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The meaning of service questionnaire and its association with psychological growth among Veterans

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ABSTRACT

Few studies have investigated what soldiers find meaningful after being exposed to highly stressful events and what positive effects they might have in the aftermath. This study reports the psychometric properties of a newly developed questionnaire, Meaning of Service (MoS), and its application to the study of how strongly meaning-making processes are associated with psychological growth. One hundred eighty-four Norwegian Air Force Veterans who have participated in various missions abroad in different branches of the military completed the MoS questionnaire along with other scales reflecting psychological growth, hardiness, resilience, stress, and exposure, as well as personal and mission characteristics. The principal component analysis mainly identified three major meaning themes as expected from previous qualitative research (*Confirmation of ability, Cohesion of peers, and Significance of effort*). The hierarchical regression analysis showed that all three meaning themes and two coping strategies were associated with psychological growth, and that *Confirmation of ability* (coping and recognition of coping) seems particularly important to enhance Veterans' prospects of psychological growth. Future research directions are proposed including suggestions for minor modifications of the questionnaire.

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KEYWORDS

Meaning of service; growth; Veteran; military; air force

What is the public significance of this article?—This study suggests that finding meaningful aspects of service in war promotes psychological growth. Finding meaning by coping with stressful situations and being recognized for it appear particularly important to enhance Veterans' prospects of psychological growth such as increased personal strength and appreciation of life.

War experiences and stressful events might affect people for life. In order to adapt to stressful events, people engage in meaning-making processes that might lead to different positive outcomes (Park, 2010). Several studies document positive consequences from war experiences, for instance psychological growth (Schok, Kleber, Elands, & Weerts, 2008). Studies that have examined factors related to growth seem only to explain a small proportion of the variance in growth, and research into new factors has been called for (Linley & Joseph, 2004). Few studies have investigated processes of meaning-making in order to explain the prevalence of growth in a military context (Schok et al., 2008). The overall aim of this study is to contribute to this field of research by establishing a questionnaire that captures

the meaning-making processes of Veterans and testing its association to growth.

Meaning is a concept difficult to define, but people often use it to describe what they consider personally significant and valuable (Park, 2010). Meaning-making refers to the process of finding meaning in situations that challenge already established beliefs and goals, which can be defined as global meaning. Global meaning encompasses our core beliefs about benevolence, justice, control, and chance in the world and beliefs about moral, self-control, and luck (Janoff-Bulman, 1989; Park, 2010). Particularly stressful life experiences might create a discrepancy between appraised meaning of an event and global meaning. A discrepancy motivates individuals to find new meaning from their experiences or change their global meaning (Park, 2010).

Capturing meaning-making

The current research identifies two characteristics as essential in meaning-making processes, assigning meaning to the service, and using coping strategies. Stressful experiences in a military context might be perceived as

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being both consistent and inconsistent with global meaning. For instance, threat might be perceived both as loss of control as well as an opportunity to prove yourself, depending on the interpretation (Lien, Firing, Bendixen, & Kennair, 2016). The positive meaning constructs from such experiences signify that threat and risk involved in a deployment were worthwhile (Schok et al., 2008). Thus, assigning positive meaning to aspects of the service is in this article defined as efforts to reduce the discrepancy between the appraised meaning of an event (e.g. loss of control), and global meaning (e.g. taking control) that is caused by exposure to stress. Efforts made to reduce discrepancies have also been operationalized to include the use of different coping strategies within nonmilitary studies (Park, 2010). The study of Lien et al. (2016) is relevant for the design of a questionnaire that capture meaning-making processes. They explored what aspects of the military service Veterans found meaningful in international operations, and reported both consistent and inconsistent meaning constructs, as well as the use of coping strategies.

The present research introduces the MoS questionnaire, which is based on prior qualitative research conducted by Lien et al. (2016). In the study of Lien et al. (2016), 3 meaning themes were identified based on thematic analysis of in-depth interviews with 13 Norwegian Afghanistan Veterans. The first, *Confirmation of ability*, referred to the experience of coping with stressful situations and being recognized for it. The second, *Cohesion of peers*, referred to belonging to a team and the experience of backing and caring. The third, *Significance of effort*, referred to as perceiving the effort of the unit as a contribution, and receiving recognition and gaining status for it (Lien et al., 2016). Finding meaningful aspects of the service are considered to be appraised meaning of the service that is consistent with global meaning (Lien et al., 2016). Furthermore, the construction of these meaning themes is assumed to be efforts to reduce discrepancies between the appraised meaning of an event and global meaning that is caused by exposure to stress.

Not all efforts result in finding new and positive aspects of the service. Some constructions of meanings do not reduce discrepancies between the appraised meaning of an event and global meaning such as meaning themes do. Lien et al. (2016) also identified that assigning meaning to certain parts of an event could result in finding new and negative aspects of the service, referred to as inconsistency themes. These inconsistency themes contradict the positive meaningful themes and add to the existing discrepancies between the appraised meaning of an event and global meaning that is caused by exposure to stress. Inconsistency themes might

activate meaning-making coping strategies in an effort to reestablish the importance of meaning themes.

Lien et al. (2016) found that the inconsistency category *Ambivalence toward action* activated the coping strategy *Counterfactual thinking* which related to how the Veterans simultaneously both wanted and did not want to experience action, and how they referred to good luck (a counterfactual negative outcome) if they did not experience action or experienced action that went well. Furthermore, the inconsistency category *Unreliable Team Members* activated *Downward Comparison*, which related to how the Veterans sometimes felt unsafe around some of their colleagues, something that gave rise to unfavorable characteristics and descriptions (downward comparison) of those being worse off. *Indifference of civilians* activated *Justification*, which related to how Veterans often found that civilians were not interested in their experience, following their explanations (justifications) for joining the deployment to Afghanistan (Lien et al., 2016).

While there already exist several questionnaires that measure various meaning-related concepts, none of these truly concentrate on meaning-making processes after being exposed to stressful events. Some questionnaires address what most people find meaningful in their lives (Mascaro & Rosen, 2008). For instance, the Personal Meaning Profile measures to what degree people find meaning in seven specific areas in life (Wong, 1998). In addition, Steger, Frazier, Kaler, and Oishi (2006), developed the Meaning in life questionnaire (MLQ) which measures the presence of meaning and search for meaning without specifying any concrete meaningful areas in life. Other report associations between these questionnaires and measures of distress and mental health (Mascaro & Rosen, 2008; Steger et al., 2006). What is more, other questionnaires address personal dispositions or motivation that might have an impact on meaning-making processes in the context of stressful events (Mooren, Schok, & Kleber, 2009). For instance, Sense of Coherence (SOC) measures how experiences are perceived as comprehensible, manageable, and meaningful (Antonovsky, 1987). SOC is described as a coping disposition (Sammallahti, Holi, Komulainen, & Aalberg, 1996), and is found to be associated (Pietrzak, Goldstein, Malley, Rivers, & Southwick, 2010) and not to be associated with growth (Linley & Joseph, 2004). Furthermore, Mooren et al. (2009) developed the Meaning of War Scale as an attempt to clarify the significance of meaning from experiences of war and violence. The Meaning of War Scale measures meaning-related thoughts and assumptions through the following four dimensions: 1) Distrust, 2) Growth, 3) Adhering to religion, and 4) Causal explanations (Mooren et al.,

2009). These dimensions seem to correspond to outcomes of meaning-making processes such as psychological growth, changed global meaning, and causal understanding as described in Park (2010).

Outcomes of meaning-making

Research on meaning-making processes report different possible outcomes from being exposed to stressful events. Psychological distress often follows exposure to stressful events (Tedeschi & Calhoun, 2004), and a successful meaning-making process is believed to lead to adaptation of distress (Park, 2010). However, research has revealed that meaning-making might be associated with both an increase and a decrease in distress (Park, 2010). Outcomes might also involve general psychological effects such as a change in global meaning. This also involves negative changes, such as lack of trust in others (Mooren et al., 2009) or finding human life to be worthless and the world to be unjust (Schok, Kleber, & Boeije, 2010). Another such general psychological effect of meaning-making processes is growth (Park, 2010). Posttraumatic growth (Tedeschi & Calhoun, 2004), posttraumatic change (Nordstrand, Hjemdal, Holen, Reichelt, & Bøe, 2017), perceived benefits (Britt, Adler, & Bartone, 2001) and related terms refer to psychological changes as when people being exposed to highly stressful events view themselves as stronger and more confident than before, value their relationships more, and rethink what is most important in life (Joseph & Linley, 2005). Some also report of negative changes in growth dimensions after war experiences (Nordstrand et al., 2017).

Outcomes of meaning-making processes might also be described through certain meaning constructs that refer to a specific stressful experience. For instance, people might refer to how they have accepted or made sense of bereavement, chronic illness, or some other personal crises (Park, 2010). In a military context, research also reveals the general meaning constructs of soldiers that do not always concern a specific stressful experience but rather other aspects of the service. Such meaning assigned to the service might be conceptualized differently, both as meaning-making efforts and outcomes of meaning-making processes. For instance, Schok et al. (2010) explored “*personal meanings that Veterans assign to their deployment experiences*” (p. 281) and reported both meaning assigned to the service (such as comradeship among the soldiers) and meaning in terms of growth (such as increased value for life), without distinguishing between these two meaning constructs. However, Britt et al. (2001) examined whether meaningfulness of work in peacekeeping operations

predicted perceived benefits (growth) after redeployment.¹ Thus, they investigated whether meaning assigned to the service had any positive psychological effects such as growth.

Aims and predictions

In the present research, different meaning structures reflecting meaning-making processes were made applicable to a Veteran sample through a newly developed questionnaire, Meaning of Service (MoS). The first aim of this study is to report on the psychometric properties of this questionnaire, covering the following meaning constructs: meaning themes, inconsistency categories, and coping strategies. We predict that meaning themes, inconsistency categories, and coping strategies are identified as separate constructs in a Principal Component Analysis (PCA). The second aim of this study is to report on the meaning of constructs’ associations with psychological growth. We predict that the meaning themes are positively associated with growth. A previous study shows that some experiences are inconsistent with experiences Veterans have found meaningful and that the use of coping strategies can reduce the impact of such inconsistent experiences (Lien et al., 2016). Consequently, coping strategies might be positively associated with growth, in particular when the experience of an inconsistency category is high rather than low. Thus, we also predict that inconsistency categories will affect the relationship between coping strategies and growth. This is based on an assumption that those who will reestablish meaning by the use of adequate coping strategies are those having experienced a high degree of inconsistencies.

We also want to control for objective and subjective measures of stress, resilience, and hardiness. Previous research have showed that objective- and subjective measures of stress have proven to be predictors of growth (Fontana & Rosenheck, 1998; Maguen, Vogt, King, King, & Litz, 2006). Other predictors of growth include hardiness (Britt et al., 2001) and resilience (Lepore & Revenson, 2006). Resilience which includes social support systems that might provide peer support (Pietrzak et al., 2010) and post-deployment support (Maguen et al., 2006) are considered most relevant for the present study.

In sum, our predictions are as follows:

- (1) Meaning themes, inconsistency categories, and coping strategies are identified as separate constructs in a principal component analysis.
- (2) Objective stress, subjective stress, hardiness, and resilience are associated with growth.
- (3) The MoS questionnaire is associated with growth, i.e., Themes of meaning, and Coping strategies

are positively associated with growth, and inconsistency categories will affect (e.g. moderate or mediate) the relationship between coping strategies and growth.

Method

Design and participants

A cross-sectional study was carried out on active Air Force Personnel Veterans in Norway between September and November 2016. Of those invited to participate, 87% ($n = 184$) completed the questionnaire (93% men).² All predefined age groups were represented in the sample (ranging from *25 and younger* to *50 and older*). Median grouped age was 41–45 years. The sample consisted of conscripts, noncommissioned, and commissioned officers in the Norwegian Air Force who had participated in one or more of the missions in which the Norwegian Air Force has been engaged during the last two decades. Based on characteristics of gender, age, and mission, this sample is representative of the population of the Norwegian Air Force Veterans.³

Procedure

Local unit commanders at a number of military Air Force bases in Norway were initially contacted and Veterans still in service were invited to participate in the study during local unit meetings. One researcher informed the Veterans verbally or in writing, emphasizing the purpose of the study, that it was voluntary, and that confidentiality was guaranteed. Then, the questionnaire was handed out to all Veterans present, and the researcher left the room. To ensure that there was no pressure to participate involuntarily, all Veterans handed in the questionnaire in a sealed envelope regardless of whether or not they had completed it. The procedure was approved by the Norwegian Center for Research Data (Personvernombudet, NSD). Most Veterans completed and submitted the questionnaire on site. For 23 of the Veterans participating in this study, the information and the questionnaire were distributed via e-mail (completed questionnaires were collected at a later point in time).

Measurements

Objective stressors

We applied four different measures of objective stress from two different questionnaires in the present study. Objective stressors included the following indexes: (1) Combat exposure index (CEI) and (2) Moral provocation

index (MPI) (Forsvarets Sanitet [Norwegian Defense Medical Service], 2013; Hougsnæs, Bøe, Dahl, & Reichelt, 2016). The CEI consisted of 14 items and included questions about being under attack, being wounded, taking lives, being exposed to improvised explosives, or being involved in severe accidents. The MPI consisted of eight items and had questions about handling corpses, seeing other soldiers being wounded or killed, experiencing sexual harassment, witnessing brutality toward others, or acting immorally oneself. These two indexes were rated on a scale with responses 0 (*No*), 1 (*1–3 times*), 2 (*4–7 times*), and 3 (*More than 7 times*). To complement these indexes, we added four items from the (3) War-related threat (WRT) index and four items from the (4) Risk of equipment failure (REF) index from the Critical incidents during mission questionnaire (Moldjord, Laberg, & Rundmo, 2015). The WRT included questions about flying into conflict areas, patrolling during night or in bad weather conditions, being exposed to fire and shrapnel, and maneuvering away from threats. The REF index included questions about use of equipment not meeting operational demands, having technical problems, avoidance of rules and regulations, and operating without radio contact. These two indexes were rated on an 8-point Likert scale from 0 (*Never*) to 7 (*Continuously*). The internal reliability for the CEI ($\alpha = 0.72$), the MPI ($\alpha = 0.74$), the WRT index ($\alpha = 0.73$), and the REF index ($\alpha = 0.75$) was all acceptable.

Subjective stressors

Subjective stressors were measured with a 27-item questionnaire reflecting four subscales; (1) Experience of threat, (2) Experience of safety and coping, (3) Experience of work and rest, and (4) Experience of family relations (Forsvarets Sanitet, 2013). The items included questions about stressor load from possible attacks, perception of safety, perception of workload and stressors connected to separation from family. The participants rated their responses on a 5-point Likert scale from 0 (*not at all*) to 4 (*very much*). The internal reliability for the Experience of threat was good ($\alpha = 0.86$), while for the Experience of safety ($\alpha = 0.73$), for the Experience of work and rest ($\alpha = 0.70$) it was acceptable,⁴ and for the Experience of family relations it was good ($\alpha = 0.80$).

Resilience scale (RSA)

For measuring resilience, we applied the 33-item Resilience scale for adults (RSA; Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003; Hjemdal, Friborg, Stiles, Rosenvinge, & Martinussen, 2006) that covers six subscales; (1) Perception of self, (2) Planned future, (3) Social competence, (4) Family cohesion, (5) Social

resources, and (6) Structured style. The participants rated their responses on a 7-point scale ranging from 1 (*difficult to accomplish*) to 7 (*feasible*). The internal reliability of the 33-item scale was excellent ($\alpha = 0.92$).

Hardiness

Hardiness was measured with a 15-item scale (Norwegian version-revised; Hystad, Eid, Johnsen, Laberg, & Bartone, 2010). Hardiness covers three subscales; (1) Commitment, (2) Challenge, and (3) Control (Maddi, 2013). The sample-item statement was: *Most of my life is spent doing things that are meaningful*. The participants rated their responses on a 4-point scale from 1 (*not at all true*) to 4 (*completely true*). The internal reliability of this scale was acceptable ($\alpha = 0.77$).

Psychological growth

We applied two complementary measures for psychological growth in this study. First, we applied the 10-item short-form of the posttraumatic growth inventory (PTGI-SF, Norwegian version; Cann et al., 2010). The PTGI-SF covers five subscales: (1) Relating to others, (2) New possibilities, (3) Personal strength, (4) Spiritual change, and (5) Appreciation of life. The sample-item statement was: *I changed my priorities about what is important in life and I have a greater sense of closeness with others*. The participants rated their responses on a 6-point Likert scale from 0 (*no change*) to 5 (*change to a very great degree*). Then, we applied the posttraumatic change scale (PTCS) that was developed by Nordstrand et al. (2017). The 26-item questionnaire measures both positive and negative changes across four subscales: (1) Self-confidence, (2) Interpersonal involvement, (3) Awareness, and (4) Social adaptability. Sample items were “*my ability to manage stress is . . .*,” and “*my contact with other people in general is . . .*.” The participants rated their responses on a 5-point Likert scale from -2 (*much worse than before*), 0 (*no change*) to 2 (*much better than before*). Particular attention was given to Personal strength and Appreciation of life of PTGI and the Self-confidence (SC) and Awareness dimension of PTCS, since these subscales reflect what Veterans often report of growth (Erbes et al., 2005; Maguen et al., 2006; Nordstrand et al., 2017; Pietrzak et al., 2010). The internal reliability of the 10-item PTGI scale was excellent ($\alpha = 0.92$). The subscales covering the Personal strength and the Appreciation of life dimension showed good internal consistency (both $\alpha = 0.82$). The reliability of the 26-item PTCS scale was good ($\alpha = 0.85$). The reliability of the Self-confidence dimension was good ($\alpha = 0.82$), and the Awareness dimension was acceptable ($\alpha = 0.68$).

Meaning of service (MoS)

The MoS questionnaire was constructed for this study in order to measure the degree to which the personnel had found meaningful aspects of doing military service in international operations (meaning themes), and experiences of inconsistencies of such experiences and accompanying meaning-making coping strategies (inconsistency themes) as found in Lien et al. (2016). The final 28-item MoS questionnaire covered a 16-item meaning themes section: (1) *Confirmation of ability*, (2) *Cohesion of peers*, and (3) *Significance of effort*. It also included six-item inconsistency categories which together with a separate six-item coping questionnaire covered three pairs of inconsistency themes; (1) *Ambivalence to action* which activates the coping strategy *Counterfactual thinking*, (2) *Unreliable team members* which activates *Downward comparison* and (3) *Indifference of civilians* which activates *Justification*. The participants rated their responses on a 5-point Likert scale from 1 (*not at all*) to 5 (*to a great extent*) on all items.

Statistical analysis

To examine the factor structure for meaning themes, inconsistencies of meaning, and coping strategies, we performed a PCA analysis of all 28 items covered by the MoS questionnaire. Furthermore, hierarchical multiple regression analyses were conducted on the outcome measures of psychological growth; PTGI (and the subscale Personal strength and Appreciation of life), and PTCS (the subscale Self-confidence and Awareness). Hierarchical analyses were applied to study possible mediator effects. All analyses were performed using IBM SPSS Statistics version 24.

Results

Examining the factor structure for meaning of service (MoS)

We performed a principal component varimax (maximum likelihood) analysis with orthogonal rotation on the 28-item MoS questionnaire to establish a sound factor structure ($n = 183$).⁵ Although this is an explorative methodology, our analyses were guided by the meaning and inconsistency themes as identified in the qualitative work of Lien et al. (2016). In short, we expected to identify the following three meaning themes to load on separate components: *Confirmation of ability*, *Cohesion of peers*, and *Significance of effort*. We also expected the different inconsistency categories to load on separate components. This would result in three separate loadings of the inconsistency categories, such as *Ambivalence to action*, *Unreliable team*

members, and *Indifference of civilians*, and three separate loadings of the coping strategy categories, such as *Counterfactual thinking*, *Downward comparison*, and *Justification*. The final analysis is shown in [Appendix A](#).

Assumptions for data analysis were first evaluated, where the two items relating to *Ambivalence to action* were removed from further analysis due to low communality ($< .25$ after extraction). Furthermore, the two items relating to the category Status (Significance of effort) were removed because they did not fit the factor structure and appeared to be measuring something else. If an item loaded on more than one factor we considered the relative factor loading and the conceptual relationship with the remaining component items. Items in bold indicate items selected. The first three factor loadings are in accordance with the expected structure and reflect the themes of meaning as found in the previous research (Lien et al., 2016). *Confirmation of ability* (with i14 discarded) was internally consistent ($\alpha = 0.78$), as was also *Cohesions of peers* ($\alpha = 0.83$) and *Significance of effort* ($\alpha = 0.72$).

The themes of inconsistencies were not in accordance with the expected structure (Lien et al., 2016). Here, we expected that the remaining five variables would load on five different factor loadings. However, the inconsistency category *Unreliable team members* was discarded because it loaded on the meaning themes *Cohesion of peers*. *Justification* was also discarded as it loaded on the same component as *Indifference of civilians*. Thus, a variable, *Indifference of civilians*, with four items, was established with an acceptable internal consistency of ($\alpha = 0.69$). In addition, a variable, *Counterfactual thinking*, with two items, was established with an acceptable internal consistency ($\alpha = 0.69$), and a variable, *Downward comparison*, with two items, was established with a good internal consistency ($\alpha = 0.87$).

Psychological growth: mean level and correlates

We identified several participants ($n = 32$) who only had been stationed in bases in Europe and/or were personnel who had not experienced any objective stress, i.e., typical support personnel working within a base in non-conflict areas.⁶ Based on the premise that a person needs to experience stressors in order to report growth, these Veterans were excluded, leaving 151 eligible for analysis. Normality of distributions was checked throughout and transformations were deemed unnecessary (Dunlap, Chen, & Greer, 1994).

As can be seen from the means in [Appendix B](#), participants reported low levels of growth ($M = 1.3$) on the PTGI scale (0 indicates no change). One-in-four

(23%) reported no growth. Comparable low levels of change ($M = 0.3$) were reported using the PTSC scale (0 indicates no change). Significantly, none of the Veterans reported on the different aspects as worse than before. Of the various PTGI and PTCS subscales, participants reported relatively more growth on the following subscales: Personal Strength ($M = 1.9$) and Appreciation of life ($M = 1.8$) in relation to PTGI, Self-Confidence ($M = 0.6$), and Awareness ($M = 0.5$) in relation to PTCS. The zero-order correlations in [Appendix B](#) suggest that the various predictors of growth were moderately to strongly associated. The associations among the various domains of objective stressors, subjective stressors, resilience, and meaning themes were moderate to strong (correlations in the $r = .31$ to $r = .54$ range). The subjective stressor – family relations – was less strongly associated with the other subjective stressor domains. Furthermore, the associations between the predictors of subjective stressors, objective stressors, and coping strategies were moderately strong, while resilience and hardiness showed no association with any of the objective stressors. Two of the meaning themes (*Cohesion of peers* and *Significance of effort*) were negatively associated with subjective stressors, while the various domains of objective and subjective stressors were positively associated with coping strategies. Psychological growth, as measured with PTGI and PTCS, was moderately associated with the meaning theme Confirmation of ability. Associations between psychological growth and objective and subjective stressors were positive, but varied across stressor domains. Finally, resilience was not associated, and Hardiness was not consistently associated with measures of psychological growth.⁷

Hierarchical multiple regression analysis

We conducted hierarchical multiple regression analyses that examined predictors of the two measures of psychological growth, PTGI and PTCS. In separate additional analyses, we also predicted the PTGI subscales Personal strength and New possibilities, and the PTCS subscales Self-confidence and Awareness. In line with the principle of parsimony, we discarded for each Block variables that were not significant. We entered variables on objective stressors first (Model 1). Next, we entered variables on subjective stressors (Model 2), and Hardiness (Model 3). The three meaning themes were entered in Model 4 and the two coping strategy variables were entered in Model 5.

In the final model (Model 5, [Table 1](#)), objective stress as measured with the moral provocation index (MPI) significantly increased the level of psychological growth

Table 1. Predictors of posttraumatic growth (PTGI). Hierarchical multiple regression analysis, trimmed model (n = 149).

	R^2	R^2_{adj}	F	B	$SE\ B$	β	t	p
Model 1	0.09	0.09	15.37					
Objective stress – Moral Provocation Index (MPI)				.74	.19	.31	3.92	.000
Model 4	0.21	0.19	18.95					
Objective stress – Moral Provocation Index (MPI)				.66	.18	.27	3.70	.000
Meaning Theme – Confirmation of Ability				.52	.12	.34	4.53	.000
Model 5	0.24	0.22	14.92					
Objective stress – Moral Provocation Index (MPI)				.54	.19	.22	2.96	.004
Meaning Theme – Confirmation of Ability				.50	.11	.32	4.40	.000
Coping Strategy Cohesion – Downward Comparison				.14	.06	.18	2.38	.019

(PTGI) together with the meaning theme *Confirmation of ability* and the coping strategy *Downward comparison*. These predictors accounted for 24% of the variance in PTGI. The strongest predictor for growth was *Confirmation of ability*, which alone accounted for about 11% of the variance. The meaning theme *Significance of effort* was significant if *Confirmation of ability* was excluded, and accounted for 6% of the variance in Model 5, $F(3,145) = 11.01$, $p < .01$. The Subjective stressor variable Experience of work and rest significantly predicted PTGI in Model 2 and Model 3. However, this effect was fully accounted for by the variables in Model 4 and Model 5. Hardiness did not predict PTGI over and above the effects of subjective stressors.

The hierarchical regression model predicting the PTGI subscale Personal strength accounted for 22% of the variance in the final model. In Model 4 the meaning theme *Confirmation of ability* $F(1, 148) = 36.70$, $p < .01$, $R^2 = .20$, and in Model 5 the coping strategy *Downward comparison* $F(2, 147) = 22.00$, $p < .01$, $R^2 = .22$ significantly increased the level of Personal strength. The meaning theme *Significance of effort* accounted for 4% of the variance in Model 5, $F(1, 148) = 6.22$, $p < .01$, if *Confirmation of ability* was excluded. The MPI index was significant in Model 1 together with Hardiness in Model 3. However, the effects of these variables were fully accounted for by the variables in Model 4 and Model 5.

The hierarchical regression model predicting the PTGI subscale Appreciation of life accounted for 20% of the variance. In Model 5 the MPI index $F(1,147) = 14.30$, $p < .01$, $R^2 = .09$, Experience of work and rest $F(2,146) = 10.76$, $p < .01$, $R^2 = .13$, the meaning theme *Confirmation of ability* $F(3,145) = 9.79$, $p < .01$, $R^2 = .17$, and the coping strategy *Downward comparison* $F(4, 144) = 8.90$, $p < .01$, $R^2 = .20$ significantly increased the level of Appreciation of life. In Model 1, the MPI index and Risk of Equipment Failure (REF) index significantly predicted Appreciation of life, but the effect of REF Index was mediated by the subjective stressors in Model 2.

The hierarchical regression model predicting the PTCS accounted for 16% of the variance. In the final model, the objective stress of MPI index $F(1,149) = 7.53$, $p < .01$, $R^2 = .05$, and the meaning theme *Confirmation of ability* $F(2, 148) = 14.16$, $p < .01$, $R^2 = .16$ significantly predicted growth. *Cohesion of peers* accounted for 5% of the variance, $F(2, 148) = 8.29$, $p < .01$ when *Confirmation of ability* was excluded.

The hierarchical regression model predicting the PTCS subscale Self-confidence accounted for 31% of the variance. In Model 5, objective stress of Risk of equipment failure index (REF) $F(1,148) = 9.73$, $p < .01$, $R^2 = .06$, step three with Hardiness $F(2,147) = 8.61$, $p < .01$, $R^2 = .11$, step four with the meaning theme *Confirmation of ability* $F(3, 146) = 18.52$, $p < .01$, $R^2 = .28$ and step five with the coping strategy *Counterfactual thinking* $F(4, 145) = 16.02$, $p < .01$, $R^2 = .31$ significantly increased the level of Self-confidence. *Cohesion of peers* accounted for 3% of the variance, $F(1, 148) = 6.22$, $p < .05$, when *Confirmation of ability* was excluded. The MPI index, the War related threat (WRT) index, and the REF index significantly predicted Self-confidence in Model 1 to 3, but the effects were fully accounted for by the variables in Model 4 and Model 5.

The hierarchical regression model predicting the PTCS subscale Awareness accounted for 9% of the variance. In Model 5, only the subjective stress of Experience of threat $F(1,149) = 14.40$, $p < .01$, $R^2 = .09$ significantly increased the Awareness level. The MPI index and REF index were independently significant in Model 1. However, the effects of these indexes were accounted for in Model 2.

Discussion

Psychometric properties of MoS and associations with growth

The present study reports the psychometric properties of Meaning of Service (MoS) questionnaire and how strongly it is associated with psychological growth.

First, we predicted that the previously identified meaning themes, inconsistency categories and coping strategies (Lien et al., 2016) would appear as separate constructs in a PCA analysis. The analysis revealed a factor structure of three meaning themes: *Confirmation of ability*, *Cohesion of peers*, and *Significance of effort*, as predicted. However, none of the three pairs of inconsistency categories and coping strategies converged to the presumed factor structure, leaving us with the following two coping strategies for further analysis: *Counterfactual thinking* and *Downward comparison*. This partly supports our prediction. Overall, 5 out of 24 items failed to fit the expected factor structure based on the original qualitative analyses of Lien et al. (2016). The wording of these five items was rephrased as shown in the revised MoS questionnaire in the Appendix.

Second, we predicted that objective stress, subjective stress, hardiness, and resilience were associated with growth. The results showed that all of these predictors were associated with growth except resilience. Hardiness was associated with growth through the PTCS Self-confidence dimension. This is somewhat different from the study of Britt et al. (2001) who found an association between hardiness and Perceived benefits which reflects several dimensions of growth (Britt et al., 2001). The subjective stressor variables *Experience of threat* and *Experience of work and rest* were predictors of the PTGI appreciation of life dimension and PTCS awareness dimension, respectively. These results indicate that life threat might redefine priorities in life as supported by findings of Maguen et al. (2006), and that high workload and limited time to rest might have a corresponding effect. In addition, the regression analyses revealed that all of the significant objective stressors were found to be mediated by meaning themes and coping strategies in at least one of the analyses. This supports the notion that psychological growth is not a direct result of being exposed to stressful events, but rather due to the management of the psychological distress they cause (Tedeschi & Calhoun, 2004).

Third, we predicted that the MoS questionnaire was associated with growth. *Confirmation of ability* was positively associated with all analyzed measures of growth except the PTCS Awareness dimension. *Cohesion of peers* and *Significance of effort* were also significant predictors of growth in some analyses, but did not add to the explained variance. Furthermore, *Downward comparison* was associated with the PTGI analyses, including the Personal strength and Appreciation of life dimensions. This is consistent with a description of coping strategies as a general predictor of growth (Linley & Joseph, 2004). However, the *Counterfactual thinking*

coping strategy was only associated with the PTSC Self-confidence dimension. This suggests that *Counterfactual thinking* is used to buffer a reduced perception of control and self-efficacy as proposed in Lien et al. (2016). Overall, this partly supports our prediction. Furthermore, Veterans often report growth of the particular growth dimensions we have analyzed in the current research, such as Appreciation of life and Personal strength (Pietrzak et al., 2010). These dimensions of growth might be regarded as personal changes, in comparison to relational changes and existential changes (Nordstrand et al., 2017). This might explain why *Confirmation of ability* was significant in most analyses and that *Cohesion of peers* and *Significance of effort* are more relevant predictors of relational and existential dimensions of growth. Alternatively, a more complex empirical relationship than the conceptual model proposed in Lien et al. (2016) is needed to explain all dimensions of growth.

Increasing meaningfulness and growth

Despite not being able to verify every construct proposed in Lien et al. (2016), the current research suggests a possible direction for how to increase the soldiers' experience of meaningfulness and growth. The *Confirmation of ability* meaning theme and the *Counterfactual thinking* coping strategy are relevant and important original contributions to the study of growth and meaning construction among Veterans. This theme signifies the importance of coping and recognition of coping in order to satisfy a need for efficacy and control (Lien et al., 2016). Self-efficacy is typically enhanced by performance experiences, observation of role models, and verbal persuasion (Maddux, 2002). This indicates that soldiers who perform well in live military operations not only increase their self-efficacy but also establish meaning constructs that promote growth. This speaks in favor of rotations systems so that most soldiers are engaged in operations and avoid being stuck in camp for the entire deployment. It also speaks in favor of units to have regular feedback sessions where positive aspects of coping efforts are emphasized.

Being exposed to morally questionable situations seems to lead to meaning-making processes that are more thorough than for other stressors. In some analyses, objective and subjective stressors were associated with growth without being mediated by meaning themes or coping strategies. In particular, moral provocation stands out as such a predictor of growth in several of the analyses. This indicates that the soldiers in the current study have established meaning constructs from

moral dilemmas that have not been part of the current research, but that still predict growth. Moral dilemmas reflect types of situations where soldiers are uncertain about how to react, and that bring about a need to contextualize and justify one's own behavior and the behavior of others (Litz et al., 2009). Thus, meaning constructs from moral dilemmas should be made explicit among the soldiers in order to create common knowledge of prudent ways to behave when confronted with moral challenges in war. Consequently, initiatives from leaders before and during the deployment that increase this competence of the soldiers might promote growth and possibly reduce moral injury known to cause long-term health problems (Litz et al., 2009).

The role of peers seems to be an important aspect of meaning-making among soldiers. Peer cohesion in the current study was associated with growth. However, resilience (RSA; Friborg et al., 2003; Hjemdal et al., 2006) which includes support from family and friends, was not associated with growth. Thus, whereas team members seem to provide the best support in the construction of meaning in a military context (Pietrzak et al., 2010), family and friends may be more important in other contexts (Schroevers, Helgeson, Sanderman, & Ranchor, 2010). This reveals the importance of peers to support the development of meaning constructs during service. Since construction of meaning might be revised over time (Skaggs & Barron, 2006), peers might still play an important role when Veterans have returned to their home base. Consequently, programs to facilitate talks between Veterans after redeployment which also address possible distress could benefit the Veterans concerning general psychological health and growth (Tedeschi & McNally, 2011). Such talks should also include inconsistent meaning constructs such as meaningless, frustrating, and disappointing experiences in order to normalize the experience and increase the knowledge of meaning-making processes.

Limitations and future research

The present research has used a cross-sectional design and cannot discern any causal relationships between the variables. A longitudinal design should be employed in future research to document causal associations between different predictors of growth. While the present research is primarily representative for Norwegian Air Force personnel, these findings can probably be generalized to other samples of Veterans as there are similarities between the current research in meaning constructs and research of other nationalities, branches of the military services and missions (Gustavsen, 2016; Schok et al., 2010). In addition, the use of the PTCS in future studies

might also shed light on the differences between PTGI and PTCS, revealing important understanding of meaning-making processes. We have found the MoS questionnaire to include relevant factors when considering determinants of psychological growth. Further research with the revised MoS questionnaire might reveal how meaning themes, inconsistency categories, and coping strategies might predict all dimensions of the PTGI and PTCS measures. However, there might be other themes of meaning to include in future studies (Schok et al., 2010). These could be meaning themes that mediate moral provocation and other stressors found to be predictors in the current study, which ultimately will give us more knowledge of the needed effort to enhance growth of Veterans.

Conclusion

The aim of this research has been to develop a new questionnaire called Meaning of Service (MoS) and to test its associations with growth in a Veteran sample. The present study has found that MoS is related to two different validated measures of growth, also when controlling for stressor load and hardness. Future studies are needed to further validate the revised MoS questionnaire and explore how meaning themes might predict other dimensions of growth not analyzed here. Given the relatively strong relationship between meaning themes and growth found in this study, further longitudinal studies should examine whether different meaning themes are associated with growth in other Veteran samples. In particular, it seems that the *Confirmation of ability* factor captures an important aspect of the process of growth in Veterans. This particular meaning theme calls for focus on coping and recognition of coping among peers in military units in order to enhance Veterans' prospects of psychological growth.

Notes

1. Meaningfulness of work was defined as: (a) "*being engaged in important and relevant work during the operation*" and (b) "*experiencing events during the course of the deployment that put the deployment in a broader contextual framework*" (p. 55). Perceived benefits measured if soldiers became more aware of problems in the world, were better to deal with stress, appreciated life more and appreciated family more than before.
2. Two respondents were excluded from the analyses due to a lack of response on several questions.
3. Based on data received from the Norwegian Armed Forces of the population of still active Air Force Veterans, the sample in this study was not significantly different according to the following calculation of Chi-

square goodness of fit: gender $\chi^2(1) = 0.08, p > .05$, age $\chi^2(6) = 6.09, p > .05$ and mission $\chi^2(6) = 12.55, p > .05$. MPA P3 missions from Seychelles and Sicily were not part of the study and accounted for 5% of the population.

4. Four items used relating to work load, demanding work and the possibility to rest and be alone when needed.
5. One respondent was identified as an outlier and excluded from further analysis based on the combination of the a high inter-quartile range of 6.5 on objective stressor variable (CEI), having served a total of over 50 months in international operations and with low level of growth on PTGI and PTCS.
6. For instance, technical personnel stationed in Crete during air operations over Libya in 2011.
7. We found a negative correlation between PTGI and the RSA dimension Family cohesion.

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No potential conflict of interest was reported by the authors.

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Appendix A. Factor Loadings for the Meaning of Service Questionnaire (n = 183)

	Factor loadings					
	1	2	3	4	5	6
Confirmation of Ability (meaning category)						
i12 I received feedback for doing my job well (Recognition Ability)	.80	.26				
i2 I heard from others that I did a good job (Recognition Ability)	.72					
i9 I got to challenge myself and prove I was able to do my job (Coping)	.44	.33				
i14 I experienced that prior training helps in the job I had (Coping)		.43	.26		-.29	
Cohesion of Peers (meaning category)						
i16 I felt like a part of my unit (crew, platoon, group) (Belonging)		.76				
i22 In my unit (crew, platoon, group) we cared about each other outside work (Caring)		.67				
i1 In my unit (crew, platoon, group) we supported each other during operations (Backing)		.64	.25			
i10 Our unit became a united group of friends (crew, platoon, group) (Belonging)		.64				
i11 I had someone in my unit (crew, platoon, group) I could share intimate thoughts and feelings with (Caring)		.58				
i19 In my unit (crew, team, group), I could rely on help from others if I needed job support (Backing)		.56				
Significance of Effort (meaning category)						
i7 As a unit we were recognized for our work (Recognition effort)			.63			-.28
i18 I understood the importance of the work our squad was assigned (Contribution)			.55			
i21 My unit was told we had an important job (Recognition effort)	.35		.48			
i3 I saw the effect of the work we did in our unit (Contribution)	.31		.48			
Counterfactual thinking (coping strategy category)						
ci2 We were lucky in some situations – the result could have been way worse than it was				.99		
ci6 We were lucky to not end up in more dangerous situations than we did				.50		
Impaired Cohesion (inconsistency category)						
i20 I worked with people I was confident would react well to a dangerous situation (R)		-.52				
i8 I cooperated with people I could trust would solve their part of the job (R)		-.46	-.33		.26	
Downward Comparison (coping strategy category)						
ci5 Some people in my unit (crew, team, group) did not have the required set of skills, in contrast to us					.94	
ci3 Some people in my unit (crew, team, group) should not have been there with us					.77	
Little Significance (inconsistency category)						
i5 Civilians understood what we were engaged in (R)						.63
i17 Civilians showed interest in what we did (R)			-.27			.54
Justification (coping strategy category)						
ci3 Civilians could never quite understand why we participated voluntarily in such operations						.63
ci6 There is little reason to explain to civilians why one deploys to such operations			.27			.54

(R) = reversely coded

Appendix B. Zero-order Associations (Pearson's r) for Predictor and Outcome Variables (n = 149-151)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1 Objective stressor – Combat Exposure	-																					
2 Objective stressor – Moral Provocation	.48**	-																				
3 Objective stressor – War-Related Threat	.55**	.37**	-																			
4 Objective stressor – Risk of Equipment Failure	.36**	.46**	.47**	-																		
5 Subjective stressor – Threat	.45**	.48**	.42**	.46**	-																	
6 Subjective stressor – Safety and Coping	.25**	.25**	.25**	.28**	.44**	-																
7 Subjective stressor – Work and Rest	.21**	.24*	.27**	.38**	.41**	.30**	-															
8 Subjective stressor – Family Relations	.07	.17*	.06	.23**	.29**	.17*	.07	-														
9 Resilience – RSA	.01	.01	.04	-.16	-.08	-.36**	-.02	-.25**	-													
10 Hardiness	.07	.08	.09	-.03	-.05	-.23**	-.06	-.20*	.52**	-												
11 Meaning theme Confirmation of Ability	.13	.10	.12	.07	.13	-.03	.12	-.01	-.01	.17*	-											
12 Meaning theme Cohesion of Peers	.19*	.10	.18*	.06	.02	-.24**	-.02	-.19*	.27**	.13	.43**	-										
13 Meaning theme Significance of Effort	.04	-.09	-.08	-.10	-.15	-.20*	-.16*	-.11	.07	.00	.50**	.41**	-									
14 Coping Strategy Ability Counterfactual Thinking	.39**	.38**	.44**	.39**	.45*	.24**	.30**	.11	-.10	-.08	.11	.16*	.04	-								
15 Coping Strategy Cohesion Downward Comparison	.18*	.28**	.09	.42**	.18*	.09	.22*	.03	-.14	-.04	.10	.01	.06	.21**	-							
16 Posttraumatic growth inventory (PTGI)	.07	.31**	.13	.21*	.24**	.16*	.23*	.06	-.12	.12	.36**	.15	.20*	.20*	.28**	-						
17 Personal Strength PTGI	.09	.18*	.13	.14	.20*	.15	.18*	-.01	-.10	.22**	.44**	.13	.21*	.20*	.22**	.84**	-					
18 Appreciation of Life PTGI	.15	.31**	.20*	.30**	.27**	.18*	.26**	.11	-.11	.06	.25**	.09	.11	.23**	.28**	.84**	.62**	-				
19 Posttraumatic change scale (PTCS)	.08	.22**	.14	.19*	.17*	.07	.17*	-.09	-.04	.17*	.36**	.25**	.12	.19*	.11	.69**	.68**	.58**	-			
20 Self Confidence PTCS	.17*	.19*	.22**	.23**	.18*	.02	.18*	-.11	-.05	.22**	.45**	.25**	.15	.28**	.18*	.55**	.70**	.46**	.81**	-		
21 Awareness PTCS	.10	.17*	.12	.22**	.30**	.07	.17*	.03	-.06	.12	.18*	.07	-.02	.14	.07	.56**	.46**	.56**	.75**	.49**	-	
Mean	0.1	0.4	1.4	2.5	1.7	2.0	2.3	2.4	5.4	3.5	3.7	3.7	3.6	2.7	2.7	1.3	1.9	1.8	0.3	0.6	0.5	
SD	0.2	0.4	1.2	1.4	0.5	0.5	0.4	0.6	0.7	0.3	0.6	0.6	0.6	1.0	1.2	0.9	1.3	1.2	0.2	0.4	0.3	

*p < 0.05, **p < 0.01, RSA – Resilience Scale for Adults.

Appendix C. Revised Meaning of Service Questionnaire

Meaning of Service (MoS)

Please mark one option ranging from “not at all” to “to a great extent” that best fits the following statements regarding your participation in international operations.

i1	In my unit (crew, team, group) we supported each other when solving missions/tasks
i2	I heard from others that I did a good job
i3	I saw the effect of the work we did in our unit
i4	Even though it involved personal risk, a part of me hoped for the possibility to overcome challenging situations
i5*	People outside the armed forces understood what we were doing
i6	As a unit, we received recognition for our work.
i7	I worked with people I could not trust doing their part of the job
i8	I challenged myself and I proved I was able to do my job
i9	Our unit became a united group of friends (crew, team, group)
i10	I had someone in my unit (crew, team, group) I could share intimate thoughts and feelings with
i11	I received feedback for doing my job well
i12	A part of me wished to show that I worked well in action-filled situations, even though it was dangerous
i13	I received feedback for being good at my job
i14	I felt like a part of my unit (crew, team, group)
i15*	People outside the armed forces showed interest in what we did
i16	I understood the importance of the work our squad was assigned
i17	In my unit (crew, team, group), I could rely on help from others if I needed it
i18	I worked with people I was not sure would react well to a dangerous situation
i19	My unit was told we had an important job
i20	In my unit (crew, team, group) we cared about each other outside work/missions

In my service during international operations (intops) I think that ...

C11

it has been important for me to explain to outsiders why I chose such a service
we were lucky in some situations – the result could have been way worse than it was

C12

some people in my unit (crew, team, group) should not have been there with us

C14

I have had to defend my decision to participate in intops to civilians

C15

some people in my unit (crew, team, group) did not have the required set of skills, in contrast to us
we were lucky to not end up in more dangerous situations than we did

C16

* Indicates that items are reversed. **Bold** indicates suggested new and rephrased items.

Remarks on the Revised MoS questionnaire: *Recognition ability* (i14) and *Ambivalence to action* (i4, i13) were changed to better fit this category. *Justification* (C11, C14) was rewritten to describe a coping strategy of *justification*. In hindsight, the original items were not a coping strategy, something that the PCA analysis also indicated. Questions of *Unreliable team members* (i8, i20) were written without reversal to describe an inconsistency theme.