Danger- and non-danger-based stressors and their relations to posttraumatic deprecation or growth in Norwegian veterans deployed to Afghanistan

Andreas Espetvedt Nordstrand, Hans Jakob Bøe, Are Holen, Jon Gerhard Reichelt, Christer Lunde Gjerstad & Odin Hjemdal

To cite this article: Andreas Espetvedt Nordstrand, Hans Jakob Bøe, Are Holen, Jon Gerhard Reichelt, Christer Lunde Gjerstad & Odin Hjemdal (2019) Danger- and non-danger-based stressors and their relations to posttraumatic deprecation or growth in Norwegian veterans deployed to Afghanistan, European Journal of Psychotraumatology, 10:1, 1601989, DOI: 10.1080/20008198.2019.1601989

To link to this article: https://doi.org/10.1080/20008198.2019.1601989

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

Published online: 29 Apr 2019.

Submit your article to this journal

View Crossmark data
Danger- and non-danger-based stressors and their relations to posttraumatic deprecation or growth in Norwegian veterans deployed to Afghanistan

Andreas Espetvedt Nordstrand a,b, Hans Jakob Bøe a,c, Are Holen d, Jon Gerhard Reichelt e, Christer Lunde Gjerstad a,f and Odin Hjemdal b

a Institute of Military Psychiatry, Norwegian Armed Forces Joint Medical Services, Trondheim, Norway; b Department of Psychology, NTNU, Norwegian University of Science and Technology, Trondheim, Norway; c Vestre Viken Hospital Trust, Division of Mental Health and Addiction, Kongsberg DPS, Kongsberg, Norway; d Department of Mental Health, NTNU, Norwegian University of Science and Technology, Trondheim, Norway; e Norwegian Armed Forces Joint Medical Services, Oslo, Norway; f Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway

ABSTRACT

Objective: This study aimed to explore how exposure to danger-based and non-danger-based stressors may influence personal changes in veterans (N = 4053) after deployment to Afghanistan.

Method: Twelve war zone related traumatic events were used to form two stressor categories. The non-danger-based category included two stressor types: Moral Challenges and Witnessing, and the danger-based category included one type: Personal Threat. Thus, three stressor types were explored in relation to self-reported personal changes after war zone stressor exposure, e.g. negative changes labelled posttraumatic deprecation, positive changes labelled posttraumatic growth or no major change. Furthermore, the relationship between the stressor types and reported levels of distress were explored.

Results: The two non-danger-based stressor types, Moral Challenges (p < .001) and Witnessing (p < .001), were both significantly more associated with deprecation rather than growth, when compared to Personal Threat. Moreover, the non-danger-based stressors were significantly associated with a rise in posttraumatic stress symptoms, as well as a rise in symptoms of depression, anxiety and insomnia (p < .001). In contrast, exposure to the danger-based stressor was only significantly associated with a rise in the posttraumatic stress symptoms in the current model (p < .001). Reports of no-change were significantly associated with low degrees of exposure to all the three stressor types (p < .001).

Conclusion: The current study highlights the special adverse effects of non-danger-based stressors. Our findings show that they are more associated with posttraumatic deprecation rather than with growth. This underscores the heterogeneity of responses to traumatic events and adds to the current knowledge about the impact of various stressor types.

Estresores basados en peligro y estresores no basados en peligro en relación con declive postraumático o crecimiento postraumático en veteranos noruegos desplazados a Afganistán

Objetivo: El objetivo del estudio fue explorar cómo la exposición a estresores basados en peligro y a estresores no basados en peligro puede influenciar cambios personales en veteranos (N = 4053) luego de ser desplazados a Afganistán.

Métodos: Doce eventos traumáticos relacionados a zonas de guerra se usaron para elaborar dos categorías de estresores. La categoría de estresores no basados en peligro incluyó a dos tipos: Desafíos Morales y Ser Testigo. La categoría de estresores basados en peligro incluyó un tipo: Amenaza Personal. Consecuentemente, se exploró la relación de tres tipos de estresores con los cambios personales auto reportados luego de la exposición a estresores de zona de guerra; así, los cambios negativos fueron etiquetados como ‘declive postraumático’, y los cambios positivos como ‘crecimiento postraumático’ o como ‘sin cambio significativo’. Adicionalmente, se exploró la relación entre los tipos de estresores y los niveles reportados de sufrimiento.

Resultados: Los dos tipos de estresores no basados en peligro, Desafíos Morales (p < .001) y Ser Testigo (p < .001) estuvieron significativamente más asociados a declive que a crecimiento, cuando fueron comparados con Amenaza Personal. Asimismo, los estresores no basados en peligro estuvieron significativamente asociados a un incremento en síntomas de estrés postraumático, así como a un incremento en síntomas de depresión, ansiedad e insomnio (p < .001). En contraste, la exposición a estresores basados en peligro estuvo únicamente asociada de manera significativa a un incremento en síntomas de estrés postraumático según el modelo actual (p < .001). Los reportes de no haber experimentado un cambio estuvieron asociados significativamente a bajos niveles de exposición a los tres tipos de estresores (p < .001).

ARTICLE HISTORY
Received 1 December 2018
Revised 11 March 2019
Accepted 14 March 2019

KEYWORDS
Posttraumatic growth; posttraumatic stress; military; trauma; moral injury; veterans

PALABRAS CLAVE
Crecimiento Postraumático; Estrés Postraumático; militares; trauma; daño moral; veteranos

HIGHLIGHTS
• Danger-based trauma is closely linked to posttraumatic growth.
• Non-danger-based trauma is mostly linked to posttraumatic deprecation.
• Non-danger-based trauma is associated with a broader range of distress symptoms after exposure.

CONTACT Andreas Espetvedt Nordstrand a.e.nordstrand@gmail.com Institute of Military Psychiatry, Norwegian Armed Forces Joint Medical Services

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (http://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.
Traditionally, the focus of traumatic stress research has been on fear-based events consisting of danger and horror, as exemplified by Norris (1990, 1992). She suggested that traumatic stress consists of ‘violent encounters with nature, technology, or humankind’ (Norris, 1992, p. 409). Such stressors are often referred to as personal life threats (Shea, Pesseau, Finley, Reddy, & Spofford, 2017; Xue et al., 2015). In many traumatic situations, however, peritraumatic fear may not be present, and the threat to life or body may not be the most stressful part of the incident (Shakespeare-Finch & Armstrong, 2010; Yehuda, Southwick, & Giller, 1992). Sensory impressions of death or major suffering of others by seeing, hearing, touching or smelling can in itself be traumatic. This type of trauma is commonly referred to as Witnessing stressors (Carson et al., 2000; Dryden, 2012; Fontana, Rosenheck, & Brett, 1992; Pietrzak, Whealin, Stotzer, Goldstein, & Southwick, 2011; Stein et al., 2012). Moreover, Witnessing stressors can also include learning about the death or injury of someone close (Stein et al., 2012). A typical example from the conflict in Afghanistan is witnessing the aftermath of a terrorist attack on a civilian target.

Some experiences involving human maliciousness, can also be traumatizing, without a life-threat or danger. Instead, the most stressful aspect may rather involve major provocations of the individual’s values and morality. Such moral stressors have been defined as ‘perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations’ (Litz et al., 2009, p. 700). Being involved in actions resulting in civilian casualties due to collateral damage is one example of a moral stressor. Distinctions that are more general have also been made, categorizing incidents involving personal threat as Danger-Based Stress, and moral stressors as well as witnessing incidents together as Non-Danger-Based Stress (Ramage et al., 2015).

Neuro-imaging studies have indicated that danger-based and non-danger-based stressors activate quite different locations in the brain. Ramage et al. (2015) found that only danger-based stressors elicited increased metabolic activity in the fear circuitry involving the amygdala. In contrast, the non-danger-based stressors increased the metabolism in the precuneus, a part of the medial parietal cortex involved in episodic memory and self-processing operations (Cavanna & Trimble, 2006). This divergence in location with regards to the neural activities may suggest differences in how the brain is processing danger- and non-danger-based stressors; the finding underscores the relevance of exploring the differences between the two (Norrholm & Jovanovic, 2010). Furthermore, several studies suggest that various types of traumatic stressors may produce different symptomatic outcomes. Generally, danger-based stressors are associated with a hyperarousal symptom cluster, while non-danger-based stressors seem associated rather with a depression symptom cluster (Pietrzak et al., 2011; Ramage et al., 2015; Shea et al., 2017; Stein et al., 2012). Moreover, non-danger-based stressors may precipitate more posttraumatic distress than the danger-based stressors (Litz et al., 2009; Nash et al., 2010; Ramage et al., 2015).

Exposure to major stressors tend to be disruptive and lead to negative psychological developments in individuals (Norris, 1992; Ozer, Best, Lipsy, & Weiss, 2003; Yehuda et al., 1992). However, a...
growing body of research also indicates that many individuals report positive psychological developments, such as greater personal strength or closer relationships, after such stressors (Linley & Joseph, 2004). Positive psychological development after exposure to trauma has been referred to by labels such as posttraumatic growth (PTG), stress-related growth, benefit finding and posttraumatic change (Helgeson, Reynolds, & Tomich, 2006; Park & Helgeson, 2006; Tedeschi & Calhoun, 1996). However, concerns have been raised about the most common ways of operationalizing such concepts, as several studies found that self-reported growth was closely associated with high levels of distress and psychopathology (e.g. Frazier, Conlon, & Glaser, 2001; Holgersen, Boe, & Hølen, 2010; Taylor & Armor, 1996).

One reason for this may be that prevalent instruments, such as the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996) and Stress-Related Growth Scale (Park, Cohen, & Murch, 1996), only allow the respondents to report positive developments. It has been proposed that this may produce a major response bias toward reports of illusory changes (Park & Helgeson, 2006). In recent advances, however, both negative, positive or no change can be reported on each item (Marshall, Frazier, Frankfurt, & Kuijjer, 2015; Nordstrøm, Hjømndøl, Hølen, Reichelt, & Boe, 2017). When using this format, positive developments have been found to correlate negatively with psychological distress (Nordstrøm et al., 2017). Negative developments represent posttraumatic depression, increased distress and even other kinds of psychopathology, while positive posttraumatic development imply growth (PTG) unlinked to psychopathology and distress (Livneh, McMahon, & Rummill, 2018). No change, on the other hand, can be indicative of either insufficient traumatic exposure to initiate any posttraumatic development or to resilience (Ozer et al., 2003; Tedeschi & Calhoun, 2004). The assumption is that bi-directional response options reduce the risk of capturing pseudo-growth associated with high levels of distress (Armel, Gunthert, & Cohen, 2001; Cheng, Wong, & Tsang, 2006; Livneh et al., 2018). This approach may also add to the current understanding of aetiology, diagnostic classification and treatment after trauma (Karanci & Acarturk, 2005; Maguen, Vogt, King, King, & Litz, 2006; Steenkamp, Litz, Hoge, & Marmar, 2015).

In this study we wanted to explore war zone stressors categorized as danger-based stressors and non-danger-based stressors, the latter divided into Moral Challenges and Witnessing. The aim was to explore the links between these three types of stressors and the posttraumatic outcome in terms of the subsequent development towards deprecation, growth or no posttraumatic change, and also their associations with posttraumatic distress and personal changes. Specifically, we hypothesized that non-danger-based stressors would contribute more towards higher levels of psychological distress.

1. Methods

1.1. Participants

The study used data from a cross-sectional, post-deployment survey carried out during the spring of 2012. All Norwegian military personnel deployed to Afghanistan between late 2001 and the end of 2011 were invited to participate. A total of 7155 male and female personnel were identified by the Recruiting Department of the Norwegian Armed Forces to fit the requirements. Of the invited personnel, 4225 (59%) responded in total: 1931 (46%) by mail and 2294 (54%) on the web. Twenty-nine respondents answered both by mail and on the web. In these 29 cases, duplicates were removed to retain only one survey response per person. Of the responses, 172 (2.4%) were either incomplete or active refusals. The non-responders plus those with incomplete responses and active refusals amounted to 3102 (43.3%) persons. In all, 4053 individuals returned fully completed questionnaires, resulting in a final response rate of 56.7%. Table 1 shows the demographic characteristics of the participants and the non-responders.

1.2. Procedure

The identified personnel received an invitation by mail to take part in the study by completing a 20-page questionnaire. The respondents could either return a paper version by mail or complete the questionnaire in a digital format on the web. A responder incentive was offered; the participants were included in a lottery of three sport watches. The data collection phase lasted 13 weeks, from 20 February to 24 May 2012 and included two reminders to those who did not respond.

Table 1. Demographic characteristics of participants (56.7%) and non-responders (43.3%) of Norwegian Afghanistan veterans (N = 7155) by numbers and percentage.

|                | Participants N = 4053 (%) | Non-Responders N = 3012 (%) |
|----------------|--------------------------|-----------------------------|
| Biological Sex (female)* | 336 (8.3) | 164 (5.3) |
| Biological Sex (male) | 3717 (91.7) | 2938 (94.7) |
| Post Deployment Marital status (married) | 1256 (31.0) | 977 (31.5) |
| Deployment Age (years)* | | |
| 20–30 | 1305 (32.2) | 1256 (40.5) |
| 30–40 | 1528 (37.7) | 1070 (34.5) |
| 40–50 | 884 (21.8) | 512 (16.5) |
| 50+ | 336 (8.3) | 264 (8.5) |
| Employment status (Post Deployment) | | |
| Unemployed | 182 (4.5) | 130 (4.2) |
| Employed in the military | 1905 (47.0) | 1442 (46.5) |
| Long-term disabled | 89 (2.2) | 78 (2.5) |

Note: Chi-square test, * Significant discrepancy (p < .005) between responders and non-responders. Age registered at beginning of deployment.
The survey data was stored and extracted from the Norwegian Armed Forces Health Registry and the Norwegian Labor and Welfare Administrations (NAV). The researchers only had access to anonymous data. All participants had given written informed consent to participate. All procedures, data collection, storing and distribution of data were made in accordance with the existing legislation regulating the Norwegian Armed Forces Health Registry. Additional anonymous collection of health information about the non-responders was approved by the Regional Committee for Medicine and Health Research Ethics of South-East Norway.

1.3. Measures

1.3.1. War zone stressors

The project group for the Afghanistan 2012 Survey developed a traumatic exposure index for the survey. At the outset, it consisted of 23 items of typical traumatic events that were likely to occur during deployment. Based on literature reviews (Breslau & Davis, 1987; Fontana et al., 1992; Jordan, Eisen, Bolton, Nash, & Litz, 2017; Litz et al., 2009; Shea et al., 2017; Stein et al., 2012; Vogt, Proctor, King, King, & Vasterling, 2008), we selected a set of items that covered danger-based or non-danger-based stressors (Ramage et al., 2015). The danger-based stressors were related to Personal Threat incidents, while the non-danger-based stressors consisted of Moral Challenges (Litz et al., 2009; Stein et al., 2012) and Witnessing incidents (Green, Grace, Lindy, Gleser, & Leonard, 1990). Items that did not fit any of the three target stressor categories were omitted, which reduced the number of items for this study from 23 to 12. Each item was rated by the respondent on a 5-point Likert scale based on their frequency of exposures. The response options were: 0 = ‘not experienced’; 1 = ‘experienced 1–2 times’; 2 = ‘experienced 3–12 times’; 3 = ‘experienced 13–50 times’; and 4 = ‘experienced 50+ times’. An individual sum exposure score was calculated for all three target stressor types, giving sum scores of 0–20 (Personal Threat, 4 items), 0–15 (Moral Challenges, 3 items) and 0–25 (Witnessing, 5 items) for every respondent. In the analyses, the exposure scores related to each of the three target stressors were treated as continuous variables, and they were labelled Personal Threat (M = 1.32, SD = 1.86), Moral Challenges (M = .98, SD = 1.43) and Witnessing (M = 2.60, SD = 2.38). Bivariate correlations between the trauma types Personal Threat and Witnessing (r = .446, p < .001), between Personal Threat and Moral Challenges (r = .245, p < .001), and between Moral Challenges and Witnessing (r = .397, p < .001) were significant. The correlation coefficients indicated weak to moderate covariance between the stressor types. The mean exposure score for all the 12 items was 4.9 (SD = 4.38), and 10.8% of the sample had been exposed to all three stressor categories, either simultaneously or on separate occasions.

The three target stressor variables were not mutually exclusive; we assumed that some events could involve multiple stressor types. The items summed under each stressor type and the related frequencies of exposed persons and their percentages are presented in Table 2.

1.4. Posttraumatic development: depreciation, growth or no change

Group placement was dependent upon the kind of posttraumatic development that each participant reported, and was made by means of the Posttraumatic Change Scale (PTCS). The instrument contains 26 items (M = 3.28, SD = .34, α = .91). Each item is phrased in an unbiased manner with a format like, e.g. ‘My social life is …’ or ‘My trust in other people is …’. Each item is rated on a 5-point Likert scale. The response options are: 1 = a lot worse/less than before; 2 = worse/less than before; 3 = same as

| War Zone Stressor Items | Exposed n (%) |
|-------------------------|---------------|
| **Personal Threat**     |               |
| Wounded or injured in combat | 110 (2.7) |
| Attacked by enemies      | 1002 (45.0)  |
| Surrounded or ambushed by enemies | 818 (20.4) |
| Experienced moment I thought I would die | 636 (20.8) |
| **Witnessing**           |               |
| Seen, processed or handled dead bodies or body parts | 1503 (37.5) |
| Know someone seriously injured or killed | 1956 (48.8) |
| Witnessed brutality towards civilians, captured enemies, or prisoners | 746 (18.6) |
| Seen innocent victims of war | 2210 (55.4) |
| Seen fellow soldier being seriously injured or killed | 572 (14.3) |
| **Moral Challenges**    |               |
| Seem morally reprehensible occurrences | 1697 (42.4) |
| Did or participated in morally reprehensible occurrences | 446 (11.1) |
| Failed to act on something I in retrospect think I should have done | 503 (12.6) |

Note. Individual respondents may report multiple stressors. Exposed = Experienced at least once.
before; 4 = better/more than before; and 5 = a lot better/more than before exposure to the war zone stressors, if any, during the deployment. This format allows the respondent to indicate the direction of her or his posttraumatic development towards depreca-
tion (DG), growth (GG) or no-change (NG).

With this placement method, the sample \( (N = 4053) \) was divided into three groups based on the participants’
individual arithmetic mean on the PTCS (total). The
DG consisted of respondents with a mean PTCS score of
1 through 2.99, the GG of respondents with mean scores of
3.1 through 5, and the NG of respondents with mean scores between 2.99 and 3.1. The mid-score
on the PTCS, representing no change, is 3. This narrow
inclusion interval for the NG was chosen to avoid
categorizing modest deprecaution or growth as no
change. Very few respondents (< 2%) scored both 1
and 5 on different items on the PTCS. Therefore, no
mixed development group was included.

1.5. Posttraumatic characteristics of personal
changes

The PTCS has four sub-dimensions: Self-Confidence
(8 items, \( M = 3.45 \), \( SD = .51 \), \( \alpha = .89 \)), Interpersonal
Involvement (6 items, \( M = 3.0 \), \( SD = .37 \), \( \alpha = .73 \)),
Awareness (6 items, \( M = 3.4 \), \( SD = .459 \), \( \alpha = .79 \)) and
Social Adaptability (6 items, \( M = 3.20 \), \( SD = .35 \),
\( \alpha = .70 \)). By self-reports, the sub-dimensions capture
the various psychological characteristics of the post-
traumatic changes manifesting in the aftermath of
stressor exposure. The Self-Confidence sub-dimen-
sion relates to trust in one self, while the
Interpersonal Involvement sub-dimension relates to
trust in others. The Awareness sub-dimension relates
to appreciation of life and inner values, while the
Social Adaptability sub-dimension relates to social
strategies and function. All four sub-dimensions
have demonstrated a good model fit and satisfying
psychometric properties (Nordstrand et al., 2017).
The associations between group placement and per-
sonal changes on the four PTCS sub-dimensions
scores were explored. This produced DG, GG and
NG values on all four sub-dimensions for each parti-
cipant to be included in the analyses.

1.6. Measures of psychological distress measures

The following measures captured the levels of dis-
tress: anxiety, depression and insomnia. In addition, the
PTSS was used as a measure of the posttraumatic
stress symptom load.

Hospital Anxiety and Depression Scale (HADS): The
HADS contains 14 items and consists of two subscales:
anxiety (7 items; HADS-A [\( M = 2.91 \), \( SD = 2.78 \),
\( \alpha = .77 \)]) and depression (7 items; HADS-D
[\( M = 1.76 \), \( SD = 2.41 \), \( \alpha = .78 \)]). Each item is rated
on a scale from 0 to 3, giving a maximum score of 21
for anxiety and depression alike. For screening pur-
poses, a sum score of 11 or higher on either subscale
are generally considered to represent a ‘case’ of
psychopathology, while scores of 8–10 represent ‘border-
line’ and 0–7 signifies ‘normal’ levels of distress
(Zigmond & Snaith, 1983). The HADS has been widely
used as a brief self-rating instrument of anxiety and
depression both for dimensional and categorical detec-
tion (case/non-case). Furthermore, HADS has been
frequently used in both epidemiological and specialist
care studies (Zigmond & Snaith, 1983). Moreover,
HADS has been validated in a Norwegian population
(Mykletun, Stordal, & Dahl, 2001).

Insomnia Severity Index (ISI): The ISI (Bastien,
Vallières, & Morin, 2001) is a 7-item self-report
instrument capturing insomnia symptoms, as well as
the degree of concerns or distress caused by those
symptoms. Disturbed sleep is commonly reported
after trauma; it may interfere with fear extinction
and thus compromise trauma recovery (Kobayashi,
Boarts, & Delahanty, 2007). Each item has a 5-point
Likert response format. Total sum scores of 22–28 or
higher are considered to represent severe clinical
insomnia, scores of 15–21 represent moderate clinical
insomnia (moderate severity), 8–14 subthreshold
insomnia, and 0–7 represent no clinically significant
insomnia (\( M = 3.67 \), \( SD = 3.98 \), \( \alpha = .89 \)) (Morin,
Belleville, Bélanger, & Ivers, 2011). In part, the con-
tent of the ISI corresponds to the Diagnostic and
Statistical Manual of Mental Disorders, Fourth
Edition (DSM-IV) diagnostic criteria for insomnia.
The ISI has good face validity and excellent psycho-
metric properties (Morin et al., 2011). The sum score
will be referred to as the ISI (total) score.

Posttraumatic Symptom Scale (PTSS): Concurrent
posttraumatic stress symptoms were detected using
the 10-item self-report version of PTSS; this question-
naire was developed in Norway in relation to the
North Sea Oil Rig Disaster (Holen, Sund, & Weisath,
1983). In this version, each item is rated on a
7-point Likert scale. The scale covers general stress
manifestations such as sleep difficulties, irritability,
depressed mood and startle reactions in the past
seven days. The response options go from 1 = never/
rarely to 7 = very often, giving a potential total sum
score range from 10 to 70. Total sum scores of 35 or
higher represent a likely case of psychopathological
posttraumatic stress symptoms (\( M = 16.94 \),
\( SD = 8.82 \), \( \alpha = .90 \)). The total sum score is referred
to as the PTSS (total) score.

1.7. Data analysis

The frequency distribution of the stressor items was
calculated, reflecting the respondents’ stressor ex-
posure on the item and variable level, i.e. Personal
Threat, Moral Challenges and Witnessing. A simultaneous multivariate multiple linear regression (Stevens, 2002) was conducted to examine the relative contribution of Personal Threat, Moral Challenges and Witnessing in predicting reports of psychological distress on four outcome measures (PTSS, HADS-A, HADS-D and ISI). Two circumstantial variables were included as covariates in this analysis. The first was the total number of deployments for each person. This was included to control for the potential disruptive, non-traumatic effects of deployment, such as the absence from family and a regular social life, the burden on intimate relationships, physical constraints and work load. The second covariate was the elapsed time in years from the last deployment until participation in the study, and was included to control for variation in the length of time since the respondents were exposed to the war zone stressors when completing the survey. The relative importance of the covariates and stressor variables in the model were compared using the standardized regression coefficients; the β weights.

Divergent effects of the various stressor types were investigated by analyses of variance (ANOVA) with post hoc Bonferroni corrections. The development groups derived from the PTCS (total) score and the four PTCS (sub-dimension) scores, i.e. deprecation group, growth group and no-change group, were entered as the dependent variables in separate one-way ANOVAs. Between-group comparisons were made for all five sets of developmental groups. Levene’s test of homogeneity of variance was significant for all ANOVAs. Accordingly, Welch’s F is reported. When deciding the appropriate significant p-value for the current study, several aspects relevant for the analysis and the sample size of our study were considered (Dixon, 1998). The current study is based on a large sample (N = 4053). Thus, a conservative significance level of .001 was chosen in the relevant analyses.

2. Results

2.1. War zone stressors and distress

The relationships between the war zone stressors and the symptom measures are presented in Table 3. Exposure to Personal Threat, Moral Challenges and Witnessing explained a significant amount of the variance in all the outcomes; the types of stressors were all significant predictors of the posttraumatic stress symptoms in the model, as expressed by the PTSS (total) score. In contrast, only Moral Challenges and Witnessing were significant predictors of the distress measures – anxiety, depression and insomnia, as measured respectively by the HADS-A, HADS-D and ISI scores. Neither the number of deployments, nor time since last deployment, proved to be significant in the equation as predictors for any of the psychological distress measures. Collinearity diagnostics did not indicate the presence of multicollinearity in any of the regression analyses (Coakes, 2005; Hair, Anderson, Tatham, & Black, 1998). Tolerance values ranged from 0.74 to 0.94, variance inflation factors from 1.06 to 1.43, and condition indices from 1.00 to 4.05. No step showed two or more coefficients accounting for < .90 of the variance.

Table 3. Multivariate multiple linear regression of exposure scores from three war zone stressors: Personal Threat, Witnessing and Moral Challenges, and also the persons’ number of deployments and time since last deployment as the independent variables in relation to the psychological distress scales: PTSS, HADS-A, HADS-D and ISI as the dependent variables.

| Variables | β   | SE  | β   | R²   |
|-----------|-----|-----|-----|------|
| PTSS [F(5, 3866) = 144.987, p < .001] | | | | 0.15*** |
| Personal Threat | .756 | .079 | .160*** |
| Witnessing | .657 | .066 | .176*** |
| Moral Challenges | 1.206 | .100 | .195*** |
| Time Since Last Deployment | −.048 | .055 | −.013 |
| Number of Deployments | −.240 | .079 | −.046 |
| HADS-A [F(5, 3866) = 36.606, p < .001] | | | | 0.045*** |
| Personal Threat | .067 | .027 | .045 |
| Witnessing | .081 | .022 | .069*** |
| Moral Challenges | .302 | .034 | .155*** |
| Time Since Last Deployment | .014 | .018 | .012 |
| Number of Deployments | −.059 | .027 | −.036 |
| HADS-D [F(5, 3866) = 34.886, p < .001] | | | | 0.043*** |
| Personal Threat | .041 | .023 | .032 |
| Witnessing | .069 | .019 | .067*** |
| Moral Challenges | −.269 | .029 | −.159*** |
| Time Since Last Deployment | .000 | .016 | −.001 |
| Number of Deployments | −.014 | .023 | −.010 |
| ISI [F(5, 3866) = 18.935, p < .001] | | | | 0.024*** |
| Personal Threat | −.024 | .038 | −.011 |
| Witnessing | .129 | .032 | .077*** |
| Moral Challenges | .311 | .048 | .112*** |
| Time Since Last Deployment | −.021 | .026 | −.013 |
| Number of Deployments | −.081 | .038 | −.035 |

Note: Post-Traumatic Symptom Scale (PTSS); Hospital Anxiety and Depression Rating Scale (HADS-A, HADS-D); Insomnia Severity Index (ISI). <> Exposure score Sig. *** p < .001 with distress scale.
2.2. War zone stressors and posttraumatic development

The associations between the different war zone stressors and the reported posttraumatic development in terms of deprecation, growth or no change are shown in Table 4. The three outcome groups reflect the overall direction of the veteran’s subsequent posttraumatic development based on the PTCS (total) scores: the deprecation group (DG; \( N = 326, 8.0\% \)), the growth group (GG; \( N = 3,255, 80.3\% \)) and the no-change group (NG; \( N = 445, 11.0\% \)). Incomplete responses accounted for a small number of participants (Missing; \( N = 27, 0.7\% \)).

Analyses revealed that exposure to Personal Threat did not significantly differentiate between those who reported posttraumatic deprecation and those who reported posttraumatic growth. In contrast, exposure to the non-danger-based stressor types, i.e. Witnessing and Moral Challenges, were significantly higher among respondents reporting posttraumatic deprecation, compared to those reporting posttraumatic growth.

Regarding the characteristics of posttraumatic change as captured by the PTCS sub-dimensions, the findings were mixed (Table 4). On the sub-dimensions Interpersonal Involvement and Social Adaptability, exposure to all three war zone stressor types were significantly more associated with deprecation rather than growth. By contrast, reports of growth or deprecation on the Self-Confidence sub-dimension were not significantly different in regard to exposure scores of any of the stressor types. Of note, on the sub-dimension Awareness, we find that those who reported deprecation were significantly more exposed to Moral Challenges and Witnessing than those who reported growth, however, there was no difference in relation to the exposure to Personal Threat.

Respondents with no posttraumatic change were significantly less exposed to any of the three stressor types when compared to those who reported posttraumatic deprecation or growth. This was the case both for the three outcome groups derived from the PTCS (total) score, and in regard to the characteristics of posttraumatic change as derived from the PTCS (sub-dimension) scores (Table 4).

3. Discussion

The current study demonstrates that stressor types differ in their associations with the subsequent posttraumatic development of the veterans, i.e. towards deprecation, growth or no change, a stressor-response link is found. Importantly, exposure to moral challenges and witnessing death and suffering are more prevalent among veterans who report posttraumatic deprecation, compared to those veterans who report growth. In line with previous findings, a certain exposure load seems required to result in posttraumatic deprecation or growth (Dekel, Ein-Dor, & Solomon, 2012). Those reporting lower exposure to war zone stressors also report less posttraumatic distress in the wake of deployment.

Both danger-based and non-danger-based types of stressors are associated with posttraumatic stress symptoms. However, the findings suggest that exposure to non-danger-based stressors may have a broader impact on the symptom expression than exposure to danger. This is comparable to recent studies investigating the impact of different stressor types (Shea et al., 2017). In the current sample, morally challenging incidents and witnessing the death and suffering of others seem to be more associated with distress in terms of anxiety, depression and insomnia than fear-based situations are. The time elapsed since the last deployment to Afghanistan seems not to affect psychological distress in our model, indicating that the effects of exposure are not temporally dependent. This is contrary to some previous findings, where time since trauma has emerged as a significant predictor of the effect sizes for depression (Helgeson et al., 2006).

Measures of posttraumatic deprecation and growth are commonly broken down into different characteristics (sub-dimensions) of personal changes (Helgeson et al., 2006). In the current study, deprecation and growth was measured along four such sub-dimensions, and this gives some information on the pattern of posttraumatic changes in the sample. The study finds that 80.3% of the sample reports some degree of growth; this is comparable to previous findings (Linley & Joseph, 2004). Moreover, the danger-based stressors are primarily linked to positive changes in characteristics such as higher self-confidence and increased awareness of life-values, as well as appreciation of life. Similar effects have been identified in other studies (Maguen et al., 2006). Previous research suggests that an individual’s sense of predictability and controllability during the traumatic situation is important for the posttraumatic outcome (Başoğlu et al., 2005). Both the preparedness and the available social support in the military units may help to facilitate growth rather than adverse effects of danger.

Posttraumatic deprecation was reported by 8.0% of the sample, and non-danger-based stressors appear to be more linked to such deprecation. This demonstrated association adds to the current knowledge on this issue, even though the mechanisms by which it occurs are not clear from the results. However, previous studies have found that non-danger-based stressors have strong correlations with guilt, shame and symptoms of depression (Jordan et al., 2017; Norrholm & Jovanovic, 2010; Ramage et al., 2015). A central dimension of
Table 4. One-way ANOVA with Bonferroni post hoc group comparison of exposure scores from war zone stressors in relation to the deprecation group, the growth group and the no change group in the Norwegian Afghanistan veterans (N = 4053).

| War Zone Stressors | Mean Deprecation Group | Mean Growth Group | Mean No Change Group | One-way ANOVA Welch's F | Group comp. | Mean diff. | p     |
|-------------------|------------------------|-------------------|---------------------|------------------------|-------------|-----------|-------|
| Sub-Dimension I: Self-Confidence |                        |                   |                     |                        |             |           |       |
| Personal Threat   | M[1.28(±1.83)]          | M[1.49(±1.96)]    | M[.73(±1.38)]       | F(2, 3965) = 56.21 p < .001 | −1 vs 1     | −.21      | .30   |
| Moral Challenges       | M[1.34(±1.82)]          | M[1.04(±1.45)]    | M[.67(±1.17)]       | F(2, 3969) = 30.34 p < .001 | −1 vs 1     | .30       | .007  |
| Witnessing            | M[3.16(±2.74)]          | M[2.75(±2.38)]    | M[1.97(±2.16)]      | F(2, 3948) = 42.47 p < .001 | −1 vs 1     | .41       | .037  |
| n                  | 228                     | 2939              | 857                 |                        |             |           |       |
| Sub-Dimension II: Interpersonal Involvement |                        |                   |                     |                        |             |           |       |
| Personal Threat       | M[1.87(±2.19)]          | M[1.39(±1.87)]    | M[.95(±1.58)]       | F(2, 3970) = 72.21 p < .001 | −1 vs 1     | .47       | <.001  |
| Moral Challenges       | M[1.46(±1.74)]          | M[1.00(±1.41)]    | M[.70(±1.17)]       | F(2, 3974) = 83.22 p < .001 | −1 vs 1     | .45       | <.001  |
| Witnessing             | M[3.43(±2.69)]          | M[2.64(±2.30)]    | M[2.14(±2.15)]      | F(2, 3950) = 87.05 p < .001 | −1 vs 1     | .79       | <.001  |
| n                  | 886                     | 1486              | 1663                |                        |             |           |       |
| Sub-Dimension III: Awareness |                        |                   |                     |                        |             |           |       |
| Personal Threat       | M[1.56(±1.91)]          | M[1.40(±1.91)]    | M[.99(±1.68)]       | F(2, 3966) = 16.73 p < .001 | −1 vs 1     | .16       | .79   |
| Moral Challenges       | M[1.79(±1.92)]          | M[1.01(±1.42)]    | M[.70(±1.25)]       | F(2, 3970) = 45.90 p < .001 | −1 vs 1     | .78       | <.001  |
| Witnessing             | M[3.55(±2.77)]          | M[2.70(±2.34)]    | M[2.07(±2.24)]      | F(2, 3946) = 36.80 p < .001 | −1 vs 1     | .85       | <.001  |
| n                  | 182                     | 3028              | 815                 |                        |             |           |       |
| Sub-Dimension IV: Social Adaptability |                        |                   |                     |                        |             |           |       |
| Personal Threat       | M[1.85(±2.18)]          | M[1.45(±1.87)]    | M[.99(±1.71)]       | F(2, 3971) = 47.32 p < .001 | −1 vs 1     | .40       | <.001  |
| Moral Challenges       | M[1.54(±1.77)]          | M[1.08(±1.46)]    | M[.69(±1.20)]       | F(2, 3975) = 73.08 p < .001 | −1 vs 1     | .46       | <.001  |
| Witnessing             | M[3.36(±2.65)]          | M[2.82(±2.36)]    | M[2.12(±2.24)]      | F(2, 3950) = 65.25 p < .001 | −1 vs 1     | .54       | <.001  |
| n                  | 449                     | 1990              | 1596                |                        |             |           |       |

Posttraumatic Change Scale Total

(Continued)
Deprecation appears to be negative interpersonal changes, such as diminished ability to trust others, and a reduced capacity for emotional closeness with other people. Shame and guilt may be components of such changes. One possibility is that shame related to non-danger-based incidents, such as being involved in morally transgressive actions, increases the barriers to disclose these experiences to others (Gray et al., 2012; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). In turn, this may sway the posttraumatic development in the direction of posttraumatic deprecation rather than towards growth (Tedeschi & McNally, 2011). In contrast, veterans who have been exposed to life-threatening situations may socially have less reticence to disclose their experiences and, thereby, may be more open to get support from colleagues, family and mental health professionals (DeViva et al., 2016; Möller-Leimkühler, 2002). Studies have found that military veterans often fear negative reactions when talking about their war zone experiences (Guay, Billette, & Marchand, 2006). Possibly, this may be particularly salient in relation to non-danger-based traumas (Nash et al., 2010). Disclosing traumas related to witnessing or moral issues could put veterans at risk of social stigma and negative social responses (Ullman & Filipas, 2001), and increase their reticence towards seeking social support (Lepore & Revenson, 2006), which is regarded as important in fostering posttraumatic growth (Tedeschi & McNally, 2011; Valentiner, Holahan, & Moos, 1994). Importantly, the role of shame and social stigma as mediators between exposure to the various stressor types and posttraumatic deprecation or growth is not fully understood. Future studies investigating these post-traumatic mechanisms seem warranted.

The current study may have implications for the interventions and follow-up of individuals exposed to stressors such as moral challenges and witnessing. Given that the mainstream understanding of PTSD, so far, is primarily centred on the danger-based aspects of the stressors, there may be a risk that individuals exposed to non-danger-based incidents are being identified to a lesser degree and, therefore, they may be given less attention and support. Our findings highlight the relevance of expanding the scope of what constitutes traumatic stressors and the potential consequences of such experiences. Concentrating solely on the danger-related criteria of the PTSD diagnosis will restrict the view of traumatization, and limit the support of people exposed to other variants of trauma.

### 3.1. Future directions

The current study is based on cross-sectional data. Future research that examines the temporal progression of reactions to the different types of stressors is needed,
both in terms of long-term development of PTSD and depression, as well as posttraumatic depression and growth. This could bolster causal inferences and determine the direction of the associations we identified. One testable hypothesis is that Moral Challenges, Witnessing and Personal Threat incidents instigate divergent longitudinal trajectories in regard to these phenomena. Furthermore, in light of the controversy concerning early psychological intervention after trauma exposure (Everly & Mitchell, 2000), it would be fruitful to investigate if a trauma specific intervention strategy could increase the effectiveness of such efforts. There are efforts aimed at developing interventions tailored to manage non-danger-based experiences (Litz, Lebowitz, Gray, & Nash, 2017), and the current results add legitimacy to such endeavours. Finally, the role of shame, guilt and depression in the development of posttraumatic depression is not fully understood. Previous studies have pointed to the links between such feelings and non-danger-based stressors (Jordan et al., 2017; Nash et al., 2010). Understanding the mechanisms by which non-danger-based stressors influence posttraumatic development towards depression rather than growth merits further research, and could have important clinical implications.

3.2. Limitations

There are several limitations in the current study. Importantly, the sample is predominantly male (91.7%), and the gender bias may have influenced the results. Previous studies have found that females report more posttraumatic growth after trauma than males, and this may have influenced the stressor-response links we identified (Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010). The data presented are based on short-form self-report measures. Females and older veterans had a significantly higher response rate than the males in general and the younger veterans; this is to be considered when interpreting the results. Due to the large sample size in the current study, we were not able to collect anamnestic data, nor conduct diagnostic interviews. Moreover, the cross-sectional design of the current study does not capture such self-reported changes over time and caution is required in inferring potential relations between stressors and the subsequent responses.

This sample consisted entirely of selected and well-trained military personnel. The respondents’ preparedness is likely to reduce the generalizability of the findings to the general population. This may in part explain why danger-based stressors seem to have less negative impact in the sample compared to non-danger-based stress. Of note, we did not control for potential additive effects of exposure to multiple trauma types in the individual respondents. Such occurrences may have influenced post trauma outcomes, and this is a limitation in the current study.

Finally, although the reported pattern of associations between stressor types and measures of distress are significant, the explained variance regarding some scales were small, particularly for insomnia ($R^2 = .024, p < .001$). However, significant associations with a low $R^2$ in a large sample, as in our current study, can still provide important information on data trends particularly when studying psychological phenomena (Figueiredo Filho, Júnior, & Rocha, 2011). In addition, the current results are comparable to previous findings (Shea et al., 2017; Stein et al., 2012), which also indicate that the associations between our predictors and response variables are valid.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Andreas Espetvedt Nordstrand  http://orcid.org/0000-0002-2012-0574

Christer Lunde Gjerstad  http://orcid.org/0000-0002-6398-9042

References

Armeli, S., Gunthert, K. C., & Cohen, L. H. (2001). Stressor appraisals, coping, and post-event outcomes: The dimensionality and antecedents of stress-related growth. *Journal of Social and Clinical Psychology, 20*(3), 366–395.

Başoğlu, M., Livanou, M., Crnobarić, C., Frančišković, T., Suljić, E., Durić, D., & Vranešić, M. (2005). Psychiatric and cognitive effects of war in former Yugoslavia: Association of lack of redress for trauma and posttraumatic stress reactions. *JAMA, 294*(5), 580–590.

Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the insomnia severity index as an outcome measure for insomnia research. *Sleep Medicine, 2*(4), 297–307.

Breslau, N., & Davis, G. C. (1987). Posttraumatic stress disorder: The etiologic specificity of wartime stressors. *The American Journal of Psychiatry, 44*:578–583.

Carson, M. A., Paulus, L. A., Lasko, N. B., Metzger, L. J., Wolfe, J., Orr, S. P., & Pitman, R. K. (2000). Psychophysiological assessment of posttraumatic stress disorder in Vietnam nurse veterans who witnessed injury or death. *Journal of Consulting and Clinical Psychology, 68*(5), 890.

Cavanna, A. E., & Trimble, M. R. (2006). The precuneus: A review of its functional anatomy and behavioural correlates. *Brain, 129*(3), 564–583.

Cheng, C., Wong, W.-M., & Tsang, K. W. (2006). Perceptions of benefit and costs during SARS outbreak: An 18-month prospective study. *Journal of Consulting and Clinical Psychology, 74*(5), 870–879.

Coakes, S. J. (2005). SPPS version 12.0 for windows: Analysis without anguish. Version. Milton, Queensland Australia: John Wiley & Sons Australia.

Dekel, S., Ein-Dor, T., & Solomon, Z. (2012). Posttraumatic growth and posttraumatic distress: A longitudinal study. *Psychological Trauma: Theory, Research, Practice and Policy, 4*, 94–101.
DeViva, J. C., Sheerin, C. M., Southwick, S. M., Roy, A. M., Pietrzak, R. H., & Harpaz-Rotem, I. (2016). Correlates of VA mental health treatment utilization among OEF/OIF/OND veterans: Resilience, stigma, social support, personality, and beliefs about treatment. *Psychological Trauma: Theory, Research, Practice, and Policy, 8*(3), 310.

Dixon, P. (1998). Why scientists value p values. *Psychonomic Bulletin & Review, 5*(3), 390–396.

Dryden, A. E. (2012). The effects of combat exposure on post-deployment coping deficits in OEF/OIF/OND veterans (Doctoral dissertation). United States, US: Virginia Consortium for Professional Psychology. Old Dominion University.

Everly, G. S., & Mitchell, J. T. (2000). The debriefing “controversy” and crisis intervention: A review of lexical and substantive issues. *International Journal of Emergency Mental Health, 2*(4), 211–226.

Figueiredo Filho, D. B., Júnior, J. A. S., & Rocha, E. C. (2011). What is R2 all about? *Leviathan (São Paulo)*, (3), 60–68.

Fontana, A., Rosenheck, R., & Brett, E. (1992). War zone traumas and posttraumatic stress disorder symptomatology. *Journal of Nervous and Mental Disease, 180*, 748-755.

Frazier, P., Conlon, A., & Glaser, T. (2001). Positive and negative life changes following sexual assault. *Journal of Consulting and Clinical Psychology, 69*(6), 1048.

Gray, M. J., Schorr, Y., Nash, W., Lebowitz, L., Amidon, A., Lansing, A., … Litz, B. T. (2012). Adaptive disclosure: An open trial of a novel exposure-based intervention for service members with combat-related psychological stress injuries. *Behavior Therapy, 43*(2), 407–415.

Green, B. L., Grace, M. C., Lindy, J. D., Glser, G. C., & Leonard, A. (1990). Risk factors for PTSD and other diagnoses in a general sample of Vietnam veterans. *American Journal of Psychiatry, 147*, 729–733.

Guay, S., Billette, V., & Marchand, A. (2006). Exploring the links between posttraumatic stress disorder and social support: Processes and potential research avenues. *Journal of Traumatic Stress: Official Publication of the International Society for Traumatic Stress Studies, 19*(3), 327–338.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (Fourth ed.). Englewood Cliffs, NJ: Prentice-Hall International, Inc.

Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology, 74*(5), 797.

Holgersen, K. H., Boe, H. J., & Holen, A. (2010). Long-term perspectives on posttraumatic growth in disaster survivors. *Journal of Traumatic Stress, 23*(3), 413–416.

Jordan, A. H., Eisen, E., Bolton, E., Nash, W. P., & Litz, B. T. (2017). Distinguishing war-related PTSD resulting from perpetration-and betrayal-based morally injurious events. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*(6), 627.

Karanci, N. A., & Acarturk, C. (2005). Post-traumatic growth among marmara earthquake survivors involved in disaster preparedness as volunteers. *Traumatology, 11*(4), 307.

Kobayashi, I., Boarts, J. M., & Delahanty, D. L. (2007). Polysomnographically measured sleep abnormalities in PTSD: A meta-analytic review. *Psychophysiology, 44*(4), 660–669.

Lepore, S. J., & Revenson, T. A. (2006). *Resilience and posttraumatic growth: Recovery, resistance, and reconfiguration* (pp. 24–46). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Linley, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress: Official Publication of the International Society for Traumatic Stress Studies, 17*(1), 11–21.

Litz, B. T., Lebowitz, L., Gray, M. J., & Nash, W. P. (2017). Adaptive disclosure: A new treatment for military trauma, loss, and moral injury. New York, NY: Guilford Publications.

Litz, B. T., Stein, N., Delaney, E., Lebowitz, L., Nash, W. P., Silva, C., & Maguen, S. (2009). Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. *Clinical Psychology Review, 29*(8), 695–706.

Livneh, H., McMahon, B. T., & Rumrill, P. D. (2018). The duality of human experience: Perspectives from psychosocial adaptation to chronic illness and disability—empirical observations and conceptual issues. *Rehabilitation Counseling Bulletin, 62*(2), 78–93. 0034355218800802.

Maugen, S., Vogt, D. S., King, L. A., King, D. W., & Litz, B. T. (2006). Posttraumatic growth among Gulf War I veterans: The predictive role of deployment-related experiences and background characteristics. *Journal of Loss and Trauma, 11*(5), 373–388.

Marshall, E. M., Frazier, P., Frankurt, S., & Kuijer, R. G. (2015). Trajectories of posttraumatic growth and depri- ciation after two major earthquakes. *Psychological trauma: Theory, Research, Practice, and Policy, 7*, 112–121.

Möller-Leimkühler, A. M. (2002). Barriers to help-seeking by men: A review of sociocultural and clinical literature with particular reference to depression. *Journal of Affective Disorders, 71*(1–3), 1–9.

Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The insomnia severity index: Psychometric indicators to detect insomnia cases and evaluate treatment response. *Sleep, 34*(5), 601–608.

Myklebust, A., Stordal, E., & Dahl, A. A. (2001). Hospital Anxiety and Depression (HAD) scale: Factor structure, item analyses and internal consistency in a large population. *The British Journal of Psychiatry, 179*(6), 540–544.

Nash, W. P., Vasterling, J., Ewing-Cobbs, L., Horn, S., Gaskin, T., Golden, J., … Lester, P. (2010). Consensus recommendations for common data elements for operational stress research and surveillance: Report of a federal interagency working group. *Archives of Physical Medicine and Rehabilitation, 91*(11), 1673–1683.

Nordstrand, A. E., Hjelmøl, O., Holen, A., Reichelt, J. G., & Boe, H. J. (2017). Measuring Psychological change after trauma: Psychometric properties of a new bi-directional scale. *Psychological trauma: Theory, research, practice and policy, 9*(6), 696.

Norholm, S. D., & Jovanovic, T. (2010). Tailoring therapeutic strategies for treating posttraumatic stress disorder symptom clusters. *Neuropsychiatric Disease and Treatment, 6*, 517.

Norris, F. H. (1990). Screening for traumatic stress: A scale for use in the general population. *Journal of Applied Social Psychology, 20*(20), 1704–1715.

Norris, F. H. (1992). *Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups*. *Journal of Consulting and Clinical Psychology, 60*(3), 409.
Ozer, E. J., Best, S. R., Lipsky, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. Psychological Bulletin, 129(1), 52.

Park, C. L., Cohen, L. H., & Murch, R. L. (1996). Assessment and prediction of stress-related growth. Journal of Personality, 64(1), 71–105.

Park, C. L., & Helgeson, V. S. (2006). Introduction to the special section: Growth following highly stressful life events–Current status and future directions. Journal of Consulting and Clinical Psychology, 74(5), 791.

Pietrzak, R. H., Johnson, D. C., Goldstein, M. B., Malley, J. C., & Southwick, S. M. (2009). Perceived stigma and barriers to mental health care utilization among OEF-OIF veterans. Psychiatric Services, 60(8), 1118–1122.

Pietrzak, R. H., Whealin, J. M., Stotzer, R. L., Goldstein, M. B., & Southwick, S. M. (2011). An examination of the relation between combat experiences and combat-related posttraumatic stress disorder in a sample of Connecticut OEF–OIF Veterans. Journal of Psychiatric Research, 45(12), 1579–1584.

Ramage, A. E., Litz, B. T., Resick, P. A., Woolsey, M. D., Dondanville, K. A., & Young-McCaughan, S., the STRONG STAR Consortium. (2015). Regional cerebral glucose metabolism differentiates danger- and non-danger-based traumas in post-traumatic stress disorder. Social Cognitive and Affective Neuroscience, 11(2), 234–242.

Shakespeare-Finch, J., & Armstrong, D. (2010). Trauma type and posttrauma outcomes: Differences between survivors of motor vehicle accidents, sexual assault, and bereavement. Journal of Loss and Trauma, 15(2), 69–82.

Shea, M. T., Presseau, C., Finley, S. L., Reddy, M. K., & Spofford, C. (2017). Different types of combat experiences and associated symptoms in OEF and OIF national guard and reserve veterans. Psychological Trauma: Theory, Research, Practice, and Policy, 9(S1), 19.

Steenkamp, M. M., Litz, B. T., Hoge, C. W., & Marmar, C. R. (2015). Psychotherapy for military-related PTSD: A review of randomized clinical trials. JAMA, 314(5), 489–500.

Stein, N. R., Mills, M. A., Arditte, K., Mendoza, C., Borah, A. M., & Resick, P. A., the STRONG STAR Consortium. (2012). A scheme for categorizing traumatic military events. Behavior Modification, 36(6), 787–807.

Stevens, J. (ed.). (2002). Applied multivariate statistics for the social sciences (4th ed.). Mahwah, NJ: Lawrence Erlbaum.

Taylor, S. E., & Armor, D. A. (1996). Positive illusions and coping with adversity. Journal of Personality, 64, 673–898.

Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth PTCS: Measuring the positive legacy of trauma. Journal of Traumatic Stress, 9(3), 455–471.

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. Psychological Inquiry, 15(1), 1–18.

Tedeschi, R. G., & McNally, R. J. (2011). Can we facilitate posttraumatic growth in combat veterans? American Psychologist, 66(1), 19.

Ullman, S. E., & Filipas, H. H. (2001). Predictors of PTSD symptom severity and social reactions in sexual assault victims. Journal of Traumatic Stress, 14(2), 369–389.

Valentiner, D. P., Holahan, C. J., & Moos, R. H. (1994). Social support, appraisals of event controllability, and coping: An integrative model. Journal of Personality and Social Psychology, 66(6), 1094.

Vishnevsky, T., Cann, A., Calhoun, L. G., Tedeschi, R. G., & Demakis, G. J. (2010). Gender differences in self-reported posttraumatic growth: A meta-analysis. Psychology of Women Quarterly, 34(1), 110–120.

Vogt, D. S., Proctor, S. P., King, D. W., King, L. A., & Vasterling, J. J. (2008). Validation of scales from the deployment risk and resilience inventory in a sample of operation Iraqi freedom veterans. Assessment, 15, 391–403.

Xue, C., Ge, Y., Tang, B., Liu, Y., Kang, P., Wang, M., & Zhang, L. (2015). A meta-analysis of risk factors for combat-related PTSD among military personnel and veterans. PloS one, 10(3), e0120270.

Yehuda, R., Southwick, S. M., & Giller, E. L. (1992). Exposure to atrocities and severity of chronic posttraumatic stress disorder in Vietnam combat veterans. American Journal of Psychiatry, 149(3), 333–336.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. Acta Psychiatrica Scandinavica, 67(6), 361–370.