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Late-Onset Stress Symptomatology (LOSS) Scale – Short Form: Development and Validation

Christopher B. Brady, Ph.D.^{#1,2,3}, Anica Pless Kaiser, Ph.D.^{#1,3,4}, Avron Spiro III, Ph.D.^{1,3,4,5,6}, Eve Davison, Ph.D.^{1,3,4}, Daniel King, Ph.D.^{1,3,4}, and Lynda King, Ph.D.^{1,3,4}

¹VA Boston Healthcare System

²Harvard Medical School

³Boston University School of Medicine

⁴National Center for PTSD

⁵Boston University School of Public Health

⁶Massachusetts Veterans Epidemiology Research and Information Center

These authors contributed equally to this work.

Abstract

Objectives: Late-onset stress symptomatology (LOSS) is a phenomenon observed in older combat veterans who experience increased combat-related thoughts, feelings, and reminiscences corresponding with the changes and challenges of aging. Previously, we developed and validated the LOSS Scale as a tool to assess LOSS. This paper describes the development and validation of a LOSS Scale short form (LOSS-SF) for use in various settings to screen veterans who may be actively re-examining their past wartime experiences.

Method: Three studies examined the reliability (Study 1) and the concurrent (Study 2), convergent/divergent (Study 3) validity of the LOSS-SF in separate samples of male combat veterans age 55 and older (total N = 346). Veterans were administered measures via telephone and

Corresponding Author: Christopher Brady, Ph.D. Christopher.Brady2@va.gov.

Author Note

Drs. Brady and Pless Kaiser contributed equally as first co-authors and are listed alphabetically. Christopher Brady, Ph.D., is affiliated with VA Boston Healthcare System, Boston University School of Medicine, and Harvard Medical School. 150 S. Huntington Ave (151C), Boston MA 02130. 857-364-2596. Christopher.Brady2@va.gov. Anica Pless Kaiser, Ph.D., is affiliated with the National Center for PTSD, VA Boston Healthcare System, and Boston University School of Medicine. 150 S. Huntington Ave (116B-2), Boston, MA 02130. 857-364-5309. Anica.PlessKaiser@va.gov. Avron Spiro III, Ph.D. is affiliated with VA Boston Healthcare System, National Center for PTSD, Boston University Schools of Medicine and Public Health, and the Massachusetts Veterans Epidemiology Research and Information Center. 150 S. Huntington Ave (151N), Boston, MA 02130. 857-364-2888. Avron.Spiro@va.gov. Eve Davison, Ph.D., is affiliated with the National Center for PTSD, VA Boston Healthcare System, and Boston University School of Medicine. 150 S. Huntington Ave, Boston, MA 02130. 857-364-4012. Eve.Davison@va.gov. Daniel King, Ph.D. and Lynda King, Ph.D. are affiliated with VA Boston Healthcare System and Boston University School of Medicine. DanKing@bu.edu, LKing@bu.edu. 978-969-2394.

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mail survey. Correlation and regression analyses examined the reliability and validity of the LOSS-SF.

Results: Across the three studies, the LOSS-SF exhibited strong internal consistency ($\alpha = .93$), test-retest reliability (2 week interval on average; $r = .88$), and good concurrent validity with the LOSS Scale ($r = .81$). Convergent and divergent validity were supported by the pattern of correlations between the LOSS-SF and other construct measures.

Conclusion: The LOSS-SF is a reliable and valid measure to quickly assess thoughts, feelings, and reminiscences about past combat experiences in older veterans and identify those veterans who may benefit from psychological interventions to effectively resolve related issues.

Keywords

aging male combat veterans; war experiences; re-engagement; reliability; validity

Introduction

In 2016, 47% of the veteran population in the United States was aged 65 or older (National Center for Veterans Analysis and Statistics, 2017). Considerable research has examined the health and functioning of aging military veterans (Elder & Clipp, 1989; Elder, Shanahan, & Clipp, 1994), including a focus on combat-related posttraumatic stress disorder (Aldwin, Levenson, & Spiro, 1994; Fontana & Rosenheck, 1994; Kahana, Harel, & Kahana, 1989). Relatively little is known, however, about the consequences of early combat exposure *in conjunction with* the subsequent stressors of aging. Most older adults experience stressful events such as retirement, death of a spouse and close friends, diminished physical capacity, and limited social support. Older veterans, however, may experience these stressful events from a unique perspective influenced by their past exposure to life-threatening combat stressors.

Late-onset stress symptomatology (LOSS)

Recent work by us (Davison et al., 2006; King, King, Vickers, Davison, & Spiro, 2007; Spiro, Settersten, & Aldwin, 2016) and others (e.g., Kang, Aldwin, Choun, & Spiro, 2016) has examined how various factors over the life course may influence how aging veterans process traumatic events related to military service. Our perspective considers how normative aging processes might elicit stress symptoms related to combat exposure in the distant past that differ from PTSD in both severity and type. Our focus is on “aging veterans who appear to successfully adjust following military service but then express late-life increases in thoughts, feelings, or distress related to their early life combat” (King et al., 2007, p. 175). We have termed this phenomenon “late-onset stress symptomatology” (LOSS). LOSS is a phenomenon among older veterans who: (a) were exposed to highly stressful war-zone events in their early adult years; (b) have functioned successfully with no long-term history of chronic stress-related disorders; but (c) begin to reminisce about combat-related experiences when confronting the changes and challenges of aging (e.g., retirement, loss of spouse, physical illness), long after their combat experiences.

Not all aging veterans exhibit troublesome stress symptomatology, whether related to earlier war-zone events or not. Individual differences in the experience of LOSS may be related to intrapersonal risk and protective factors. Factors such as the veteran's appraisal of the value of the combat experience, coping style, and hardiness (Aldwin et al., 1994; King, King, Fairbank, Keane, & Adams, 1998; Suvak, Gold, Savarese, King, & King, 1999; Suvak et al., 1999) have been identified.

Our group developed and validated a scale assessing LOSS to examine how this phenomenon relates to intrapersonal factors (e.g., sense of mastery, satisfaction) and differs from other combat-related stress reactions such as PTSD. This research suggested that LOSS was related to other measures of distress and resilience, and, further, could be discriminated from PTSD (King et al., 2007; Potter et al., 2013). Thus, assessing both LOSS and PTSD symptoms could identify veterans who are experiencing delayed combat-related stress reactions that could interfere with daily functioning.

Development of the Original LOSS Scale

King and colleagues (2007) described the development and validation of the LOSS Scale. In short, this scale is composed of 33 items that assess current feelings, memories, and possible distress about past combat experiences (e.g., Everyday things have started reminding me of the war), and 11 supplementary items that assess positive feelings about military experiences (e.g., I learned valuable skills while serving in the war). Each item is rated on a 5-point Likert-type response scale with options 0=*Strongly disagree*, 1=*Disagree*, 2=*Neither agree nor disagree*, 3=*Agree*, and 4=*Strongly agree*. The 33 items assess four LOSS content themes: recent increased frequency of thoughts/dreams about war, recent increased negative attitude toward war, strong emotional reactions to daily life events, and self-perception of recent behavior change or spouse/partner/family perception of recent behavior change. These content themes center on experience-based changes in thoughts and memories that occur in the context of aging, rather than specific mental health symptoms. Items are linked to general rather than specific wartime experiences. The sum of the 33 LOSS items comprises the LOSS Scale total score.

King et al. (2007) reported that the LOSS Scale demonstrated a high degree of internal consistency reliability (coefficient alpha = .97). Scores were stable over brief intervals (2–6 days) but were sensitive to developmental change over longer intervals (1.8 years). Factor analysis suggested a single factor. Bivariate associations between the LOSS score and other variables (e.g., life stressors, resilience, and quality of life) demonstrated that the LOSS Scale exhibited positive and negative associations with measures of distress and resilience, respectively. Regression analyses examining the incremental validity of the LOSS Scale compared with a measure of PTSD (PTSD Checklist-Civilian Version; PCL-C) demonstrated that the LOSS Scale predicted scores on measures of general mental health above and beyond the PCL-C. A subsequent study (Potter et al., 2013) showed that the LOSS Scale exhibited stronger relations with normative aging process measures (e.g., concerns with retirement) and weaker associations with measures of mental health symptoms and emotional well-being (e.g., depression, life satisfaction). In sum, these studies' findings provided statistical and conceptual support for the LOSS construct and

LOSS Scale, and suggested that LOSS is associated with a normative life-review of trauma-related memories rather than the more severe psychological and emotional reactions experienced in late-onset PTSD.

Development and Validation of the LOSS Short Form

We believe that LOSS occurs in the context of normative aging stressors and life review processes that likely occur for a broader population than those who report clinically significant mental health symptoms. Thus, we believe that veterans experiencing LOSS may not present to mental health clinics, but they may report war-related memories to medical care providers. Given the limited time for medical office visits, a brief LOSS screening tool may identify older veterans who may benefit from psychoeducational services that address past war-related concerns. Furthermore, the high internal consistency reliability and single factor underlying the LOSS Scale suggested that a shorter version could be developed. Accordingly, we developed the LOSS Short Form scale.

LOSS Short Form (LOSS-SF) item selection and scale development

Nine geriatric mental health professionals from the VA Boston Healthcare System (VABHS) attended a lecture on LOSS given by a member of our team (E.H.D.). After the lecture, the clinicians were given a form with each of the 33 LOSS Scale items and asked to rate each item with regard to the degree that it represented the LOSS construct. They used a scale that ranged from 1 (*The item is a weak representation of LOSS*) to 5 (*The item is a strong representation of LOSS*) to rate each item. We calculated the average ratings for each LOSS Scale item as a measure of construct saturation (range 2.44 – 5.00). To select items from the LOSS Scale to be included in the LOSS-SF, we identified potential items primarily based on the item-total correlations ascertained from the King et al. (2007) LOSS validation study (range = .62 - .79); however, we also considered the clinician ratings discussed above in choosing between items with similar item-total correlations. Finally, the number of items selected from each LOSS content theme (noted above) mirrored the proportions in the LOSS Scale. This procedure produced the 11-item LOSS-SF.

Reliability and Validity Studies

Three studies examined the psychometric properties of the LOSS-SF in separate samples of male combat veterans aged 55 and older. These studies determined the scale's internal consistency and test-retest reliability (Study 1), concurrent validity (Study 2), and convergent and divergent validity (Study 3). For all studies, we collected additional information (mood, cognition, etc.) to characterize the samples.

Method

Common methods across the three studies are described here. Unique methods for each study are described below in each study's respective section. Veterans were administered measures via telephone and by mailed questionnaires for all studies. All procedures were approved by the Institutional Review Board at VABHS.

Participants

Sample recruitment and telephone consent.: Male combat veterans aged 55 and older were recruited via flyers placed in primary care and medical psychology clinics within VABHS. We also recruited participants from national veteran alumni organizations, affiliated reunions, and through general advertisements in veteran publications and military-related websites. Potential participants called a toll-free number, and research staff described the study and the inclusion/exclusion criteria using a written script. Only veterans who had been deployed to a warzone and exposed to combat and/or other trauma during their military service were enrolled. Veterans with a dementia diagnosis or who had a psychiatric hospitalization within the past year were excluded. Informed consent was provided by telephone, followed by a brief cognitive assessment (see measures below). Because of the verbal nature of the questionnaires and the use of telephone recruitment and assessment procedures, non-fluent English speakers or persons with substantial hearing or vision impairment were excluded.

Procedure—Enrolled participants were mailed a packet containing a demographic questionnaire (see Table 1) and the LOSS-SF with additional questionnaires per each study's unique methods as described below. The questionnaires required approximately 45 to 60 minutes to complete, and participants were paid \$20 for their participation upon returning the completed packet.

Measures – supplementary measures for all studies

Combat Exposure (King et al., 2007).: This is a 13-item questionnaire that asks veterans about their exposure to war-zone and combat events. The response format is dichotomous (0=*No*, 1=*Yes*). A total score is calculated (range 0–13); higher values indicate greater combat exposure.

Primary Care PTSD screen (PC-PTSD; (Prins et al., 2003).: The PC-PTSD is a 4-item screen for PTSD designed for use in primary care and other medical settings. The screen includes an introductory sentence to cue respondents to traumatic events (e.g., In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:) followed by 4 items requiring a dichotomous (0=*No*, 1=*Yes*) answer (e.g., Have had nightmares about it or thought about it when you did not want to?). In most circumstances, a score of 3 or higher suggests the presence of PTSD. The internal consistency reliability is .85. A total score is used (range 0–4), with higher scores indicating a higher probability that the respondent has current PTSD.

PROMIS Emotional Distress - Depression and Anxiety short forms (Cella, 2009).: Each of these scales begins with the introductory statement, “In the past 7 days...” followed by items such as “I felt worthless” (Depression short form) or “I felt fearful” (Anxiety short form). Each item is accompanied by a 5-point Likert-type response scale with options 1=*Never*, 2=*Rarely*, 3=*Sometimes*, 4=*Often*, and 5=*Always*. The Depression short form has 8 items (total score range 8–40) and the Anxiety short form has 7 items (total score range 7–35). The internal consistency reliability is .99 for the depression short form and .96 for the

anxiety short form. T-scores ($M=50$; $SD = 10$) for each short form are used; higher scores indicate higher levels of depressive/anxious symptoms.

Short Michigan Alcoholism Screening Test-Geriatric Version (SMAST-G; Blow, Gillespie, Barry, Mudd, & Hill, 1998). This 10-item questionnaire asks about experiences with alcohol in the past year (e.g., When talking with others, do you ever underestimate how much you actually drink?). The response format is dichotomous (0=*No*, 1=*Yes*). The internal consistency reliability is .86. A total score is used (range 0–10), with higher scores indicating a greater probability of problematic alcohol use.

Telephone Interview for Cognitive Status – modified (TICS_m; Welsh, Breitner, & Magruder-Habib, 1993). The TICS_m, a modification of the original TICS (Brandt, Spencer, & Folstein, 1988), is a brief cognitive assessment questionnaire that assesses orientation, concentration, memory (both immediate and delayed word list recall), naming comprehension, calculation, reasoning and judgment. The test has been validated with the Mini-Mental State Exam (Järvenpää et al., 2002), with older adult populations (Welsh et al., 1993), and as an epidemiological and longitudinal study measure (Plassman, Newman, Welsh, & Helms, 1994). The maximum score is 50 and higher scores indicate better cognitive performance.

Results and Discussion – Sample Demographics and Supplementary Measures

Because the various analyses examining the reliability and validity of the LOSS-SF (reported below) were conducted in different samples, we examined whether there were any differences on demographics and measures across studies to consider when interpreting results. Significant differences were subsequently evaluated via a series of one-way ANOVA (s) with post hoc comparisons (Scheffe) for interval-level data and chi square analyses for nominal-level data. Table 1 shows that the sample for the convergent/divergent validity study (Study 3) had about one and a half more years of education than the samples in the reliability (Study 1) and concurrent validity (Study 2) studies. Marital status differed by study; Study 3 had a larger proportion of married members than Study 1, and Study 1 had a higher proportion of members who were never married than the other two groups. Examining differences on the other measures (i.e., LOSS-SF, TICS_m, Combat Exposure, PTSD Checklist, PROMIS scales, and SMAST-G) across the 3 samples, we found a significant difference only on combat exposure ($p < .0001$). Combat exposure score for the convergent/divergent validity sample (Study 3) was significantly lower than the reliability (Study 1) and concurrent validity (Study 2) samples (p 's $< .01$).

Study 1: LOSS Short Form internal consistency and test-retest reliability

Method—Sample and measures information are presented in Table 1. For Study 1, two survey mailings, each including the LOSS-SF, were conducted. The response rate (i.e., completing all assessments) was 95.2%, yielding a sample of 60 male combat veterans. Upon receiving the first completed questionnaire packet from a participant, the second packet was sent, containing the LOSS-SF and additional measures.

Results and Discussion—The two administrations of the LOSS-SF occurred 13.6 days apart on average (range = 3 to 49 days), with 90% of participants completing both administrations within 21 days. The LOSS-SF total score from the first administration averaged 22.6 ($SD = 9.5$), and 22.9 ($SD = 8.8$) from the second. At each occasion, internal consistency coefficients (Cronbach's alpha) were high .92 at the first, and .91 at the second. The test-retest reliability (Pearson) coefficient between the two occasions was .88, indicating good consistency in scores across successive measurements.

The LOSS-SF thus demonstrated strong internal consistency reliability and test-retest (average of 2-week interval) reliability. This suggested that the LOSS-SF items measured a single construct, and that the LOSS-SF appeared to reliably measure this construct consistently over a relatively short interval. Thus, we subsequently examined the concurrent validity of the LOSS-SF.

Study 2: LOSS-SF concurrent validity

Next, we sought to examine the strength of the association between scores on the LOSS-SF compared with scores on the LOSS Scale.

Method—Sample and measures information are presented in Table 1. Similar to Study 1, participants were sent 2 mailings; each consisting of a questionnaire packet containing either the LOSS-SF or LOSS Scale, with additional questionnaires described above (common measures across all studies). Upon receiving the first completed questionnaire packet, we sent another packet containing the other version of the LOSS scale. Additional measures were consistently paired with either the LOSS-SF or the LOSS scale and the order of administration of the two LOSS scales was counterbalanced across participants. The response rate for the concurrent validity study was 92.6%.

Results and Discussion—Fifty participants completed both LOSS scales. The length of time between administrations of these two measures averaged 12.4 days (range = 4 to 62 days), with 90% of participants completing both administrations within 21 days. The 33-item LOSS Scale total score averaged 66.2 ($SD = 28.6$). The LOSS-SF total score averaged 22.9 ($SD = 9.2$). To examine concurrent validity of the LOSS-SF versus the LOSS Scale, we calculated the Pearson correlation between the two scores; it was .81, indicating a strong positive association between the two scales. The internal consistency reliability of the LOSS-SF was excellent: Cronbach's alpha = .92.

Study 3: LOSS-SF convergent/divergent validity

Finally, we sought to examine the strength of the association between the LOSS-SF and measures selected to examine convergent/divergent validity with other domains within the conceptual model of LOSS and to replicate the original validation of the LOSS Scale (King et al., 2007). Thus, we administered the LOSS-SF with measures of military experiences, retirement concerns, health and well-being, alcohol use, social support and everyday life events. We sought to compare the validity findings of the LOSS-SF to those found in the LOSS Scale by King et al. (2007). Specifically, convergent validity of the LOSS-SF would be demonstrated if the scale exhibited a similar pattern of relatively stronger associations

with certain constructs as seen with the LOSS Scale; divergent validity would be supported if LOSS-SF exhibited a similar pattern of relatively weaker associations with certain constructs also seen with the LOSS Scale.

Method—Sample and measures information are presented in Table 1. Participants were mailed a single questionnaire packet containing the LOSS-SF with additional measures described above (common measures across all studies) and measures specific to Study 3. The response rate for the convergent/divergent validity study was 91.5%, with 236 participants completing the study.

Measures

The Elders Life Stressor Inventory: (ELSI; Aldwin, 1990; Aldwin, 1991) was administered to a subset of 50 participants and contains 30 events that are commonly experienced by individuals in later-life. Participants are asked to indicate whether an event has occurred for them during the past year and, if so, the extent to which the event was stressful. Responses range from 1 = *Not at all* to 5 = *Extremely*. The total number of stressful life events (range 0–30) is used; higher values reflect the experience of more stressful life events.

The Veterans RAND 12 Item Health Survey: (VR-12; Usman Iqbal et al., 2007). The VR-12 was developed from the Veterans RAND 36 Item Health Survey (VR-36), which was developed from the MOS RAND SF-36 Version 1.0. The VR-12 is a brief, self-administered 12-item health survey to assess disease-specific effects on quality of life in general and in selected populations. The 12 items are summarized into two scores, a physical component score (PCS) and a mental health component score (MCS), which provide a contrast between physical and psychological health status. Higher values reflect better physical and mental health-related quality of life.

PTSD Checklist-Civilian: (PCL-C; Weathers, Litz, Huska, & Keane, 1994). The PCL-C consists of 17 items that were directly adapted from the *Diagnostic and Statistical Manual of Mental Disorders IV* (American Psychiatric Association, 1994) to assess PTSD symptomatology. Participants are asked to rate how much they have been bothered by each statement in the past month. Items are rated on a 5-point scale with response options ranging from 1 = *Not at all* to 5 = *Extremely*. Similar to King and colleagues, we used the PCL-C rather than the military version to validate the LOSS-SF against a measure that assesses PTSD regardless of source (i.e., military vs. civilian trauma). The older adult combat veterans in this study had been civilians for years; therefore, this civilian assessment of trauma was more appropriate to use in this sample. Higher values indicate more, or more severe, posttraumatic stress symptoms. Internal consistency was .96 in the current sample.

Concerns about retirement.: This is a 16-item scale developed by King and colleagues (2007) for the previous full LOSS Scale validation study that assesses the degree to which retirement, or impending retirement, might provoke stress or anxiety. Items are rated on a 5-point Likert-type scale, with responses ranging from 0 = *Strongly disagree* to 4 = *Strongly agree*. The total score (range 0–64) is used; higher values indicate more retirement concerns. The internal consistency reliability (alpha) was .94.

Social support: (King, King, & Vogt, 2003; King, King, Vogt, Knight, & Samper, 2006). This is a 9-item scale that assesses the degree to which a person believes that they receive emotional and instrumental support from their friends and family. Each item is rated on a 5-point Likert-type response scale (with anchors of 1 = *Strongly disagree* to 5 = *Strongly agree*). The total score (range 9–45) is used; higher values indicate more social support. The internal consistency reliability is .98 in the current sample.

The Sense of Mastery Scale: (SMS; Pearlin, Menaghan, Lieberman, & Mullan, 1981; Pearlin & Schooler, 1978). This is a 7-item scale that assesses a person's feelings of control over facets of his/her life and effectiveness to cope with negative life events. Items are rated on a 5-point scale (0 = *Strongly disagree* to 4 = *Strongly agree*). The total score (range 0–28) is used; higher values indicate higher sense of mastery. Internal consistency reliability for this measure was .98 in the current sample.

The Satisfaction with Life Scale: (SLS; Diener, Emmons, Larsen, & Griffen, 1985). This 5-item scale assesses one's overall satisfaction with his/her life. Items are rated using a 7-point scale with response options from 0 = *Strongly disagree* to 6 = *Strongly agree*. The total score (range 0–30) is used; higher values indicate more life satisfaction. The internal consistency reliability was .90.

Statistical analyses: Bivariate correlations with Bonferroni correction for multiple comparisons were computed with the LOSS-SF total score and other measures to examine convergent/divergent validity. As in the LOSS scale validation by King et al. (2007), we expected that the LOSS-SF would show positive associations with scales assessing life stressors and other measures of distress (i.e., combat exposure, ELSI, PCL-C, and concerns about retirement). Conversely, we expected negative associations with scales assessing resiliency and satisfaction with life and relationships (i.e., social support, sense of mastery, satisfaction with life). We included one of our across-study measures, the Combat Exposure Scale, in these analyses because this scale was used by King et al in their validation of the LOSS Scale. We also examined the discriminant validity of the LOSS-SF compared with the PCL-C by examining differences in the relative strength of correlations of each measure with the other measures of distress, resiliency and satisfaction with life and relationships. Differences in the relative strength of the respective correlations of the LOSS-SF and PCL-C with these other measures would provide additional information about the degree to which each scale assesses different constructs. We used dependent correlation comparison tests (Cohen, Cohen, West, & Aiken, 2003) to assess the difference in correlation of the LOSS-SF versus the PCL-C with these measures. These comparative analyses are analogous to those used by Potter et al. (2013).

Similar to King et al. (2007) we also investigated incremental validity of the LOSS-SF by conducting a multiple regression analysis. This analysis examined whether the LOSS-SF score contributed significant and unique variance in predicting a measure of psychological distress, specifically, the VR-12 mental health component score (MCS). If so, this would support the incremental validity of the LOSS-SF relative to the other measures of psychological distress.

Results and Discussion—The LOSS-SF total score averaged 21.0 ($SD = 10.4$). Internal consistency was high, reflected in a Cronbach's alpha of .94. We examined the degree to which the LOSS-SF score was related to cognitive function and found no relation ($r = -0.07$, $p > .10$). Table 3 presents bivariate correlations between the LOSS-SF and other measures, along with similar correlations between the LOSS Scale and these measures (as reported in King et al. [2007]). The pattern of correlations of the LOSS-SF with other measures was generally consistent with that found by King et al. (2007). Specifically, significant positive associations were found between the LOSS-SF and scales assessing life stressors and other measures of distress (i.e., combat exposure, PTSD, and concerns about retirement). The correlation between LOSS-SF and ELSI was not significant. Conversely, LOSS-SF exhibited significant negative associations with scales assessing health-related quality of life, resiliency, and satisfaction with life and relationships (i.e., VR-12 MCS/PCS, social support, sense of mastery, satisfaction with life). The consistency in the pattern of correlations of the LOSS-SF and LOSS Scale with the respective scales provided support for the convergent/divergent validity of the LOSS-SF, especially as an abbreviated measure of LOSS.

Table 4 shows the correlations of the LOSS-SF and PCL-C with the respective other measures. The last row (r^2 difference) shows the difference in the proportion of variance that the LOSS-SF and PCL-C shared with the other measures as an index of discriminant validity between these two measures. The table shows significant differences between the LOSS-SF and PCL-C in the relative strength of association (and associated variance accounted for by each measure) with the other measures of distress, resiliency and satisfaction with life and relationships. Compared with the LOSS-SF, the PCL-C had stronger positive relationships with distress measures (PROMIS Anxiety and Depression) and stronger negative relationships with resiliency and satisfaction with life and relationships measures. The examination of incremental validity of the LOSS-SF via regression analysis compared the PCL-C and LOSS-SF in predicting psychological distress as indexed by the VR-12 mental health component score (MCS). In this model ($R^2 = .58$, $p < .0001$), the PCL was significant, $B = -.59$, $p < .0001$, whereas the LOSS-SF was not, $B = .08$, $p < .30$. Thus, compared with the PCL-C, the LOSS-SF did not contribute significant additional variance in predicting the MCS, which suggested that the LOSS-SF did not provide incremental validity in this model.

Combined Results: LOSS-SF

Table 5 shows item-level data and total score from the total sample combined across the three studies (among participants with complete LOSS-SF scores; $n = 325$). The combined LOSS-SF total score mean was 21.7 ($SD = 10.1$). Individual item means ranged from 1.47 to 2.44. Internal consistency reliability was .93.

General Discussion

We examined the reliability and validity of the 11-item LOSS-SF and the findings largely supported the LOSS-SF as being comparable to the LOSS Scale. Two-week (on average) test-retest reliability of the LOSS-SF was strong. Concurrent validity was strong as shown by the relationship between the LOSS-SF and LOSS Scale total scores. Additionally, the

pattern of correlations of the LOSS-SF with measures of other domains was largely similar to that seen between these measures and the LOSS Scale in the original validation study (King et al., 2007). Our analyses of the relative associations of the LOSS-SF and PCL-C with other measures of distress, resiliency and satisfaction with life and relationships were consistent with a similar analysis of the LOSS Scale by Potter et al. (2013) in the King et al. (2007) sample. Taken together, the similarity of results of the present study and King et al. study provides support for the convergent/divergent validity of the LOSS-SF, especially as an abbreviated measure of the LOSS Scale. Thus, these findings are consistent with a conceptualization of LOSS as being less related to mental health symptomatology and more strongly related to protective resources (e.g. sense of mastery, satisfaction with life), compared to PTSD.

On the other hand, our regression results showed that, compared with the PCL-C, the LOSS-SF did not contribute significant unique variance in predicting psychological distress as indexed by the VR-12 mental health component score. This suggested that the LOSS-SF did not provide incremental validity in this model. A similar analysis in King et al. (2007) showed that the LOSS Scale did contribute significant and unique variance in predicting psychological distress. This may have been due to sample differences, the larger sample in King et al. (524–562), and/or the additional items (22) in the LOSS Scale.

Regarding sample differences between the two studies, nearly half of the sample in King et al. (2007) was composed of World War II/Korean Conflict veterans, with the remaining half being Vietnam-Era veterans. In contrast, we had an approximate 20/80 percent split among the respective eras. Additionally, comparing our findings on the LOSS Scale total score with King et al., our score averaged 66.2, which was substantially higher than the average score of 38.2 in the King et al. sample. Perhaps our sample, with substantially more Vietnam-Era veterans, had a higher proportion of veterans experiencing relatively recent PTSD symptomatology or psychological distress which was better captured by the PCL-C predicting the MCS score. Recent findings by Potter et al. (2013) have shown that the PCL-C and LOSS Scale show differing inter-relatedness depending on the degree of distress endorsed by individuals assessed by each scale.

This study has several limitations to consider. This study was conducted using a convenience sample composed of older (aged 55) male veterans who were exposed to combat. In addition, the education level of participants was high, and the racial/ethnic makeup was quite homogenous. These factors limit the generalizability of the findings to other samples. It would be interesting to investigate the psychometric properties and conceptual role of LOSS in the lives of older women who have experienced earlier-life trauma.

Despite the limitations of the current study, the results of this study and Potter et al. (2013) have led us to reconsider the ways in which we believe members of this group actively engage or reengage in thinking about their wartime experiences, in an effort to find meaning and build coherence (Davison et al., 2016). This is in contrast to PTSD symptoms of avoidance and re-experiencing. The LOSS process may be successfully resolved and lead toward positive outcomes such as growth, acceptance, and satisfaction, or, conversely, may

lead to increased distress and more negative outcomes such as depression, substance use, or PTSD. We now refer to these phenomena as *later-adulthood trauma reengagement*, or LATR.

With this reconceptualization in mind, we believe the LOSS-SF scale may be a valuable tool for identifying older veterans who might benefit from an intervention designed to promote positive resolution of the LATR process, or instead, may require interventions geared more toward treating unresolved PTSD symptoms. Accordingly, LOSS-SF scores and scores on measures such as the PCL-C, when administered together may vary depending on where a veteran falls on the positive/negative outcome spectrum. For example, veterans with a high score on LOSS-SF and low score on PCL-C may be reengaging past wartime experiences toward a positive outcome, and may be good candidates for a psychoeducational intervention. Conversely, veterans with a low score on LOSS-SF and a high score on PCL-C may be reengaging past wartime experiences toward a negative outcome; those with high scores on the PCL-C, no matter their LOSS-SF score, should be provided with appropriate referrals (e.g., to a PTSD clinic). As such, the LOSS-SF may be a valuable tool to help guide treatment recommendations. Accordingly, we have included the LOSS-SF scale in the Appendix to be used in conjunction with the validation data in Table 5 for use in clinical and research settings.

Appendices

Appendix 1:: LOSS Short Form

Participant ID# _____

Thinking About Military Service

INSTRUCTIONS: The following statements ask about your attitudes, experiences, and thoughts about military service, and how these may have changed compared to when you were younger. Please read each item carefully and circle the choice that best applies.

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|--|-------------------|----------|----------------------------|-------|----------------|
| 1. I think about the war more than I used to. | 0 | 1 | 2 | 3 | 4 |
| 2. Everyday things have started reminding me of the war. | 0 | 1 | 2 | 3 | 4 |
| 3. As I get older, I get more upset when talking about the war than I used to. | 0 | 1 | 2 | 3 | 4 |
| 4. My family and friends tell me that I have recently been speaking more emotionally about the war. | 0 | 1 | 2 | 3 | 4 |
| 5. I dream about the war more now than when I was younger. | 0 | 1 | 2 | 3 | 4 |
| 6. These days, I become more emotional around certain days or anniversaries that remind me of the war. | 0 | 1 | 2 | 3 | 4 |

| | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|--|-------------------|----------|----------------------------|-------|----------------|
| 7. Lately, my thoughts about the war bother me more. | 0 | 1 | 2 | 3 | 4 |
| 8. I need to talk about the war more now than when I was younger. | 0 | 1 | 2 | 3 | 4 |
| 9. These days, I think more about my role in the war. | 0 | 1 | 2 | 3 | 4 |
| 10. When I am faced with stressful events, I find myself thinking about the war. | 0 | 1 | 2 | 3 | 4 |
| 11. Lately, I think more about friends I lost during the war. | 0 | 1 | 2 | 3 | 4 |

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Table 1:
Sample Demographics and Supplementary Measures by Study

| Characteristic | Study | | | | | | p |
|----------------------------|----------------------|----------------|----------------------------|----------------|---------------------------------------|----------------|-------|
| | Reliability (n=60) | | Concurrent validity (n=50) | | Convergent/divergent validity (n=236) | | |
| | <i>n</i> or <i>M</i> | % or <i>SD</i> | <i>n</i> or <i>M</i> | % or <i>SD</i> | <i>n</i> or <i>M</i> | % or <i>SD</i> | |
| Age | 68.1 | 8.1 | 68.1 | 8.0 | 70.5 | 8.6 | .04 |
| Years of Education | 14.4 | 2.6 | 14.5 | 2.7 | 15.9 | 2.8 | .0001 |
| Race | | | | | | | n.s. |
| Caucasian | 54 | 91.5 | 43 | 86.0 | 211 | 94.6 | |
| Other | 5 | 8.5 | 7 | 14.0 | 12 | 5.4 | |
| Military Branch | | | | | | | n.s. |
| Army | 52 | 86.7 | 40 | 80.0 | 150 | 67.3 | |
| Navy | 2 | 3.3 | 4 | 8.0 | 18 | 8.1 | |
| Marines | 4 | 6.7 | 3 | 6.0 | 34 | 15.2 | |
| Air Force | 2 | 3.3 | 3 | 6.0 | 20 | 9.0 | |
| Service Era | | | | | | | n.s. |
| World War II | 6 | 10.0 | 3 | 6.0 | 15 | 6.9 | |
| Korean Conflict | 5 | 8.3 | 7 | 14.0 | 37 | 17.0 | |
| Vietnam | 49 | 81.7 | 40 | 80.0 | 166 | 76.1 | |
| Marital Status | | | | | | | .0001 |
| Married | 40 | 66.7 | 30 | 60.0 | 168 | 75.3 | |
| Divorced/Widowed/Separated | 18 | 30.0 | 12 | 24.0 | 50 | 22.5 | |
| Never Married | 2 | 3.3 | 8 | 16.0 | 5 | 2.2 | |
| Retirement Status | | | | | | | n.s. |
| Not Retired | 8 | 13.3 | 7 | 14.0 | 17 | 7.6 | |
| Semi-Retired | 7 | 11.7 | 7 | 14.0 | 30 | 13.5 | |
| Retired | 41 | 68.3 | 34 | 68.0 | 157 | 70.4 | |
| Other | 4 | 6.7 | 2 | 4.0 | 19 | 8.5 | |
| Combat Exposure * | 10.3 | 2.7 | 10.3 | 2.5 | 8.9 | 3.4 | .001 |
| PC-PTSD * | 1.9 | 1.5 | 2.2 | 1.8 | 1.9 | 1.7 | n.s. |
| PROMIS Depression * | 53.1 | 8.9 | 53.1 | 11.2 | 52.3 | 10.3 | n.s. |
| PROMIS Anxiety * | 55.0 | 10.9 | 53.1 | 13.3 | 52.8 | 11.8 | n.s. |
| SMAS-T-G * | 1.8 | 2.6 | 2.2 | 3.0 | 2.0 | 2.5 | n.s. |
| TICSm Total Score * | 34.5 | 4.8 | 34.4 | 4.7 | 35.1 | 4.8 | n.s. |

Note.

* See "Reliability and validity studies" for description of statistically significant differences.

Table 2:

Measures Administered to Examine LOSS-SF Reliability and Validity by Study

| | Study | | |
|---|-------------|---------------------|-------------------------------|
| | 1 | 2 | 3 |
| | Reliability | Concurrent validity | Convergent/divergent validity |
| Measure, mean (SD) | | | |
| LOSS-SF | 22.6 (9.4) | 22.9 (9.2) | 21.0 (10.5) |
| LOSS scale | | 66.2 (28.6) | |
| Elders Life Stressor Inventory | | | 8.1 (6.8) |
| VR-12 - physical component score | | | 39.1 (10.2) |
| - mental health component score | | | 45.9 (12.0) |
| Posttraumatic stress disorder checklist | | | 36.1 (16.5) |
| Concerns about retirement | | | 1.6 (0.9) |
| Social support | | | 2.7 (0.7) |
| Sense of mastery | | | 17.8 (5.1) |
| Satisfaction with life | | | 18.2 (7.4) |

Note. See text for test descriptions; LOSS-SF = LOSS Scale – Short Form; LOSS scale = Late-Onset Stress Symptomatology Scale; VR-12 = Veterans Rand 12 Item Health Survey.

Table 3: Bivariate Correlations Between LOSS-SF and Study Variables (Study 3 [#]) Compared With Full LOSS Scale In King et al. (2007 [§])

| Measure | LOSS-SF | LOSS Scale |
|---|--------------------|------------|
| Combat exposure | 0.30 [*] | .20 |
| Elders Life Stressor Inventory | 0.22 [@] | .29 |
| Veterans Rand 12 (VR-12/SF12) MCS | -0.54 [*] | -0.52 |
| Veterans Rand 12 (VR-12/SF12) PCS | -0.17 | -0.25 |
| Posttraumatic stress disorder checklist | 0.71 [*] | 0.69 |
| Concerns about retirement | 0.49 [*] | 0.57 |
| Social support | -0.27 [*] | -0.39 |
| Sense of mastery | -0.41 [*] | -0.56 |
| Satisfaction with life | -0.32 [*] | -0.39 |

Note.

[#] N ranges from 179 to 335.

[@] N = 50, p > .05.

[§] N ranges from 524–562.

^{*} Bonferroni corrected significance level p < .006 (p < .05/9 comparisons)

Table 4: Bivariate Correlations Between LOSS-SF and PCL-C with Measures of Distress, Resiliency and Satisfaction with Life and Relationships

| Measure | LOSS-SF | PCL-C | r ² difference# |
|---------------------------|---------|-------|----------------------------|
| PROMIS Depression | 0.52 | 0.76 | -0.30 ** |
| PROMIS Anxiety | 0.59 | 0.80 | -0.30 ** |
| Concerns about retirement | 0.43 | 0.55 | -0.12 * |
| Social support | -0.25 | -0.41 | -0.10 ** |
| Sense of mastery | -0.45 | -0.60 | -0.15 ** |
| Satisfaction with life | -0.33 | -0.56 | -0.21 ** |

Note.

Dependent correlation comparison tests; Listwise N = 172. Elders Life Stressor Inventory not tested due to n.s. correlation with LOSS-SF.

* p < .01;

** p < .0001

Table 5:

LOSS-SF Item and Total Score Characteristics (N = 325)

| Item | M |
|--|--------------|
| I think about the war more than I used to | 2.44 |
| Everyday things have started reminding me of the war | 1.79 |
| As I get older, I get more upset when talking about the war than I used to | 1.92 |
| My family/friends tell me that I have recently been speaking more emotionally about the war | 1.47 |
| I dream about the war more now than when I was younger | 1.79 |
| These days, I become more emotional around certain days or anniversaries that remind me of the war | 2.24 |
| Lately, my thoughts about the war bother me more | 1.82 |
| I need to talk about the war more now than when I was younger | 1.89 |
| These days, I think more about my role in war | 2.30 |
| When I am faced with stressful events, I find myself thinking about the war | 1.80 |
| Lately, I think more about friends I lost during the war | 2.24 |
| Total LOSS-SF Score | 21.70 |