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Assessing late-onset stress symptomatology among aging male combat veterans

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Abstract
This study's goal was to develop a measure of late-onset stress symptomatology (LOSS). LOSS is a phenomenon observed in aging combat veterans who (a) were exposed to highly stressful combat events in their early adult years, (b) have functioned successfully throughout midlife with no history of chronic stress-related disorders, but (c) begin to register increased combat-related thoughts, feelings, and reminiscences commensurate with the changes and challenges of aging. Several samples of older male combat veterans from World War II, the Korean Conflict, and the Vietnam War served as participants. We developed a LOSS Scale that demonstrated a high degree of internal consistency reliability (coefficient alpha = 0.97). Scores were stable over brief intervals but were sensitive to developmental change over an extended period. Factor analysis suggested a single LOSS factor. Bivariate associations between LOSS score and other variables (e.g., indicators of contemporary life stressors, resilience, quality of life) were consistent with hypotheses, and there was support for the incremental validity of LOSS *vis-à-vis* posttraumatic stress symptoms and symptoms of general distress. Discussion of the potential uses of the scale, future directions for psychometric research, and suggestions for generalizing the LOSS construct to other trauma populations are provided.

Introduction

Historically, going back at least 140 years, reference has been made to the deleterious mental health effects of exposure to combat (see review by Hyams, Wignall, & Roswell, 1996). For the past three decades, behavioral and social scientists have engaged in intensive empirical study of the consequences of military experiences among men and women serving in regions of combat or other hazardous circumstances. Indeed, the rich collection of studies on trauma and posttraumatic stress disorder (PTSD; American Psychiatric Association, 1994) was largely motivated by investigations of veterans of the Vietnam War, and studies of veterans of more recent conflicts and missions continue to appear in the published literature. In the majority of these studies, attention is given either to veteran's initial adjustment (e.g., Boscarino, 1979; Egendorf, Kadushin, Laufer, Rothbart, & Sloan, 1981; Hoge et al., 2004; Litz, King, King, Orsillo, & Friedman, 1997; Wolfe, Erickson, Sharkansky, King, & King, 1999) or to the long-term consequences of chronic PTSD or other comorbid conditions for those who retain symptomatology beyond the immediate post-deployment years (e.g., King, King, Foy, Keane, & Fairbank, 1999; Kulka et al., 1990; McFall, Fontana, Raskind, & Rosenheck, 1999). In this research, our focus was 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. Our goal was to develop a reliable and valid measure of this phenomenon.

Clinical psychologists and other mental health professionals have increasingly recognized the onset of distressing combat-related memories, agitation, or PTSD-like symptoms in aging combat veterans. A number of case studies (e.g., Hyer, Summers, Braswell, & Boyd, 1995; Johnston, 2000; Pomerantz, 1991) have described a first-time stress reaction occurring later in life and opined that it is typically coincident with the occurrence of normative aging life events, such as retirement, health decline, or the death of family and friends. A lead article in the American Psychological Association *Monitor* (Sleek, 1998) described the phenomenon and noted that it has been widely observed by U.S. Department of Veterans Affairs clinicians. Such case studies and anecdotal evidence have led researchers

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to suggest that the aging process may exacerbate residual effects of trauma (e.g., Hyer et al., 1995).

Along these lines, for several years we have been investigating a concept we call *late-onset stress symptomatology* (LOSS) in aging combat veterans. By LOSS, we mean a phenomenon observed in aging combat veterans who (a) were exposed to highly stressful combat events in their early adult years, (b) have functioned successfully over the course of their lives with no history of chronic stress-related disorders, but (c) begin to register increased combat-related thoughts, feelings, and reminiscences as they encounter the changes and challenges of the aging process (e.g. retirement, physical deterioration, loss of spouse or other close relatives and friends), often 30, 40, or 50 years after their combat experiences (Davison et al., 2006).

The idea that combat-related exposure can have lasting effects that emerge or become especially pronounced in older age is not new. Certainly, researchers have investigated the health and functioning of aging military veterans (e.g., Elder & Clipp, 1988, 1989; Elder, Shanahan, & Clipp, 1994), as well as the negative and positive developmental consequences of prior combat exposure (e.g., Aldwin, Levenson, & Spiro, 1994). The LOSS construct incorporates the role of normative aging events in eliciting memories and reactions that seem related to combat exposure several decades prior. Many stressors associated with the aging process may have a unique and in some cases deleterious effect upon elderly veterans who were exposed to life-threatening combat stressors in their early years. That is, the "losses" that accompany growing older (Christenson, Walker, Ross, & Matbie, 1981, p. 985) may serve as precipitants to the onset of what we call LOSS in aging combat veterans. Again, the interest here is in veterans who have functioned successfully after their military service and through the mid-adult years, only to report increases in combat-related recollections and reactions in later life. For many veterans, reminiscences and reflections may prove not particularly distressing; for others, the resultant degree of upset or agitation may be marked.

In a discussion setting forth the conceptual framework for LOSS, Davison et al. (2006) noted a variety of possible etiological paths that might account for the phenomenon. First, there is a fairly substantial body of literature that links the expression of trauma symptomatology in old age to cognitive decline, dementia, and functional impairment (Floyd, Rice, & Black, 2002; Grossman, Levin, Katzen, & Lechner, 2004; Johnston, 2000; McCartney & Severson, 1997). Yet the mechanisms underlying this association are still debated. Older trauma victims' symptomatology may manifest as disorientation, confusion, and memory loss; on the other hand, cognitive decline may trigger increased distress and trauma symptoms. Another explanation may be found in Erikson's (1968) assertion that a critical task of old age is life review, which would likely motivate the revival of important life events, of which life-threatening combat experiences certainly qualify. There are also the aforementioned normative aging stressors as possible precipitants of LOSS, which may bring about feelings of loss of autonomy and control, or powerlessness, that recapitulate memories and feelings related to earlier trauma and losses (Buffum & Wolfe, 1995; Somer, 2000). General medical fragility in old age may be an important stressor that places additional demands on available resources and introduces psychological fragility, thus exacerbating the residual effects of trauma.

It is important to differentiate the construct of LOSS from other constructs, especially delayed-onset PTSD. Bolstered by qualitative data from aging combat veterans, Davison et al. (2006) noted that LOSS, and not delayed-onset PTSD, is explicitly defined in terms of the tasks and challenges of the aging process: ''LOSS represents a broader construct than PTSD, and encompasses a continuum of combat trauma-related phenomenology that specifically manifests within the context of normative late-life stressors'' (p. 39). LOSS may or may not be particularly distressing, but rather may be an expected consequence of normative aging for some veterans who faced serious combat experiences in early life. Unlike PTSD, therefore, LOSS need not necessarily impair functioning. Furthermore, while reminiscence and possible upset and agitation are characteristics of LOSS, these manifestations do not fully map onto the classic PTSD symptom clusters of re-experiencing, avoidance and emotional numbing, and hyperarousal. That is, a predominant feature of LOSS is reminders and memories, with some emphasis on arousal; in contrast, core aspects of PTSD are absent, such as avoidance and emotional numbing.

The United States veteran population continues to age. By the year 2010, nearly 40% of U.S. veterans, currently numbering a not inconsequential 25 million, will be at least 65 years old (VetPop2000, n.d.). It is necessary to facilitate their successful aging and meet their mental health needs. Research on late-onset stress symptomatology in elderly combat veterans thus seems an important and timely line of investigation. This study was undertaken to develop a reliable and valid measure of LOSS, as defined above and elaborated by Davison et al. (2006).

This article is organized to highlight the unfolding process of construct validation and the concomitant process of instrument development (Cronbach & Meehl, 1955; King & King, 1990; Landy, 1986). That is, the initial definition of the construct is followed by an elaboration of the putative content domains that it encompasses; the generation of possible indicators or items; the demonstration of

measurement consistency or reliability, factorial validity, and initial and ongoing support for concurrent and other forms of validity. Thus, in Part 1 to follow, we describe the development of the LOSS Scale. Its content is framed within the context of the definition of LOSS, the literature, and focus groups with aging veterans, from which items were generated and refined. In Part 2, we examine item and scale properties in a large sample of older male combat veterans. In Part 3, we explore the factor structure of the instrument and offer some support for discriminant validity. In Part 4, we investigate the consistency or stability of scores on the LOSS Scale in two veteran samples and over two time intervals, with additional attention to the reliability of change scores. Finally, in Part 5, we further evaluate validity, again using two samples.

Part 1: Scale Development

Focus Groups

The initial phase of scale development involved a qualitative, information-gathering approach using focus groups. Focus groups entail moderator-facilitated discussion among multiple participants. Group members serve as expert informants who address both questions posed by the moderator and comments of other participants (Morgan, 1996). Consequently, more information about feelings, memories, and experiences may be elicited from a focus group than from traditional interview situations (Greenbaum, 1998). Sensitive to the participants' frame of reference, the moderator allows group members to guide discussion, within a planned strategy of structured inquiry (Krueger, 1998). This technique enables exploration of the nature and organization of participants' memories, beliefs, and motivations. The aim is to examine the perspectives participants hold and to learn how these perspectives shape overt behavior (Goldman & McDonald, 1987). Also, participants may inform with regard to others like them; they may offer details about either themselves or members of their cohort (Thomae, 1992; Vogt, King, & King, 2004).

A total of 47 veterans participated in the LOSS focus groups: 24 who had served in World War II, 18 from the Korean Conflict, and 5 from the Vietnam War era.[1] For men, two groups were conducted for each war-era cohort. Five female military veterans (e.g., former WACS, WASPs, and WAVEs from the World War II cohort) constituted the seventh group.[2] The first column of Table 1 presents demographic characteristics of the focus group participants. The group moderator, a doctoral-level clinical geropsychologist, led group members through a discussion centered around the experiences of homecoming, their post-war education and careers, retirement and later life, the types of coping strategies they employ when faced with life difficulties or stress, and, most important, how they think the process of aging has affected their physical and psychological health. Each focus group, approximately 1–1/2 hours in length, was audiotaped. For extensive details on recruitment, screening, and other procedures related to the focus groups, see Davison et al. (2006).

Generation of LOSS-related Content

Two research assistants reviewed each audiotape twice, once with instructions to merely listen and become globally familiar with the flow of the discussions, and again with instructions to transcribe passages of the discussions that pertained to LOSS and its potential antecedents and correlates. Analysis of content was guided by the following specific questions: (a) Have these veterans experienced features of LOSS (either in themselves or in friends or acquaintances) as proposed here? (b) From their own perspective, how do they characterize the various features of the phenomenon? (c) Do their comments offer any explanation as to why such a phenomenon might be occurring so many years after combat exposure? (d) Do comments of these veterans suggest any particular exposure or background characteristics that might make one more vulnerable? (e) Do the participants report the normative events associated with aging, and do they independently link them to LOSS? (f) If they observe LOSS in themselves or others, does their commentary reveal attributions of responsibility, perceptions of control, self-efficacy, or strategies that seem to prevent potential distress?

Transcribed content in response to these questions was extracted and organized for review by the full research team. Four overlapping LOSS content themes were represented in the focus group data: (a) having increased thoughts and dreams about the war, (b) feeling more emotional about the war, (c) having stronger reactions to daily stressors, and (d) noticing changes in their (the veterans') own behavior or being told by close others that their behavior had changed. These themes were not considered to be orthogonal subdimensions of LOSS, but rather, identified to enhance content representativeness and thus item generation. Again, see Davison et al. (2006) for detailed quotes and qualitative analyses of the focus group data.

Constructing the LOSS Scale

In the second phase of scale development, we derived a paper-and-pencil self-report instrument to measure the LOSS construct. Items for the LOSS Scale were guided by our definition of the construct, with ongoing reference to the scientific and professional literature on war-related stress, and informed by critical information derived from the focus groups. Items were generated by a five-member team composed of doctoral-level experts

Table 1. Characteristics of the samples.

Variable	Sample				
	Focus group (Part 1) $n=47$	Survey (Parts 2, 3, & 5) $n=562$	Brief-interval test-retest (Part 4) $n=22$	Longer interval test-retest (Part 4) $n=69$	Second validity sample (Part 5) $n=88$
Age group					
30–39			1		
40–49			8		
50–59	5	70	9		
60 & older			3		
60–69	10	194		8	5
70–79	25	221		46	31
80–89	7	55		15	34
90 & over		3			3
Missing	0	19	0	0	15
Marital status					
Married or living as a couple	31	447	7	46	60
Not married	16	111	14	14	14
Missing	0	4	0	9	14
Highest level of education					
No high school	1				
Some high school	5	34			
Completed high school	10	73			
Voc/Tech training	0	29			
Some college	17	89			
Completed college	5	128			
Graduate or professional	9	207			
Missing	0	2			
Retirement status					
Not retired	3	132	7	8	10
Retired	44	405	3	50	63
Other		25	11	1	
Missing	0	0	0	10	15
Branch of service					
Army	26	163	15	23	26
Air force/army air corps	3	203	4	9	13
Navy	11	165	1	27	29
Marine corps	6	29	3	3	12
Coast guard		1			1
Missing	1	1	0	7	7
Era of service					
World War II		195			
Korea		87			
Vietnam		279			
More than one		41			
All three		16			
Missing		1			
Prisoner of war status					
Yes		318			
No		244			
Missing		0			
Received mental health counseling					
Yes		174	5	5	8
No		382	17	59	71
Missing		6	0	5	9

in clinical geropsychology, developmental psychology with gerontology expertise, combat-related stress, and psychometric theory and techniques, along with support from a master's level health psychologist and two psychology research assistants.

Item construction was an iterative process. We began by developing items guided by the content themes that had emerged from focus groups. The items were repeatedly brought to the group for review, with emphasis on content representativeness (did the item capture the definition of the LOSS construct?), readability (was the sophistication or level of language in the item appropriate to the intended population?), and conformity to other

well-known standards for item-writing (e.g., Aiken, 1994; Sax, 1989). The end result was a set of 33 items that were judged as best representative of the construct as originally defined and elaborated from focus group data. Sample items are: *Everyday things have started reminding me of the war. These days, I'm bothered by memories of my wartime experiences. My family and friends tell me that I have recently been speaking more emotionally about the war. I think about my war buddies more than I used to. These days, I become more emotional around certain days or anniversaries that remind me of the war*. Each item was accompanied by 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*.

In addition to the 33 LOSS items, all of which reflected distress, we inserted 11 filler items that tapped a positive perspective on past military experiences (e.g., *I learned valuable skills while serving in the war*). We elected to include these 11 positive appraisal items because (a) they tend to offset the negativity of the 33 LOSS items, and (b) during the focus groups, many participants mentioned personal gains and growth that they attributed to their combat and military service. In fact, these 11 filler items assessing positive aspects of military service form their own subscale, which plays a part in the later examination of factor structure (Part 3).

Part 2: Item and scale characteristics

In Part 2 of this study, we obtained quantitative data from a new sample to examine item and scale properties and finalize the LOSS Scale.

Method

Participants

We administered the LOSS Scale (along with other measures) to 562 male veterans, all of whom had been exposed to combat and other trauma during their military service (see below). This sample was drawn from three distinct groups of veterans with the aim of achieving diversity in background and life experiences, socioeconomic status, and other potential risk and resilience factors related to health. We sought to ensure a broad range of individual differences on relevant variables. Of the 562 participants, 130 were from veterans enrolled in the VA Normative Aging Study. This study has followed a large cohort of men (95% of whom are military veterans) since their enrollment between 1961 and 1970. A primary goal of the Normative Aging Study is to assess the impact of life events on aging (see Bossé, Ekerdt, & Silbert, 1984; Schnurr, Spiro, Aldwin, & Stukel, 1998; and Spiro, Schnurr, & Aldwin, 1994, for details on this longitudinal project). The 150 Normative Aging Study veterans at least 65 years of age who scored highest on Keane et al.'s (1989) Combat Exposure Scale ($M = 17.12$, $SD = 8.95$) were invited to participate in the present study, from which 130 veterans agreed. An additional 124 veterans were VA ambulatory care patients from the Veterans Health Study. This study was a longitudinal project that recruited male patients from four VA facilities in the greater Boston area between 1993 and 1996. A goal of the Veterans Health Study was to assess health-related quality of life in veterans receiving VA care (see Kazis et al., 1998, for a further description). To meet our criterion of combat exposure, Veterans Health Study participants who were at least 65 years of age were rank-ordered on their scores on a short form of the Laufer Combat Exposure Scale (Gallops, Laufer, & Yager, 1981), and the highest scoring 150 veterans were invited ($M = 7.96$, $SD = 2.62$), from which the 124 participants were obtained. The remaining 308 participants were repatriated prisoners of the Vietnam War registered with the R. E. Mitchell Center for Prisoner of War Studies, Pensacola, FL. The Mitchell Center database of approximately 500 men is the only existing longitudinal information on Vietnam-era prisoners of war. For many, their health and adjustment has been monitored over the 32 years since repatriation (see Keane et al., 2001, for additional details). By definition, one can assume that these individuals, many of whom faced long imprisonments with psychological and physical torture and extreme deprivations, met the criterion of high exposure to a war-related stressor. Demographic information on the full sample of 562 veterans is the second column of Table 1.

Procedure

Participants were recruited by mail. Each veteran received an introductory letter explaining the purpose of the project, along with a stamped return postcard for indicating whether or not he wished to participate. Adopting Mangione's (1998) multistep method to optimize responses to mailed questionnaires, we followed the mailing of the initial letter with the mailing of the package containing the survey itself. Subsequently, we sent a reminder postcard, a re-mailing of the package to nonrespondents, and a final reminder postcard. To comply with the confidentiality agreements of each parent database (Normative Aging Study, Veterans Health Study, and Mitchell Center), a system was created so that only staff at the parent site could link subject codes and survey responses to particular individuals. In the end, the overall response rate was 72%, 87% for veterans from the Normative Aging Study, 83% for those from the Veterans Health Study, and 62% for the participants drawn from the Mitchell Center.

Analyses

Classical test theory-oriented item and scale characteristics (Aiken, 1994; Anastasi, 1982; Nunnally, 1978) were computed. Item means and standard deviations were derived, as were each item's corrected item-total correlation (the correlation of the item's score with the sum of scores on all other items measuring the construct). Then the properties of the LOSS Scale as a whole were investigated in the form of a computed total score or sum of the 33 LOSS items, with emphasis upon the scale mean, median, standard deviation, and range. Finally, we computed an estimate of the LOSS Scale's internal consistency reliability.

Results and Discussion

The distribution of scores for items tended to be somewhat positively skewed. Nonetheless, item means and standard deviations indicated a fairly high degree of dispersion, given the 0–4 response scale. Item-total correlations ranged from 0.36 to 0.82, with an average of 0.68; 31 of the 33 items had item-total correlations that exceeded 0.50. Examination of individual item characteristics as well as a reassessment of item content did not point to any particularly weak items that should be removed. Therefore, all 33 items were retained.

The distribution of LOSS total scores was slightly positively skewed with a mean of 34.64 and a median of 33.00. Scores ranged from 0 to 119, and the standard deviation was 23.73. Fourteen respondents (approximately 3%) had LOSS scores of 0; no respondent scored the maximum possible of 132. Overall, total scores on the measure displayed a great deal of variability, suggesting that the LOSS Scale is able to adequately detect individual differences in the construct being assessed. Importantly, the estimated internal consistency reliability coefficient was quite high, alpha = 0.97. This finding suggests that the items on the scale are likely measuring a single global construct. Appendix A contains the 33 LOSS items, along with the 11 positive appraisal filler items.

Part 3: Factor structure

We next turned attention to factor structure. Given our definition of LOSS, the recognition that the themes that emerged from focus groups and guided item writing were highly overlapping (e.g., increased thoughts about the war provoke more emotionality, reactions to daily stressors are seen as a deviation from prior behavior), and the LOSS Scale's high internal consistency, we expected the items to load on a single factor. Also, we took advantage of the set of positive appraisal filler items (described below) and hypothesized that they would form a second factor. Because previous studies have demonstrated that there is a weak to nonexistent association between negative aspects of the combat experience and the ability to express positive gains from that same experience (e.g., Aldwin et al., 1994; Vogt, King, King, Savarese, & Suvak, 2004), the hypothesis that these two factors would be relatively uncorrelated provided a mechanism to garner support for discriminant validity.

Method

Participants

Data were the responses of 497 veterans, a subsample of the 562 respondents from Part 2 (see Table 1) who answered the entire complement of items on the LOSS survey instrument.[3]

Measures

As earlier noted, in addition to the focal measure of interest, the 33-item LOSS Scale, the LOSS instrument contains 11 items assessing positive appraisal of military experiences that were introduced to partially offset the negative tenor of the LOSS items (see Appendix A). In essence, these items form their own subscale intended to measure personal gains and growth attributed to combat and military service. Like the LOSS items, each positive appraisal item is rated using a 5-point Likert-type response format, with responses of 0 = *Strongly disagree*, 1 = *Disagree*, 2 = *Neither agree nor disagree*, 3 = *Agree*, and 4 = *Strongly agree*. Examples are: *The military allowed me to grow up. I learned valuable skills while serving in the war. The military taught me how to get along with others*. Internal consistency reliability was 0.84 in this sample.

Analyses

Factor analysis was conducted using the Comprehensive Exploratory Factor Analysis (CEFA; Browne, Cudeck, Tateneni, & Mels, 1998) program, which provides maximum likelihood estimates of factor loadings and an index of the adequacy of the number of factors extracted (the root mean square error of approximation; RMSEA). In addition, upon rotation, it yields standard errors of factor loadings, from which can be calculated critical ratios, the loadings divided by their respective standard errors. We systematically conducted four factor analyses, extracting five, four, three, and then two factors using maximum likelihood and oblique rotation. The CEFA program was employed, rather than a confirmatory factor analysis program; though we had expectations concerning the structure of the LOSS Scale (i.e., unidimensionality), we felt that at this stage of the development of the measure a confirmatory analysis would be premature.

Results and Discussion

The five-, four-, and three-factor solutions yielded RMSEA values of 0.061, 0.064, and 0.071, respectively. Due to high inter-item correlations (i.e., the high internal consistency), complex factor loadings defied reasonable interpretation for each of these structures. The two-factor solution, on the other hand, was clearly interpretable, with all LOSS items loading on one factor and all positive appraisal items loading on the other factor. For this model, $\chi^2(859, N = 497) = 3{,}558.73$, $p < 0.001$, and RMSEA = 0.080 (90% CI = 0.077–0.082), indicating acceptable fit (Hu & Bentler, 1998). The resulting rotated factor solution, factor loadings accompanied by their critical ratios (each loading divided by its standard error), is displayed in Table 2. For this two-factor solution, there is a strong tendency for the pattern of factor loadings to endorse the proposed structure: the 33 LOSS items loading on Factor 1 and the 11 positive appraisal items loading on Factor 2. Moreover, support for the specified solution is obtained when substantially larger critical ratios occur for the factor on which the item is supposed to load, as opposed to other factors. This was the case for all 33 LOSS items: Critical ratios for LOSS items on Factor 1 ranged from 9.33 to 65.31 with a mean of 32.15. In contrast, critical ratios were smaller for each LOSS item on Factor 2, where the range was −7.30 to 6.84 and the mean was 0.02. Similarly, for the positive appraisal items, critical ratios on Factor 2 ranged from 8.36 to 35.18 with a mean of 19.64. By comparison, critical ratios on Factor 1 ranged from −3.71 to 7.89 with a mean of −0.05. CEFA also provides 90% confidence intervals for all factor loadings. It is noteworthy that none of the intervals for loadings of items on their designated factor overlapped the intervals for the loadings of those items on the other factor. Therefore, the findings endorse the unidimensionality of LOSS and the expected two-factor solution. Importantly, as hypothesized, the two factors were relatively uncorrelated at $r = -0.11$, evidence endorsing the discriminant validity of the LOSS construct. A limitation of these results is that the CEFA program employs listwise deletion when data are missing, which reduced our sample by 11.6% (497 out of 562) and therefore tempers the external validity of the findings.

Table 2. Factor Loadings and Critical Ratios for a Rotated Two-factor Solution.

		Factor 1		Factor 2	
Item no.	Predicted factor	Factor loading	Critical ratio	Factor loading	Critical ratio
1	1	0.69	28.67	−0.13	−3.88
2	1	0.74	35.14	0.00	0.00
3	1	0.77	40.32	−0.08	−2.70
5	1	0.72	31.09	0.00	−0.12
6	1	0.75	37.60	−0.02	−0.68
7	1	0.53	15.91	−0.06	−1.45
9	1	0.72	32.77	0.11	3.44
10	1	0.73	33.09	0.21	6.84
11	1	0.71	31.00	−0.08	−2.30
13	1	0.59	19.70	0.21	5.78
14	1	0.76	37.85	−0.04	−1.19
15	1	0.84	60.29	−0.04	−1.60
17	1	0.52	15.73	−0.20	−5.13
18	1	0.68	27.24	0.00	0.06
19	1	0.59	19.80	−0.04	−1.16
21	1	0.75	37.50	0.06	1.77
22	1	0.74	35.33	0.12	3.74
23	1	0.70	29.17	0.14	4.33
25	1	0.81	50.56	−0.04	−1.52
26	1	0.80	47.18	0.00	0.00
27	1	0.63	22.61	−0.04	−1.17
29	1	0.66	25.19	0.09	2.54
30	1	0.68	27.12	−0.14	−4.24
31	1	0.75	35.52	−0.07	−2.29
33	1	0.36	9.33	0.22	5.33
34	1	0.77	40.42	0.09	3.07
35	1	0.73	32.95	0.01	0.38
37	1	0.66	26.36	−0.24	−7.30
38	1	0.83	55.27	0.04	1.63
39	1	0.85	65.31	−0.11	−4.38
41	1	0.49	13.86	0.23	5.78
42	1	0.58	19.37	0.05	1.37
43	1	0.61	21.75	−0.15	−4.17
4	2	0.03	0.78	0.55	16.12
8	2	0.00	−0.13	0.67	23.93
12	2	0.03	0.89	0.58	17.45
16	2	−0.02	−0.40	0.42	10.48
20	2	−0.20	3.71	0.35	8.36
24	2	0.29	7.89	0.42	11.13
28	2	−0.07	−2.59	0.77	35.18
32	2	−0.08	−2.31	0.58	17.48
36	2	−0.09	−2.54	0.58	18.22
40	2	0.05	1.52	0.71	27.31
44	2	0.00	0.07	0.73	30.42

Note: The item numbers in this table correspond to the numbering system used in the 44-item LOSS survey instrument.

Part 4: Test-retest reliability and the reliability of change

In Part 4 of this study, we used two samples to investigate the consistency or stability of LOSS scores over two time intervals and also the consistency of change in LOSS scores over the more lengthy time interval.

Consistency over a Brief Interval

The LOSS Scale was administered twice to a sample of 22 male combat veterans drawn from a separate study examining the biology of PTSD. Demographic information about these veterans is presented in the third column of Table 1. Although they were a part of an investigation of PTSD, the majority of these participants were community volunteers for research who likely have no history of stress symptomatology but were combat-exposed; as shown in Table 1, 77% reported having never received mental

health services. Participants visited a laboratory on two separate occasions, during which they completed a large array of surveys and questionnaires, including the LOSS Scale, on each visit. The interval between the first and second laboratory visits was 2 to 6 days, and the average interval between visits was 3.29 days ($SD = 1.35$). This interval is admittedly brief, yet participants responded to hundreds of other questionnaire items assessing health symptoms, personality, attitudes, and experiences on both occasions, and this might tend to decrease the likelihood that the specific responses to the LOSS items on the second occasion are primarily influenced by memory or practice effects.

LOSS scores were calculated for each participant at both Time 1 and Time 2. The mean LOSS score at Time 1 was 37.51 ($SD = 27.19$); at Time 2, the mean LOSS score was 35.69 ($SD = 30.21$). The test-retest reliability was 0.89 in this sample, suggesting that scores on the LOSS Scale are quite stable over a brief interval. Moreover, a paired *t*-test for change in scores from Time 1 to Time 2 was nonsignificant, $t(21) = 0.61$, $p = 0.55$ (two-tailed).

Consistency over an Extended Interval

Sixty-nine Normative Aging Study veterans completed the LOSS Scale on two occasions. After completing the LOSS Scale on a first occasion, these individuals happened to be selected for a subsequent, unrelated investigation of Normative Aging Study veterans, and arrangements were made to include the LOSS Scale in that separate study. The fourth column of Table 1 provides demographic information on this sample. For 59 of these 69 veterans, the exact dates of the two occasions on which the LOSS Scale was completed were known. The range in time between the two occasions was 1.65 to 2.05 years, and the average time interval between occasions was 1.78 years ($SD = 0.12$), or about 650 days.

The mean LOSS score at Time 1 was 31.43 ($SD = 17.86$); at Time 2, the mean LOSS score was 35.70 ($SD = 19.60$). The stability coefficient for this sample was 0.69, and the paired *t*-test yielded a significant change, $t(68) = -02.41$, $p < 0.05$ (two-tailed). Thus, there was a slight increase in LOSS scores over this extended timeframe (as one might expect, given the nature of the construct), yet relative standing of individuals over this longer interval exhibited a reasonable amount of consistency, as reflected in the resulting stability coefficient.

Implicit in the conceptualization of LOSS is the expectation that the process of normative aging will introduce potential shifts in one's position on the construct, indeed, as demonstrated by the significant increase in LOSS scores for this group of high-combat veterans. Accordingly, over some extended interval, there are expected individual differences in observed change in LOSS scores, and one might very well be interested in assuring the reliability of such individual differences in change. Applying formulas provided by Williams and Zimmerman (1996), the reliability of the change in LOSS over this longer (1.65–2.05 years) interval is 0.90. Thus, the LOSS Scale appears well-suited for research situations in which the interest is to longitudinally track changes in LOSS.

Part 5: Evidence for validity

Having examined the factor structure of the LOSS Scale and documented several indices of reliability, we next turned to evidence for its validity in terms of relationships between scores on this measure and scores on measures of other constructs. As detailed below, we had some specific hypotheses in support of concurrent validity and tested these expectations in two separate samples. In addition, in one of the samples, the administration of LOSS in conjunction with other measures of distress afforded the opportunity to examine incremental validity. Incremental validity refers to the extent to which a measure of a construct (e.g., LOSS) is able to explain or predict an outcome of interest (e.g., functional status) above and beyond an existing measure of another construct (e.g., PTSD; Haynes & Lench, 2003). As portrayed in these analyses, an index of incremental validity is found in the form of a partial regression coefficient representing the influence of the measure of interest net of the influence of the other measure.

Method

Participants

For this examination of validity, the first sample was the aforementioned group of 562 combat veterans drawn from the Normative Aging Study, Veterans Health Study, and R. E. Mitchell Center for Prisoner of War Studies (Table 1, second column). When these veterans completed the LOSS survey instrument, they also completed a number of self-report measures. A second sample comprised a wholly new group of 88 combat veterans from the Normative Aging Study who had not participated in any other LOSS survey but who completed the LOSS Scale as a part of ongoing Normative Aging Study longitudinal data collection. Demographic information on these veterans is presented in the last column of Table 1.

Measures

First Sample

Concerns about retirement. Retirement-related issues were frequently mentioned by focus group participants. Therefore, we sought to include

a measure that would assess the degree to which retirement, or impending retirement, might create worry or distress. Finding no suitable existing measure, we systematically constructed items to assess this construct. Relying on the retirement literature (e.g., Bossé, Levenson, Spiro, Aldwin, & Mroczek, 1992; Bossé, Spiro, & Kressin, 1996; Bossé, Spiro, & Levenson, 1997; Kim & Moen, 2001) and content from the focus groups, we generated a 16-item scale. Sample items, each rated on a 5-point Likert-type response scale (with anchors of 0 = *Strongly disagree* to 4 = *Strongly agree*), include *I am/was concerned about financial matters after retirement*, *I am/was concerned about feeling ready to retire*, and *I am/was concerned about staying active* (*e.g., hobbies, volunteering, church activities*) *after retirement*. This measure had high internal consistency reliability (alpha = 0.94).

Life events and stressors. The Elders Life Stressor Inventory (ELSI; Aldwin, 1990, 1991) contains 30 events that occur more typically for later-life individuals. Participants are asked to indicate whether an event has occurred during the previous year and, if so, the extent to which they were bothered or upset by the event (rated on a 5-point scale ranging from 1 = *Not at all* to 5 = *Extremely*). Summed scores based on the total number of stressful life events were calculated for each individual. Sample items include *Major personal injury or illness*, *Death of spouse*, and *Assuming major responsibility for a parent*. Alpha in this sample was 0.81.[4]

Social support. We used a 9-item social support scale (adapted from King, King, & Vogt, 2003; King, King, Vogt, Knight, & Samper, 2006) that assesses the extent to which individuals think that their friends and family provide emotional sustenance and instrumental assistance. Emotional sustenance refers to the extent to which others provide the individual with understanding, companionship, a sense of belonging, and positive self-regard. Instrumental assistance refers to the extent to which the individual receives tangible aid such as help to accomplish tasks and material assistance or resources from others. The response format was a 5-point scale ranging from 1 = *Strongly disagree* to 5 = *Strongly agree*. Total scores were computed; higher values indicate more social support. Sample items include *Among my friends or relatives, there is someone who makes me feel better when I am feeling down* and *If I were ill, there are friends or family who would help me*. The internal consistency was 0.84.

Sense of mastery. The Sense of Mastery Scale (Pearlin, Managhan, Lieberman, & Mullan, 1981; Pearlin & Schooler, 1978) is a 7-item measure of an individual's sense of control over aspects of his/her life and efficacy to handle negative life events. Items are rated on a 5-point scale (0 = *Strongly disagree* to 4 = *Strongly agree*). Sample items include *I can do just about anything I really set my mind to* and *There is really no way I can solve some of the problems I have* (reverse-scored). Alpha for this measure was 0.83.

Health-related functional status. The Short Form-12 Health Survey (SF-12) is a shortened version of the SF-36 (Ware, Kosinski, & Keller, 1995, 1996a, 1996b), which assesses physical functioning, role limitations due to physical problems, social functioning, bodily pain, general psychological health, role limitations due to emotional problems, vitality, and general health perceptions. This abbreviated instrument has been found to reproduce at least 90% of the variance in the physical and psychological subscales of the SF-36, which has well-established reliability and validity (Ware & Sherbourne, 1992; Ware, Snow, Kosinski, & Gandek, 1993). Sample items include *In general, would you say your health is*? (responses: *excellent*, *very good*, *good*, *fair*, and *poor*) and during the past four weeks *Did you have a lot of energy*? (responses: *all of the time*, *most of the time*, *a good bit of the time*, *some of the time*, *a little of the time*, and *none of the time*). Using the algorithms derived by the scale developers, two scale scores were computed: one for physical functional health status and one for mental functional health status.

Life satisfaction. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item measure that assesses an individual's satisfaction with general features of his/her life. Respondents are asked to indicate the degree of satisfaction using a 7-point scale with anchors ranging from 0 = *Strongly disagree* to 6 = *Strongly agree*. Sample items include *If I could live my life over, I would change almost nothing* and *I am satisfied with my life*. Alpha for this measure was 0.91.

General distress. The Brief Symptom Inventory (BSI; Derogatis, 1975, 1993) is a 53-item measure of overall psychological health as well as specific psychological symptoms (e.g., depression, anxiety, hostility). Items are rated on a 5-point scale ranging from 0 = *Not at all* to 4 = *Extremely*. Sample items include the extent to which the individual was distressed by *Having to avoid certain things, places, or activities because they frighten you*; *feeling no interest in things*, and *feeling lonely even when you are with people*. Rather than focusing on specific symptom dimensions, the Global Severity Index (GSI) may be used as a more general index of psychological functioning and distress and was employed here.

GSI scores are calculated as sums of the nine symptom dimensions divided by the total number of responses. In the present study, the resulting raw score was then standardized according to male nonpatient norms. This measure had high internal consistency reliability in the present study (alpha = 0.97).

Posttraumatic stress symptomatology. We also included a measure of PTSD symptom severity that assesses reactions to stressful life experiences. This measure, the PTSD Checklist-Civilian (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993), contains 17 items directly adapted from the *DSM-IV* (*Diagnostic and Statistical Manual of Mental Disorders IV*, American Psychiatric Association, 1994) to evaluate PTSD's Criteria B (re-experiencing and intrusive thoughts and memories), C (active avoidance and emotional numbing), and D (hyperarousal). Respondents rate on a 5-point scale (with anchors ranging from 1 = *Not at all* to 5 = *Extremely*) how much *you have been bothered by that problem in the past month*. The PCL-C has demonstrated coefficient alphas in the mid to high 0.90s (alpha was 0.94 in this sample) and is strongly correlated with one of the most well-accepted measures of PTSD, the Clinician-Administered PTSD Scale (Blake et al., 1995; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Sample items include *Feeling as if your future somehow will be cut short*? *feeling distant or cut off from other people*? and *feeling very upset when something reminded you of a stressful experience from the past*? There is also a military version of the PCL, but we selected the civilian version to provide a more conservative test of discriminant validity of the LOSS construct. We sought to demonstrate that LOSS could be distinguished from not only PTSD tied to early combat exposure but PTSD derived from *any* Criterion A event over the lifetime. The civilian version of the PCL references trauma of any type, to include trauma in the military as well as traumatic exposures that are likely to be experienced over the life course. The vast majority of these samples of aging veterans have been "civilians" for decades, and to differentiate LOSS from PTSD would seem to mandate a measure of PTSD that allows for the capture of PTSD regardless of its source.

Combat exposure. To assess combat exposure, we selected a 13-item measure (taken from King et al., 2003, 2006) that asks veterans about the types of war-zone and combat events to which they were exposed. The response format is dichotomous (0 = *No*, 1 = *Yes*). Sample items include *Did you go on combat patrols or missions*? *did you take part in an invasion that involved naval, air, and/or land forces*? and *were you wounded or injured in combat*? Alpha in this sample was 0.74.[4]

Second Sample. The second sample of veterans completed the ELSI, Sense of Mastery Scale, SF-12, and Satisfaction with Life Scale. In addition, they completed the following measures:

Positive and negative affect. Positive and negative affect were assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS has 20 items: 10 that measure positive affect, and 10 that measure negative affect. Each item is an adjective, and respondents are instructed to "indicate to what extent you have felt this way *during the past 4 weeks*." Each item is rated using a 5-point scale (with anchors ranging from 1 = *Very slightly or not at all* to 5 = *Extremely*). Sample items include *interested* (positive affect) and *afraid* (negative affect). Coefficient alphas have typically been in the upper 0.80s (e.g., alpha for positive affect = 0.87; alpha for negative affect = 0.87; Watson et al., 1988). In 2003, the Normative Aging Study administered the PANAS to approximately 750 participants, which included the present sample of 88 veterans. Alphas based on this data collection were 0.90 for positive affect and 0.88 for negative affect.

Optimism and pessimism. Optimism and pessimism were assessed using the Life Orientation Test (LOT; Scheier & Carver, 1985). This scale has eight items. Four items concern optimistic outcomes (alpha = 0.72) and four items are about pessimistic outcomes (alpha = 0.83; Litt, Shafer, & Napolitano, 2004). In the current study, respondents rated each item on a 5-point scale (with anchors ranging from 0 = *Strongly disagree* to 4 = *Strongly agree*). Sample items include: *I always look on the bright side of things* and *I'm always optimistic about my future* (optimism), and *if something can go wrong for me, it will* and *things never work out the way I want them to* (pessimism). For the 2003 Normative Aging Study data collection, alpha for optimism was 0.78 and alpha for pessimism was 0.83.

Personal well-being. Personal well-being was assessed by the Personal Well-Being Scale (PWB; Ryff, 1989). This measure contains six subscales, each with five items, that focus on the following: a positive attitude towards the self and one's past life (self-acceptance; *When I look at the story of my life, I am pleased with how things have turned out so far*), satisfying interpersonal relationships (positive relations with others; *I feel like I get a lot out of my friendships*), a sense of independence and self-determination (autonomy; *I have confidence in my own opinions, even if they are contrary to the general consensus*), a belief that life is meaningful

(purpose in life; *I have a sense of direction and purpose in life*), the ability to manage the surroundings in which one finds oneself (environmental mastery; *In general, I feel I am in charge of the situation in which I live*), and openness to new experiences and continued growth (personal growth; *I think it's important to have experiences that challenge how you think about yourself and the world*). Each item is rated on a 5-point scale (0 = S*trongly disagree* to 4 = S*trongly agree*). Normative Aging Study-based alphas for this scale were as follows: self-acceptance, 0.75; positive relations, 0.67; autonomy, 0.76; purpose in life, 0.73; environmental mastery, 0.76; and personal growth, 0.65.

Analyses

Bivariate correlations were computed between score on the LOSS Scale and scores on the other measures. As support for the concurrent validity of the construct, we postulated that higher LOSS scores would be positively associated with contemporary life stressors (concerns about retirement and ELSI), with other indicators of distress (GSI and PCL), and with a negative and pessimistic world view (PANAS and LOT). LOSS scores also were hypothesized to be negatively associated with measures of resilience (perceived social support and sense of mastery) and with the general quality of life indicators (life satisfaction, the set of PWB subscales, and functional status, especially mental health functional status).

To examine incremental validity, we employed multiple regression with data from the larger sample. In two separate analyses, SF-12 mental health score (a variable deemed most indicative of general psychological well-being) was regressed on scores on the PCL and LOSS, and then on scores on the GSI and LOSS. A significant and unique contribution of LOSS scores above and beyond the contribution of scores on these two other indicators of distress would provide support for incremental validity.

Results and Discussion

Table 3 presents the correlations between LOSS and the other measures for the two samples. Findings generally were consistent with expectations and supportive of the LOSS construct. The association between LOSS and concerns about retirement was fairly robust ($r = 0.57$), suggesting that this important event may be a factor in the emergence of late-life difficulties related to early-life trauma exposure. As hypothesized, a relationship, albeit modest to moderate, was found between LOSS and contemporary life stressors as assessed by the ELSI ($r = 0.29$ for the first sample and $r = 0.17$ for the second sample; this latter value was not statistically significant). The two highest correlations—between LOSS and GSI ($r = 0.59$) and between LOSS and PCL ($r = 0.69$) in the first sample—both supply evidence for validity. At the same time, the correlation with the PCL score is not so high as to suggest that LOSS is merely a proxy for the more traditional PTSD condition, with shared variance being slightly less than 50%. Also, as predicted, data from the second sample supported the associations between LOSS and tendencies toward negative affect ($r = 0.46$) and pessimism ($r = 0.40$). Much weaker and nonsignificant associations were found for positive affect and optimism.

The significant correlations with social support ($r = -0.39$, first sample) and sense of mastery ($r = -0.56$ and $r = -0.40$) are likewise noteworthy and as hypothesized: Those individuals scoring higher on LOSS are less likely to feel they have the emotional and instrumental social resources to meet life's demands and less likely to feel that they are in control of their day-to-day lives. As postulated, the correlations of LOSS with life satisfaction ($r = -0.39$ and $r = -0.40$) are moderately strong, in the expected direction, and consistent across samples; those reporting more LOSS also are less satisfied with aspects of their life. For the second sample, all six correlations between LOSS and PWB subscales are in the expected direction, and five of the six are reasonably strong (range of $r = -0.43$ to -0.56). Concerning functional status, the expected negative association between LOSS and mental health functional status obtained for both samples ($r = -0.52$ and $r = -0.48$). A fairly small association between LOSS and physical health functional status ($r = -0.25$) emerged only for the first sample.

Table 3 also reports weak associations between LOSS and the 11-item measure of positive appraisal of military experiences, a recapitulation of the discriminant validity evidenced in their relationship from Part 3's factor analysis. Finally, it is interesting to note the relationship between LOSS and combat exposure, available for the first sample. Again, although participants were selected on the basis of having extensive combat experience (and would thus have some degree of range restriction on this variable), the significant association with combat exposure ($r = 0.20$) lends further credibility to the validity of the LOSS construct.

The evaluation of incremental validity via multiple regression analyses yielded some additional support for the LOSS construct. When SF-12 mental health functional status was regressed on PCL and LOSS, the partial correlation of LOSS with SF-12 (controlling for the contribution of PCL) was -0.12, $t(546) = -2.79$, $p < 0.01$. Likewise, when the SF-12 score was regressed on GSI and LOSS, the partial correlation of LOSS with SF-12 (controlling for GSI) was -0.17, $t(550) = -3.91$, $p < 0.01$. It is noteworthy that LOSS contributed additional, though relatively modest, amounts of variance to psychological functioning over and above

Table 3. Bivariate carrelations among LOSS and additional measures.

Measure	Correlation with late-onset stress symptomatology (LOSS)	
	First sample	Second sample
Positive appraisal of military experiences	−0.03	0.12
Concerns about retirement	0.57**	
Physical health functional status	−0.25**	0.01
Mental health functional Status	−0.52**	−0.48**
General distress (GSI)	0.59**	
Combat exposure	0.20**	
Social support	−0.39**	
Life events and stressors (ELSI)	0.29**	0.17
Posttraumatic stress symptomatology (PCL)	0.69**	
Sense of mastery	−0.56**	−0.40**
Life satisfaction	−0.39**	−0.40**
Negative affect (PANAS)		0.46**
Positive affect (PANAS)		−0.21
Pessimism (LOT)		0.40**
Optimism (LOT)		−0.15
Self-acceptance (PWB)		−0.54**
Positive relations with others (PWB)		−0.52**
Autonomy (PWB)		−0.51**
Purpose in life (PWB)		−0.43**
Environmental mastery (PWB)		−0.56**
Personal growth (PWB)		−0.20

Notes: For the first sample, sample sizes range from 524–562; for the second sample, sample sizes range from 66–73.
**$p < 0.01$

that accounted for by two well-recognized indices: both in the case of the GSI, a measure of general distress, and in the case of the PCL, a measure of symptom severity linked to exposure to trauma. Overall, these findings provide preliminary evidence for the validity of the LOSS Scale.

Conclusions

The goal of this study was to systematically develop a paper-and-pencil self-report measure of late-onset stress symptomatology (LOSS) in aging male combat veterans, a phenomenon recently introduced by Davison et al. (2006). Based on data from combinations and portions of six samples of older combat veterans, the accumulated evidence indicates that the LOSS Scale has promise for the assessment of elderly veterans. Bolstered by special attention to content validity, including qualitative data from members of the target population (Part 1), we provided evidence for the reliability of the LOSS Scale (Parts 2 and 4), its latent structure (Part 3), and associations with other constructs and incremental evidence in initial support of validity (Part 5). We conclude that the LOSS Scale demonstrates a high degree of internal consistency reliability and that scores are stable over brief intervals but also sensitive to potential developmental change over a more extended period of time. In addition, the results of factor analysis are suggestive of a single factor that underlies responses to the LOSS items and is minimally related to a second factor intended to assess positive appraisal of prior military experiences. Furthermore, the pattern of associations between scores on the LOSS Scale and measures of other variables is very consistent with expectations, and there is support for the incremental validity of LOSS *vis-à-vis* measures of general distress and more specific trauma-related distress.

Why is it important to have a measure of this particular construct at this time, and how might the LOSS Scale be practically used? As noted in the introduction to this paper, the rather large veteran population is aged or aging, and the cohort of over 3 million US military veterans who served in the Vietnam War is reaching old age. These veterans—who were essentially the catalyst for the formalization of modern conceptualizations of posttraumatic stress—may be particularly attuned to trauma and its consequences. Given the aging of the veteran population, coupled with the distress that could be caused by the emergence of combat-related thoughts, feelings, reminiscences, memories, or symptoms in elderly veterans (see Hierholzer, Munson, Peabody, & Rosenberg, 1992), such an assessment instrument seems timely. Accordingly, the LOSS Scale might serve as a supplement to the more traditional PTSD assessment for aging combat veterans who present themselves to VA or other facilities with stress complaints. The scale potentially can provide more descriptive detail on the nature and perhaps etiology of presenting symptoms. In addition, the LOSS Scale (or an abbreviated version; see below) may have practical use in primary care settings to detect underlying concerns and difficulties for persons presenting with physical health complaints. Finally, familiarity with the LOSS construct and its measurement might inform the future development of psycho-educational interventions aimed at preventing late-life distress related to early combat exposure among the growing population of older military veterans. The assumption here, of course, is that LOSS may be a part of normative aging for some combat veterans, and unlike those with diagnoses of PTSD and the dysfunction that accompanies it, veterans experiencing LOSS may be quite amenable to interventions aimed at reframing reminiscences and confronting

daily stressors so as to successfully navigate the course of aging.

As a research instrument, the LOSS Scale is intended to help elucidate the process of aging in individuals exposed to extreme early-life stressors. To this end, an understanding of risk and resilience for LOSS is required. Researchers studying the mental health of veterans generally have identified such factors as the veteran's coping style and hardiness as potential influences (e.g., Aldwin et al., 1994; King, King, Fairbank, Keane, & Adams, 1998; Suvak, Vogt, Savarese, King, & King, 2002). Moreover, gerontologists have shown that certain beliefs and attributions may render aging individuals more or less susceptible to mental health problems. These variables include attributions of responsibility (Aldwin, 1992), learned helplessness (Burns & Seligman, 1991), perceptions of control (Ogden & Mitandabari, 1997), mastery (Aldwin, Sutton, & Lachman, 1996), and perceived self-efficacy (Bandura, 1998). Therefore, to yield a complete picture of LOSS, future work incorporating personal strengths along with vulnerabilities is necessary.

The LOSS Scale is a candidate for additional psychometric enquiry. Although the multi-part development study reported here drew upon data generated from six samples with a great deal of diversity (e.g., both clinical and community groups, geographically broad, varying military backgrounds and exposures, wide range of ages), the measure would profit from additional reliability and validity research in new aging veteran samples. In particular, attempts might be directed at administering the measure to a sample that is truly representative of the population of aging combat veterans. Also, the high alpha for the LOSS Scale suggests that not all 33 items may be necessary to provide adequate internal consistency. In fact, the application of the Spearman-Brown correction (Nunnally, 1978) indicates that one-third of the number of items would still achieve an alpha of just over 0.90, other factors held constant. Surely, a 10- to 12-item LOSS short form might have appeal. Hence, future efforts might be directed toward the creation of a reliable and valid abbreviated form of the measure, with careful attention to appropriately retaining content representativeness (Messick, 1980).

Finally, another avenue for investigation might be the adoption of the LOSS conceptualization and measure to aging members of other trauma populations whose exposure occurs in early life, who function without serious mental health problems over the mid-life years, but who develop distress related to the early trauma in later years. We acknowledge that combat is the cardinal stressor at this stage of construct development and do not preclude examination of other stressors or adaptation of LOSS to such stressors in future work. In fact, one of the authors (EHD) has received grant support to extend study of the LOSS construct to older women with a history of sexual assault victimization, either as children or as young adults, or both. In this regard, Allers Benjack and Allers (1992) noted that one of the most common manifestations of unresolved trauma in older adults with histories of childhood sexual abuse is re-victimization, such as elder abuse. As women are more likely to have a sexual trauma history than are men, and as the ratio of women to men increases with advancing age, it seems compelling to study LOSS in the context of older female survivors of sexual trauma. The construct may likewise be pertinent to other populations who experience trauma in their early years: perhaps victims of severe childhood neglect, victims of intimate partner domestic violence in early adulthood, or persons exposed to political violence, terrorist attacks, or life-threatening natural disasters in their younger years. Again, the emphasis would be the activation of thoughts, feelings, and possible distress related to the early trauma within the context of normative late-life stressors.

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Notes

[1] One focus group participant served in both World War II and the Korean Conflict; he is recorded within the Korean Conflict group of participants.

[2] We were somewhat hampered in our attempt to pursue LOSS in women, as it proved difficult to find older female veterans who had been exposed to military combat. By definition, combat-related LOSS involves older veterans of World War II, the Korean Conflict, or the Vietnam War who have engaged in high levels of traditional combat. This virtually eliminates women at this stage of construct validation, as women assuming combat roles in the military is a very recent trend.

[3] We made special efforts to ensure that the instrument would be easy to complete by elderly respondents (e.g., large print, high-quality bond paper, and printing only on one side of each page), and we provided a page-by-page reminder to "please respond to every item." Nevertheless, approximately 11.6% of these older veterans failed to answer at least one of the set of 44 LOSS survey items.

[4] Responses to items for variables such as combat exposure and life events and stressors may be considered causal indicators of their respective constructs. Hence, co-variation among these items is not expected to be particularly high, and estimates of internal consistency reliability therefore may be less than expected for variables with effect indicators (see Bollen & Lennox, 1991; Cohen, Cohen, Teresi, Marchi, & Velez, 1990; MacCallum & Browne, 1993; Netland, 2001; Vogt et al., 2004).

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Appendix A: LOSS and Positive Appraisal Items

1	As I get older, I get more upset when talking about the war than I used to.
2	Everyday things have started reminding me of the war.
3	These days, I'm bothered by memories of my wartime experiences.
4	The military allowed me to grow up.
5	When things go wrong, I feel like I'm back in combat.
6	If I don't keep myself busy, I think about the war.
7	My family and friends have told me that I am talking too much about the war.
8	I learned valuable skills while serving in the war.
9	I dream about the war more now than when I was younger.
10	These days, I think more about my role in the war.
11	As I age, seeing or hearing anything related to the war upsets me.
12	The military taught me how to get along with others.
13	I think about my war buddies more than I used to.
14	Independence Day, Veterans' Day, and Memorial Day services have become more distressing for me.
15	These days, I think about the war at times when I don't want to.
16	The military helped me pursue my educational goals.
17	As I grow older, I have more regrets about my role in the war.
18	My family and friends tell me that I have recently been speaking more emotionally about the war.
19	The more I learn about the war, the more angry I become.
20	Serving in the war let me travel to places I would have never seen.
21	When I am faced with stressful events, I find myself thinking about the war.
22	Compared to when I was younger, I think more about my experiences in the war.
23	Lately, I think more about friends I lost during the war.
24	Having fought in a war is a big part of my life.
25	Recently, I have moments when I feel like I'm back in combat.
26	I think more about the war when I'm under stress.
27	Movies and television shows about war bother me more than they used to.
28	My war experience helped me become a better person.
29	These days, I become more emotional around certain days or anniversaries that remind me of the war.
30	Lately, I have been thinking about seeing a doctor about the way I've been acting.
31	These days, I get more angry thinking about the war than I used to.
32	I personally benefited in the long run by serving in the war.
33	I get more emotional over patriotic things than I used to.
34	I need to talk about the war more now than when I was younger.
35	Lately, I've been having nightmares about the war.
36	The military helped me pursue my career goals.
37	I have started feeling more guilty about my wartime experiences.
38	I think about the war more than I used to.
39	Lately, my thoughts about the war bother me more.
40	I learned a lot about myself in the service.
41	I have recently looked for old wartime buddies with whom I can talk about the war.
42	Media coverage about the war (newspaper articles, movies, and television news) often makes me feel anxious, sad, or angry.
43	Lately, my family and friends have told me to see a doctor about the way I've been acting.
44	My war experience taught me good leadership skills.

Note: Instructions are: The statements below 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 to you. LOSS items are: 1, 2, 3, 5, 6,7, 9, 10, 11, 13, 14, 15, 17, 18, 19, 21, 22, 23, 25, 26, 27, 29, 30, 31, 33, 34, 35, 37, 38, 39, 41, 42, 43. Positive appraisal items are: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44. Each item is responded to using the following scale: 0 = *Strongly disagree;* 1 = *Disagree;* 2 = *Neither agree nor disagree*; 3 = *Agree;* 4 = *Strongly agree*.