of combat varies from theatre-to-theatre, many researchers find it best to develop measures specially for the wars they are studying.

The combat exposure measure used in the Sniper 2010 Survey was similar to combat exposure measures used in other CAF studies conducted during the Afghanistan campaign. The scale consisted of 45 items taken from the Stress on Operations Scale, one of the scales within CAF Human Dimensions in Operations (HDO) surveys (Garabedian & Blanc, 2008), and other scales employed in U.S. studies (Hoge, Castro, Messer, McGurk, Cotting, & Koffman, 2004; Keane, Fairbank, Caddell, Zimering, Taylor, & Mora, 1989; Schell & Marshall, 2008). Two aspects of combat exposure were measured with each item of the scale – amount of combat exposure and level of concern with the exposure. First, the amount of exposure was assessed by asking respondents to report how often they experienced each of the 45 combat stressors (see Figure 1 for a list) on a five-point response scale (0=never, 1=one time, 2=two to four times, 3=five to nine times, 4=ten or more times). Second, respondents were asked how much concern (or trouble) each of the experiences caused them, also on a five-point scale (0=no trouble or concern, 1=little trouble or concern, 2=some trouble or concern, 3= much trouble or concern, 4=very much trouble or concern).

Findings. Figure 1 displays the levels of combat exposure reported by the survey respondents on left side of the figure and levels of concern on the right side. The data show that 93 sniper respondents (82% of the sample) reported they had been attacked or ambushed (Item 1) and 90 respondents (79% of the sample) had seen destroyed homes or villages (Item2). Levels of concern summarized on the right side of Figure 1 show that 30 respondents (32%) had some concern with being attacked or ambushed (Item 1) and a smaller number, 17 respondents (19%), had some concern about seeing destroyed homes or villages (Item 2).

Figure 1

Percentage of Sniper Respondents Who Experienced Combat Stressors on Their Most Recent Deployment to Afghanistan and the Extent to Which These Experiences Cause Them Concern

How often have you experienced any of these stressful situations?

1 - Never
2 - One time
3 - Two to four times
4 - Five to nine times
5 - Ten or more times

How much trouble or concern has this caused you?

1 - No trouble or concern
2 - Little trouble or concern
3 - Some trouble or concern
4 - Much trouble or concern
5 - Very much trouble or concern

1	2	3	4	5		1	2	3	4	5
3	7	22	28	36	1. Being attacked or ambushed.	64	23	6	1	
7	4	15	11	60	2. Seeing destroyed homes or villages.	78	14	3		
3	7	18	28	40	3. Receiving small arms fire.	62	26	4	1	1
11	19	35	17	13	4. Seeing dead bodies or human remains.	59	30	4	2	
54	18	15	4	4	5. Handling or uncovering human remains.	72	14	6	1	
22	20	39	11	4	6. Witnessing an accident which resulted in serious injury or death.	63	23	9		
40	12	25	9	9	7. Witnessing violence with the local population or between ethnic groups.	81	11	1		
24	18	39	13	2	8. Seeing dead or seriously injured Canadians.	47	28	14	4	1
10	15	30	23	18	9. Knowing someone seriously injured or killed.	40	23	24	5	2
52	10	5	10	15	10. Participating in demining operations.	75	11	4		
10	25	40	13	9	11. Improvised IED/booby trap exploded near you.	56	25	7	4	1
3	3	7	10	74	12. Working in areas that were mined or had IED's.	59	24	9	3	1
22	13	29	9	23	13. Having hostile reactions from local civilians.	76	14	3		
55	17	14	4	4	14. Disarming civilians	85	7	1		
40	20	18	9	6	15. Being in threatening situations where you were unable to respond because of ROE's.	70	9	7	4	3
9	9	25	16	38	16. Shooting or directing fire at the enemy.	80	11	4		
45	18	12	9	11	17. Calling in fire on the enemy.	85	7	2		
93	2				18. Engaging in hand-to-hand combat.	90	3			
8	4	19	18	47	19. Clearing/searching homes or buildings.	77	14	4		
51	12	18	8	6	20. Clearing/searching caves or bunkers.	83	7	4		
70	13	9	2	2	21. Witnessing brutality/mistreatment toward non-combatants.	84	4	4		

81	12	3			22. Being wounded/injured.	82	9	3		
40	16	18	5	13	23. Seeing ill/injured people you were unable to help.	69	17	4	3	
6	8	23	23	35	24. Receiving incoming artillery, rocket, or mortar fire.	60	25	7	2	1
30	24	21	11	10	25. Being directly responsible for the death of an enemy.	76	11	4	2	1
85	4	6			26. Observing violations of Laws of Armed Conflicts/Geneva Conventions.	86	4	1	1	
95		1			27. Being responsible for the death of Canadian or ally personnel.	93				
27	14	21	19	14	28. Having members of your own unit become a casualty.	57	22	11	3	
51	21	16	2	5	29. Had a close call; dud landed near you.	72	13	6	1	
74	16	2	3	2	30. Had a close call; a bullet or shrapnel hit a piece of your personal equipment.	85	5	4		
95	1				31. Had a close call; equipment shot off your body.	92	1			
94	1	1			32. Had a close call; was shot or hit, but protective equipment saved you.	92	1			
76	15	4			33. Had a buddy shot or hit who was near you.	82	10	2	1	
74	11	10	1	1	34. Informed unit member/friend of a soldier's death.	81	8	3	2	
67	11	11	3	4	35. Witnessing the verbal abuse of non-combatants.	85	6	2		
71	7	15	1	2	36. Witnessing the damage and/or destruction of private property when it was not necessary.	87	5		1	
79	3	9	4	1	37. Witnessing a non-combatant being physically hit/kicked when it was not necessary.	89	4	1		
88	4	4	1		38. Witnessing a detainee being physically hit/ kicked when it was not necessary.	90	3			
93	1	2			39. Witnessing the unauthorized modification of ROE to accomplish the mission.	91	1	1		
93		2		1	40. Witnessing ROE being ignored to accomplish the mission.	91		2		
47	6	18	6	18	41. Witnessing corruption by local nationals, including government officials and security personnel.	81	9	3	1	1
18	7	22	11	37	42. Witnessing incompetence by local nationals, including government officials and security personnel.	64	21	5	4	1
6	2	25	11	52	43. Having to work under tight deadlines.	67	19	7	1	1
26	8	21	7	33	44. Being expected to do more than is reasonable.	69	16	9	1	
83	13				45. Had an injury that required me to be hospitalized.	86	5	2		

Most common stressors. Table 2 lists the 10 stressors that were experienced most often by the respondents. Item 12, working in areas that were mined or had improvised explosive devices (IEDs) was the most common stressor, reported by 94 respondents (93% of the sample). It was followed closely by Item 2, seeing destroyed homes or villages, which was experienced by 90 respondents (89% of the sample).

Table 2
Most Common Combat Stressors

Stressor	*M*	*SD*	*%*
12. Working in areas that were mined or had IED's.	3.6	1.0	93
2. Seeing destroyed homes or villages.	3.2	1.3	89
43. Having to work under tight deadlines.	3.1	1.2	90
3. Receiving small arms fire.	3.0	1.1	94
19. Clearing/searching homes or buildings.	3.0	1.3	88
24. Receiving incoming artillery, rocket, or mortar fire.	2.8	1.2	89
16. Shooting or directing fire at the enemy.	2.7	1.3	87
42. Witnessing incompetence by local nationals, including government officials and security personnel.	2.4	1.5	77
9. Knowing someone seriously injured or killed.	2.3	1.2	88
44. Being expected to do more than is reasonable.	2.1	1.6	69

Note. Items were measured on a 5-point scale (0=never, 1=one time, 2=two to four times, 3=five to nine times, 4=ten or more times).

Most troubling stressors. The 10 combat stressors which respondents found most concerning (or troubling) are listed in Table 3. This table shows that the respondents were most troubled by knowing someone seriously injured or killed (Item 9) and seeing dead or seriously injured Canadians (Item 8). However, it should be noted that, even though these are the most troubling stressors perceived by this sample of Army snipers, the absolute level at which the typical sniper felt troubled by them is very low.

Five of the most troubling stressors in Table 3 also appear as most common stressors in Table 2 giving an indication of the stress level of the snipers' combat experiences. They include knowing someone seriously injured or killed (Item 9), working in areas that were mined or had IEDs (Item 12), receiving incoming artillery, rocket, or mortar fire (Item 24), witnessing incompetence by local nationals, including government officials and security personnel (item 42), and receiving small arms fire (Item 3).

Least experienced stressors. The 10 least experienced combat stressors are listed in Table 4. Included in this list is engaging in hand-to-hand combat (Item 18) and had an injury that required them to be hospitalized (Item 45).

Table 3
Most Troubling Combat Stressors

Stressor	*M*	*SD*	*%*
9. Knowing someone seriously injured or killed.	.99	1.0	94
8. Seeing dead or seriously injured Canadians.	.78	.93	94
11. Improvised IED/booby trap exploded near you.	.60	.89	94
28. Having members of your own unit become a casualty.	.57	.82	93
12. Working in areas that were mined or had IED's.	.56	.85	95
24. Receiving incoming artillery, rocket, or mortar fire.	.50	.79	94
15. Being in threatening situations where you were unable to respond because of ROE's.	.48	.99	92
42. Witnessing incompetence by local nationals, including government officials and security personnel.	.48	.84	95
4. Seeing dead bodies or human remains.	.46	.68	95
3. Receiving small arms fire.	.44	.71	95

Note. Items were measured on a 5-point scale (0=no trouble or concern, 1=little trouble or concern, 2=some trouble or concern, 3= much trouble or concern, 4=very much trouble or concern).

Table 4
Least Experienced Combat Stressors

Stressor	M	*SD*	*%*
31. Had a close call; equipment shot off your body	.01	1.0	1
18. Engaging in hand-to-hand combat	.02	.14	2
27. Being responsible for the death of Canadian or allied personnel	.02	.19	1
32. Had a close call; was shot or hit, but protective equipment saved you	.03	.21	2
39. Witnessing the unauthorized modification of ROEs to accomplish the mission	.05	.29	3
40. Witnessing ROEs being ignored to accomplish the mission	.07	.47	3
38. Witnessing a detainee being physically hit/kicked when it was not necessary	.14	.50	8
45. Had an injury that required me to be hospitalized	.14	.35	13
26. Observing violations of the Law of Armed Conflict/ Geneva Conventions	.17	.52	10
22. Being wounded/injured	.18	.46	15

Note. Items were measured on a 5-point scale (0=never, 1=one time, 2=two to four times, 3=five to nine times, 4=ten or more times).

Ethical stressors. Ten of the 45 combat exposure items have ethics implications and given the Army's interest in battlefield ethics (Walker, 2009), they are highlighted in Table 5. From this table we see that 60 respondents (52% of the sample) reported observing ill or injured people they were unable to help (Item 23), and 27 of these respondents expressed some concern with this. A smaller number of 9 respondents had witnessed a detainee being physically abused (Item 38) while only 3 respondents reported any concern with this. Unfortunately, we can't tell from these data how many of the concerned respondents had expressed their concern at the time they witnessed these incidents or reported these infractions to their chain of command. A positive aspect of the data in Table 5 is that three of these ethics-related items also appear as least experienced combat stressors above in Table 4 (i.e., Items 38, 39, and 40).

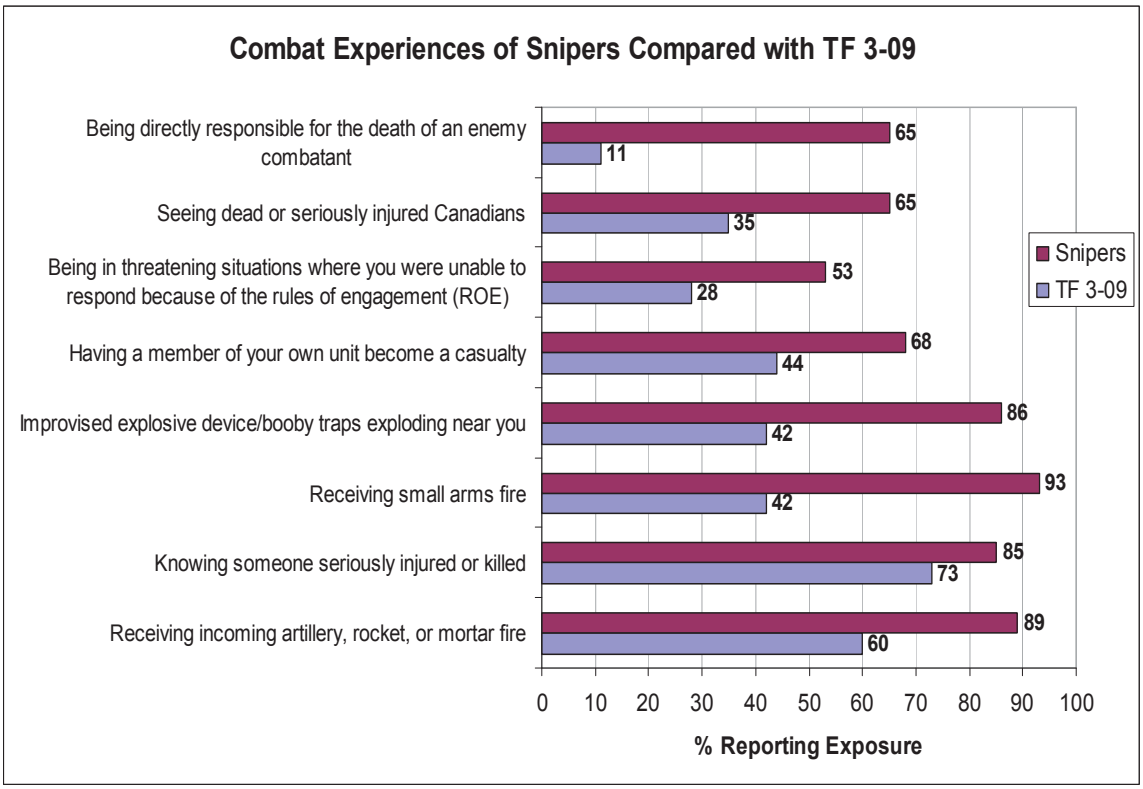
Table 5
Ethics-Related Stressors

Witnessed by	Stressor	Concerned
60	23. Seeing ill/injured people you were unable to help.	27
55	41. Witnessing corruption by local nationals, including government officials and security personnel.	15
33	35. Witnessing the verbal abuse of non-combatants.	9
29	21. Witnessing brutality/mistreatment toward non-combatants.	9
28	36. Witnessing the damage and/or destruction of private property when it was not necessary.	7
19	37. Witnessing a non-combatant being physically hit/kicked when it was not necessary.	5
11	26. Observing violations of Laws of Armed Conflicts/ Geneva Conventions.	6
9	38. Witnessing a detainee being physically hit/kicked when it was not necessary.	3
3	39. Witnessing the unauthorized modification of ROE to accomplish the mission.	2
3	40. Witnessing ROE being ignored to accomplish the mission.	2

Comparison with Task Force 3-09. As mentioned earlier, one can get a better understanding of the results of a particular study by comparing present results with those obtained in similar studies. At the time of the Sniper 2010 Survey there were no published Canadian studies of combat exposure, except for one internal CAF report by Garber and Zamorski (no date), who had collected measures of combat exposure from 1431 soldiers of Task Force 3-09, the third Canadian task force sent to Afghanistan in 2009. The dimensions of combat exposure that were measured in both the Garber and

Zamorski study and the Sniper 2010 Survey are displayed in Figure 2 to provide some perspective on the combat exposure reported by the sniper respondents of the 2010 survey. The differences are dramatic; the sniper sample reported more exposure for each of the stressors in Figure 2. They were responsible for the death of more enemy combatants, they saw more dead, or seriously wounded Canadians and they were fired on by the enemy more often. Overall, the data in Figure 2 suggest that the snipers in this study had considerable combat experience.

Figure 2
Comparison of Sniper Combat Exposure with Task Force 3-09



Note. The TF 3-09 data in this figure are taken from Figure 2 on Page 15 of Garber and Zamorski (no date).

Interrelations among measures. In studies such as this it is beneficial to observe the interrelations among variables of interest. Consequently, a correlation matrix is provided in Table 6 showing how combat exposure and concern with this exposure are related to the major mental health variables assessed in this study. The correlation coefficients in this matrix range from modest (.30) to high (.60-.80) and the large number of positive correlations indicate that most of these variables are interrelated. Positive numbers in a correlation matrix show that increases in respondents' scores on one scale correspond with increases in their scores on another scale; the size of each correlation coefficient indicates the strength of these associations (higher values indicating a stronger

relationship between the two variables). The correlations in Table 6 show that survey respondents' ratings of combat exposure were related with their ratings on measures of PTSD, depression and anger; however, the relations between concern and these mental health outcomes are even stronger. Given that the measure of concern represents respondents' appraisals of the impact combat exposure has had on them, the stronger correlations are indicative of the emotional effect combat can have on soldiers. Also visible from the inter-correlations of distress, PTSD, depression, anger, and alcohol misuse in Table 6 is evidence of the comorbidity of these mental health outcomes. Many studies report that these afflictions often appear together, so it is not surprising that the correlations in this matrix replicate this finding.

Table 6
Correlation Matrix of Combat Exposure and Indicators of Well-Being

	1	2	3	4	5	6	7	8	9
1. Combat Exposure	(.88)	.39*	.26*	.14	.34*	.26*	-.05	.28*	.08
2. Concern		(.95)	.40*	.51*	.60*	.64*	.11	.41*	.30*
3. NTSQ			(.89)	.30*	.39*	.43*	.21*	.35*	.22*
4. Psychological Distress				(.86)	.71*	.80*	.32*	.59*	.34*
5. PTSD					(.88)	.83*	.22*	.61*	.26*
6. Depression						(.84)	.26*	.65*	.39*
7. Alcohol Misuse							(.74)	.28*	.24*
8. Anger								(.79)	.25*
9. Perceived Stigma									(.95)

Note. The Cronbach alpha for each scale is listed in the diagonal in brackets. * denotes statistically significant correlation coefficients.

Future research. There is a substantial body of research showing that combat exposure is related to mental health problems, so it is important for the CAF to stay abreast of this literature and, at the same time, continue monitoring these relations in samples of CAF soldiers. Combat stressors can vary from operation to operation, so it is critical that CAF researchers regularly measure the dimensions of combat exposure for ongoing CAF operations and monitor the prevalence rates of mental health outcomes to learn which aspects of combat have the most impact on soldier mental health.

3.2 Non-Traumatic Stress

Background. In addition to the stress effects of combat exposure reported above, the present study of sniper well-being explored the impact of stressors originating outside combat as well as stress that does not reach the threshold that would be considered traumatic. Consequently, Section 1 of the Sniper 2010 Survey included a second

measure of deployment-related (i.e., operational) stress, originally developed by the Australian Defence Forces (Deans, 2007; Deans & Byrne, 2009), and which has appeared in the literature under two names, the Non-Traumatic Stressor Questionnaire (NTSQ) and the Major Stressors Inventory – Revised (MSI-R). As the NTSQ name implies, this scale measures stressors which are not traumatic, but are nevertheless stressful. The scale's 22 items are arranged in three sub-scales – work frustrations, operational concerns, and separation concerns – and individual items are measured on a 5-point response scale (1-5) and summed to create sub-scale and scale scores. The NTSQ has been shown to correlate with work team morale and mental health (Deans, 2007; Deans & Byrne, 2009).

Findings. Two reports have been written on the NTSQ (Deans, 2007; Deans & Byrne, 2009), but neither of these provide scale scores which can be compared with the Sniper 2010 Survey data. Fortunately, the developer of the NTSQ was able to provide scale means and standard deviations (C. Deans, personal communication, April 26, 2012) for one of the samples she referred to in her 2007 report, the sample of 695 Australian peacekeepers "who deployed to East Timor between May 2003 and November 2003" (Deans, 2007, 23). These data have been included in Table 7 along with the NTSQ results from the Sniper 2010 Survey respondents and show that the Canadian snipers scored higher than the Australian peacekeepers on two of the three sub-scales of the NTSQ. It is not clear why the sniper sample scored higher on these NTSQ measures, but perhaps part of the reason may be that most of the sniper sample had previously served in combat and at the time of completing these scales they were back home employed in less stimulating work (e.g., training rather than operations), which may have been more stressful than the Australian peacekeeping experience.

As for relations among NTSQ subscales and other mental health outcomes, the correlations in Table 8 reveal that the NTSQ and its subscales are positively associated with most of the study's mental health measures.

Future research. No further research with the NTSQ is recommended at this time.

Table 7
Comparison of Canadian Army Snipers and Australian Peacekeepers on Non-Traumatic Stressors Questionnaire

		Sniper 2010 Sample (*n*=103)		Australian Peacekeepers (*n*=695)		
Scale	Items	M	SD	M	SD	Diff
Work Frustrations	7	14.1	4.3	13.8	4.6	no significant diff
Operational Concerns	8	13.0	4.0	10.9	3.1	Sig, t = 6.16, p < .001
Separation Concerns	7	12.9	4.2	10.6	3.7	Sig, t = 5.74, p < .001
Total NTSQ	22	40.0	10.5	32.5	9.2	Sig, t = 7.58, p < .001

Note. Items were measured on a 5-point scale (1-5) and summed to create scale scores.

Table 8
Correlation Matrix of NTSQ Factors and Indicators of Well-Being

	1	2	3	4	5	6	7	8	9	10	11	12
1. NTSQ	(89)	.80*	.85*	.85*	.24*	.40*	.30*	.39*	.43*	.21*	.35*	.22*
2. Work Frustrations		(78)	.50*	.50*	.14	.30*	.25*	.31*	.35*	.22*	.30*	.27*
3. Operational Concerns			(83)	.63*	.23*	.32*	.11	.18	.26*	.12	.24*	.02
4. Separation Concerns				(81)	.20	.40*	.41*	.47*	.47*	.24*	.35*	.26*
5. Combat Exposure					(88)	.36*	.13	.32*	.24*	-.06	.28	.07
6. Concern						(95)	.51*	.60*	.64*	.11	.41*	.30*
7. Psychological Distress							(86)	.71*	.80*	.32*	.59*	.34*
8. PTSD								(88)	.83*	.22*	.61*	.26*
9. Depression									(84)	.26*	.65*	.39*
10. Alcohol Misuse										(74)	.28*	.24*
11. Anger											(79)	.25*
12. Perceived Stigma												(95)

Note. The Cronbach alpha for each scale is listed in the diagonal in brackets. * denotes statistically significant correlation coefficients.

3.3 Non-Operational Stress

Background. The first two sections of this report looked at stress due to combat exposure (3.1) and non-traumatic stress of an operational nature (3.2). Expanding on this coverage of stress, the Sniper 2010 Survey included items from the Canadian Forces Occupational Stress Questionnaire (CFOSQ), originally developed by Kelloway and Barling (1994) to measure aspects of non-operational stress in the military workplace. The complete CFOSQ contains many scales, but only 21 were sufficiently relevant to sniper well-being to be included in the Sniper 2010 Survey. In total, 78 items from the following CFOSQ scales were included: quantitative load (4 items), qualitative load (4 items), work scheduling (4 items), skill use (4 items), decision making (4 items), control at work (4 items), role conflict (4 items), role clarity (4 items), equipment (4 items), recognition (4 items), feedback (3 items), rewards (4 items), job security (4 items), bureaucracy (5 items), coworkers (4 items), supervisor (4 items), work interference with family (4 items), postings (4 items), personal (4 items), procedural justice (1 item) and interactional justice (1 item). Each item was measured with a 7-point response scale (1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neither agree nor disagree, 5=slightly agree, 6=agree, 7=strongly agree) and scale scores were calculated by summing item scores.

Findings. Table 9 presents the CFOSQ item and scale means of sniper respondents alongside the means from the original sample of 123 CAF personnel Kelloway and Barling (1994) employed in their development of the CFOSQ. Readers are cautioned not to draw firm conclusions when comparing the sniper scores with those of the original CFOSQ sample, however, because the sniper sample and the original CFOSQ sample are not comparable and the psychometric quality of several CFOSQ scales is questionable. Each of these cautions is explained further below.

It is unlikely that Kelloway and Barling's original CFOSQ sample is a proper comparison group for the respondents on the Sniper 2010 Survey. Ideally, a comparable sample would include other Canadian soldiers who had fought in a combat theatre like Afghanistan. According to Kelloway and Barling (1994), their CFOSQ developmental sample consisted of 123 CAF personnel stationed at CFBs Borden and Esquimalt, and included individuals from the army (47), navy (28) and air force (42). The average tenure (i.e., time in the military) of the sample was 19.3 years. Given the low number of army personnel in the sample and their relative seniority in terms of length of service, it is unlikely that this sample included many young combat soldiers, like those in the Canadian Army sniper community. Consequently, the original CFOSQ sample is not a sample which would permit meaningful comparisons with the snipers of the 2010 Survey. But the sniper data in Table 9 could be used by any future researchers who are looking for CFOSQ data from combat veterans.

There is also a measurement problem with four of the CFOSQ scales in Table 9 that make interpreting the scores on these scales problematic. CFOSQ scale scores are calculated by summing item scores to arrive at a total scale score, but for qualitative load, role clarity, rewards, and bureaucracy, each scale contains items that are scored in opposing directions, so that simply summing the item scores to obtain a scale score will

result in some items cancelling others. The usual remedy in this instance is to employ reverse scoring (i.e., recode 1 to 7, 2 to 6, 3 to 5 and 5 to 3, 4 to 2, 7 to 1) so that all items will be scored in the same direction. (See Item 2 in the qualitative load scale for an example.)

The problem can be seen in the role clarity scale where Item 8 (I am usually given clear directions) and Item 46 (I know what to expect from my supervisors) measure greater role clarity, while Item 27 (It is not clear what my superiors expect from me) and Item 65 (I usually don't know what is expected of me at work) measure a lack of clarity. If we calculate the total role clarity score by summing the four item scores, the opposing items will cancel one another. Recoding the scores of Items 8 and 46 (i.e., scores of 1 recoded to 7, 2 recoded to 6, etc.) will ensure the item scoring is compatible with the other two items of the scale, 27 and 65, but Kelloway and Barling (1994) make no mention of recoding these items, raising the possibility that this might be an oversight on their part. Similar problems exist with Items 12 and 68 in the rewards scale, and Items 70 and 76 in the bureaucracy scale. There seems to be similar problem with Item 59 in the Qualitative Load scale which is keyed in the same direction as Item 1, which Kelloway and Barling (1994) identified for recoding, but they made no mention of recoding Item 59.

The problem presented by these conflicting items is apparent when we try to assess the internal consistency of these scales. For example, the Cronbach alpha for qualitative load as shown in Table 9 is quite low at .35 and the alphas for the scales role clarity, rewards, and bureaucracy in the same table were essentially 0. This reflects poorly on the psychometric quality of these scales, because Cronbach alphas of .7 or higher are the usual standard for acceptable internal consistency (Nunnally & Bernstein, 1994).

The questionable items (8, 12, 46, 59, 68, 70, 76), were recoded as described above and new Cronbach alphas calculated for the four scales (qualitative load, role clarity, rewards, bureaucracy) with dramatic results suggesting that the items should indeed be recoded. For example, when Item 59 was recoded, the new alpha for the qualitative load scale became .64, a significant improvement over the previous alpha of .35. On recoding Items 8 and 46, the new alpha for role clarity became .79 instead of the previous .00. Similarly, recoding Items 12 and 68 of the rewards scale resulted in a new alpha of .79 in contrast to the earlier alpha of .00. Finally, recoding bureaucracy Items 70 and 76 resulted in a new alpha of .72, another large improvement over the previous alpha of .00.

Future research. No future research is recommended with the CFOSQ at this time.

Table 9
Canadian Forces Occupational Stress Questionnaire – Item Means from the Original Sample and the Sniper 2010 Well-Being Survey Sample

Quantitative Load

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
1	I have too much work to do.	3.0	1.4	3.3	1.8
20	I have to work quickly to keep up.	3.4	1.3	4.3	1.8
39	There is never enough time to get everything finished.	3.3	1.4	4.0	1.7
58	I'm frequently behind in my work.	2.4	1.1	3.3	1.7
Total Scale (4 items, Cronbach's alpha = .68)		12.1		14.9	

Qualitative Load

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
2r	My job is easy. (Reversed scored)	5.4	1.6	4.7	1.7
21	My job requires a lot of concentration.	5.7	1.0	5.3	1.4
40	My job is very demanding.	5.3	1.2	5.1	5.7
59	My job requires very little training.	1.7	1.3	5.7	1.6
Total Scale (4 items, Cronbach's alpha = .35)		18.1		20.8	

Work Scheduling

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
3	I frequently have to work overtime.	3.7	1.8	4.2	1.9
22	I frequently work in the evenings or on weekends.	3.5	1.5	4.0	2.1
41	I often have to work overtime without advance notice.	3.6	1.5	3.1	1.8
60	Planning my private life is difficult because of my work schedule.	3.9	1.8	3.5	1.9
Total Scale (4 items, Cronbach's alpha = .71)		14.7		14.8	

Skill Use

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
4	My job allows me to use my skills and abilities.	5.5	1.6	5.3	1.6
23	My job allows me to develop new skills.	5.7	1.3	5.1	1.6
42	My job allows me to learn new things.	5.8	1.1	5.3	1.5
61	I've had to acquire new skills to keep up with my job.	5.3	1.3	5.0	1.7
Total Scale (4 items, Cronbach's alpha = .82)		22.3		20.7	

Decision Making

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
5	I have enough influence on my job.	5.0	1.5	4.7	1.6
24	I have the opportunity to be involved in decision-making.	5.6	1.0	5.0	1.8
43	I have a say in how my work gets done.	5.4	1.0	5.3	1.4
62	I have the opportunity to make my own decisions.	5.3	1.0	5.3	1.5
Total Scale (4 items, Cronbach's alpha = .81)		21.3		20.3	

Control at Work

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
6	I decide how to spend my time.	4.3	1.5	5.0	1.5
25	I have control over my work schedule.	3.8	1.5	4.8	1.6
44	I decide how to spend my time at work.	4.4	1.4	5.0	1.5
63	I decide which tasks I work on each day.	4.3	1.2	4.9	1.5
Total Scale (4 items, Cronbach's alpha = .84)		16.8		19.7	

Role Conflict

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
7	Different superiors want me to do different things at the same time.	3.7	1.6	3.6	1.8
26	I am often asked to do more than one task at the same time.	4.9	1.3	5.0	1.7
45	Superiors and subordinates expect me to do different things.	4.2	1.4	4.5	1.8
64	To do my job well I have to do different things for different people at the same time.	4.2	1.4	4.7	1.7
Total Scale (4 items, Cronbach's alpha = .71)		17.0		17.8	

Role Clarity

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
8	I am usually given clear directions.	5.3	1.5	4.1	1.8
27	It is not clear what my superiors expect from me.	2.6	1.2	4.6	1.7
46	I know what to expect from my supervisors.	5.5	1.0	4.9	1.5
65	I usually don't know what is expected of me at work.	2.5	1.1	5.2	1.4
Total Scale (4 items, Cronbach's alpha = .00)		15.9		18.8	

Equipment

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
9	I have to work with outdated equipment.	4.6	1.7	4.2	1.9
28	It is difficult to get the right equipment for the job.	4.4	1.7	4.3	1.8
47	Some of our equipment is simply too old to fix anymore.	4.6	1.7	3.7	1.8
66	To do my job properly I would need new equipment.	4.5	1.6	3.8	1.8
Total Scale (4 items, Cronbach's alpha = .88)		18.1		16.0	

Recognition

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
10	People in the CF don't often say thank you when you do good work.	4.0	1.6	5.2	1.5
29	Supervisors don't often notice good work.	3.1	1.5	4.5	1.6
48	You only ever hear about your performance when you make a mistake.	3.6	1.5	4.4	1.8
67	No one in authority appreciates my work.	2.6	1.3	3.3	1.5
Total Scale (4 items, Cronbach's alpha = .78)		13.3		17.4	

Feedback

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
11	I get regular feedback on my job performance.	4.6	1.4	4.3	1.7
30	I usually hear if I'm doing a good job at work.	4.7	1.3	4.7	1.5
49	I get regular feedback on my job performance.	4.6	1.2	4.4	1.6
Total Scale (3 items, Cronbach's alpha = .84)		13.9		13.4	

Rewards

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
12	There is not enough recognition for good work in the CF.	4.3	1.3	5.2	1.5
31	People who work hard in the CF get promoted.	3.6	1.7	4.6	1.8
50	If you do good work the CF will reward you.	3.9	1.5	4.6	1.6
68	Promotions are not usually based on job performance.	4.4	1.7	4.5	1.8
Total Scale (4 items, Cronbach's alpha = .00)		16.2		18.9	

Job Security

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
13	I am concerned that I will have to leave the sniper community.	5.3	1.8	4.1	2.0
32	I worry about my future as a sniper.	4.6	1.9	4.0	1.9
51	I expect to have to leave the sniper job in the near future	4.2	1.8	4.5	1.8
69	I don't know how long I will remain a sniper in the CF.	5.2	1.4	4.6	1.9
Total Scale (4 items, Cronbach's alpha = .73)		19.3		17.2	

Bureaucracy

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
14	We have too many new policies in the CF.	4.4	1.3	4.7	1.6
33	Policies in the CF are made as a result of political pressure.	5.1	1.2	5.9	1.2
52	Current policies in the CF interfere with the way we work.	4.4	1.3	4.8	1.7
70	The people who make the decisions in the CF have a clear sense of the role of the military.	3.6	1.3	4.7	1.5
76	Policies in the CF generally improve the way we work.	3.6	1.0	4.3	1.4
Total Scale (5 items, Cronbach's alpha = .00)		21.1		24.4	

Coworkers

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
15	The people I work with all help each other.	5.9	1.2	5.0	1.5
34	I can trust my coworkers.	6.2	0.9	5.0	1.3
53	At work everybody helps each other out.	5.7	1.1	4.8	1.5
71	My coworkers and I work as a team.	6.1	0.9	5.1	1.5
Total Scale (4 items, Cronbach's alpha = .90)		23.9		19.9	

Supervisor

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
16	I can trust my supervisor to "go to bat" for me.	5.7	1.5	5.1	1.5
35	My supervisor will help me out whenever he/she can.	5.9	1.1	5.4	1.1
54	My supervisor looks out for his/her people.	5.7	1.2	5.1	1.4
72	My supervisor sets a good example.	5.7	1.3	5.0	1.6
Total Scale (4 items, Cronbach's alpha = .91)		23.0		20.6	

Work Interference with Family

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
17	Sometimes my duties conflict with family/personal life.	5.0	1.5	5.1	1.5
36	Because of work I am frequently away from home.	5.4	1.2	3.9	1.8
55	Because of work I have had to miss family functions.	5.5	1.4	4.3	1.8
73	It is difficult to balance my work and family demands.	3.9	1.6	3.6	1.8
Total Scale (4 items, Cronbach's alpha = .74)		19.8		16.9	

Postings

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
18	Getting posted would mean a major disruption in my spouse's career.	4.8	2.0	4.1	2.4
37	It would be difficult for my wife/family to relocate if I were posted.	4.8	2.0	3.7	2.2
56	Every time I'm posted my spouse has to find a new job.	4.5	1.5	4.8	2.2
74	Getting posted would interfere with my children's schooling.	3.9	1.6	4.8	1.9
Total Scale (4 items, Cronbach's alpha = .74)		18.0		17.4	

Personal

No.	Item	Sniper Data		CAF Data	
		M	*SD*	*M*	*SD*
19	My friends or family who are not in the CF sometimes argue with me about the role of the military.	3.6	1.7	3.9	1.7
38	I have experienced discrimination because I am a member of the CF.	2.8	1.6	3.9	1.9
57	There are places in this community where members of the CF are not welcome.	3.1	1.4	4.1	1.5
75	People in this community do not like members of the CF.	2.9	1.4	3.6	1.4
Total Scale (4 items, Cronbach's alpha = .57)		12.4		15.5	

Procedural Justice (Organization)

No.	Item	Sniper Data		CAF Data	
77	If a member of the CF filed a policy-related complaint (e.g., sexual harassment, bilingualism etc), the CF would:	*M*	*SD*	*M*	*SD*
a.	Always collect enough information before making a decision.	4.9	1.3	4.5	1.6
b.	Ensure that there were appropriate ways to appeal the decision.	4.9	1.1	4.4	1.5
c.	Make sure every side in the complaint could present their view.	5.0	1.2	4.6	1.6
d.	Act promptly to investigate the complaint.	4.7	1.4	4.3	1.6
Total Scale (4 items, Cronbach's alpha = .90)		19.5		17.8	

Interactional Justice (Supervisor)

No.	Item	Sniper Data		CAF Data	
78	If you or someone else in your work group approached your supervisor with a complaint, your supervisor would:	*M*	*SD*	*M*	*SD*
a.	Give you feedback about any decisions made.	5.4	1.1	4.9	1.4
b.	Deal with you openly and honestly.	5.4	1.2	4.9	1.4
c.	Treat your complaint confidentially.	5.3	1.3	4.8	1.5
d.	Deal with your complaint immediately.	5.3	1.3	4.8	1.5
Total Scale (4 items, Cronbach's alpha = .94)		21.4		19.4	

Note. Individual items in Table 9 were measured on a 7-point scale (1-7) and scale scores were calculated by summing the scores of the items comprising each scale.

3.4 Family Stress

Background. The second measure in Section 2 of the Sniper 2010 Survey is a scale of four items from the Operational Mental Health Assessment (OMHA), a CAF instrument recently developed by researchers from the medical and human resource communities of the CAF/DND to assess mental health symptoms and needs in theatre. Focusing primarily on family stressors, the four items ask respondents if they have experienced "in recent years" the death or illness of a family member (Item 79), the birth of a child (Item 80), spousal or partner separation (Item 81) or a serious financial problem (Item 82). Each item was measured with a 2-point response scale (Yes, No).

Findings. The responses to these items depicted in Table 10 indicate that in recent years about half the sniper respondents experienced the death or serious illness of a family member, about one-third had fathered a child, a smaller number had become separated, and an even small number of 6 respondents (about 5% of the sample) had experienced serious financial problems.

Table 10
Prevalence of Family Stressors

In recent years did any of the following occur?	Yes	No
Death or serious illness of a family member	61	52
Birth of a child	40	73
Spouse or partner left you	22	91
Serious financial problem	6	107

Note. N = 114.

The responses from the four items in Table 10 were combined to form one index of family stress which is shown in Table 11 to correlate with some of the mental health indicators measured in this study. The correlations are weak, but they do show that family stress is associated with PTSD, depression, alcohol misuse and anger, though the correlations are small.

Future research. No future research is recommended in this area at this time.

Table 11
Correlation Matrix of Family Stress and Indicators of Well-Being

	1	2	3	4	5	6	7	8	9
1. Family Stress	__	.13	.19	.18	.29*	.23*	.19*	.24*	-.03
2. NTSQ		__	.40*	.30*	.39*	.43*	.21*	.35*	.22*
3. Concern with Combat Exposure			__	.51*	.60*	.64*	.11	.41*	.30*
4. Psychological Distress				__	.71*	.80*	.32*	.59*	.34*
5. PTSD					__	.83*	.22*	.61*	.26*
6. Depression						__	.26*	.65*	.39*
7. Alcohol Misuse							__	.28*	.24*
8. Anger								__	.25*
9. Perceived Stigma									__

Note. * denotes statistically significant correlation coefficients.

3.5 Present Health

Background. Section 3 of the Sniper Well-Being Survey 2010 assessed present health and psychological distress. The first four items of this section are taken from the OMHA and measure current health. Measured with a 5-point response scale, the first three items asked respondents:

In the past month …
… How would you rate your health?
… How often have you gone to sick call or visited a doctor or other medical professional for a physical condition?
… How many days of work did you miss due to illness?

Item 4 asked respondents for a yes/no answer to the question: Did you spend one or more nights in a hospital as a patient during the past six months?

Findings. Responses to the items in this section suggest that the sniper respondents were mostly in good health at the time of completing the survey. As shown in Table 12, 76 of 113 snipers (67% of the sample) rated their health in the month before completing the survey as excellent or very good. Only 8 respondents (7%) rated their health as fair or poor. The ratings of personal health in Table 12 are also consistent with the number of visits the respondents reported making to a doctor or another medical professional in the previous month as well as the number of days of work missed because of illness. Only 5 snipers (4%) reported visiting a doctor or medical professional in the previous month (Table 13), and only 3 of the 113 sniper respondents (3%) missed any days of work during the month prior to completing the survey. Overall, the data in Tables 12 through 15 suggest that the sniper respondents felt very healthy at the time of completing the survey.

Table 12
Ratings of Personal Health in the Past Month

Rating	Excellent	Very Good	Good	Fair	Poor
Frequency	41	35	29	6	2

Note. N = 113 snipers.

Table 13
Frequency of Visits in the Past Month to a Doctor or Other Medical Professional for a Physical Condition

Number of Visits	None	Once	Twice	3-4 Visits	5 or More
Frequency	80	17	11	2	3

Note. N = 113 snipers.

Table 14
Number of Days of Work Missed in the Past Month Because of Illness

Days Missed	None	One	Two	Three	Five or More
Frequency	110	3	0	0	0

Note. N = 113 snipers.

Table 15
Number of Times Hospitalized for One or More Days in the Past Month

Days Missed	None	One	Two	Three	Five or More
Frequency	110	3	0	0	0

Note. N = 113 snipers.

Future research. Future studies should continue to monitor the physical health of soldiers, especially those working in higher risk conditions.

3.6 Psychological Distress

Background. The Kessler Psychological Distress Scale is a measure of nonspecific, generalized, psychological stress, which was developed for use as a screening tool in the U.S. National Health Interview Survey (Kessler et al., 2003). Individual items ask respondents to report the extent to which they experienced anxiety and depressive symptoms over the previous month (Kessler, Andrews, Colpe, Hiripi, Mroczek, Normand, Walters, & Zaslavsky, 2002). There are two versions of the scale – a 10-item measure called the K10 and a six-item K6 (whose items are also included in the K10). A Canadian study of the K6 and K10 concluded that both are effective screening instruments (Cairney, Veldhuizen, Wade, Kurdyak & Streiner, 2007), but it is typically the K10 that is used in CAF research (Garabedian & Blanc, 2008).

Several scoring methods have been employed with the Kessler scale, so readers need to pay particular attention to how items and scales are sored when reading reports on K10 and K6 studies. Individual items on the K10 and K6 are measured with a 5-point response scale, but there are differences in how the 5-point response categories have been scored in published studies. For example, some researchers have scored the items so that lower values reflect higher levels of distress (i.e., 1 means 'all of the time' and 5 means 'none of the time'). Other researchers have done the opposite so that higher scores reflect higher distress, and some have used a response scale of 0 to 4 instead of 1 to 5. The present study employed the 5-point scale described by Andrews and Slade (2001) in which 1=none of the time, 2=a little of the time, 3=some of the time, 4=most of the time, 5=all of the time. Thus, in this study of sniper well-being, K10 scores range from 10 to 50, and higher scores reflect greater levels of psychological distress.

There is also some confusion on how the total K10 scores should be interpreted. For example, attempts have been made to categorize people by their stress levels. To this end, some reports have suggested that K10 scores predict later development of a mental health disorder, with scores of 10-15 indicating low risk for developing a disorder, scores of 16-29 indicating moderate risk of developing a disorder and scores of 30-50 indicating high risk (Government of South Australia, 2002; Australian Bureau of Statistics, 2001). Recent K10 publications make no mention of predicting subsequent disorders, but simply refer to total K10 scores as reflecting low, moderate, high and very high levels of current psychological distress (Koster, Taylor, Atkinson, Gill, Winefield & Chittleborough, 2009). This is the approach followed in the present study.

Findings. Table 16 enables us to compare the K10 scores of three samples of Canadian soldiers: the respondents of the Sniper 2010 Survey, the snipers from the initial 2008 sniper well-being study (Bradley, 2010), and a group of Canadian combat soldiers who had completed the K10 in 2008-09 as part of the HDO survey they filled out on returning from Afghanistan. Table 16 depicts the distribution of K10 scores for each sample, while also showing the number of respondents from each sample who would be classified, according to the scoring scheme of Koster et al. (2009), as showing low, moderate, high and very high distress. Andrews and Slade (2001) have suggested that scores of 22 or higher (i.e., Koster et al.'s high and very high groups) indicate respondents with

psychological distress. The data in Table 16 show that 5% of the Sniper 2010 Survey respondents, 16% of the initial 2008 sniper sample and 23% of the HDO sample have either high or very high scores according to Koster et al. thus displaying psychological distress according to Andrews and Slade. With only 19 subjects in total, the 2008 sniper sample is quite small in comparison to the other two groups, so we must be cautious when interpreting the data from that sample. All three samples have larger numbers of respondents with scores at the lower end of the psychological distress scale, and the two sniper samples have significantly fewer individuals in the higher distress categories.

Table 16
Prevalence of Sniper Psychological Distress Measured by the K10

K10 Score	Survey 2010	2008 Study (Bradley, 2010)	CAF HDO Sample
Low Score 10-15	84 snipers (74%)	13 (68%)	484 (56%)
Moderate Score 16-21	23 (20%)	3 (16%)	184 (21%)
High Score 22-29	5 (4%)	1 (5%)	139 (16%)
Very high Score 30-50	1 (1%)	2 (11%)	65 (7%)
	N = 113	N = 19	N = 872

Note. The CAF HDO sample consists of 872 soldiers (primarily junior non-commissioned members from combat arms occupations), who served in the Kandahar region of Afghanistan between 2008 and 2010, and completed the K10 as part of the HDO survey administered to them on their return to Canada (Ivey, 2012).

A subset of six K10 items, called the K6, was included in the CAF's Health and Lifestyle Information Survey (HLIS) of CAF personnel in 2004 and again in 2008/09, providing an opportunity to extend our comparison of sniper distress levels with those of other CAF personnel. The K6 consists of 6 items scored on a 5-point response scale (0-4) so that total K6 scores range from 0 to 24. Using the scoring procedure reported by Kessler et al. (2003), HLIS researchers employed a cut-off score of 13 to represent "a probable case of serious mental illness … likely needing further evaluation (Born, Bogaert, Payne, & Wiens, no date, 30)." K6 scores were calculated for the Sniper 2010 Survey using the same scoring procedures, so their distress levels could be compared with the distress levels of HLIS male respondents (as there are no females in the sniper sample). Table 17 provides a comparison of sniper respondents scoring at or above the cut-off of 13 with the male HLIS respondents who scored at the same level. We can see that the levels of psychological distress in all three samples are low, but they are particularly low in the 2010 sniper survey sample, where only one respondent scored at or above the cut-off of 13.

Table 17
K6 Psychological Distress Levels in the Sniper 2010 Survey and HLIS Surveys

Survey	K6 ≥13
Sniper Well-Being Survey 2010 Sample	0.9%
HLIS 2004 (Males only)	2.1%
HLIS 2008/09 (Males only)	2.3%

Note. Sniper sample = 113; HLIS 2004 male sample = 1760; HLIS 2008/09 male sample = 1,868.

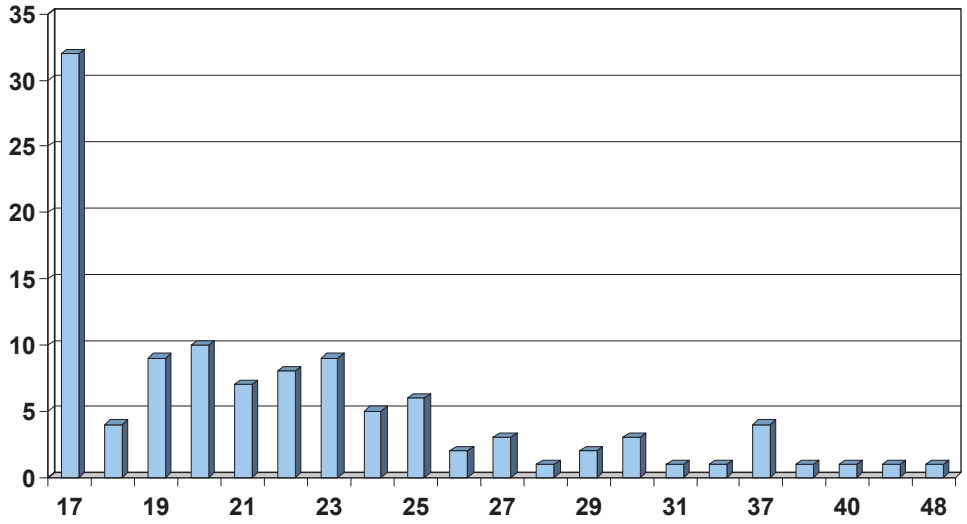
Future research. There are a number of CAF studies which have employed the K10 and K6. The results of these studies should be consolidated and summarized in a single report to permit a better understanding of the prevalence of psychological distress across the CAF and the utility of the K10 and K6 in assessing this distress.

3.7 Posttraumatic Stress

Background. Given the substantial body of research showing that exposure to combat can lead to posttraumatic stress (Litz & Schlenger, 2009), Section 4 of the Sniper 2010 Survey included the 17-item Posttraumatic Symptom Checklist (PCL), plus two items (Items 18 and 19) asking where the trauma occurred and how it impacted on the respondent's personal life. The PCL items measure symptoms experienced in the previous month on a 5-point scale (e.g., 1=not at all, 2=a little bit, 3=moderately, 4=quite a bit, 5=extremely). The PCL is psychometrically robust according to a review of its measurement properties by Keen, Kutter, Niles, and Krinsley (2008). There are two versions of the PCL – one military (Weathers, Huska, & Keane, 1991), the other civilian (Weathers, Litz, Herman, Huska, & Keane, 1993). The civilian scale (PCL-C) was used in this study for two reasons. First, it is broader in scope than the military version and therefore better able to tap into PTSD symptoms beyond those only related to military experiences. Second, it has been used previously in CAF research (Zamorski, 2008).

Findings. PCL-C total scale scores can range from 17 to 85 and Figure 3 shows that most of the sniper sample was at the lower end of this scale. Overall, scores ranged from 17 to 48, with 90% of the sample scoring below 30.

Figure 3
Sniper 2010 Survey Posttraumatic Stress Disorder Checklist Scores



Note. Eighty snipers (70% of the survey sample) reported having a traumatic experience during their military career.

Guidelines for interpreting PCL scores vary depending on sample and treatment setting. For example, Weathers et al. (1993) recommended a cut-off of 50 based on their research with high-risk, treatment-seeking, Vietnam veterans, whereas Lang, Laffaye, Satz, Dresselhaus, and Stein (2003) recommended a lower cut-off between 28 and 30 for their sample of female veterans in a primary care setting. Because fewer people in primary care settings are seeking mental health treatment, a lower cut-off would identify individuals needing treatment who might otherwise be missed. Bliese, Wright, Adler, Cabrera, Castro and Hoge (2008) examined the efficiency of different cut-off scores in a sample of U.S. soldiers returning from combat and found that cut-off values between 30 and 34 yielded high levels of test sensitivity and specificity. (Sensitivity refers to the test's ability to correctly identify those who have the condition and specificity relates to the extent to which the test correctly identifies those who do not have the condition.) For their sample of returning combat veterans, Bliese et al. (2008) found that cut-offs of 30-34 resulted in correctly identifying 70% of those diagnosed with PTSD by a clinician (sensitivity) and correctly identifying 90% of those who were diagnosed by a clinician as not having PTSD (specificity).

Applying these cut-offs to the PCL-C scores of the Sniper 2010 Survey sample in Figure 3, we can see that none of the sample scored at or above 50, the cut-off recommended by Weathers et al. (1993). This compares favourably with the report by Zamorski (2008), who reported that 4% of 8179 CAF personnel (330 individuals) returning from Afghanistan had scored 50 or higher on the same PTSD measure. But using the Bliese et al. (2008) cut-off, 12% of the sniper survey sample (13 of 111 respondents) scored over 30, thus falling within the range that they identified as screening positive for PTSD. It is

noteworthy that nine of the 13 respondents who scored over 30 were combat veterans. In total, 109 sniper respondents were combat veterans and 100 had a PCL-C score of 30 or below.

What is not known, of course, is how accurate these PCL-C scores are. In some cases where the PCL is used as a screening device and soldiers know they will be sent to a mental health worker if they score high, they may under-report their symptoms because of the potential stigma associated with mental health issues. Accordingly, respondents of the Sniper 2010 Survey were not asked to identify themselves in the hope that their scores on scales like the PCL-C would more accurately reflect their actual symptoms. Overall, the PCL-C scores of the sniper sample appear low, but when viewed through the lens of the Bliese et al. (2008) criterion, it seems that almost 10% of those snipers who were combat veterans would benefit from further screening for PTSD. This finding is consistent with a recent study of 30,000 CAF veterans of the war in Afghanistan showing that 8% met the diagnostic criteria of PTSD (Boulos & Zamorski, 2013).

Future research. With almost 10% of the sniper sample meeting the Bliese et al. (2008) criterion for further screening and research evidence that PTSD can take some time to materialize (Gray, Bolton & Litz, 2004), PTSD might become an even bigger threat to the mental health of CAF members in coming years. Therefore, it is recommended that combat veterans be encouraged to complete mental health screening measures like the PCL throughout their lives and partake of treatment as warranted.

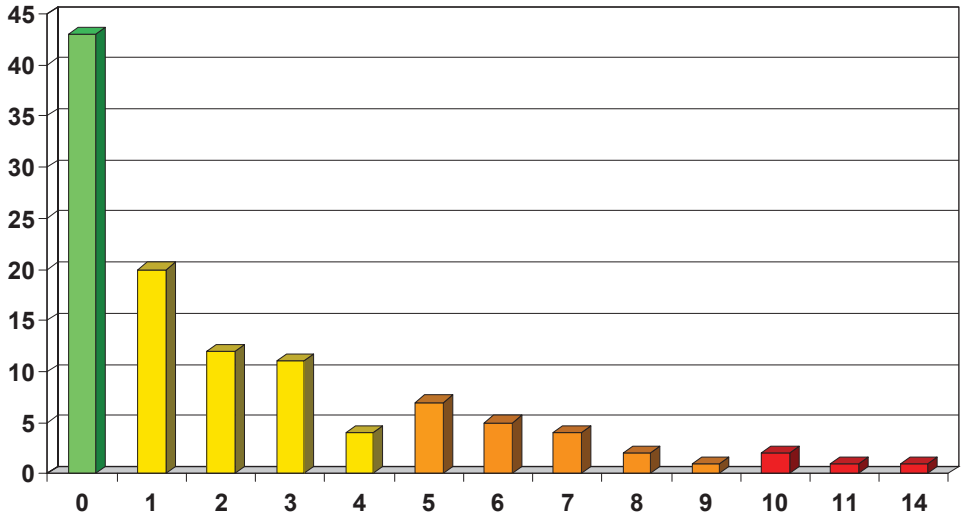
3.8 Depression

Background. Depression is the most common mental health problem (Tolman, 2005) in the general population and it is a common affliction among combat veterans (Milliken, Auchterlonie, & Hoge, 2007). Depression can also coexist with PTSD (Oquendo, Friend, Halberstam, Brodsky, Burke, Grunebaum, Malone, & Mann, 2003).

Section 5 of the Sniper 2010 Survey included the Patient Health Questionnaire-9 (PHQ-9), a 9-item measure of depression (Kroenke, Spitzer & Williams, 2001) that has been used in post-deployment screening of CAF personnel (Zamorski, 2008). The nine items of the PHQ-9 measure the nine depression criteria listed in DSM-IV. Each item asks how often the respondent has been bothered by a depression symptom over the past four weeks. Responses are scored on a 4-point scale, where 0=not at all, 1=few or several days, 2=more than half the days, and 3=nearly every day, so total scale scores can range from 0 to 27. A two-part item was added to ask respondents on a 4-point scale if the problems assessed in the PHQ-9 made it difficult for them to do their work or get along with others. For interpreting PHQ-9 scores, Kroenke et al. (2001) contend that scores of 1-4 reflect minimal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression and scores of 20 or more reflect severe depression. Scores of 15 or more are taken as a sign of major depression (Kroenke et al., 2001; Pietrzak et al., 2009).

Findings. The PHQ-9 scores of the sniper sample shown in Figure 4 range from 0 to 14, with most of the sample (96%) scoring below 10. None of the scores in Figure 4 are high enough to indicate major depression. Instead, 47 respondents (42% of the sample) fall in the minimal depression category, 19 respondents (17%) in the mild depression category, and 4 respondents (4%) in the moderate depression category.

Figure 4
Sniper 2010 Survey Patient Health Questionnaire-9 Scores



The most recent HLIS 2008/2009 contains estimates of depression which can be compared to depression data collected in the Sniper Well-Being 2010 Survey. The HLIS survey measured depression with the first two items of the PHQ-9: "How often have you been bothered by (1) little interest or pleasure in doing things, and (2) feeling down, depressed, or hopeless." Described in the scientific literature as the PHQ-2, scores can range from 0 to 6, and the cut-off for major depressive disorder on this measure is 3 or greater. As shown in Table 18, 3.7% of the 113 snipers of the 2010 survey sample (i.e., 4 snipers) scored 3 or higher on the PHQ-2 compared to 7.7% of the 1,673 non-commissioned members who had completed the same two-item measure in the *HLIS 2008/2009*. Unfortunately, we know very little about the non-commissioned members who completed the HLIS, other than the fact that they include both male and female CAF service personnel between the rank of private and chief warrant officer. One of the reasons that the PHQ-2 scores for snipers might be lower than those of HLIS respondents is because the HLIS sample included women, and women tend to score higher than men on measures of depression, whereas the sniper sample was exclusively male. The results in this section still show that four of the sniper respondents might benefit from further mental health screening.

Table 18
Comparable Estimates of Major Depressive Disorder Prevalence in the Sniper 2010 Sample and HLIS 2008/09 Sample

Sample	Proportion
Sniper Well-Being Survey 2010 Sample	3.7%
HLIS 2008/09 Sample (non-commissioned members)	7.7%

Note. Sniper sample = 113; HLIS non-commissioned member sample = 1,673.

Future research. Future research should continue to monitor the depression levels of CAF personnel while paying particular attention to comorbidity with other mental health illnesses.

3.9 Occupational Impairment

Background. Of primary interest in studies like this is the effect that mental health issues have on the job performance of research subjects. To this end, Section 5 the 2010 Survey included the three-item measure of occupational impairment employed by Blanc, Zamorski, Ivey and Garber (2011). Measured on a 2-point yes/no response scale, the items ask:

During the past 4 weeks, have stress or emotional problems …

… limited your ability to do your job?
… caused you to work less carefully than usual?
… caused your supervisor to be concerned about your performance?

According to Blanc et al. (2011), answering yes to any of these questions places the respondent into the "occupationally impaired" category and answering no to all of the questions classifies the respondent as "not occupationally impaired."

Findings. Displayed in Table 19, the answers to these questions suggest that only 7 respondents felt that their work had been impacted by stress or emotional issues. The responses from Table 19 were combined to form a measure of occupational impairment and subsequent correlational analyses reported in Table 20 below show that respondents who scored higher on occupational impairment also had slightly higher scores on many of the mental health indicators collected in this study.

Table 19
Occupational Impairment

During the past 4 weeks, have stress or emotional problems …	Yes	No
… limited your ability to do your job?	0	111
… caused you to work less carefully than usual?	6	105
… caused your supervisor to be concerned about your performance?	1	110

N = 111; 3 subjects did not respond.

Table 20
Correlation Matrix of Occupational Impairment and Indicators of Well-Being

	1	2	3	4	5	6	7	8	9	10
1. Occupational Impairment	__	.04	.31*	.36	.59*	.50*	.55*	.18	.46*	.30*
2. Family Stress		__	.13	.19	.18	.29*	.23*	.19*	.24*	-.03
3. NTSQ			__	.40*	.30*	.39*	.43*	.21*	.35*	.22*
4. Concern with Combat Exposure				__	.51*	.60*	.64*	.11	.41*	.30*
5. Psychological Distress					__	.71*	.80*	.32*	.59*	.34*
6. PTSD						__	.83*	.22*	.61*	.26*
7. Depression							__	.26*	.65*	.39*
8. Alcohol Misuse								__	.28*	.24*
9. Anger									__	.25*
10. Perceived Stigma										__

Note. * denotes statistically significant correlation coefficients.

Future research. Because the measure of occupational impairment employed in this study is based on only three items, it is relatively easy to obtain and should therefore be considered by future researchers wishing to study the effects of stress on military life.

3.10 Utilization of Mental Health Resources

Background. Two important aspects of military mental health are the extent to which personnel make use of the services that are available to them and how helpful they find these resources. The 10 items in Section 6 of the Sniper 2010 Survey were adapted from several studies of military personnel (Schell & Marshall, 2008; Hoge et al., 2004) to

assess the extent to which individuals have experienced any mental health issues, have accessed mental health resources, and their satisfaction with the services they received.

Findings. When asked if they were concerned by issues such as stress, emotional, alcohol, drug, or family problems (Item 1), 86 respondents (75% of the sample) said no, 20 (18%) expressed slight concern, and 3 others expressed more concern. Eleven respondents (10% of the sample) expressed an interest in receiving help with these concerns, and 6 reported that they were already receiving treatment for a stress, emotional, alcohol or family problem. As for accessing mental health services, the data in Table 21 show that, in the previous year, a small proportion of the sample had visited mental health professionals, within or outside the CAF, or had sought nonprofessional assistance from friends and coworkers. Of the 32 individuals who had seen a mental health professional, 19 (60%) were satisfied with the assistance they received (Table 22).

Table 21
Rates of Accessing Mental Health Resources in the Past Year

	One Visit	Two Visits	Three or More
Mental health professional	6 (5%)	4 (4%)	6 (5%)
General medical doctor	4 (4%)	2 (2%)	2 (2%)
Military chaplain	9 (8%)		
Unit medic	1 (1%)	1 (1%)	1 (1%)
Friend in the unit	7 (6%)	2 (2%)	3 (3%)
Boss	6 (5%)		
Other unit member	3 (3%)		
Mental health worker outside the CF	4 (4%)	4 (4%)	3 (3%)

Table 22
Satisfaction with Assistance Received

Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
7 (22%)	6 (19%)	5 (16%)	14 (44%)

Note. Thirty two individuals had seen a mental health professional.

Future research. Future CAF research should continue to monitor attitudes towards mental health resources and the extent to which these resources are used and appreciated by CAF personnel.

3.11 Alcohol Misuse

Background. Historically, alcohol use (and misuse) has been a significant part of military life. In earlier times, soldiers were given alcohol to fortify themselves in battle, and

officers have been known to reward their soldiers with alcohol for a job well done. Over the ages, soldiers have imbibed to help with sleep or to deal with the stress and boredom of military life (Holmes, 1985). There is a substantial body of empirical research showing that alcohol misuse is widespread in today's military as well. Hoge et al. (2004) found that about 25% of the U.S. military veterans of the wars in Iraq and Afghanistan admitted to drinking more than they meant to and a slightly smaller number felt they should reduce their drinking. Higher numbers of Marines admitted to excessive drinking and wanting to cut back. Studies of U.S. marines (Schuckit, Kraft, Hurtado, Tschinkel, Minagawa & Shaffer, 2001) and U.S. army rangers (Sridhar, Deuster, Becker, Coll, O'Brien, & Bathalon, 2003) suggest that specialized military groups may be particularly vulnerable to alcohol misuse. Given that snipers are specialized soldiers, it was decided to examine their drinking habits in this study.

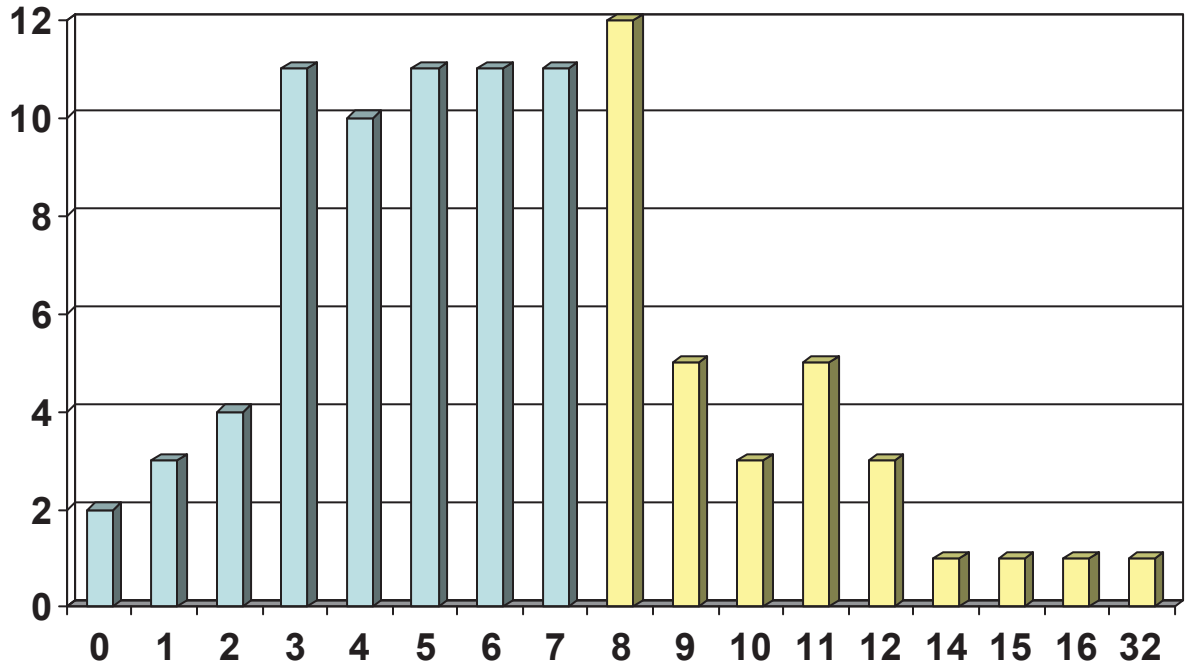
Alcohol use was assessed in the Sniper 2010 Survey with the 10-item Alcohol Use Disorders Identification Test, also known as the AUDIT (Babor, Higgins-Biddle, Saunders & Monteiro, 2001). Created under the auspices of the World Health Organization, the AUDIT was originally developed to screen primary care patients for alcohol-related problems. The AUDIT purports to assess three dimensions of alcohol use: consumption (Items 1-3), dependence (Items 4-6) and harm experienced (Items 7-10). Individual items are scored on a 5-point response scale (0-4) so that total scores on the 10-item AUDIT can range from 0 to 40.

Research has shown that the AUDIT is as psychometrically sound as other tests in its field (Reinert & Allen, 2002; Reinert & Allen, 2007). Its test-retest reliability is respectable, with correlations between test and retest scores ranging from .75 to .97. As for its construct validity, the AUDIT's three dimensions (consumption, dependence and harm experienced) have been confirmed in factor-analytic studies, but these studies also suggest that the AUDIT is better characterized as measuring two factors – alcohol consumption (Items 1-3) and the consequences of drinking (Items 4-10) (Reinert & Allen, 2007).

As mentioned in the earlier sections of this report covering PTSD and depression, one of the major issues with screening tests (like the AUDIT) is identifying the cut-score that best classifies test-takers as meeting the diagnostic criteria for the condition being assessed. Cut-scores are determined by viewing the percentage of test-takers who are correctly diagnosed by a clinician with the condition (called test sensitivity) and those correctly diagnosed as not having the condition (called test specificity). Optimal cut-scores on the AUDIT can vary from sample to sample because they are determined empirically by comparing sensitivity and specificity rates for different alcohol-related conditions (hazardous drinking, harmful drinking, alcohol dependence, etc.) across different groups of test-takers (i.e., men, women, adolescents, seniors, different ethnic groups, etc.). Researchers suggest different AUDIT cut-scores for men and women. For females, a cut-score of 5 yields the highest levels of sensitivity and specificity for at-risk drinking. The results for men are more equivocal however, with "recommended cut-points for identifying hazardous drinking in men [ranging] from 5 to 7" (Reinert & Allen,

2007, 190). Many researchers take the position that a total score of 8 or higher indicates hazardous or harmful alcohol use for men.

Figure 5
Sniper 2010 Survey Scores on the Alcohol Use Disorders Test



Findings. As shown in Figure 5, the total AUDIT scores for the sniper sample ranged from 0 to 32, with 34% of the sample scoring 8 or higher, which is considered an indicator of hazardous levels of drinking. Reinert and Allen (2002) have described hazardous drinking as putting oneself "at risk for alcohol-related physical and psychological damage" (272).

With 34% of the sniper sample's AUDIT scores meeting the definition of hazardous drinking, these data warrant additional scrutiny. However, before analysing the AUDIT data further, two points of caution must be emphasized, one relating to the accuracy of self-report measures of alcohol use and the other pertaining to the comparability of different studies.

Confidence in the findings of this research into the drinking patterns of army snipers hinges on the quality of responses they gave to the AUDIT questions. Like many other studies in this field, the present study employed self-reports of alcohol consumption, and there is always the possibility that participants will respond inaccurately when self-reporting, either intentionally or subconsciously. The developers of the AUDIT maintain that their test provides for accurate responding (Babor et al., 2001), but there is no way to know for sure how accurate the snipers were in their responses to AUDIT questions.

When the author returned to sniper units to brief on the results of this study, he was told on several occasions by research participants that they typically lie (and under-report) when asked by medical staff how much alcohol they consume. When asked by the researcher if they lied while completing the AUDIT, they responded that they could not recall. One might expect the snipers' responses on the AUDIT to be relatively accurate as they were not asked to identify themselves on the survey and they were assured that their responses would be held in confidence and not shared with military authorities. The perception of many who work in the field of alcohol research and treatment is that individuals under-report their drinking levels (Stockwell, Donath, Cooper-Stanbury, Chikritzhs, Catalon & Mateo, 2004), but given the relatively high levels of consumption observed in this study, we might conclude with confidence that the snipers did not under-report in this research. If they did under-report, their actual drinking levels would be quite problematic indeed.

While sniper scores on the AUDIT convey a certain degree of valuable information, it would be helpful to know how Sniper 2010 Survey AUDIT scores compare with AUDIT scores of other Canadian soldiers. Fortunately, some comparisons can be made because the AUDIT has been included in the CAF's HLIS in recent years. In 2004 and 2008/2009, 14% and 21% of the male HLIS respondents scored at 8 or higher respectively (Payne, 2010). At 34%, the rate of hazardous drinking by respondents in the Sniper 2010 Survey is more than twice the rate reported by males in the 2004 HLIS survey and more than 50% higher than the 2008/09 HLIS survey, a dramatic difference indeed. However, as mentioned earlier in Section 2.6 of this report, comparing data from one study to another is problematic because the results of individual studies can be influenced by subtle (and often unknown) differences in the ways the studies were conducted as well as the type of people sampled in the studies. For example, some of the differences in alcohol use noted between the HLIS and sniper studies might be the result of sampling methods employed in each study. The HLIS respondents were randomly selected from all services of the Canadian Forces and therefore reflect a representative sample of CAF personnel, whereas the sniper respondents were a 'sample of convenience,' consisting of snipers from regular force infantry battalions who were available and willing to complete the AUDIT when the survey was administered at their garrison. Snipers who were away from their garrison at that time because of training, illness, or other reasons, did not complete the AUDIT. Therefore, it is possible that some unknown component of the AUDIT scores is due to the way that participants were selected for this study. It is also possible that some of the differences in AUDIT scores between the studies might be due to the manner in which the soldiers completed the questionnaire. Although it was completed in paper-and-pencil format in both studies, respondents completed the Sniper 2010 Survey in a classroom with their unit mates under the guidance of the author, while HLIS respondents completed it on their own at a place of their own choosing (i.e., home, work, or elsewhere). Both groups responded to the same AUDIT questions, so some comparison can be undertaken, but, as mentioned above, with caution. To enhance the comparability of the two samples for this report, only HLIS data from army male non-commissioned respondents were considered because all the snipers in the present study are male and non-commissioned members. While this increases the potential comparability of the two studies, other sample differences remain

(e.g., combat experience, rank, education, and age) which could lead to different outcomes for the two studies. For example, research evidence shows that younger males drink more than older males (Jacobson, Ryan, Ryan, Hooper, et al., 2008).

Unfortunately, there is insufficient range of age in the sniper sample to examine the relationship between sniper age and alcohol consumption with confidence. The mean AUDIT scores of the sniper sample are summarized by age group in Table 23 showing snipers between 32 and 36 years of age with the highest AUDIT scores. However, statistical analyses on these data (correlations, ANOVA) were unable to detect an association between age and alcohol consumption, perhaps because of the small numbers of snipers in the various age groups (in particular the 17-21 and 37+ groups) as well as the uneven dispersion of scores of the groups (as reflected in the SD).

Table 23
Mean AUDIT Scores by Age

Age	n	Mean	SD
17-21	3	4.33	1.16
22-26	38	6.55	4.49
27-31	36	6.28	3.45
32-36	23	8.04	5.97
37+	7	4.43	2.15

In addition to the cut-score of 8, hazardous drinking is defined in the AUDIT manual as having three or more alcoholic drinks on a typical day when drinking (i.e., a score of 1 or higher on Question 2 of the AUDIT – How many drinks containing alcohol do you have on a typical day when you are drinking?), or having six or more drinks on one occasion (i.e., a score of 1 or higher on Question 3 – How often do you have six or more drinks on one occasion?). On these two questions, 72% of the sniper sample reported consuming 3 or more drinks on a typical day of drinking and 93% (104 snipers) said they consumed six or more drinks on one occasion.[2] This level of binge drinking by snipers (93%), is notably higher than the 84% of army male non-commissioned respondents of the HLIS 2008/09 study who self-reported binge drinking (E. Payne, personal communication, June 19, 2012).[3] Taken together, the AUDIT total scores and scores on AUDIT Questions 2 and 3 suggest that snipers may engage in more hazardous drinking than other Canadian Army male non-commissioned members do.

[2] Binge drinking is normally defined as consuming five drinks on one occasion, but the AUDIT binge item measures six drinks.

[3] Special thanks go to Elspeth Payne of the Canadian Forces Health Services Group Headquarters and author of the original HLIS 2008/09 AUDIT research for conducting additional analyses which make comparison with the present sniper sample possible.

The snipers in this study may also consume more alcohol than their U.S. counterparts. Because the first three items of the AUDIT measure how much and how often respondents drink, these items can be summed to provide an index of alcohol consumption. Table 24 depicts sniper consumption levels alongside those of a sample of U.S. male veterans of Operation Enduring Freedom (Afghanistan) and Operation Iraqi Freedom who completed the AUDIT in a study by Hawkins, Lapham, Kivlahan and Bradley (2010). In the category of severe misuse, defined by the U.S. authors as an AUDIT score of 8-12, Table 24 shows that Canadian sniper scores are slightly higher (14%) than those of the U.S. servicemen (12.1%). There is a larger difference however between the samples in the mild/ moderate level of misuse, with 42% of the Canadian sniper sample in this category compared to 12.8 % of the American sample. While the cautions mentioned earlier about comparing data across studies also apply here, the data in Table 24 are consistent with earlier suggestions that alcohol consumption levels of the army sniper sample appear to be high.

Table 24
Canadian Army Snipers and U.S. OEF/OIF Veterans AUDIT Consumption Scores

	Sniper 2010 Sample (*n*=110)		OEF/OIF (*n*=610)	
	n	(%)	*n*	(%)
Non-drinkers (0)	2	(2)	169	(27.7)
Negative screen (1-4)	46	(42)	289	(47.4)
Mild/moderate misuse (5-7)	47	(42)	78	(12.8)
Severe misuse (8-12)	15	(14)	74	(12.1)

Note. Consumption score = sum of AUDIT Items 1-3; OEF = Operation enduring Freedom (Afghanistan); OIF = Operation Iraqi Freedom. OEF/OIF data are taken from a study by Hawkins et al. (2010).

Alcohol dependence is an important aspect of alcohol misuse to be considered and according to the AUDIT manual, a score of 1 or higher on the sum of Questions 4-6 "imply the presence or incipience [beginning] of alcohol dependence" (Babor et al., 2001, 19). Table 25 shows that 4% of the sniper sample and 18% of Canadian Army male non-commissioned respondents of the HLIS 2008/09 scored in the dependent range (E. Payne, personal communication, June 19, 2012). While the sniper percentage for dependence is substantially smaller than the HLIS percentage, we must remember the previously-mentioned cautions about comparing Sniper 2010 Survey data with HLIS results. Among other factors, some of which have been mentioned above, the size of the sniper sample is too small to draw conclusions on alcohol dependence with confidence.

Another important outcome associated with alcohol misuse is the extent to which individuals have already experienced harm from their drinking. A score of 1 or higher on the sum of Questions 7-10 indicates harmful drinking and the data in Table 25 shows 9% of the sample fell into in this category as well as 24% of the HLIS 2008/09 Army Male Noncommissioned Respondents (earlier cautions on comparing these results still apply) (E. Payne, personal communication, June 19, 2012).

Table 25
Comparison of Canadian Army Snipers and HLIS 2008/09 Army Male Noncommissioned Respondents on Alcohol Dependence and Harmful Drinking Indices

		Dependence		Harmful Drinking	
	n	*n*	(%)	*n*	(%)
Sniper 2010 Survey	114	5	(4)	10	(9)
HLIS 2008/09	16028[1]	2941	(18)		
HLIS 2008/09	15769[1]			3833	(24)

[1] Ideally, the HLIS sample size (*n*) on the second and third row of this table would be identical, but missing data on some AUDIT questions accounts for the difference in the two numbers. Dependence = a score of 1 or higher on the summation of AUDIT Items 4-6; Harmful drinking = a score of 1 or higher on the summation of AUDIT Items 7-10.

Some studies have found a link between alcohol misuse and combat exposure (Hoge, et al., 2004; Jacobson et al., 2008), but the present study did not. There were moderate size correlations between Alcohol misuse (as measured by the AUDIT) and the mental health measures (see Table 6) of psychological distress (.32), PTSD (.22), depression (.26), and anger (.28) as would be expected given the number of studies demonstrating the comorbidity of alcohol abuse and mental health symptoms, but AUDIT scores did not correlate with combat exposure as anticipated. When scores on the combat exposure scale were split (at the median) to separate the sample into two groups, respondents with lower levels combat exposure and those with higher levels (see Table 26), it seemed that the snipers with more combat exposure also had lower AUDIT scores. However, when tests of significance were conducted on all the mental health data in Table 26, none of the mean differences between the lower and higher combat exposure groups of respondents were statistically significant, meaning that the differences suggested in this table between these two groups are not meaningful.

Table 26
Self-Reports of Mental Health Symptoms in Respondents with Low and High Combat Exposure

	Low Combat Exposure			High Combat Exposure		
	M	SD	N	M	SD	N
Psychological distress	13.9	5.5	43	14.3	3.9	41
Depression	2.0	3.2	43	2.6	2.9	41
PTSD	21.4	6.2	43	24.0	7.4	40
Anger	2.9	3.4	43	4.1	3.3	41
Stigma	27.9	10.0	42	25.9	9.5	41
Alcohol misuse	6.8	3.9	42	6.1	2.9	40

Note. M=mean; SD=standard deviation; N=number of respondents.

Snipers scored higher than the HLIS army non-commissioned males on overall AUDIT scores and AUDIT measures of consumption, suggesting that snipers drink more than other soldiers. However, there was a smaller percentage of snipers than HLIS respondents in the dependent and harmful drinking categories. This may indicate that the snipers are able to manage their drinking habits better, or perhaps these data are inaccurate or unreliable because of the small sample size in the sniper study. There is no way of knowing for sure, but the small size of the sniper sample precludes us from placing much confidence in the results on dependence and harm experienced. It seems apparent however that the snipers in this study drink more than their army counterparts, assuming that everyone responded honestly to the AUDIT questions.

Future research. The results of this study suggest that the sniper respondents are consuming alcohol at hazardous and perhaps harmful rates. It is also possible that the sniper respondents under-reported their drinking patterns, so the situation may be worse than suggested here. These conclusions are tentative at best and need to be verified with further research. It is recommended that research into the drinking patterns of army snipers be extended and expanded. In addition to the AUDIT questions on consumption, dependence, and harm, a larger sample of snipers should be asked when they drink (time of day, type of occasions, frequency, duration), where they drink (location, setting), who they drink with (alone, in groups, related activities), and why they drink (e.g., to be sociable, to fit in, to cope with stress and boredom).

3.12 Anger

Background. Anger is an emotion that is commonly experienced by individuals who have been subjected to trauma and it is also "strongly associated with combat-related

PTSD" (Novaco, Swanson, Gonzalez, Gahm, & Reger, 2012, p.1; see also Biddle, Creamer, Forbes, Elliott, & Devilly, 2002). The Dimensions of Anger Scale (DAR) is a 7-item scale (Forbes, Hawthorne, Elliott, et al., 2004), which was shown to be a reliable and sensitive measure of anger in a series of studies conducted among Australian Vietnam veterans with combat-related PTSD (Hawthorne, Mouthaan, Forbes, & Novaco, 2006). The DAR measures four dimensions of anger – frequency, duration, intensity, and expression. Originally, DAR items were measured on a 9-point response scale (0-8), but research by Hawthorne et al. (2006) revealed that the scale's 9-point response categories induced response bias, so they recommended a 5-item version of the scale (DAR 5) in which items were assessed on a 5-point response scale from 0 (not at all) to 4 (very much). The DAR 5 items were included in the *Sniper Well-Being Survey 2010* along with the other two items from the original DAR and all seven items were measured with the DAR 5's 5-point response scale (0-4).

There were few published studies of anger research on military samples at the time of this research and no agreement among these studies on which anger scales should be accepted by the military research community; consequently, no comparable studies of military personnel were available when this report was written. However, it appears from the correlation matrix of this study's major measures in Table 6 that anger is moderately related to concern with combat exposure (.30), psychological distress (.34), PTSD (.26), depression (.39), alcohol misuse (.24), and social stigma (.25). The relations between anger and PTSD in this study are consistent with the findings of Novaco et al. (2012) and Biddle et al. (2002) mentioned above.

Findings. Data from individual DAR items and the two DAR scales are provided in Tables 27 and 28 to enable future researchers to expand our knowledge on this important topic. The spread of scores in both tables suggests that the sniper participants in this research were experiencing relatively low levels of anger, but without a comparable research sample, this statement is mere conjecture.

Future research. Further research on anger in combat veterans is highly recommended because we know from this and previous research that anger is related to PTSD (Novaco et al., 2012; Biddle et al., 2002). Because anger may mediate or moderate the relations between combat exposure and other mental health outcomes, the relations between anger and combat exposure need to be explored.

Table 27
Anger Item Minimum Scores, Maximum Scores, Mean Scores and Standard Deviations

	Item	Min	Max	M	SD
1	I often find myself getting angry at people or situations.	0	4	1.07	.90
2	When I do get angry, I get really mad.	0	4	.95	.99
3	When I get angry, I stay angry.	0	2	.39	.57
4	When I get angry at someone, I want to hit or clobber the person.	0	4	.56	.80
5	My anger interferes with my ability to get my work done.*	0	2	.09	.34
6	My anger prevents me from getting along with people as well as I would like to.	0	2	.19	.43
7	My anger has a bad effect on my health.*	0	4	.25	.69

Note. Items were measured on a 5-point scale (0-4). Items 5 and 7 are part of the original DAR scale but not the DAR 5.

Table 28
DAR and DAR 5 Scale Data

Scale	Items	Alpha	Min	Max	M	SD
DAR	7	.79	0	17	3.49	3.3
DAR 5	5	.76	0	12	3.15	2.76

Note. Items were measured on a 5-point scale (0-4) and summed to create scale scores.

3.13 Encounters with the Law

Background. In recent years there has been evidence of disproportionate levels of antisocial behaviour, misconduct and incarceration of military veterans in Britain (Treadwell, 2010) and the United States (Booth-Kewley, Highfill-McRoy, Larson, & Garland, 2010), but this issue has received little attention in Canada except for a few media reports (Bruser, 2009). Together, these works indicate that some soldiers suffering from combat-related trauma run afoul of the law (civilian and military), suggesting that encounters with the justice system may be an important correlate of post-combat trauma needing more attention.

Section 9 of the Sniper 2010 Survey contained six items which ask survey respondents if they had been investigated, charged, or convicted by the military or civilian justice systems in the previous year. Each item was measured with a 2-point response scale (Yes, No).

Findings. The data in Table 29 reveal that only a few of the survey respondents admitted to being investigated, charged, or convicted by military or civilian justice systems in the previous year. Given the very small number of respondents who reported encounters with the law, no further analyses were conducted with these data.

Table 29
Encounters with the Law

In the past 12 months, have you been …	Yes	No
Military Justice System		
… investigated by authorities?	1	104
… charged, but not convicted?	1	111
… convicted?	4	109
Civilian Justice System		
… investigated by authorities?	4	109
… charged, but not convicted?	3	110
… convicted?	0	113

Future research. This topic is of some concern in the U.K. and the U.S., but not in Canada, perhaps because the CAF is smaller. Given that trauma-related mental health illness takes some time to materialize, it is recommended this issue be monitored.

3.14 Barriers to Care

Background. Ideally soldiers should be able to access mental health services when they need them, but in reality there are many barriers, real and perceived, which can keep soldiers from making use of these valuable resources. Barriers to care are relevant to the current study of sniper well-being for several reasons. First, studies suggest that stigma and other barriers affect the stressor-strain relationship (Hoge, et al., 2004; Pietrzak, et al., 2009). Individuals who perceive stigma and other barriers to care also display more symptoms of strain, whereas those who perceive fewer barriers display fewer stress symptoms. At this point it is not clear whether encountering the barriers adds to the strain individuals experience or that simply experiencing the strain heightens their awareness of the barriers, but the consequence is that those who most need help often don't receive it because of perceived barriers.

Stigma is the best known barrier to mental health care. It is thought that many people hesitate to seek mental health care because of the prejudice and discrimination they anticipate from peers and superiors. In the military, social stigma is widely recognized as a barrier to mental health care (Britt, 2000), but there are also other barriers such as logistical difficulties (e.g., treatment is too far away) and negative attitudes about treatment (e.g., family and friends would be more helpful). In fact, one of the

outstanding issues in this field of research is to clarify the structure of such barriers (e.g., are all barriers perceived to be the same or are there different categories of barriers; if there are different categories, do they function in the same way?). Britt, Greene-Shortridge, Brink, Nguyen, Rath, Cox, Hoge, and Castro (2008) examined the factor structure of 11 barrier items in a study of 203 American university students and obtained a two-factor solution they defined as perceived stigma and barriers to care. Then they confirmed the two-factor structure on a larger sample of 3,648 U.S. soldiers. Sudom, Zamorski, and Garber (2012) examined the structure of 19 barrier items in a study of 2,437 Canadian military personnel serving in Afghanistan and settled on a 3-factor model they defined as stigma, structural barriers to care, and negative attitudes towards care.

Drawing on the work of Schell and Marshall (2008), Hoge et al. (2004), and Wong, Marshall, Schell, Elliott, Hambarsoomians, Chun and Berthold (2006), a scale of 30 items measuring barriers to care was developed and included in Section 10 of the Sniper 2010 Survey. From these studies four types of barriers seemed relevant: stigma (e.g., members of my unit might have less confidence in me), structural obstacles (e.g., there would be difficulty getting time off work for treatment), logistical difficulties (e.g., it would be too difficult to get to the location where the treatment specialist is), attitudes about treatment (e.g., even good mental health care is not very effective), but writing items for the structural and logistical scales proved difficult enough that it was decided to combine these items in one scale. Although not a barrier item *per se*, Item 31 was included in the scale to measure respondents' perceptions of the Army's support to those with mental health problems (The Army supports soldiers who have mental health problems). The 31 items were measured on a 5-point response scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

Findings. Table 30 lists the 30 barriers to care items grouped according to the type of barrier (i.e., perceived stigma, structural or logistical barrier, beliefs or preferences about treatment) they were originally thought to measure. Ideally, data reduction analyses would be conducted on these 30 items to seek empirical support for the 3-factor model of barriers to care suggested above (stigma, structural and logistical issues, and attitudes about treatment), but with only 114 survey respondents, the research sample in this study is too small to conduct such analyses with confidence. An alternative indicator of the factor structure of barrier items is the internal consistency of each of the proposed scales. Displayed in Table 30, the Cronbach alphas for each scale are well above .80 indicating that the items in each scale are conceptually coherent, measuring a common construct (Nunnally & Bernstein, 1994).

Table 30
Perceptions of Barriers Reported by Snipers with Concerns and Snipers Without Concerns

Are you concerned by issues such as stress, emotional, alcohol, drug, or family problems?	No (84)	Yes (26)
Stigma Scale Total Score	2.38	2.88*
7. It would be too embarrassing	2.21	2.50
8. It would harm my career	2.58	3.12*
9. Members of my unit might have less confidence in me	2.64	3.19*
10. My unit leadership might treat me differently	2.48	3.08*
11. My leaders would blame me for the problem	1.90	2.50*
12. I would be seen as weak	2.52	2.88
13. It might affect my security clearance	2.27	2.65
20. My unit leaders might respect me less	2.35	2.85*
27. I do not think that my treatment would be kept confidential	2.39	3.04*
28. I am afraid of what others would think	2.48	3.00*
Cronbach's alpha of the 10-item Stigma Scale = .95		
Structural and Logistical Scale Total Score	1.79	1.77
2. Mental health services aren't available	1.67	1.77
3. I don't know where to get help	1.69	1.65
5. There would be difficulty getting time off work for treatment	1.98	2.19
4. It is difficult to get an appointment	2.04	1.96
6. Too difficult to get to the location of the MH specialist	1.80	1.54
14. My leaders discourage the use of mental health services	1.74	1.88
16. I would have to go too far to get treatment	1.75	1.62
17. Mental health care costs too much money	1.87	1.56
24. My friends and family would respect me less	1.81	2.12
25. My spouse or partner would not want me to get treatment	1.77	1.77
29. It would take too much time to be in treatment	2.23	2.76*
Cronbach's alpha of the 11-item Structural and Logistical Scale = .90		
Beliefs and Preferences Scale Total Score	2.28	2.44
1. I don't trust mental health professionals	2.22	2.35
15. I might be given medicine that would interfere with doing my job	2.37	2.85
18. Psychological problems tend to work themselves out without help	2.24	2.27
19. Getting mental health treatment should be a last resort	2.06	2.12
21. My mental health is none of anybody's business	2.30	2.92*
22. I don't have confidence in the CF's mental health system	2.32	2.68
23. Even good mental health care is not very effective	2.14	2.54*
26. I would think less of myself if I could not handle it on my own	2.25	2.46
30. Family and friends would be more helpful than an MH professional	2.70	2.81
Cronbach's alpha of the 9-item Beliefs and Preferences Scale = .88		

For each of the 30 items in Table 30, two scores are provided, the mean score of those who responded yes when asked in Item 1 of Section 6 of the survey if they were concerned by issues such as stress, emotional, alcohol, drug, or family problems and the mean score of those who answered no to this question. These two scores were calculated because earlier studies showed that individuals with psychological problems were more likely to perceive stigma than individuals who did have psychological problems (Hoge, et al., 2004; Pietrzak, et al., 2009). The data in Table 30 indicate that those respondents who had reported some concern also had higher scores on the stigma items (i.e., they perceived more stigma) and these differences were large enough to be statistically significant in the case of 7 stigma items (Items 8, 9, 10, 11, 20, 27 and 30). From these data it is clear that those who are concerned about a mental health matter perceive more stigma than those who don't have any mental health concerns. There is a similar trend for respondents who had reported some concern to also score higher on the items measuring beliefs and preferences about treatment, but these differences were not large and only statistically significant for two items, Items 21 and 23. Respondents with mental health concerns and those without did not differ in their responses to the structural and logistical items, except for Item 29.

Stigma is a complex issue in general and is possibly even more so in the sniper community (e.g., the snipers in Table 26 with higher levels of combat exposure reported lower perceptions of stigma). Many would agree that soldiers should seek out and receive any treatment they might need for mental health problems, and that any barriers which serve to thwart such access are harmful. However, snipers are elite soldiers of whom much is expected, so many individuals, snipers included, might also agree that any sniper who is not functioning at top capacity should be given lighter responsibilities while recovering from his psychological wounds. Snipers gain a great deal of satisfaction from their work (Bradley, 2010), so it possible that many snipers will not come forward with mental health problems, or will wait until the problems become severe, because they value being a sniper and are reluctant to do anything which might jeopardize their standing in this elite community.

Future research. Future research should examine stigma attitudes across a broad range of individual difference categories (e.g., combat experience, rank, age, education, gender, etc.) and seek to clarify the conceptual structure of barriers to care.

3.15 Posttraumatic Growth

Background. It is well known that exposure to trauma can lead to negative outcomes, but there is also a growing body of research showing that individuals can grow from their traumatic experiences (Linley & Joseph, 2004; Calhoun and Tedeschi, 2006). A number of studies have observed posttraumatic growth in combat veterans (Maguen et al., 2006; Pietrzak, Goldstein, Malley, Rivers, Johnson, Morgan & Southwick, 2010) and soldiers who had been prisoners of war (Solomon & Dekel, 2007; Feder, Southwick, Goetz, Wang, Alonso, Smith, Buchholz, Waldeck, Ameli, Moore, Hain, Charney &

Vythilingam, 2008). No one has studied the potential for growth in combat with Canadian soldiers, so it was decided to examine this issue in the Sniper 2010 Survey.

A prominent measure in this field is the Posttraumatic Growth Inventory (PGTI), a 21-item scale developed by Tedeschi and Calhoun (1996) which is included in Section 11 of the survey. PGTI items measure the following 5 factors: relating to others (7 items), new possibilities (5 items), personal strength (4 items), spiritual change (2 items), and appreciation of life (3 items). Individual items measure changes respondents experienced because of a traumatic event on a six-point response scale (0 = did not experience this change, 1 = experienced the change to a very small degree, 1 = experienced the change to a very small degree, 2 = experienced the change to a small degree, 3 = experienced the change to a moderate degree, 4 = experienced the change to a great degree, 5 = experienced the change to a very great degree).

Findings. When asked if they had ever experienced a traumatic event (or crisis) in their military service, 80 respondents said yes, 32 said no, and two did not respond. Table 31 depicts the mean scores and internal consistency estimates (Cronbach alphas) for the five sub-scales of the PGTI. Three of the five sub-scales had Cronbach alphas in excess of .80 indicating good levels of reliability (Nunnally & Bernstein, 1994), and the remaining two were close to this mark, each with .75. The mean scores for each of the scales in Table 31 don't convey much by themselves, but data from other studies depicted in Tables 32, 33 and 34 permit a few comparisons. For example, in Table 32, a comparable sample of 1,834 soldiers from a U.S. Infantry Brigade studied by Gallaway et al. (2011) scored slightly higher than the Canadian respondents of the Sniper 2010 Survey on most of the PGTI scales. Similar results are apparent in Table 33 from another U.S. study by Maguen, et al. (2006). In Table 33, when Canadian sniper PGTI scores from the present study were recoded to match the scoring procedures employed by Maguen and colleagues, the results showed that the U.S. sample scored slightly higher on all PGTI scales. A similar trend is illustrated in Table 34 with a study by Pietrzak et al. (2010) of 272 U.S. veterans who served in OEF and OIF between 2003 and 2010. Table 34 compares the percentage of respondents from the *Sniper 2010 Survey* and Pietrzak et al. (2010) study who gave ratings of Great or Very Great Posttraumatic Growth on 6 PGTI items (i.e., scores of 4 or 5 on the 5-point response scale) and shows that a larger percentage of American soldiers endorsed these items with a response of Great or Very Great Posttraumatic Growth. The data in Tables 32 to 34 suggest that the Canadian sniper sample has observed less growth from the trauma they experienced in their military careers than their American counterparts, but this suggestion must be taken with caution given the concerns raised earlier about comparing samples from other studies.

Future research. Posttraumatic growth in the military is an area requiring further attention as most of the research in this field is based on studies of nonmilitary personnel.

Table 31
Sniper 2010 Survey Scores on the Posttraumatic Growth Inventory

	Factor	Items	*M*	*SD*	Alpha	*n*
I	Relating to others	7	9.1	8.7	.92	79
II	New Possibilities	5	7.1	6.1	.85	80
III	Personal Strength	4	9.5	5.5	.85	80
IV	Spiritual Change	2	1.9	2.7	.75	80
V	Appreciation of Life	3	6.3	3.9	.75	79

Note. Items were rated on the following 6-point scale: 0 = no change, 1 = very small degree of change, 2 = small degree of change, 3 = moderate degree of change, 4 = great degree of change, 5 = very great degree of change. Scale scores are calculated by summing item scores.

Table 32
Comparable Scores on the Posttraumatic Growth Inventory

			Canadian Snipers (n=80)		Gallaway et al. US Sample (n=1834)	
	Factor	Items	*M*	*SD*	*M*	*SD*
I	Relating to others	7	9.1	8.7	11.1	8.8
II	New Possibilities	5	7.1	6.1	9.6	6.8
III	Personal Strength	4	9.5	5.5	9.5	5.7
IV	Spiritual Change	2	1.9	2.7	3.3	3.3
V	Appreciation of Life	3	6.3	3.9	7.7	4.4
Total PTGI Score		21	34.0	24.3	41.1	25.8

Note. Scale scores are calculated by summing item scores.

Table 33
Other Comparable Scores on the Posttraumatic Growth Inventory

			Canadian Snipers (n=80)		Maguen et al. US Sample (n=83)	
	Factor	Items	*M*	*SD*	*M*	*SD*
I	Relating to others	7	1.3	1.2	2.2	1.5
II	New Possibilities	5	1.4	1.2	2.4	1.5
III	Personal Strength	4	2.4	1.4	2.9	1.4
IV	Spiritual Change	2	0.9	1.4	2.2	1.9
V	Appreciation of Life	3	2.1	1.3	3.4	1.4
Total PTGI Score		21	1.6	1.2	2.5	1.3

Note. M = mean score of items in the scale. The U.S. sample consisted of 83 U.S. service personnel, 57% of whom were male, 47% were deployed from active duty units, 33 % from National Guard units, and 20% from Reserve units.

Table 34
Comparison of Endorsements of Great or Very Great Posttraumatic Growth on Select Items of the Posttraumatic Growth Inventory

		Canadian Snipers (n=80)		Pietrzak et al. (2010) U.S. Sample (n=272)	
	Item	N	%	N	%
1	I changed my priorities about what is important in life	13	11	142	52
13	I can better appreciate each day	14	12	139	51
10	I know better that I can handle difficulties	32	28	132	49
4	I have a greater feeling of self-reliance	20	18	112	41
12	I am better able to accept the way things work out	20	17	107	39
18	I have a stronger religious faith	4	4	45	17

Note. Item 1 is a marker for Factor V – Appreciation of life, Item 13 is a marker for Factor V – Appreciation of life, Item 10 is a marker for Factor III – Personal Strength,

Item 4 is a marker for Factor III – Personal Strength, Item 12 is a marker for Factor III – Personal Strength, Item 18 is a marker for Factor IV – Spiritual Change. The U.S. sample comprised on 272 veterans who served in OEF and OIF between 2003 and 2010. They completed the survey on average 26-28 months after their last deployment (Pietrzak et al., 2010).

3.16 Self-Efficacy

Background. Research has shown that higher levels of perceived self-efficacy are associated with stronger performance in a variety of areas; consequently, self-efficacy may have a mitigating effect on the harmful effects of stress. Drawing on the advice of Bandura (2006), a measure of sniper self-efficacy was developed for this study and included in Section 12 of the Sniper 2010 Survey. The self-efficacy scale consists of ten items measuring two dimensions: individual sniper self-efficacy (e.g., How confident are you that, as an individual sniper, you can perform sniper tasks?) and collective, sniper section efficacy (e.g., How confident are you that, working together as a unit, your sniper section can provide your unit with the sniper capability it needs in operations?). Survey participants recorded their responses to these items on a 101-point scale from 0 (cannot do at all) to 100 (highly certain can do).

Findings. Sniper 2010 Survey respondents reported high levels of self-efficacy. Indeed, they were particularly confident in their ability to perform in field training and operations, as shown by the data in Table 35. Scores on the individual items were also consistent as the Cronbach's alpha for the seven-item individual self-efficacy scale was .88. The respondents were equally confident in the collective capability of their sniper sections as shown in Table 36. The Cronbach's alpha for the three-item sniper section efficacy scale was .87. Together, the data in Tables 35 and 36 indicate that snipers are a confident group, with high levels of confidence in both their personal sniper skills and the collective skills of their sniper mates.

As for the extent to which self-efficacy and confidence in the efficacy of one's sniper section relate to other measures of interest, the correlations in Table 37 show that individual self-efficacy was negatively correlated with psychological distress, alcohol misuse, and social stigma. These negative correlations mean that respondents reporting high levels of self-efficacy were more likely to have reported lower levels of psychological distress, alcohol misuse, and social stigma. These results indicate that self-efficacy may play a protective role in mitigating the effects of mental health outcomes, but the correlations are small, so the associations may not be strong.

Future research. This study suggests that self-efficacy may protect soldiers from mental health problems. Future research should examine this hypothesis further.

Table 35
Individual Self-Efficacy Item Minimum Scores, Maximum Scores, Mean Scores and Standard Deviations

How confident are you that, as an individual sniper, you can:	Min	Max	M	SD
… perform your military duties in garrison?	50	100	95.9	9.4
… meet the physical fitness demands of field training?	65	100	95.7	8.2
… perform typical soldier tasks (field craft, etc.) in field training?	70	100	96.9	6.3
… perform sniper tasks (shooting, spotting, etc.) in field training?	70	100	95.4	8.0
… meet the physical fitness demands of operations?	70	100	96.2	7.5
… perform typical soldier tasks (field craft, etc.) in operations?	70	100	96.9	6.5
… perform sniper tasks (shooting, spotting, etc.) in operations?	70	100	96.0	7.2
Individual Self-Efficacy Scale Score	72.9	100	96.2	5.9

Note. Items were measured on a 101-point scale (0-100). Scale score is the average of the scale's items.

Table 36
Sniper Section Efficacy Item Minimum Scores, Maximum Scores, Mean Scores and Standard Deviations

How confident are you that, working together as a unit, your sniper section can:	Min	Max	M	SD
… perform its military duties in garrison?	60	100	96.1	8.4
… provide your unit with the sniper capability it needs in field exercises?	70	100	96.3	8.0
… provide your unit with the sniper capability it needs in operations?	70	100	96.3	8.1
Sniper Section Efficacy Scale Score	73.3	100	96.2	7.2

Note. Items were measured on a 101-point scale (0-100). Scale score is the average of the scale's items.

Table 37
Correlations of Sniper Efficacy and Mental Health Measures

	Sniper Self-Efficacy	Sniper Section Efficacy
Concern with Combat Exposure	-.18	-.21*
Psychological Distress	-.30*	-.23*
PTSD	-.12	-.04
Depression	-.17	-.12
Alcohol Misuse	-.19*	.07
Anger	-.12	-.17
Perceived Stigma	-.29*	-.13

Note. * denotes statistically significant correlation coefficients.

3.17 Attitudes toward the Mission

Background. The morale of soldiers can be affected by their attitudes about the cause they are fighting for (Manning, 1991). There is also a potential link between such attitudes and mental health outcomes as suggested in the study of U.S. peacekeepers by Gray, Bolton, and Litz (2004). Given the possibility that the perceptions of Canadian snipers about their missions might be associated with the onset of mental health problems on post-deployment, a scale of items measuring mission attitudes was developed for this study and included in Section 13 of the Sniper 2010 Survey.

Findings. Sixty-eight survey respondents had deployed abroad as a sniper on an operational mission and, as shown in Table 38, they held positive attitudes about the missions they had participated in. Overall, they thought that their sniper section had been successful (*M*=4.1) and they were proud to have been part of the mission (*M*=4.3).

Table 38
Attitudes toward the Mission – Mean Scores and Standard Deviations

Item	Attitudes toward the Mission	M	SD
1.	How successful (or effective) was your sniper section during this operation?	4.1	1.1
2.	How successful was the overall CF effort during this operation?	3.3	1.0
3.	How successful was the total Canadian effort during this operation (i.e., Canadian military plus other Canadian government resources and Canadian private resources)?	3.3	1.0
4.	Overall, did you feel that the mission was worthwhile?	3.7	1.1
5.	Overall, did you feel that the mission made a difference?	3.2	1.3
6.	Overall, did you feel that the cause was a good one?	3.7	1.2
7.	Overall, how proud were you to be part of this mission?	4.3	1.0

Note: Items were rated on a 5-point scale: 1 = not at all (successful, worthwhile, made a difference, good cause, proud), 3 = moderately (successful, etc.), 5 = very (successful, etc.). The Cronbach's alpha of the 7-item scale is .87.

Similar to the results observed earlier with individual sniper self-efficacy and collective sniper section efficacy, it was hypothesized that positive attitudes towards the mission might have a protective effect on mental health issues. Most of the correlations in Table 39 are negative, in the right direction to support this hypothesis (i.e., more positive attitudes associated with lower mental health scores), but only two of these correlations are statistically significant, the -.31 correlation with psychological distress (measured by the K10) and the -.49 correlation with perceived stigma. Other correlational analyses

revealed that the overall measure of attitudes towards the mission was uncorrelated with either individual sniper self-efficacy or collective sniper section efficacy.

Table 39
Correlations of Attitudes toward the Mission and Mental Health Measures

Concern with Combat Exposure	.02
Psychological Distress	-.31*
PTSD	-.05
Depression	-.13
Alcohol Misuse	-.13
Anger	-.13
Perceived Stigma	-.49*

Note: * denotes statistically significant correlation coefficients.

Future research. Attitudes about the mission should be included in future studies examining the factors which might protect soldiers from the effects of operational stress.

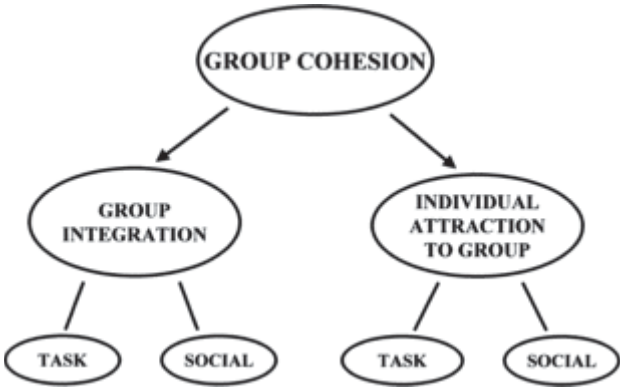
3.18 Cohesion

Background. Cohesion is related to combat effectiveness (Shils & Janowitz, 1948; Kellett, 1982; Henderson, 1985), psychological well-being (Shils, 1950; Bliese & Halverson, 1996; Hoyle & Crawford, 1994; Oliver, Harmon, Hoover, Hayes, & Pandhi, 1999; Ahronson & Cameron, 2007; Griffith & Vaitkus, 1999) and a range of other important military outcomes (Oliver, et al., 1999). However, it is the impact of cohesion on psychological well-being that is most relevant to the present study. A recent study of U.K. military personnel found that unit cohesion was associated with lower levels of PTSD (Du Preez, Sundin, Wessely, & Fear, 2012). While the importance of cohesion in military affairs seems obvious, it has been difficult to gather empirical evidence of its relation to military effectiveness. Because the interest of this research is the extent to which cohesion relates to sniper well-being, the best measure of cohesion will be one that will relate to well-being; however, earlier research does not provide clear direction in this area. For example, Bliese and Halverson (1996) found in their research that well-being had a .43 correlation with vertical cohesion (bonds with organizational leaders) and a .24 correlation with horizontal cohesion (bonds with peers and unit mates). Another part of the problem is that cohesion is a group phenomenon while most studies measure group cohesion by tapping into the attitudes of individual group members. In taking this individualistic approach, important collectivist aspects of cohesion may be overlooked. Another part of the problem is the difficulty in defining cohesion for measurement purposes.

Historical reviews of cohesion research (Bollen & Hoyle, 1990; Dion, 2000) show that some researchers have operationalized cohesion in terms of the forces that cause cohesion (e.g., attraction), the effects of cohesion (e.g., success in reaching unit goals, resistance to disrupting forces), the direction of cohesion (i.e., cohesion with leaders and cohesion with peers), and the functions of cohesion (i.e., cohesion with respect to task performance and cohesion based on social relations).

Carron's (1988) hierarchical model of cohesion (Carron, Widmeyer, & Brawley, 1985), shown below in Figure 6, depicts cohesion as comprising two major components, the extent to which individuals are attracted to the group and group bonding (i.e., closeness, similarity, integration) and each of these components has, in turn, two subordinate dimensions, one based on social relations and the other based on task considerations. From this model, Carron et al. (1985) developed the Group Environment Questionnaire for measuring cohesion in sports teams and the instrument has since been adapted for use in the military. In fact, it served as a guide for the development of the Unit Morale Profile (UMP) questionnaire (Tremblay, 2009a), a CAF measure of cohesion (Ahronson & Cameron, 2007).

Figure 6
Carron's Hierarchical Model of Group Cohesion



Given the variety of definitions and models used to measure cohesion it was decided to include three scales in the Sniper 2010 Survey to measure sniper cohesion: (a) the CAF's UMP questionnaire (Tremblay, 2009a); (b) the Perceived Cohesion Scale (Bollen & Hoyle, 1990); and (c) a Sniper Identity Scale developed specifically for this study. Each of these are discussed in turn below

The UMP was modified slightly by rewriting individual items to make them more relevant to sniper work and then included in Section 14 of the Sniper 2010 Survey. The 5-point response scale of the UMP was retained (1=completely disagree, 2=disagree, 3=neither, 4=agree, 5=completely agree).

Findings. The 15 items of the UMP yield scores on four cohesion factors and one of the items (Item 9) serves as a measure of overall cohesion. The UMP's cohesion factor scores are presented in Table 40. At the time of writing this report, there were no published UMP studies of other combat soldiers which might serve as comparison groups for the sniper sample in this study. Fortunately, Tremblay (2009b) published Canadian Army norms for the UMP's cohesion factors, permitting us to get a sense of how Sniper 2010 Survey scores on the UMP compare with those from other Canadian soldiers. The third column of Table 40 reports the Individual Task Attraction mean of the sniper sample as 4.2 and the sixth column reports the percentile ranking of this mean at the 80th percentile, as listed in Tremblay's (2009b) tables of Canadian Army norms for the UMP. The meaning associated with an 80th percentile ranking is that 80% of Canadian soldiers scored at this level or below on this factor of cohesion. Using Tremblay's norms tables in this way, we can see that the sniper mean scores on all the cohesion factors in Table 40 are high, ranging from the 75th percentile for the Group Task Integration factor to the 90th percentile ranking for the overall cohesion mean score.

Table 40
Sniper 2010 Survey Cohesion Scores on the Unit Moral Profile

Factor	Items	*M*	*SD*	Alpha	Percentile	*n*
Individual Task Attraction	4	4.2	.64	.57	80	111
Individual Social Attraction	3	4.0	.65	.77	85	110
Group Task Integration	4	3.9	.74	.74	75	111
Group Social Integration	3	3.6	.67	.78	80	110
Overall Cohesion	1	4.1	.82		90	111

Note: Items were rated on a 5-point scale with higher scores representing greater cohesion. Factor scores are the average score of items comprising the factor.

Based on previous research it was hypothesized that cohesion might serve as a protective factor for mental health problems. To this end, correlations of the UMP's cohesion factors with mental health measures (psychological distress, PTSD, depression and alcohol misuse) were examined, and a few statistically significant correlations were found, as shown in Table 41. Three of the four cohesion factors and the total UMP score were found to be negatively associated with psychological distress measured by the K10, meaning that snipers with higher cohesion scores on these scales typically scored lower on the K10 (i.e., displaying lower levels of distress). Similarly, negative correlations were found between the cohesion measures and social stigma, meaning that those with higher levels of cohesion reported lower perceptions of stigma. Analyses were also

conducted to determine if cohesion was associated with age or rank, and the results showed they were not.

Table 41
Correlations of Mental Health Measures with UMP Cohesion Indices

	ITA	ISA	GTI	GSI	Total
Concern with combat exposure	-.09	-.22	-.12	-.02	-.15
Pyschological distress	-.25*	-.21*	-.27*	-.14	-.29*
Depression	-.17	-.11	-.23	-.17	-.18
PTSD	-.01	-.07	-.09	.05	-.04
Anger	-.15	-.00	-.23	.04	-.12
Alcohol misuse	-.12	-.12	-.13	.05	-.11
Social stigma	-.42*	-.38*	-.44*	-.20*	-.48*

ITA = UMP Individual Task Attraction, ISA = UMP Individual Social Attraction, GTI = UMP Group Task Integration, GSI = UMP Group Social Integration.

Future research. Although the results of this study suggest that cohesion may provide some protection against mental health problems, the results here are tentative, given the small sample size. It is recommended that this line of inquiry be extended with larger samples in an effort to gather more conclusive findings on the link between cohesion and mental health.

3.19 Perceived Cohesion Scale

Background. The Perceived Cohesion Scale (PCS) is a 6-item measure, based on a definition of cohesion as "an individual's sense of belonging to a particular group and his or her feelings of morale associated with membership in the group (Bollen & Hoyle, 1990, 482)." Retaining the PCS's 10-point response scale (where higher scores indicate higher cohesion), the six items were adapted for measuring sniper cohesion and included in Section 15 of the Sniper 2010 Survey.

Findings. Sniper ratings on the perceived cohesion scale are presented in Table 42. As with the UMP results presented above, there were no comparable studies available for evaluating these data further, so the PCS results are recorded here for use in future studies on cohesion. A perusal of the correlation matrix below in Table 43 reveals that the PCS measures are correlated with many of the other cohesion measures. The correlations of PCS scores and mental health measures in Table 43 are all negative, indicating that higher levels of perceived cohesion are associated with lower levels of mental health symptoms. Many of these negative correlations, however, are not strong enough to be statistically significant, but when the correlations are significant as in the case of

psychological distress, depression, anger, and social stigma, the amount of variance shared with PCS is noteworthy (5% to 13%).

Table 42
Sniper 2010 Survey Scores on the Perceived Cohesion Scale

Factor	Items	*M*	*SD*	Alpha	*n*
Sense of Belonging	3	8.7	1.5	.90	111
Feelings of Morale	3	9.6	0.8	.78	111
Total	6	9.1	1.1	.87	111

Note: Items were rated on a 10-point scale with higher scores representing greater cohesion. Factor scores are the average score of items comprising the factor.

Table 43
Correlations of Mental Health Measures with Perceived Cohesion Scale Scores

	Belonging	Morale	Total
Concern with combat exposure	-.12	-.17	-.15
Pyschological distress	-.27*	-.26*	-.29*
Depression	-.23*	-.23*	-.26*
PTSD	-.16	-.11	-.16
Anger	-.18	-.28*	-.24*
Alcohol misuse	-.15	-.15	-.16
Social stigma	-.35*	-.11	-.29*

Future research. There is still much to learn about cohesion and its impact on military effectiveness, but our knowledge in this area is stymied by the lack of clarity around conceptualizing and measuring cohesion. More research is required in these areas and the PCS may have a role in this research.

3.20 Sniper Identity

Background. Research in the field of social identity also holds promise for measuring cohesion because a central part of social identity theory is that individuals form part of their self-concept on the basis of the groups they belong to, and the values and emotional significance they attach to such group membership. Based on this definition of identity, an indicator of sniper cohesion would be the extent to which individual snipers view

themselves as belonging to the sniper community and deriving value from being a sniper. Cameron (2004) suggested a three-factor model of social identity which was used in developing a 12-item sniper identity scale for Section 16 of the Sniper 2010 Survey. The scale consists of four items for each of Cameron's three dimensions. Individual items are measured on a 6-point response scale from 1 (strongly disagree) to 6 (strongly agree). The first dimension, centrality, refers to the amount of time individuals spend thinking about being a sniper. The second dimension, in-group affect, reflects the positivity of feelings associated with being a sniper. The third dimension, in-group ties, represents the perceptions of similarity, bond, and belongingness with other snipers.

Findings. Table 44 depicts the scores for the three dimensions of sniper identity developed for this study. There are no comparable studies available at this time for evaluating these results, so the data are presented here for use in future studies on cohesion. As for relations between the sniper identity measures and other cohesion indices, the correlation matrix below in Table 46 shows that while the in-group ties dimension correlates with many of the UMP and PCS cohesion measures, the centrality and in-group affect scores do not, suggesting that these two aspects of sniper identity tap into attitudes which may be independent of cohesion.

Table 44
Sniper Identity Sub-Scale Scores

Factor	Items	*M*	*SD*	Alpha	*n*
Centrality	4	3.6	1.1	.68	110
Ingroup Affect	4	5.6	0.4	.64	110
Ingroup Ties	4	5.0	0.8	.80	110

Note: Items were rated on a 6-point scale with higher scores representing higher levels of sniper identity. Factor scores are the average score of items comprising the factor.

The results of correlation analyses depicted in Table 45 reveal very little association between the sniper identity factors and mental health measures except that ingroup affect and ingroup ties were each negatively associated with social stigma (i.e., higher scores on ingroup affect and ingroup ties were associated with lower scores on social stigma).

One of the aims of the cohesion research in this study was to explore the relations among three different measures of cohesion: the UMP, the perceived cohesion scale and the measure of sniper identity developed for this study. The correlation matrix in Table 46 shows that the total scores for the UMP, PCS and Sniper identity scales were related, although the overlap between the UMP and PCS was larger than the overlap of the sniper

identity scale with either the UMP or PCS. This suggests that the sniper identity scale, while capturing aspects of cohesion, is also measuring something unique.

Future research. It is recommended that future research continue to investigate the linkages among military identity, unit cohesion and military effectiveness.

Table 45
Correlations of Mental Health Measures with Sniper Identity Scores

	Centrality	Ingroup Affect	Ingroup Ties	Total
Concern with combat exposure	.11	-.13	-.16	-.05
Pyschological distress	.05	-.15	-.14	-.09
Depression	.06	-.13	-.16	-.08
PTSD	.19	-.01	-.10	-.04
Anger	-.04	-.06	-.07	-.08
Alcohol misuse	.14	-.02	.04	.11
Social stigma	.21	-.23*	-.38*	-.12

Table 46
Inter-Correlations of Cohesion Measures

	1	2	3	4	5	6	7	8	9	10	11	12
1. UMP ITA	(.77)	.49*	.73*	.30*	.85*	.55*	.25*	.49*	-.17	.23*	.36*	.15
2. UMP ISA		(.57)	.37*	.34*	.73*	.56*	.21*	.50*	-.08	.20*	.51*	.28*
3. UMP GTI			(.78)	.19*	.79*	.43*	.31*	.43*	-.24	.25*	.40*	.12
4. UMP GSI				(.74)	.61*	.29*	.15	.27*	.14	.14	.37*	.34*
5. UMP Total					(.87)	.63*	.37*	.60*	-.13	.27*	.55*	.29*
6. PCS Belonging						(.90)	.59*	.95*	.01	.23*	.53*	.36*
7. PCS Morale							(.78)	.81*	-.05	.33*	.20*	.17
8. PCS Total								(.87)	-01	.30*	.46*	.33*
9. SI Centrality									(.68)	.05	.02	.72*
10. SI Ingroup Affect										(.64)	.31*	.50*
11. SI Ingroup Ties											(.80)	.64*
12. SI Total												(.66)

UMP ITA = Unit Moral Profile Individual Task Attraction, UMP ISA = Unit Moral Profile Individual Social Attraction, UMP GTI = Unit Moral Profile Group Task Integration, UMP GSI = Unit Moral Profile Group Social Integration, PCS Belonging = Perceived Cohesion Scale Sense of Belonging, SI = sniper identity. The Cronbach alpha for each scale is listed in the diagonal in brackets.

3.21 Reaction to Killing in Combat

Background. Given the taboo in civil society about killing other humans, one of the more complex issues in military psychology is how soldiers react to having killed in combat. Intuitively, many people expect that killing has a profound effect on veterans, and there is historical evidence showing that soldiers can be traumatized by the killings they have been part of (Bourke, 1999; Dyer, 2005; Nadelson, 2005; Grossman, 1995, 2009; Marlantes, 2011), but many former soldiers also go on to live untroubled lives after their wartime experiences (Hendin & Haas, 1984a, 1984b). Recently there have been a number of empirical studies showing that killing in combat can lead to mental health problems. Using data retrieved from the National Vietnam Veterans Readjustment Study (NVVRS), a data bank of survey responses collected in the 1980s, Fontana and Rosenheck (1999) found a relationship between killing in combat and PTSD. In another study of NVVRS data, MacNair (2002) found that killing in combat was associated with PTSD. Along the same vein, another study of NVVRS data found that the 1200 U.S. veterans in the dataset who had reported killing enemy combatants were more likely to suffer from "PTSD, dissociation, functional impairment and violent behaviours" (Maguen, Metzler, Litz, Seal, Knight, & Marmar, 2009, p. 435). In a subsequent study of 2,797 U.S. veterans of Operation Iraqi Freedom, of whom 40% reported killing an enemy in combat, Maguen and colleagues found that "killing was a significant predictor of PTSD symptoms, alcohol abuse, anger, and relationship problems (Maguen, Lucenko, Reger, Gahn, Litz, Seal, Knight & Marmar, 2010, 86)."

One of the more influential works on this topic is the book *On Killing* by psychologist and former U.S. Army lieutenant-Colonel David Grossman (1995, 2009), in which he draws on historical accounts of soldiers who have killed in combat and psychological theory to suggest a three-stage reaction to killing. Grossman's first stage is one of intense satisfaction or euphoria, which is followed by a second stage of remorse or regret, which is then followed by what can be a lengthy period of rationalization in which soldiers try to make sense of the killing. According to Grossman, not all veterans proceed through all stages at the same pace and some get stuck in one stage or another. Grossman's theory has never been empirically validated, so a scale of four items was developed for this purpose and included in Section 17 of the Sniper 2010 Survey. The first item asked respondents if they had killed in combat and each of the other items focused on one of Grossman's three stages.

Reaction to killing was also assessed separately with Item 25 of the Sniper 2010 Survey's combat exposure scale (Section 1). This item asked respondents on a 5-point scale how many times they were directly responsible for the death of an enemy combatant (1 = never, 2 = one time, 3 = two to four times, 4 = five to nine times, 5 = ten or more times) and how much trouble or concern the killing has since caused them (0=no trouble or concern, 1=little trouble or concern, 2=some trouble or concern, 3= much trouble or concern, 4=very much trouble or concern).

Findings. When asked in Section 1 of the Sniper 2010 Survey how many times they were directly responsible for the death of an enemy combatant, 66 respondents reported they had killed in combat, and the numbers they reported killing are depicted in Table 47. When asked how much trouble or concern this experience had caused them, most of the snipers reported that they experienced none or little trouble/concern (see Table 48).

Table 47
How Often Were You Directly Responsible for the Death of an Enemy?

Never	One time	Two to four times	Five to nine times	Ten or more times
30	24	21	11	10

Table 48
How Much Trouble or Concern Has This Killing Caused You?

No trouble or concern	Little trouble or concern	Some trouble or concern	Much trouble or concern	Very much trouble or concern
76	11	4	2	1

Note: This item was measured on a 5-point scale (1 = no trouble or concern, 2 = little trouble or concern, 3 = some trouble or concern, 4 = much trouble or concern, 5 = very much trouble or concern).

When asked later in Section 17 of the Sniper 2010 Survey if they had ever killed an enemy combatant in combat, 67 respondents reported they had. As shown in Table 49, the responses of these 67 snipers who said they had killed in combat also showed some support for the first stage of Grossman's model (satisfaction or feeling good at the time), but not for the second (feelings of regret or remorse after) and third stages (rationalization – measured with the item: Do you have any feelings of regret or remorse now?). The responses to these items depicted in Table 49 show that 51 of the 67 respondents who had killed in combat reported experiencing at the time either a moderate amount of satisfaction, quite a bit, or an intense amount. The spread of responses in Table 49 supports Grossman's first stage of intense satisfaction, but they show no support for stages two and three, as most the respondents did not report any feelings of regret after or later at the time of completing the Sniper 2010 Survey. There are several possible explanations for these findings. First, Grossman stated that not everyone goes through all the stages on a standard timeline. Second, it is possible that many snipers will not proceed to Stages 2 and 3 while they remain in the sniper community surrounded by their sniper colleagues. If they do transition to stages 2 and 3, it may only occur later in life.

Table 49
Reactions to Killing in Combat – Item Response Rates, Mean Scores and Standard Deviations

Item	1	2	3	4	5	M	SD
Did you feel a sense of satisfaction or feeling good at the time?	6	10	15	21	15	3.4	1.2
Did you have any feelings of regret or remorse after?	52	7	7		1	1.4	.80
Do you have any feelings of regret or remorse now?	59	4	3	1		1.2	.58

Note: N=67. Items were measured on a 5-point scale (1 = no, 2 = a little bit, 3 = moderate amount, 4 = quite a bit, 5 = intense amount).

Table 50 provides a comparison of the scores on mental health measures for those respondents who reported whether they had killed an enemy in combat or not in Section 17 of the survey. Although these results indicate that those who had reported killing also scored higher on the measure of PTSD symptoms, anger and stigma than those who had not killed, the differences between these two groups were not statistically significant when tested. Consequently, the apparent differences in Table 50 between these two groups are not meaningful.

Table 50
Self-Reports of Mental Health Symptoms by Snipers Who Had Killed and Not Killed in Combat

	Kill			No Kill		
	M	SD	N	M	SD	N
Psychological distress	13.7	3.8	66	14.1	5.2	44
Depression	2.3	2.8	66	2.3	2.8	44
PTSD	22.6	5.3	65	22.2	8.1	43
Anger	3.8	3.3	66	3.1	3.3	44
Stigma	28.2	10.0	65	25.2	9.1	43
Alcohol misuse	6.2	4.4	63	7.0	3.6	44

Because some other studies had found a linkage between alcohol misuse and combat exposure (Hoge, et al., 2004; Jacobson et al., 2008), a relationship between killing and alcohol misuse was also considered possible. In addition, the data in Table 50 show that the snipers who reported killing an enemy in combat also scored lower on the AUDIT than those who had not killed, but these differences were not statistically significant when

tested. When the AUDIT data were examined more closely (see Table 51), it was observed that those snipers who had not killed also had higher scores on the AUDIT total score, the AUDIT consumption score and the AUDIT binge drinking item.

Table 51
AUDIT Scores of Snipers Who Had Killed and Not Killed in Combat

	Kill (*n*)	No Kill (*n*)
Total Audit Score	6.16 (63)	6.98 (44)
SD	4.42	3.36
Audit C Score (alcohol consumption)	4.76 (63)	5.48 (44)
SD	2.33	2.25
Audit Item 3 Score (Binge drinking)	1.34 (65)	1.68 (44)
SD	0.83	0.80

The relationship between AUDIT scores and responses to the Section 1 item on killing were also examined further. Shown in Table 52 the results indicate that the snipers who had reported killing more enemy combatants had lower AUDIT scores than those who had not killed or killed once. Correlational analyses showed responses on the Section 1 item on killing were negatively correlated with the total AUDIT score and the binge drinking item, but the correlations were small, and just barely met the criterion for statistical significance. When the cell differences that are apparent in Table 52 were tested, the results showed the differences were not statistically different and therefore are not meaningful.

Table 52
AUDIT Scores of Snipers Based on How Often They Were Responsible for the Death of an Enemy

How often were you directly responsible for the death of an enemy combatant combat?	1 never	2 once	3 2-4 times	4 5-9 times	5 + 9 times
Total AUDIT score	7.15 (34) 3.80 *sd*	7.36 (25) 6.10 *sd*	5.43 (23) 2.52 *sd*	5.73 (11) 3.17 *sd*	5.09 (11) 2.30 *sd*
AUDIT C score (alcohol consumption)	5.5 (34) 2.36 *sd*	5.12 (25) 2.71 *sd*	4.70 (23) 1.79 *sd*	4.81 (11) 2.36 *sd*	4.27 (11) 2.05 *sd*
AUDIT Item 3 score (binge drinking)	1.71 (34) 0.80 *sd*	1.35 (26) 0.94 *sd*	1.48 (23) 0.67 *sd*	1.25 (12) 0.87 *sd*	1.18 (11) 0.75 *sd*

Overall, the responses to the survey items on killing and the linkages of these items with the mental health measures collected in this study suggest that most of the snipers who killed in combat were not experiencing many harmful effects at the time of completing

the survey. Such harmful effects may appear later as there can be a delay in the onset of post-combat mental health problems, but they may never materialize because not everyone suffers harmful consequences from their combat experiences.

Future research. Very little is known for certain about the effect that killing has on combat veterans. There is plenty of myth and supposition on this issue, but little data, so it is recommended that this topic be examined further, possibly with an interview-based study.

4 Conclusion

4.1 Summary of Findings

The snipers who completed the 2010 Survey had considerable combat experience by Canadian Army standards. One hundred and nine respondents (96% of the entire sample) reported being in combat, 60% of the sample had deployed abroad in the sniper role and 58% of the sample reported killing an enemy combatant. Although the sample had been exposed to many combat experiences, they reported very little concern or trouble (i.e., stress) as a result of these experiences.

One of the scales included in the Sniper 2010 Survey was a measure of non-traumatic stressors (i.e., stress below the trauma threshold) developed by the Australian military. The Canadian sniper respondents scored slightly higher on this measure than groups of Australian soldiers who completed the same survey while on peacekeeping duties.

The sniper respondents scored high on measures of physical health and most of the mental health measures, but a few areas of concern emerged on the mental health side. For the most part, sniper scores on the mental health measures were lower than the scores researchers typically find in surveys of CAF enlisted personnel suggesting good mental health. For example, scores on the survey's depression and anger scales were relatively low; however, depending on which cut-off score is used on the PTSD scale, up to 10% of the sniper respondents who had been in combat may be at risk for developing PTSD. Given that mental health issues can take some time to manifest, the sniper community might benefit from some mental health education, particularly those who are combat veterans.

Alcohol consumption is another area of concern to arise from the survey results. Sniper responses on the AUDIT, a well-known and much-used device in screening for alcohol problems, which was included in Sniper 2010 Survey, revealed that the sniper respondents consume alarming levels of alcohol. Alcohol consumption levels reported in the survey were noticeably higher than published levels of other CAF personnel as well as levels reported in several studies of U.S. combat soldiers. Sniper misuse of alcohol seems confined to consumption however, as their scores on measures of alcohol dependence and harm experienced (as a result of their drinking) were much lower.

British and American researchers have found some evidence that combat veterans appear disproportionally in U.K. and U.S. judicial and penal systems; however, this does not appear to be an issue of concern for the Canadian Army sniper community at this time. In response to survey questions on this topic, only a few of the sniper respondents reported having had any recent encounters with the law.

Analysis of survey responses showed that there is some social stigma towards mental health illness in the sniper community. Social stigma refers to the perception of prejudice and discrimination directed at individuals who seek out mental health treatment and is a

significant barrier to injured soldiers receiving the care they need. Stigma is insidious in that it affects those suffering from mental health problems more than those with no problems. Along this vein, survey respondents who reported that they were concerned with a stress, emotional, alcohol, drug or family problem also perceived greater stigma associated with seeking mental health treatment. On a more positive note, those with more combat experience perceived less stigma.

A recent line of research shows that some individuals can experience personal growth from their traumatic experiences and this finding has been replicated with samples of combat veterans in the U.S. No such research has been conducted in the CAF yet, but measures of posttraumatic growth were collected in this study for possible comparison with future CAF studies.

A number of measures were included in the survey to assess attitudes which might serve as protection against operational stress. These measures included self-efficacy, attitudes toward the mission and cohesion. The sniper respondents scored high on all these measures and subsequent correlational analyses showed that many of the measures were inversely related to mental health outcomes (i.e., respondents who scored high on the measures generally scored lower on the mental health measures), but the correlations were not strong. This is a positive finding which should be examined further.

The survey included several items examining the effect that killing has on combat veterans. Responses revealed that most of the 67 snipers who killed in combat had little post-combat trauma in this regard. There was virtually no difference between those who had killed in combat and those who had not on the measures of psychological distress, depression, PTSD, and anger. But those who had killed in combat had slightly lower scores on alcohol consumption, dependence and harm experienced as well as lower levels of perceived stigma (towards mental health treatment).

Overall, the results of this research show that the sniper community is generally comprised of healthy individuals, although a small percentage of the combat veterans may be at threat of developing PTSD. An area in which the entire sniper community seems to be engaging in unhealthy behavior however is alcohol consumption.

4.2 Recommendations

4.2.1 Recommended Interventions

Given the sniper respondents' results on the mental health measures, particularly the PTSD and alcohol misuse measures, it is recommended that Army leaders consider sponsoring educational briefings on mental health in military units. It is recommended that the negative effects of alcohol consumption on health and performance be emphasized. Similar briefings should be included in the training curriculum of sniper qualification courses.

4.2.2 Recommended Research

Because well-being and mental health can fluctuate over the course of an individual's life, there should be an ongoing program of CAF research in these areas. Such research would optimally poll individuals at various stages of their career and beyond, but it is impossible to link the datasets of subsequent studies with those of earlier studies when survey respondents do not identify themselves. In order to facilitate future longitudinal research, respondents of the Sniper 2010 Survey were asked to provide a Personal Identification Number (PIN) which could be used to match their 2010 survey responses to later responses in future, follow-on studies. CAF researchers now refer to this number as an Anonymous Research Code (ARC). The intent is that this ARC could provide the anonymity that respondents need to complete surveys without worrying their responses might be made public. At the same time, the ARC would give researchers a common data point which could be used to match an individual's responses from both studies. The PIN/ARC employed in the Sniper 2010 Survey consisted of six digits as described below:

PIN/ARC: ___ / ___ / ___ / ___ / ___ / ____

Spaces 1 & 2: First two letters of your mother's maiden name
Spaces 3 & 4: The numbers corresponding to the month your mother was born
Spaces 5 & 6: The first two letters of your father's first name

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Annex A

Sniper Well-Being Survey 2010

Note: if you would like to see specific items from the questionnaire, please contact the Scientific Authority, Dr. Don McCreary

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(U) This report describes the results of a study into the well-being of Canadian Army snipers. In 2010 and early 2011, 114 snipers completed a paper-and pencil survey measuring combat exposure, concern with (or trouble resulting from) this combat exposure, non-traumatic stress, non-operational stress, family stress, present health, psychological distress, posttraumatic stress disorder (PTSD), depression, utilization of mental health resources, alcohol misuse, anger, encounters with the law, barriers to care, posttraumatic growth, self-efficacy, attitudes toward the mission, cohesion, sniper identity, and reaction to killing in combat. The results of this survey showed that although the snipers had been exposed to many combat experiences, they had little post-combat trauma. For the most part, they appeared to be physically and mentally healthy, although two mental health concerns emerged. First, depending on which cut-off score is employed, almost 10% of the snipers who had served in combat may be vulnerable to developing posttraumatic stress disorder. Second, alcohol consumption levels reported by Army snipers in this study appear to be high in comparison to reports from other CAF studies. Analyses of survey responses revealed that there was some stigma about mental health treatment in the sniper community. Most of the 67 snipers who had killed in combat reported no post-combat trauma from this experience. Further research should be conducted on the issues of PTSD and alcohol consumption in the sniper community.

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(U) Army; sniper; well-being; non-traumatic stress; non-operational stress; family stress; present health; psychological distress; post-traumatic stress; depression; utilization of mental health resources; alcohol misuse; anger; encounters with the law; barriers to care; post-traumatic growth; self-efficacy; attitudes towards the mission; cohesion; sniper identity; reaction to killing in combat