

Leader Interventions for Psychological Health and Safety Solutions

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ABSTRACT

In this paper, we describe the Department of National Defence's approach to informing leader-driven actions for positive change based on the results of the 2018 Defence Workplace Well-being Survey (DWWS). The DWWS was designed to provide a baseline assessment of the workplace well-being of the Defence Team (DT; i.e., Regular Force members, Primary Reserve Force members, and civilian employees) and of its associated resilience and risk factors. The analyses resulted in the identifications of four Psychological Health (PH) profiles based on five indicators of PH (i.e., Morale, Job Engagement, Burnout, Psychological Distress, and Turnover Intentions) and of reliable predictors (i.e., social-demographic characteristics, resilience and risk factors) of membership in these profiles. Its limitations notwithstanding, the current study employed state-of-the-art techniques to (a) investigate the dimensionality of PH, (b) identify PH profiles in the DT, and (c) examine the relationships between membership in these profiles and the aforementioned predictors. In closing, we discuss the practical implications of this work for the DND, especially how the findings can inform leader-driven actions.

1.0 INTRODUCTION

The World Health Organization¹ defines *psychological health* (PH) as an integrative concept based on both the presence of positive health symptoms (i.e., well-being) and the absence of negative health symptoms (i.e., distress).^{2,3} A critical assumption of this conceptualization is that well-being and distress are distinct states that vary independently from one another within the same person rather than end points on a continuum.⁴ In fact, empirical evidence has shown that well-being measures (e.g., involvement) assess more than the opposite of distress measures (e.g., anxiety, depression) and provide relevant yet complementary information towards the conceptualization of PH.⁴

Decades of research in several areas of the social sciences have highlighted the importance of PH to organizations.⁵⁻⁷ For example, psychologically healthy employees show both increased engagement and resilience at work, and they are more creative and innovative.⁸⁻¹¹ In contrast, reduced PH has been associated with outcomes such as suboptimal job performance, absenteeism, turnover, increased health care expenditures and, in Canada in particular, approximately \$50 billion in lost annual productivity.¹²⁻²¹

1.1 Approaches to the Investigation of PH

In light of the increasing awareness of PH in organizations and its linkage to key organizational outcomes, an in-depth exploration of this construct has become critical.^{4,22} Traditionally, PH research has taken a *variable-centered* approach to investigating this construct and its associations with key predictors, correlates, and outcomes, where these relationships are explored and averaged across respondents.²³ However, this approach overlooks the possibility that the combination of PH dimensions may differ – in meaningful ways – in subgroups of participants.^{24,25}

Complementary *person-centered* techniques overcome this limitation by identifying distinct and homogenous subgroups of individuals presenting qualitatively and quantitatively distinct PH profiles across multiple variables.²⁶ Consequently, methodologists have identified these techniques as more appropriate for the investigation of research questions pertaining to the combination of PH dimensions in unique ways across individuals.^{4,22} Furthermore, relative to the variable-centered approach, not only does person-centered research seem better suited to leaders' proclivities to categorize their employees, but it also offers a more complete picture of employees as whole persons.⁴

Among the various person-centered approaches available (e.g., median-split, cluster analysis), *latent profile analysis* (LPA) is the most flexible and, arguably, the most psychometrically robust.²⁶ In LPA, latent profiles refer to subpopulations that are prototypical in nature, with individuals having a probability of membership in a given profile based on their degree of similarity with the profile's specific configuration on the indicators.²⁷ An additional strength of LPA is the possibility of including auxiliary variables (e.g., predictors, correlates, or outcomes of PH) in the analysis to determine their relation to profile membership.²⁸

To date, only a limited number of studies have examined PH from a person-centered perspective using LPA.^{4,22,24,29-31} These studies identified between four^{24,30,31} and six²⁹ PH profiles. Notably, common to all studies is the presence of three profiles: (a) *High-Functioning* (i.e., high levels of well-being); (b) *Normative* (i.e., average levels of well-being and distress); and (c) *At-Risk* (i.e., high levels of distress and low well-being). Across studies, the High-Functioning profile consisted of approximately 2% to 46% of the respondents, the Normative profile included approximately 28% to 68% of the respondents, and the At-Risk profile comprised approximately 6% to 47% of the respondents. In addition to identifying PH profiles, some of these studies have examined the relationships between membership in these profiles and potential predictors and outcomes of PH. For example, Gerber et al.²⁹ and Makikangas et al.³² found that job control, a supportive organizational climate, and physical activity are all associated with an increased probability of belonging to a High-Functioning profile, whereas Bietry and Creusier²⁴ identified associations between high levels of turnover intentions and exhaustion and an increased probability of belonging to an At-Risk profile.

Of note, the aforementioned efforts have been exclusively directed to investigating PH profiles in civilian settings, and, to date, this research has not yet been extended to military or mixed military and civilian contexts. In fact, published studies that explore PH in the military remain relatively rare³³⁻³⁵ with only 3% of occupational health psychology studies between 2010 and 2014 using a military sample³⁶, reinforcing Chen's³⁷ call for more diversity in worker populations represented in occupational health psychology research. The limited military research that does assess PH has generally focused on the association between PH indicators and extreme stressors specific to the military, such as combat exposure, peacekeeping and disaster missions.³⁸⁻⁴⁰ Despite the notion that the military work environment consists of the full range of occupational characteristics, it appears that little formal inquiry been done to explore PH in a routine military work environment.^{41,42}

1.2 Resilience and Risk Factors as Key Drivers of PH

In 2013, the Mental Health Commission of Canada (MHCC) launched a voluntary standard, the *National Standard for Psychological Health and Safety in the Workplace* (referred to herein as the Standard).⁵ The Standard highlights 13 resilience and risk factors in the workplace that reflect the academic literature and that organizations can monitor and influence to promote PH.⁵ While interest in the Standard is high, Canadian organizations still struggle with implementing practices to support PH.⁴³ Reasons for this disparity stem from long-standing organizational limitations, such as lack of funding, time, and personnel necessary to implement MHCC's comprehensive PH strategy.⁴³ Given that organizations are interested in directing their limited resources toward areas that have the largest return on investment⁴⁴, it is critical to identify the resilience and risk factors most strongly associated with PH.

1.3 Leader Interventions for PH

Empirical research on PH interventions and first-hand experience from organizational change programs indicate that obtaining intended change is often more difficult than expected.⁴⁵⁻⁴⁷ If messages from upper echelons of authority regarding organizational interventions do not match actual leadership actions, the dissonance between these communicated messages will inhibit intervention success^{48,49}, because "leaders set the tone for the entire organization, and employees look to them for cues about what constitutes acceptable conduct".⁵⁰ Specifically, organizational leaders play an important role in defining an environment in which employees can experience psychological well-being or distress.⁵¹⁻⁵⁴ That is, they can make decisions that create additional stressors for their employees, such as assigning tasks in a way that increases or diminishes the experience of role overload.⁵² Additionally, unfair, hostile and abusive management practices are all linked to adverse employee outcomes such as feelings of helplessness, reduced self-efficacy, and burnout.⁵⁵⁻⁵⁷

Conversely, when managers engage in *transformational leadership* behaviours such as consideration as well as support for employee needs, employees can demonstrate increased optimism, happiness, and motivation, and reduced job stress, strain, burnout, and depression.⁵⁸⁻⁶¹ With these findings in mind, it then follows that leadership training and development programs aimed at enhancing leadership behaviours can also serve as an indirect method to facilitate subordinate PH.⁵² As such, leadership training should be considered a viable and effective primary intervention to promote employee PH.⁵²

Additionally, organizations with leadership that is supportive of worksite health promotion programs are almost four times more likely to report substantial improvement in employee health.⁶² When leaders are actively engaged and supportive of PH interventions, employees are likely to perceive their PH as a priority.⁶³ In this case, employees may perceive psychological well-being programs as an integral part of overall organizational health and effectiveness, rather than an external program that has been imposed upon them.⁶⁴ Moreover, managerial involvement also facilitates a shared understanding of the causes and consequences of psychological distress, which plays a critical role in fostering an environment that supports the transfer of skills obtained within the intervention program to the workplace.^{65,66}

1.4 The Present Study

In conducting the current study, our aims were to: (a) investigate the dimensionality of PH in the Canadian Defence Team (DT; i.e., Regular Force and Reserve Force members and civilian personnel), based on a mixture of positive and negative indicators of PH; (b) identify PH profiles; and (c) relate membership in these profiles to the workplace resilience and risk factors identified in the Standard⁵ in order to identify key levers for leader-driven actions for positive change.

2.0 METHOD

2.1 Study Design

A stratified random sample of the target population (i.e., the DT) was selected from a sampling frame (i.e., a total of 100,018 military and civilian personnel) available via the Defence Resource Management Information System. This sampling frame was stratified into 67 organizations covering the military commands of the Canadian Armed Forces (CAF; e.g., Army, Air Force, Navy, Military Personnel Command) and the organizations of the Department of National Defence (DND; i.e., the Assistant Deputy Ministers).

Random samples were drawn from each stratum with proportional allocation for component (i.e., Regular Force, Primary Reserve, and civilian personnel), sex, rank group for military members (i.e., non-commissioned members [NCMs] and officers), and years of service for civilian personnel. This proportional allocation increased the probability of good representation of survey respondents along these variables. The random samples yielded a total sample of 41,387 personnel (after necessary exclusions such as undeliverable emails) with a small expected margin of error (< 1%) for DT estimates.

The survey administration received approval from the DND/CAF Social Science Research Review Board. Selected personnel were invited to participate in a Defence Workplace Well-Being survey (DWWS) via email or post-cards, and the survey was live from May to August 2018. The respondents provided informed consent and were assured that only aggregate data would be reported. After data cleaning, 13,112 respondents remained, for an overall response rate of approximately 32%.

2.2 Sampling Weights

Respondents within each organization were post-stratified by component and rank group (i.e., junior NCM, senior NCM, junior Officer, and senior Officer) for military personnel and age group (i.e., up to 34, 35 to 54, and 55+ years of age) for civilians. Sampling weights were calculated so that respondents would represent the target population with respect to the original stratification variable (i.e., organization) and post-stratification variables (i.e., component and rank group for military personnel and age group for civilians). The discrepancies between the population estimates for other key demographics obtained from applying the sampling weights and the true population totals from the sampling frame were examined. The population estimates for sex and first official language (FOL) were close to the correct population totals (i.e., within 5% for sex and 1% for FOL) suggesting that the weights also produced reasonably accurate estimates along these demographics. Except where otherwise noted, we conducted the subsequent analyses on the weighted data.

2.3 Respondent Characteristics

Eighty-two percent of the DT completed the DWWS in English (vs. in French). Fifty-five percent of the DT were members of the Regular Force, 20% were members of the Primary Reserve, and 25% were civilian employees. Nineteen percent of the military members were officers, whereas 26% of the civilian employees occupied a managerial or supervisory position. Seventy-six percent of the DT were male, and 74% identified English (vs. French) as their FOL. Thirty-seven percent of the DT were younger than 35, 50% were between 35 and 54 years of age, and 13% were older than 54. Thirty-nine percent of the DT had served with the CAF or the DND fewer than 11 years, 33% between 11 and 20 years, and 29% served for 20 years or more.

Table 1: DWWS scales, factors, and associated sources.

Study Variable	Factor(s)	Scale	Source(s)	# Items
Demands				
1. Work Overload	Workload Management	Reilly Role Overload	[69,70]	6
2. Work-Family Conflict	Balance	Work-Family Conflict Subscale of the WFCS	[71]	5
3. Job Stress	Workload Management	Stress in General Scale	[72,73]	8
4. Abusive Supervision	Clear Leadership and Expectations, Psychological Protection, Civility and Respect	Abusive Supervision	[74,75]	5
Resources				
<i>Job</i>				
5. Autonomy	Involvement and Influence	Autonomy Subscale of the WRBNS	[76]	6
6. Impact	Involvement and Influence	Impact Subscale of the PES	[77]	3
7. Meaningful Work	Growth and Development	Meaning at Work Scale	[77]	3
8. Competence	Psychological Competencies and Requirements	Competence Subscale of the WRBNS	[76]	4
9. Role Clarity	Clear Leadership and Expectations	Role Ambiguity Scale	[78]	6
<i>Team</i>				
10. Relatedness	Psychological and Social Support	Relatedness Subscale of the WRBNS	[76]	6
11. Psychological Safety	Psychological Protection	Team Psychological Safety Scale	[79]	7
12. Civility and Respect	Civility and Respect	Interpersonal Justice Subscale of the OJS	[80]	4
<i>Leader</i>				
13. Transformational Leadership	Clear Leadership and Expectations	Global Transformational Leadership Scale	[81]	7
14. Supervisor's Safety Behaviors	Protection of Physical Safety	Group Safety Climate Scale	[82]	5
15. Supervisor's Safety Expectations	Protection of Physical Safety	Group Safety Climate Scale	[82]	5
<i>Organization</i>				
16. Organizational Support	Organizational Support	Perceived Organizational Support	[83]	8
17. Group Culture	Organizational Culture	Group-Oriented Organizational Culture Subscale of the OCP	[84,85]	4
18. Recognition and Reward	Recognition and Reward, Growth and Development	Contingent Reward Subscale of the JSS	[86]	4
Outcomes				
<i>Positive</i>				
19. Job Engagement	Engagement	Job Engagement Scale	[87]	18
20. Morale	N/A	Military Morale Scale	[88]	6
<i>Negative</i>				
21. Burnout	N/A	Oldenberg Burnout Inventory	[89]	8
22. Psychological Distress	N/A	Kessler Psychological Distress Scale	[90]	10
23. Turnover Intentions	N/A	Turnover Intentions	[91]	3

Note. WFCS = Work-Family Conflict Scale; WRBNS = Work-Related Basic Need Satisfaction Scale; PES = Psychological Empowerment Scale; OJS = Occupational Justice Scale; OCP = Organizational Culture Profile; JSS = Job Satisfaction Survey.

2.4 Measures

The DWWS included 23 scales reflecting both the resilience and risk factors included in the Standard and the positive and negative indicators of PH. Table 1 presents these scales, their source(s) and their number of items (for more detail on some of these scales, see Ivey, Blanc, Michaud, & Dobрева-Martinova⁶⁷). The internal consistency reliability estimates (i.e., Cronbach's alphas) reached a desirable value of .80 or greater, with the exception of the Supervisor's Safety Behaviors' estimate ($\sigma = .70$).⁶⁸ Table 2 displays weighted descriptive statistics for each of the study variables.

2.5 Analytic Strategy

2.5.1 The Dimensionality of PH

We examined the dimensionality of PH via confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM) with *Mplus* (Version 8; Muthén & Muthén⁹²) by means of its robust maximum likelihood (MLR) estimator. This estimator provides “maximum likelihood parameter estimates with standard errors and a Chi-square test statistic (when applicable) that are robust to non-normality and non-independence of observations when used with TYPE=COMPLEX”.⁹² With MLR, the default is to estimate models under missing data theory using all available data.⁹² This method, full information maximum likelihood (FIML), works reasonably well under various patterns and rates of missing data¹ (e.g., > 50%).^{93,94}

We report the Satorra-Bentler scaled Chi-square with its degrees of freedom (*df*) and *p* value. However, because this statistic can be overly sensitive to sample size^{95,96}, we interpreted the following approximate fit indices, corrected for non-normality and non-independence of observations: (a) the Steiger-Lind root mean square error of approximation (RMSEA)⁹⁷ and its 90% confidence interval (CI); and (b) the comparative fit index (CFI).⁹⁸ Values close to .06 and .95, respectively, suggest excellent data-model fit, and values close to .08 and .90, respectively, indicate acceptable fit.⁹⁹

In line with Morin and colleagues'¹⁰⁰⁻¹⁰² approach to the investigation of *construct-relevant psychometric multidimensionality*, we first set out to compare the results from the CFA and ESEM on the indicators of PH. We selected this approach because the indicators of PH represent *conceptually-related* or potentially overlapping constructs.^{100,101} We then contrasted the retained CFA or ESEM solution with its matching bifactor model to test the presence of construct-relevant psychometric multidimensionality due to the assessment of a *hierarchically-superior* – here, Global PH (GPH) – construct.^{100,101} In the case of the resilience and risk factors, given the potentially overlapping nature of these constructs, we explored both a CFA and an ESEM representation of the data.

We conducted the LPAs on the factor scores^{103,104} from the retained factor solution with *Mplus*⁹² MLR estimator and FIML. We examined one to eight profiles, based on our review of the PH literature to date, which points to the potential existence of between four and six profiles. In all LPAs, we freely estimated the means and variances of the factor scores.²⁵ We used 10,000 random sets of start values and 1,000 iterations for each random start, and we retained the 500 best solutions for final stage optimization.¹⁰⁵ All models converged on replicated solutions.

¹ In the current study, listwise deletion would have resulted in $n = 9661$ or approximately 74% of the initial sample.

Table 2a: Study variables: Weighted descriptive statistics.

Variable	Unweighted <i>n</i>	Potential range	<i>M</i>	95% CI		<i>SD</i>
				<i>LL</i>	<i>UL</i>	
Demands						
1. Work Overload	12,704	1-7	3.66	3.63	3.70	1.39
2. Work-Family Conflict	12,949	1-7	3.73	3.69	3.78	1.85
3. Job Stress	12,869	0-2	1.00	0.98	1.01	0.62
4. Abusive Supervision	12,927	1-5	1.42	1.40	1.44	0.81
Resources						
<i>Job</i>						
5. Autonomy	12,758	1-5	3.06	3.04	3.07	0.75
6. Impact	13,055	1-7	4.26	4.22	4.30	1.68
7. Meaningful Work	12,946	1-7	5.41	5.37	5.45	1.51
8. Competence	12,915	1-5	4.05	4.03	4.06	0.68
9. Role Clarity	12,915	1-7	4.97	4.93	5.00	1.49
<i>Team</i>						
10. Relatedness	12,874	1-5	3.57	3.55	3.59	0.83
11. Psychological safety	12,938	1-7	4.95	4.92	4.98	1.25
12. Civility and Respect	13,046	1-5	3.90	3.88	3.93	0.95
<i>Leader</i>						
13. Transformational Leadership	12,848	1-5	3.58	3.55	3.61	1.14
14. Supervisor's Safety Behaviors	12,971	1-5	3.34	3.33	3.36	0.65
15. Supervisor's Safety Expectations	12,893	1-5	3.65	3.63	3.67	0.79
<i>Organization</i>						
16. Organizational Support	12,882	1-7	4.69	4.66	4.73	1.43
17. Group Culture	12,789	1-5	3.46	3.44	3.49	1.00
18. Recognition and Reward	12,848	1-6	3.71	3.68	3.74	1.25
Outcomes						
<i>Positive</i>						
19. Job Engagement	12,770	1-5	3.88	3.87	3.90	0.68
20. Morale	12,997	1-5	3.39	3.37	3.42	0.97
<i>Negative</i>						
21. Burnout	12,830	1-4	2.46	2.44	2.47	0.65
22. Psychological Distress	13,112	10-50	18.29	18.09	18.49	8.22
23. Turnover Intentions	13,037	1-5	2.45	2.42	2.48	1.16

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit

2.5.1 PH Profiles

To guide our selection of the optimal number of PH profiles, we considered the following indices, which are particularly helpful in choosing the model that best recovers the sample's true parameters:^{105,2} the Bayesian Information Criterion (BIC)¹⁰⁶ and the Sample-Adjusted BIC (SABIC)¹⁰⁷, where lower values signify better

² The bootstrap likelihood ratio test⁸⁶, equally effective, is not available with TYPE=COMPLEX in *Mplus* (Version 8, Muthén & Muthén⁷⁰).

Table 2b: Zero-order correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Demands																								
1. Work Overload	-																							
2. Work-Family Conflict	.64	-																						
3. Job Stress	.65	.59	-																					
4. Abusive Supervision	.21	.26	.28	-																				
Resources																								
5. Autonomy	-.42	-.49	-.49	-.42	-																			
6. Impact	-.02	-.05	-.08	-.22	.45	-																		
7. Meaningful Work	-.10	-.14	-.09	-.22	.47	.37	-																	
8. Competence	-.10	-.10	-.11	-.08	.24	.26	.30	-																
9. Role Clarity	-.34	-.32	-.32	-.29	.53	.34	.34	.35	-															
10. Relatedness	-.23	-.25	-.26	-.28	.49	.35	.34	.25	.41	-														
11. Psychological Safety	-.30	-.36	-.40	-.49	.64	.42	.34	.21	.49	.59	-													
12. Civility and Respect	-.24	-.29	-.34	-.52	.55	.37	.32	.18	.40	.50	.70	-												
13. Transformational Leadership	-.28	-.28	-.33	-.51	.54	.34	.30	.13	.46	.43	.62	.58	-											
14. Safety Behaviors	-.23	-.18	-.23	-.38	.38	.29	.23	.10	.36	.36	.42	.40	.58	-										
15. Safety Expectations	-.26	-.27	-.27	-.41	.43	.24	.27	.11	.39	.35	.48	.43	.55	.55	-									
16. Organizational Support	-.39	-.46	-.43	-.44	.65	.38	.37	.14	.48	.47	.64	.57	.57	.44	.51	-								
17. Group Culture	-.29	-.35	-.37	-.45	.57	.37	.33	.14	.44	.45	.63	.64	.59	.45	.48	.73	-							
18. Recognition and Reward	-.37	-.38	-.40	-.34	.55	.28	.28	.06	.43	.40	.54	.48	.56	.39	.44	.62	.55	-						
Outcomes																								
19. Job Engagement	-.07	-.15	-.09	-.23	.49	.40	.65	.41	.40	.40	.38	.37	.35	.30	.30	.40	.40	.30	-					
20. Morale	-.35	-.36	-.36	-.30	.60	.40	.53	.35	.48	.51	.51	.48	.48	.37	.38	.57	.55	.47	.70	-				
21. Burnout	.53	.54	.56	.37	-.67	-.31	-.41	-.23	-.46	-.47	-.55	-.48	-.46	-.34	-.43	-.62	-.54	-.54	-.50	-.70	-			
22. Psychological Distress	.40	.40	.45	.39	-.50	-.26	-.30	-.24	-.40	-.43	-.48	-.41	-.36	-.26	-.32	-.50	-.43	-.39	-.35	-.56	.69	-		
23. Turnover Intentions	.34	.37	.35	.39	-.55	-.28	-.45	-.16	-.40	-.38	-.44	-.37	-.39	-.30	-.34	-.51	-.44	-.41	-.48	-.58	.60	.45	-	

Note. For zero-order correlations, *n* ranged from 12,367 to 13,112. Correlation coefficients greater than .02 are significant at the .05 level (two-tailed).

fit.¹⁰⁸ As sample sizes become larger, however, these indices may point to an ever-increasing number of profiles.¹⁰⁹ Thus, we depict, in an *elbow* plot the decreasing values of the BIC and SABIC as the number of profiles increases.^{25,110} The point at which the slopes flatten suggests the optimal number of profiles.²⁵ For descriptive purposes, we also report the entropy, which ranges between 0 and 1 and provides a summary of the classification accuracy, where higher values indicate greater accuracy.

2.5.2 Key Levers for PH

In order to identify key levers for leader-driven actions for positive change, we explored the relative importance of the associations between the workplace resilience and risk factors identified in the Standard and membership in the latent profiles through a series of logistic regression analyses in SAS (Version 9.4; SAS Institute Inc, 2014). These analyses took into account the following six social-demographic characteristics: gender, FOL, age group, organization, component, and disability status. We considered these specific characteristics to account either for their relationships with the outcome variable (i.e., disability status) or the sampling design (i.e., gender, FOL, age group, organization, component), because the logistic regression analyses could not include the sampling weights. To evaluate the relative importance of the associations between the factors and the outcome variable, we relied on the change in the Akaike Information Criterion (AIC) between the full logistic regression model and the model that excluded each factor in turn.^{111,112} A decrease in the AIC suggests that, in comparison to the other associations, the association between the factor of interest and the outcome variable is of greater importance.¹¹³

3.0 RESULTS

3.1 The Dimensionality of PH

The ESEM showed an acceptable data-model fit ($\chi^2[773] = 16,275.71, p < .001, RMSEA [90\% CI] = .039 [.039, .040], CFI = .91$; vs. $\chi^2[933] = 36,962.21, p < .001, RMSEA [90\% CI] = .054 [.054, .055], CFI = .79$ for the CFA model), generally well-defined factors (with the exception of the Turnover Intentions factor) with standardized factor loadings greater than .50 ($|\lambda| = .19-.94; M = .62$), and small-to-moderate cross-loadings ($|\lambda| < .01-.45; M = .12$),^{102,3} The ESEM resulted in a clearer differentiation between the factors ($|r| = .13-.59, M = .35$) relative to the CFA model, $|r| = .35-.74, M = .60$.

Compared to the ESEM, the subsequent bifactor ESEM showed an improved and excellent fit to the data, $\chi^2(733) = 10,072.12, p < .001, RMSEA [90\% CI] = .031 [.031, .032], CFI = .95$. The GPH factor was generally well defined, $|\lambda| = .25-.87; M = .57$. The Morale items, the Job Engagement items pertaining to Emotional Engagement, and the Turnover Intentions items, as well as the large majority of the Burnout and Psychological Distress items, presented fully satisfactory standardized factor loadings in the expected direction on the GPH factor. With the exception of Turnover Intentions, the specific factors retained a meaningful level of specificity ($|\lambda| = .01-.75; M = .45$), especially the Job Engagement factor, where the items pertaining to Cognitive and Physical Engagement all had standardized factor loadings greater than .50. Lastly, the superiority of the bifactor ESEM is also apparent from the reduced cross-loadings ($|\lambda| < .01-.34; M = .07$) relative to the ESEM.¹⁰²

³ The complete set of results is available upon request from the first author.

3.2 PH Profiles

When conducting LPA on a hierarchically-superior construct such as GPH, Morin et al.²² suggested incorporating this construct as an additional profile indicator in the LPA. After controlling for this general tendency shared across all indicators, unique variance may remain at the indicator level that allows for the identification of patterns across indicators.²² Failure to incorporate the hierarchically-superior construct makes identification of well-differentiated profiles significantly more challenging.²² Accordingly, we included the GPH factor along with the specific factors in the LPAs.

Table 3: Results from the Latent Profile Solutions

Profile	LL	#fp	CF	BIC	SABIC	Entropy
1	-105453.60	12	3.12	211020.98	210982.84	1.00
2	-99906.41	25	2.65	200049.85	199970.40	.68
3	-97410.85	38	3.30	195182.00	195061.24	.79
4	-95303.34	51	4.34	191090.23	190928.15	.82
5	-94188.20	64	3.74	188983.19	188779.81	.83
6	-93101.84	77	3.75	186933.75	186689.05	.81
7	-92074.85	90	3.56	185003.02	184717.00	.82
8	-91212.51	103	3.5	183401.60	183074.28	.83

Note. LL = loglikelihood; #fp = number of free parameters; BIC = Bayesian information criterion; SABIC = sample-size adjusted BIC.

We report the goodness-of-fit results from all LPAs in Table 3, the factor score means and variances associated with the four-profile solution in Table 4, and the elbow plot in Figure 1. The elbow plot points to the superiority of the four-profile solution. Furthermore, the five-profile solution simply split the fourth profile from the four-profile solution into two smaller profiles, resulting in a very small profile (1%) that only differed from the fourth profile on its levels of Burnout.

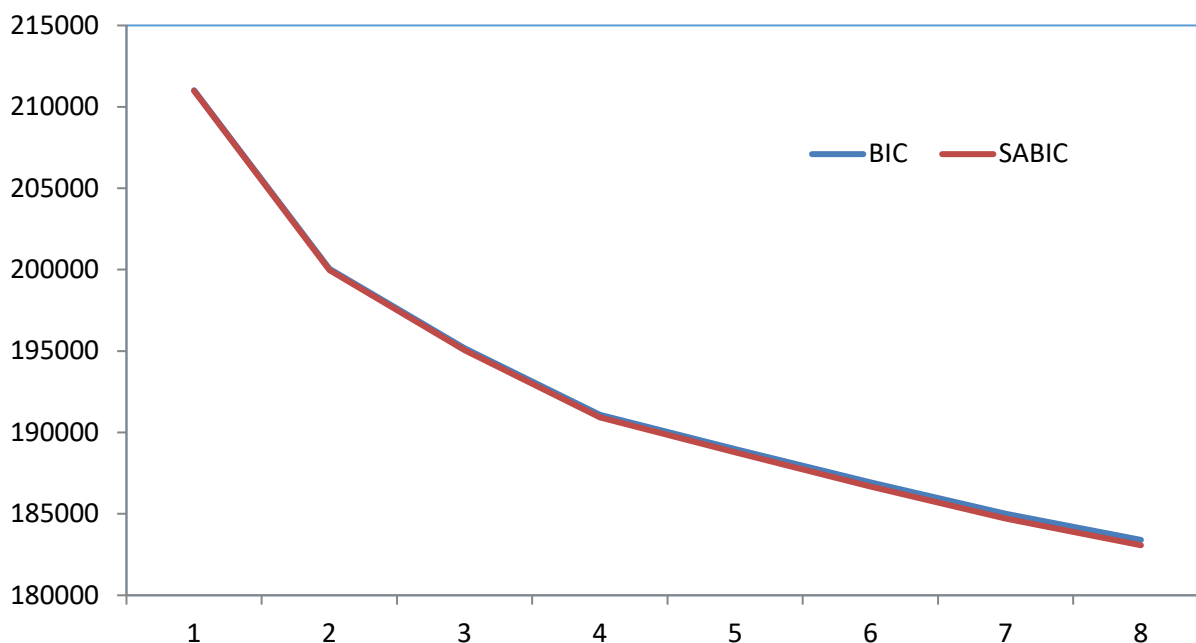


Figure 1: Elbow plot

Table 4: Profile-Specific Factor Scores [and 95% Confidence Intervals] on the PH Indicators

	Profile 1 Struggling (34%)	Profile 2 Normative (55%)	Profile 3 Coasting (6%)	Profile 4 Thriving (5%)
Within-profile means				
Global Well-Being	-0.92 [-1.04, -0.80]	0.38 [0.30, 0.45]	0.57 [0.54, 0.60]	1.43 [1.37, 1.48]
Morale	-0.01 [-0.07, 0.05]	-0.06 [-0.09, -0.03]	0.25 [0.12, 0.38]	0.44 [0.38, 0.49]
Job Engagement	0.01 [-0.05, 0.08]	-0.04 [-0.08, 0.01]	-0.35 [-0.37, -0.33]	0.84 [0.81, 0.87]
Burnout	-0.05 [-0.12, 0.03]	0.10 [0.05, 0.15]	-0.11 [-0.22, 0.01]	-0.66 [-0.89, -0.44]
Psychological Distress	0.30 [0.23, 0.37]	-0.15 [-0.20, -0.11]	-0.36 [-0.39, -0.34]	0.15 [0.12, 0.17]
Turnover Intentions	< .01 [-0.06, 0.06]	-0.02 [-0.05, 0.01]	0.11 [0.09, 0.13]	0.11 [0.07, 0.15]
Within-profile variances				
Global Well-Being	0.88 [0.81, 0.94]	0.35 [0.30, 0.41]	0.02 [0.01, 0.04]	0.02 [0.01, 0.03]
Morale	1.43 [1.28, 1.58]	0.56 [0.51, 0.60]	0.10 [-0.17, 0.37]	0.07 [0.03, 0.11]
Job Engagement	1.75 [1.56, 1.94]	0.56 [0.49, 0.63]	0.01 [0.00, 0.02]	0.01 [0.01, 0.02]
Burnout	0.97 [0.91, 1.04]	0.67 [0.63, 0.71]	0.22 [0.00, 0.44]	0.55 [0.37, 0.72]
Psychological Distress	1.96 [1.78, 2.14]	0.31 [0.23, 0.39]	0.03 [0.02, 0.04]	0.02 [0.01, 0.03]
Turnover Intentions	1.41 [1.22, 1.60]	0.54 [0.46, 0.61]	0.02 [0.00, 0.03]	0.03 [0.01, 0.04]

Turning to the four-profile solution, a *Struggling* (34%) profile shows low levels of GPH and moderately high levels of psychological Distress (see Figure 2). This profile’ standing on the other specific indicators of PH is

average. A *Normative* (55%) profile experiences moderately high levels of GPH along with an average standing on the specific indicators of PH. A *Coasting* (6%) profile also displays moderately high levels of GPH along with slightly elevated levels of Morale and moderately low levels of Psychological Distress. Compared to the Normative profile, this profile shows moderately low levels of Job Engagement, where Physical and Cognitive Engagement largely define this specific factor. This profile's standing on Burnout and Turnover Intentions is average. Lastly, a *Thriving* (5%) profile experiences high levels of GPH, in line with moderately high levels of Morale, high levels of Job Engagement, and moderately low levels of Burnout. This profile's standing on Psychological Distress and Turnover Intentions is average.

3.3 Key Levers for PH

An excellent data-model fit ($\chi^2[4,560] = 358,057.85, p < .001, RMSEA [90\% CI] = .015 [.015, .016], CFI = .97$), reduced factor correlations ($|r| = .01-.70, M = .24$; vs. $|r| = .02-.80, M = .43$), small-to-moderate cross-loadings ($|\lambda| < .00-.43; M = .03$)⁴, and, with the exception of the Autonomy factor, well-defined factors ($|\lambda| = .03-.98; M = .67$) largely supported the ESEM relative to the CFA model, $\chi^2(4,311) = 30,065.38, p < .001, RMSEA (90\% CI) = .021 (.021, .022), CFI = .93$. Prior to running the logistic regression analyses, we conducted Box-Tidwell tests on the workplace resilience and risk factor scores to examine whether or not they were linearly related to the outcome variable (i.e., membership in the Struggling profile).¹¹⁴ Some of these tests did not meet the linearity assumption. Hence, to address this concern, we built a semiparametric logistic regression model with a parametric component that included the social-demographic characteristics and a nonparametric component that included the factors.¹¹⁵ The parametric component of the regression analysis assumed linear relationships between the social-demographic characteristics and the outcome variable, whereas the nonparametric component did not. Because there were no large dependencies amongst the resilience and risk factor scores, we included all of them in the regression model simultaneously.

⁴ The complete set of results is available upon request from the first author.

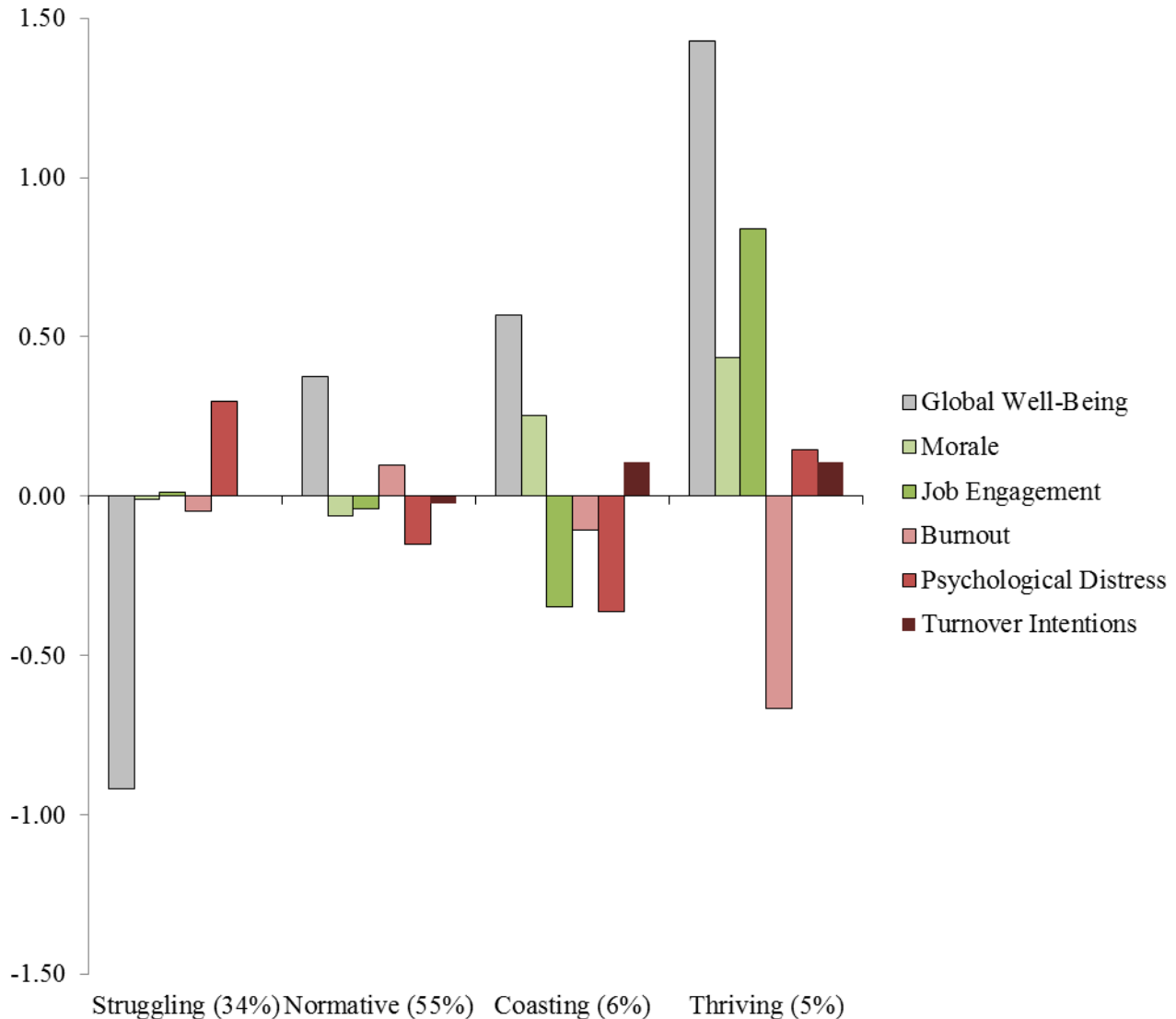


Figure 2: Defence Team's PH profiles.

Adjusting for multiple tests with a Bonferroni correction, Meaningful Work ($\chi^2[8] = 703.92, p < .001$), Relatedness ($\chi^2[3] = 157.49, p < .001$), Job Stress ($\chi^2[6] = 113.63, p < .001$), Organizational Support ($\chi^2[4] = 57.13, p < .001$), Work-Family Conflict ($\chi^2[7] = 51.29, p < .001$), Competence, ($\chi^2[4] = 50.95, p < .001$),

Recognition and Reward ($\chi^2[4] = 49.11, p < .001$), Abusive Supervision ($\chi^2[6] = 29.68, p < .001$), Role Clarity ($\chi^2[3] = 29.30, p < .001$), Work Overload ($\chi^2[5] = 22.48, p < .001$), Civility and Respect ($\chi^2[8] = 21.06, p = .007$), Impact ($\chi^2[2] = 19.03, p < .001$), disability status ($\chi^2[1] = 55.95, p < .001$) and FOL ($\chi^2[1] = 10.67, p = .001$) were significantly related to membership in the Struggling profile. Adding Meaningful Work ($\Delta AIC = 727.69$), Relatedness ($\Delta AIC = 150.81$), Job Stress ($\Delta AIC = 98.55$), Competence ($\Delta AIC = 58.91$), Recognition and Reward ($\Delta AIC = 39.53$), Organizational Support ($\Delta AIC = 33.88$), disability status ($\Delta AIC = 30.61$), and Work-Family Conflict ($\Delta AIC = 26.09$) to the model in turn led to sizable changes in the AIC. However, adding

the other social-demographic characteristics and workplace resilience and risk factors in the model in turn led to either small changes in the AIC (i.e., $0 < \Delta AIC < 20$) or to a worsening of the model fit.

4.0 DISCUSSION

4.1 Summary

As previously stated, our aims in conducting the current study, were to: (a) investigate the dimensionality of PH in the DT based on a mix of positive and negative indicators of PH, (b) identify PH profiles of the DT, and (c) relate membership in these profiles to the workplace resilience and risk factors identified in the Standard in order to identify key levers for leader-driven actions for positive change. In doing so, we provided noteworthy contributions to the study of PH in the workplace in general, and in military settings in particular. Notably, the present study relied on a state-of-the-art integrated variable- and person-centered framework for the investigation of the underlying dimensionality of PH. In line with Morin and colleagues' findings,^{4,22} variable-centered approaches (i.e., CFA, ESEM, and bifactor ESEM) revealed the presence of two distinct sources of construct-relevant psychometric multidimensionality underlying the indicators of PH in the current study. Specifically, the results pointed to Morale, Job Engagement, Burnout, Psychological Distress, and Turnover Intentions as conceptually related constructs subsumed under a GPH factor. The adoption of this representation of PH makes it possible to explicitly represent the global overarching PH construct while also taking into account the information associated with the specific PH dimensions.

The results of a series of LPAs, a person-centered methodology, using the best-fitting variable-centered measurement model (i.e., the bifactor ESEM) as a starting point, showed that meaningful specificity remained in the PH dimensions after accounting for global levels of PH. Precisely, four distinct PH profiles emerged from the data that revealed both different levels of GPH and patterns of results on the specific PH dimensions. This finding suggests that relying on a single overarching PH score to describe DT members would result in a loss of information. For example, two of the four uncovered profiles had moderately high levels of GPH, but their patterns of results on the specific PH dimensions were quite different. Reporting only a GPH score to characterize these profiles would fail to recognize their unique characteristics.

On the positive side, moderately high levels of GPH along with average scores on the specific factors characterized the dominant (55% of the DT) Normative profile. Similar to the Normative profile, the Coasting (6%) profile presented moderately high levels of GPH, but compared to the Benchmark profile, it showed moderately low scores on the Job Engagement factor. Individuals in this profile may bear a resemblance to Grant's¹¹⁶ "happy but disengaged" employees who are present but not actively engaged with the organization's goals or its daily work. The relative prevalence of high levels of GPH was low (5%), a finding that aligns with several past studies.^{24,100,101} Last, the relatively large size (34%) of the Struggling profile, characterized by low levels of GPH and moderately high levels of Psychological Distress (yet average scores on the other specific factors) also parallels past findings.^{24,100}

4.2 The Way Ahead

As Suurd Ralph, Dobрева-Martinova, and Ivey noted, the DWWS team is now getting ready for stakeholder re-engagement for the action planning and implementation phases of its assessment-to-solutions approach, taking a positive psychology slant and focusing on primary interventions (e.g., transformational leadership training programs).¹¹⁷ At the unit- or organization-level, the results of the DWWS will inform the development and prioritization of actions in collaboration with leaders to address well-being in their workplace. Considering that approximately one third of the DT reported experiencing low levels of PH coupled with moderate levels of

Psychological Distress, leaders should prioritize actions for positive change that promote an evolution from the Struggling profile to the Normative profile. By highlighting the critical factors associated with PH, our findings can provide a starting point for developing such actions. For example, across the DT, Meaningful Work, Relatedness, and Job Stress were amongst the strongest predictors of membership in the Struggling profile. Specifically, lower levels of Meaningful Work and Relatedness and higher levels of Job Stress were associated with greater odds of belonging to the Struggling profile. Thus, leaders could focus their efforts on those key levers for PH that are also areas of concern –unit- or organization-level reporting will highlight these areas, as well as areas of strength – for their unit or organization.

4.3 Study Limitations

Despite its notable contributions, the current study presents limitations. In addition to its reliance on self-report data (associated with social desirability and common method biases), it is based on a cross-sectional design, thereby making it impossible to reach clear conclusions regarding the probable causal effects of the workplace resilience and risk factors on PH profile membership. We simply situated the factors as predictors of profile membership based on theoretical expectations of their expected role in relation to PH.⁶⁷ Future research would, thus, benefit from a longitudinal design and the investigation of the stability of the profiles over time, and of the directionality of relationships between the profiles, their predictors, and their potential outcomes.

In order to mitigate survey fatigue, we left out important individual differences (e.g., Big Five personality traits) that are likely predictive of PH profile membership. Emotional stability, for example, has been shown to be negatively associated with health impairment (i.e., physical and psychological symptoms) directly and indirectly through perceptions of job demands (i.e., work overload and work-family conflict).¹¹⁸ Aspects of extraversion and conscientiousness (i.e., assertiveness and industriousness) have been shown to be positively associated with work engagement directly and indirectly through perceptions of meaningful work.¹¹⁹ Openness to experience, conscientiousness, and emotional stability measured in CAF NCM recruits prior to basic military qualification (BMQ) have been shown to be negatively associated with turnover intentions and actual attrition after BMQ.¹²⁰ Given the involvement of the five-factor model of personality in one or more of the well-being outcomes, as well as the levers of action, future research would benefit from examination of the personality correlates of profile membership, particularly to better understand the role of durable traits in lower workplace well-being and to potentially design person-treatment studies to help those more likely to struggle.

Although previous findings showed that the measures included in the DWWS were largely equivalent across their English and French versions¹²¹, comprehensive measurement invariance testing of the entire DWWS is currently underway to ensure that responses from both versions of the DWWS can be pooled together for reporting and/or for meaningful comparisons. Lastly, future research may attempt to replicate our findings in other organizations, both nationally and internationally. It would be worthwhile to investigate whether or not the dimensionality of PH, the profiles, and the relationships between the profiles and their predictors hold across diverse organizations and in other countries/cultures.

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