

# **Stress and Coping During Canadian Peacekeeping Operations and The Relationship to the Unit Climate Profile in French and English Datasets**

Scott J Duggan  
2-590 Lawrence Ave West,  
Toronto, Ontario  
M6A 1A7

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On behalf of  
DEPARTMENT OF NATIONAL DEFENCE

as represented by  
Defence R&D Canada - Toronto  
1133 Sheppard Avenue West  
Downsview, Ontario, Canada  
M3M 3B9  
DRDC - Toronto Scientific Authority  
Dr Megan Thompson

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Author

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S. J. Duggan

Approved by

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M.M. Thompson  
Scientific Authority

Approved for release by

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Chair, Document Review and Library Committee

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## Abstract

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This report summarizes the work completed in contract # W771-027818/001/TOR. The purpose of this contract was to organize the several large datasets for further statistical analysis, perform preliminary statistics, and to compare French and English versions of these datasets. A large number of datasets were received providing information about military stress and coping during peacekeeping tours. Visual analyses were conducted to determine which datasets could be used for analysis. Only the datasets that had recognizable variable labels could be properly analyzed. It was determined that there were 13 datasets that were suitable. As with previous datasets from the Human Dimensions of Operations Project, consistent and meaningful variable labels were entered. Missing data and reverse-scored items were recoded. Descriptive analyses were run on each data set. Reliabilities were also run, to ensure the internal consistency of each scale and provide some insight as to the nature of the data. These analyses indicated that most of the scales were reliable. A correlation matrix was created to compare relevant scales and subscales as a preliminary step in subsequent statistical analyses of the datasets. Factor analyses were conducted on the "COPE" scale to determine relevant factor structures. Correlation matrices were created to compare these factors. These matrices indicated similar relationships as those found with previous datasets. Factor analyses were also conducted on the French and English versions of the Unit Climate Profile for similar purposes. Again, correlation matrices were created to compare the Unit Climate Profile to the stress and coping indices. Results of these correlations indicated that the underlying factor structure for English and French datasets to be similar.

## Résumé

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Le présent rapport récapitule les travaux exécutés dans le cadre du contrat n° W771-027818/001/TOR. Ce contrat avait pour objectif d'organiser plusieurs grands ensembles de données pour analyse statistique ultérieure, d'établir des statistiques préliminaires et de comparer les versions en français et en anglais de ces ensembles de données. Nous avons reçu un grand nombre d'ensembles de données qui fournissaient de l'information au sujet du stress subi par les militaires pendant les opérations de maintien de la paix et de la manière dont ils faisaient face à ce stress. Nous avons mené des analyses visuelles afin de déterminer les ensembles de données qui pouvaient être utilisés pour l'analyse. Seuls les ensembles de données qui avaient des étiquettes variables reconnaissables pouvaient être bien analysés. Il a été déterminé que 13 ensembles de données convenaient à cette analyse. Tout comme pour les ensembles de données précédents du Projet sur les dimensions humaines des opérations, des étiquettes variables uniformes et significatives ont été introduites. Les données manquantes et les éléments à échelle inversée ont été recodés. Des analyses descriptives ont été exécutées pour chaque ensemble de données. Des analyses de fiabilité ont également été exécutées afin d'assurer l'uniformité interne de chaque échelle et de fournir un aperçu de la nature des données. Ces analyses ont indiqué que la plupart des échelles étaient fiables. Une matrice de corrélation a été créée en vue de comparer les échelles et sous-échelles pertinentes comme étape préliminaire aux analyses statistiques ultérieures des ensembles de données. Des analyses factorielles ont été faites pour l'échelle « COPE » afin de déterminer les structures factorielles pertinentes. Des matrices de corrélation ont été créées pour la comparaison de ces facteurs. Ces matrices ont indiqué des relations semblables à celles que l'on trouvait dans les ensembles de données

antérieurs. Des analyses factorielles ont été également conduites pour les versions en français et en anglais du Profil du climat de l'unité (Unit Climate Profile) à des fins semblables. Nous avons de nouveau créé des matrices de corrélation pour comparer les données du Profil du climat de l'unité et les indices de stress et de l'adaptation à ce stress. Les résultats de ces corrélations ont indiqué que la structure factorielle sous-jacente des ensembles de données en anglais et en français était semblable.

## **Executive summary**

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### **Purpose:**

The purpose of this project was to organize several large-scale datasets from the Directorate of Human Resource Research and Evaluation's (DHRRE) Human Dimensions of Operations (HDO) project for further statistical analysis. A large number of peacekeeping datasets were received that provided self-report information about military stress and coping during several Canadian Forces peacekeeping tours. The work summarized in this report follows on from previous work already completed that also involved organizing four large scale datasets from the HDO project (Duggan, 2002).

### **Methodology:**

It was apparent from the file names of the datasets, that new datasets had been created from the original data. For the purposes of these statistical analyses, only original datasets were used. Thirteen datasets were included. In each of these 13 datasets, consistent and meaningful variable names and labels were used. To determine if any "out of range" data responses were present, and to provide some initial insight into the data, simple descriptive and reliability analyses were completed. Although most scales proved to be reliable, a separate factor analysis was conducted on the "COPE" scale to determine the relevant factors. Items that loaded heavily together were grouped into sub-scales. Reliability analyses were conducted on these sub-scales to ensure sufficient reliability. Then totals were created for all the variable scales. A correlation matrix was created to compare relevant scales and subscales. Factor analyses were also conducted on French and English versions of the Unit Climate Profile where applicable. Several datasets had to be omitted from this analysis, due to small sample size. In order to obtain a sufficient French and English samples, several datasets needed to be combined. In order to avoid re-sampling of the same personnel, only certain datasets could be used, and thus analyzed. Since only the English sample included stress and coping data, comparisons between French and English Unit Climate Profile data and stress and coping indices could not be made.

### **Conclusions:**

Initial reliability analyses indicated that most scales were reliable. Relevant factors of the "COPE" scale also proved to be reliable. The correlation matrices for the "COPE" scale show similar relationships as those found with previous datasets. The factor analysis of the Unit Climate Profile for French and English subsets indicated a factor structure similar to previous findings. The analyses also indicated the underlying factor structure of the UCP in the English and French datasets to be very similar.

Duggan, S.J. 2003. Stress and Coping During Canadian Peacekeeping Operations and the Relationship to the Unit Climate Profile in French and English Datasets. W7711-027818/001/TOR. Defence Research and Development Canada – Toronto CR 2003-114.

## Sommaire

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### Objectif du projet :

Ce projet avait pour objectif d'organiser plusieurs ensembles de données à grande échelle fournis par le Projet sur les dimensions humaines des opérations (HDO ou Human Dimensions of Operations) de la Direction de la recherche et de l'évaluation en ressources humaines (DRHRH) en vue d'une analyse statistique ultérieure. Nous avons reçu un grand nombre d'ensembles de données sur les opérations de maintien de la paix avec de l'information d'autoévaluation des militaires au sujet du stress subi pendant les missions de maintien de la paix des Forces canadiennes et de leur adaptation à ce stress. Les travaux récapitulés dans le présent rapport font suite à des travaux antérieurs déjà terminés qui ont également porté sur l'organisation de quatre grands ensembles de données provenant du projet HDO (Duggan, 2002).

### Méthodologie :

Il a été apparent, d'après les noms des fichiers des ensembles de données, que de nouveaux ensembles de données avaient été créés à partir des données originales. Pour les besoins de ces analyses statistiques, seuls les ensembles de données originaux ont été utilisés. Treize ensembles de données ont été inclus. Dans chacun de ces treize ensembles, nous avons utilisé des noms et des étiquettes variables uniformes et significatifs. Pour déterminer s'il y avait des réponses « en dehors des limites établies » et pour donner un aperçu initial des données, nous avons effectué des analyses descriptives simples et de fiabilité. Même si la plupart des échelles se sont révélées fiables, une analyse factorielle distincte a été menée pour l'échelle « COPE » en vue de déterminer les facteurs pertinents. Les éléments fortement corrélés ont été regroupés en sous-échelles. Des analyses de fiabilité ont été menées pour ces sous-échelles afin d'assurer une fiabilité suffisante. Les totaux ont ensuite été établis pour toutes les échelles variables. Une matrice de corrélation a été créée pour la comparaison des échelles et sous-échelles pertinentes. Des analyses factorielles ont été faites pour les versions en anglais et en français du Profil du climat de l'unité, le cas échéant. Plusieurs ensembles de données ont dû être omis de cette analyse à cause de leur petite taille d'échantillonnage. Afin d'obtenir suffisamment d'échantillons en français et en anglais, il a fallu combiner plusieurs ensembles de données. Pour éviter d'échantillonner de nouveau le même personnel, seuls certains ensembles de données ont pu être utilisés et analysés par la suite. Étant donné que seul l'échantillonnage anglais incluait des données sur le stress et sur la manière d'y faire face, nous n'avons pas pu faire de comparaison entre les versions en anglais et en français des données du Profil du climat de l'unité et des indices de stress et de l'adaptation à ce stress.

### Conclusions :

Les analyses initiales de fiabilité ont indiqué que la plupart des échelles étaient fiables. Les facteurs pertinents de l'échelle « COPE » se sont également révélés fiables. Les matrices de corrélation de l'échelle « COPE » ont montré des relations semblables à celles que l'on trouve dans des ensembles de données antérieurs. L'analyse factorielle du Profil du climat de l'unité pour les sous-ensembles en français et en anglais a indiqué une structure factorielle semblable à celle des résultats antérieurs. Les analyses ont également indiqué que la structure factorielle sous-jacente du Profil du climat de l'unité était très semblable dans les ensembles de données en français et en anglais.

Duggan, S.J. 2003. Stress and Coping During Canadian Peacekeeping Operations and The Relationship to the Unit Climate Profile in French and English Datasets. W7711-027818/001/TOR. Defence Research and Development Canada – Toronto. CR 2003-114

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## Aim

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This report summarizes the work completed within contract number: W771-027818/001/TOR. Specifically, the report details the following benchmarks.

1. Collate and organize multiple large-scale survey data sets, check for outliers, incorrect data, missing data. Create variable names, variable labels and value labels for each data set. Ensure variable names, variable labels and value labels are consistent across sets, as required.
2. Conduct reliability analyses for each stress and coping measures within each data set, conduct descriptive analyses (frequencies and/or means, standard deviations, variances, ranges) of demographic composition for each data set.
3. Conduct correlational analyses of relationship among stress, coping, mental and physical health measures for each data set, where appropriate compare these measures across data sets.
4. Conduct factor analyses of UCP measure across multiple samples of peacekeepers. Run factor analyses separately for French and English versions of the UCP and determine if the factor structure is consistent across English and French versions of the questionnaire. Conduct correlational analyses of the relation between UCP factors and stress and coping indices, first separating French and English data. This final set of analyses was conducted for the Directorate of Human Resource Research and Evaluation.

## Peacekeeping Stress & Coping Data

### Background

The datasets received provided information about military stress and coping before, during and after several Canadian Forces peacekeeping tours. Both English and French datasets were included. The data collection method was self-report. Of the various datasets provided, it was apparent that several had been created from the original datasets. Such datasets were not used for further analyses. This report summarizes results obtained from analyses performed on the original data. Thirteen datasets were included. These 13 datasets represented different phases and time frames of the tours. For example, Tour 1 - Phase 1 would represent the first tour and first phase of that tour\*. In these datasets, a variety of scales were used. These included the Unit Climate Profile, "COPE" Scale, Experience of Stress (before, during and after deployment), Family, Homecoming Issues, Perceived Organizational Support, Positive Aspects of Peace Operations, Service Experience Scale, Signs, Stress in Military Service, Stress in Peace Operations, and The Tour in Perspective. Not all questionnaires were included in each administration, and in some cases, only the Unit Climate Profile was included. This made for a limited potential for data analysis, particularly with stress and coping measures. Another problem was that the

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\* Actual file names were altered to ensure anonymity.

order of the questionnaires within each dataset and inclusion of the questions within that questionnaire was not kept constant; again making analysis aimed at comparison across datasets difficult and limited. Finally, caution must be used when making conclusions from the analyses as there is no way to know if any of the information received was from the same individual or group of individuals across data sets.

## **Organization**

In each of the original datasets received, consistent letters were used to denote various scales. Such letters made it difficult to determine at a glance what the scale measured. To deal with this issue, variable names and labels were changed to reflect what the actual scale was meant to measure. For example, the Unit Climate Profile had previously been labeled as variable "H". A list of variable names can be found in Appendix A. It was now changed to "UNIT". Many variable names were also either ambiguous or missing. Again consistent and meaningful names were used. Existing value labels were verified and were added when such labels had been omitted. French value labels were translated into English. Finally, all variables such as "type", "width", "decimals", "columns", "align" and "measure" were checked for accuracy and were adjusted as needed. For example, "measure" refers to scale type. Some ordinal level data was incorrectly entered as nominal level data. This severely limits statistical analysis.

The original SPSS files coded missing data as either "999", "99", or "9". For ease of analysis later on, it was recoded to "SYSMIS". To determine if any "out of range" data responses were present, simple descriptive analyses were completed. Frequencies were run which indicated the number of respondents who chose each answer (value) including any out of range values. There didn't seem to be a consistent pattern of either "missing" or "out of range" data. Thus, if there was a number instead of a value in the output field, the response for that individual for that question was omitted.

## **Recoding of Reverse Scored Items**

Several of the scales employed used reverse scored items. Such items were usually labelled 'r'. The difficulty, however, was that there was no standard method of labelling which items had been recoded to reflect the reverse scoring. Since there was no way to contact the individual responsible for the initial data entry, statistical measures were used to accomplish this task. For each variable, a scale reliability analysis was run. Corrected item-total correlations were checked for each of the reverse scored items. If the correlations for such items were negative or close to zero, then that item needed to be recoded to reflect the reverse scoring. When this was completed, another reliability analysis was run to ensure that the correlations were indeed positive and farther from zero. All data sets were assumed to have a single method of dealing with reverse-coded items.

## **Preliminary Statistical Analysis – Stress and Coping Measures**

Once the data was organized, verified, and recoded, reliabilities were run on each variable in an attempt to determine whether or not further analysis might prove useful. First, overall reliabilities were conducted for each variable. Then, if applicable, sub-scale reliabilities were conducted. Those scales that showed significant reliability would be analyzed further. All reliability analyses are included in Appendix B. In general, most scales achieved a reasonable level of reliability. The “COPE” scale proved more difficult to analyze. This is because there were a number of factors included in the scale that needed to be separated and analyzed separately. Therefore a factor analysis was conducted to determine the relevant factors. Items that loaded heavily together were grouped into sub-scales. Analyses were conducted on these sub-scales to ensure sufficient reliability. Then totals were created for all the variable scales. Finally a correlation matrix was created to compare relevant scales and subscales. The data and the preliminary statistics were submitted for further analysis. This correlation matrix can be found in Appendix C.

## **Statistical Analysis of the Unit Climate Profile**

In order to determine the factor structure of the Unit Climate Profile, a factor analysis was conducted separately for French and English datasets. Due to limited sample size, many datasets could not be validly analyzed using a factor analysis given that conventionally 10 respondents per scale item are needed. In order to obtain a sufficient sample size, two of the English datasets were combined. Because HDO questionnaires are anonymous, there is no way to determine if data collected across at each sampling point in any one deployment cycle is from the same respondent or not or if the same personnel may have filled out the same survey while on different tours of duty. Thus, due to the possibility of double sampling, no datasets from the same deployment could be combined.

Separate factor analyses were conducted on one French and two English datasets. The factor loadings are included in Appendix D. In order to determine if the factor structures were consistent with previously determined factors, a chart was constructed to show how the individual items loaded as compared to original factors. This chart is included as Appendix E. Correlational analyses were then conducted between these factors and the other stress and coping indices. These analyses are included as Appendix F. Unfortunately, only one of the English datasets included any stress and coping indices. Therefore, no comparisons between French and English datasets could be made with respect to their relative relations to stress and coping indices.

## **Results**

As indicated in Appendix B the initial reliability analyses conducted indicated that the majority of the scales tested were reliable. Similarly, the relevant factors of the “COPE” scale (determined by the administration of factor analyses) also proved to be reliable. Moreover, these factors show similar relationships as those found with previous datasets.

Previous research (Murphy & Farley, 2000; Farley 2002), indicated that the Unit Climate Profile contained 12 separate factors. These factors are specified in

Appendix E. In order to determine if the current datasets loaded in a similar manner, the factor matrices for each dataset was analyzed. A UCP item was said to load sufficiently on a factor if it reached a significance level of .400. In the majority of cases, for both French and English datasets, the factor loadings conformed to previously determined factors. The exception was "Professional Morale" which failed to load significantly as a separate factor for any of the three datasets.

### **Summary**

The factor analysis of the "COPE" scale and the Unit Climate Profile for French and English subsets indicated a factor structure similar to previous findings.

### **Conclusions**

Given that the current datasets load in a similar manner to previously determined factors, it may be concluded that the Unit Climate Profile is a relatively stable measure with subscales tapping several underlying dimensions that seems to remain consistent over various tours and phases. The "COPE" scale also seems to be a relatively stable scale over time and administration.

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## 14. ABSTRACT

(U) This report summarizes the work completed in contract # W771-027818/001/TOR. The purpose of this contract was to organize the several large datasets for further statistical analysis, perform preliminary statistics, and to compare French and English versions of these datasets. A large number of datasets were received providing information about military stress and coping during peacekeeping tours. Visual analyses were conducted to determine which datasets could be used for analysis. Only the datasets that had recognizable variable labels could be properly analyzed. It was determined that there were 13 datasets that were suitable. As with previous datasets from the Human Dimensions of Operations Project, consistent and meaningful variable labels were entered. Missing data and reverse-scored items were recoded. Descriptive analyses were run on each data set. Reliabilities were also run, to ensure the internal consistency of each scale and provide some insight as to the nature of the data. These analyses indicated that most of the scales were reliable. A correlation matrix was created to compare relevant scales and subscales as a preliminary step in subsequent statistical analyses of the datasets. Factor analyses were conducted on the "COPE" scale to determine relevant factor structures. Correlation matrices were created to compare these factors. These matrices indicated similar relationships as those found with previous datasets. Factor analyses were also conducted on the French and English versions of the Unit Climate Profile for similar purposes. Again, correlation matrices were created to compare the Unit Climate Profile to the stress and coping indices. Results of these correlations indicated that the underlying factor structure for English and French datasets to be similar

(U) Le présent rapport récapitule les travaux exécutés dans le cadre du contrat no W771? 027818/001/TOR. Ce contrat avait pour objectif d'organiser plusieurs grands ensembles de données pour analyse statistique ultérieure, d'établir des statistiques préliminaires et de comparer les versions en français et en anglais de ces ensembles de données. Nous avons reçu un grand nombre d'ensembles de données qui fournissaient de l'information au sujet du stress subi par les militaires pendant les opérations de maintien de la paix et de la manière dont ils faisaient face à ce stress. Nous avons mené des analyses visuelles afin de déterminer les ensembles de données qui pouvaient être utilisés pour l'analyse. Seuls les ensembles de données qui avaient des étiquettes variables reconnaissables pouvaient être bien analysés. Il a été déterminé que 13 ensembles de données convenaient à cette analyse. Tout comme pour les ensembles de données précédents du Projet sur les dimensions humaines des opérations, des étiquettes variables uniformes et significatives ont été introduites. Les données manquantes et les éléments à échelle inversée ont été recodés. Des analyses descriptives ont été exécutées pour chaque ensemble de données. Des analyses de fiabilité ont également été exécutées afin d'assurer l'uniformité interne de chaque échelle et de fournir un aperçu de la nature des données. Ces analyses ont indiqué que la plupart des échelles étaient fiables. Une matrice de corrélation a été créée en vue de comparer les échelles et sous-échelles pertinentes comme étape préliminaire aux analyses statistiques ultérieures des ensembles de données. Des analyses factorielles ont été faites pour l'échelle « COPE » afin de déterminer les structures factorielles pertinentes. Des matrices de corrélation ont été créées pour la comparaison de ces facteurs. Ces matrices ont indiqué des relations semblables à celles que l'on trouvait dans les ensembles de données antérieurs. Des analyses factorielles ont été également conduites pour les versions en français. Enter words or phrases separated by semi-colons. military; stress and coping; peacekeeping 7. Contributing agencies and roles When the contributing agency is part of DRDC, choose the appropriate entry in 'Corporate Body' column; otherwise leave column blank and enter full details in third et en anglais du Profil du climat de l'unité (Unit Climate Profile) à des fins semblables. Nous avons de nouveau créé des matrices de corrélation pour comparer les données du Profil du climat de l'unité et les indices de stress et de l'adaptation à ce stress. Les résultats de ces corrélations ont indiqué que la structure factorielle sous-jacente des ensembles de données en anglais et en français était semblable.

## 15. KEYWORDS, DESCRIPTORS or IDENTIFIERS

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