

Special Issue: Veterans Aging: Forum

Long-term Outcomes of Military Service in Aging and the Life Course: A Positive Re-envisioning

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Received January 27, 2015; Accepted May 26, 2015

Decision Editor: John B. Williamson, PhD

Abstract

Most research on military service focuses on its short-term negative consequences, especially the mental and physical injuries of those deployed in warzones. However, studies of long-term outcomes reveal surprisingly positive effects of military service—both those early in adulthood that grow over time and others that can emerge later in life. These multidomain effects have been found in veterans of World War II and the Korean War and are now being seen in veterans of the Vietnam War. Although some are directly attributable to public policies such as the GI Bill, which facilitate educational and economic gains, there are personal developmental gains as well, including autonomy, emotional maturity and resilience, mastery, and leadership skills, that lead to better health and well-being in later life. These long-term effects vary across persons, change over time within persons, and often reflect processes of cumulative advantage and disadvantage. We propose a life-span model of the effects of military service that provides a perspective for probing both long-term positive and negative outcomes for aging veterans. We further explicate the model by focusing on both sociocultural dynamics and individual processes. We identify public-use data that can be examined to evaluate this model, and offer a set of questions that can be used to assess military service. Finally, we outline an agenda for dedicated inquiry into such effects and consider policy implications for the health and well-being of aging veterans in later life.

Key Words: Health, Mental health, Well-being, Veterans, Resilience

You gotta accentuate the positive

Eliminate the negative

Latch on to the affirmative

An' don't mess with Mister In-Between

—Johnny Mercer and Harold Arlen, 1944

We have spent the last two decades studying the long-term outcomes of military service among veterans of

World War II (WWII), the Korean War, the Vietnam War, and the Persian Gulf War. Although most research focuses on short-term negative consequences of these conflicts, especially the mental and physical injuries of those deployed in warzones, there is growing recognition that military service has profound *positive* effects on health and well-being—both early effects that grow over time and ones that can emerge later in life (MacLean & Elder, 2007; Settersten, 2006; Spiro, Schnurr, & Aldwin, 1997). These effects occur in multiple domains, including

physical health, mental health, and social and economic well-being.

We propose a conceptual model for examining the long-term outcomes of military service for aging veterans, situating military experience within the individual's life trajectory and sociohistorical context. We further explicate the model by focusing on sociocultural dynamics and individual-level processes, offering examples to illustrate potential positive consequences of service while also acknowledging its negative consequences. We propose this interdisciplinary model with the hope that it will lead scientists to develop a more comprehensive understanding of the myriad effects of service on aging veterans of today and tomorrow, and practitioners and policy makers to better anticipate and address these effects.

Military Service as a Hidden Variable in Aging

Military service, especially combat exposure, is a "hidden" variable in aging among men who served during WWII, the Korean War, and more recently, the Vietnam War (Settersten, 2006; Spiro et al., 1997). Although most aging research has been based on cohorts that were heavily involved in military service, this service has seldom been considered. Knowledge of the aging process has therefore been confounded by some of the long-term effects of service and of combat exposure in particular (Schnurr, Spiro, Aldwin, & Stukel, 1998). These effects can be latent for decades, only to surface later in response to normative losses that accompany aging (e.g., roles, relationships, cognition, health; Davison et al., 2006, 2015).

During WWII, 16 million American men served in the military, about half of the eligible population of men. Approximately 75% served overseas; about half experienced combat (Segal & Segal, 2004). During the Korean War, about 5.7 million served and 30% were deployed; during the Vietnam War, 8.7 million served and about 40% were deployed. In these three wars, women constituted about 3%–4% of troops (Census Bureau, 2013). At present, the average age of male veterans in the United States is 64 years, versus 49 years in the general population. Veterans of the Vietnam War constitute the largest surviving cohort in the United States (7.5 million), followed by those from the Korean War (2.4 million) and WWII (2.0 million; Census Bureau, 2013).

The proportion of the population serving in the military declined following WWII, and veteran characteristics also changed. Women and minorities became a larger part of the armed forces during the Vietnam War, and since the introduction of the all-volunteer force (AVF) in 1973, their participation has increased. Women now comprise about 20% of older veterans, and minorities comprise about 35% of older veterans (Department of Veterans Affairs, 2014). Since the AVF was introduced, Active Duty forces have been supplemented by Reserve and Guard troops, who are often older and more likely to have families and careers (Institute of Medicine [IOM], 2013; Segal & Segal, 2004).

The effects of service vary by era and conflict (Fontana & Rosenheck, 1994; Spiro et al., 1997), and the extent to which findings from today's aging veterans are applicable to future veterans remains unclear. For example, veterans of Afghanistan and Iraq have higher levels of PTSD than veterans of the Vietnam War, who in turn have higher levels post-traumatic stress disorder (PTSD) of PTSD than WWII veterans (IOM, 2013). Military service affects the timing and nature of social roles and the accumulation of economic and social resources such as education and income (Maclean & Elder, 2007; Schnurr & Aldwin, 1993; Settersten, 2006), which affect both mental and physical health. It is therefore important to develop models that delineate how sociocultural dynamics and individual-level processes interact to affect the long-term outcomes of military service.

We propose a re-envisioning of this field—from a concern with specific short-term outcomes of warzone deployment to a broader and deeper consideration of long-term outcomes of military service, and from a focus on negative outcomes to the recognition of a full continuum of negative, null, and positive outcomes. Most studies of long-term effects of military service focus on a single outcome and examine veterans of a single conflict. There is an urgent need to develop a more integrated and dynamic approach for assessing the varied legacies of service and identifying risk and protective factors for the health and well-being of aging veterans and the processes that modulate these effects. It is also crucial to learn what is common and distinct about the aging experiences of veterans from different wars or conflicts.

A Life-span View of Military Service

In developing our model, we drew inspiration from both "life span" and "life course" perspectives in developmental psychology and sociology, respectively (e.g., Baltes, Lindenberger, & Staudinger, 2006; Elder, Shanahan, & Jennings, 2015), glossing over differences between them (see Settersten, 2009). In this article, we use these terms interchangeably.

Our interdisciplinary view of military service rests on five principles. First, the effects of military service are lifelong. Although short-term effects can be observed more readily and seem more direct, many aspects of service reverberate throughout life. Second, the effects of service are multidimensional, affecting multiple domains of life, including health and well-being. We should consider a broad spectrum of outcomes rather than only one or a few. Third, military service leads to both gains and losses—and therefore positive as well as negative outcomes, reflecting, for example, a deviation-amplification process model (Aldwin, Levenson, & Kelly, 2009) or a positive turning point or a life-course disruption model (London & Wilmoth, 2006). One corollary is that the same experience (e.g., combat) affects people differently, depending on individual and contextual factors, and on its timing in the life course. Fourth, the effects of service are experienced within a matrix of social relationships

(e.g., family members, friends, service mates, and communities) that can protect veterans or create risk for them over time. Fifth, these effects occur within and are affected by sociohistorical context. For example, the nature of the military and the experiences of combat have changed greatly since the American Civil War and continue to evolve.

Figure 1 is our conceptual model of the long-term outcomes of military service. This model situates the person's life trajectory (lower arrow) within their sociohistorical context (the upper timeline, indicating American wartime eras). The body of the figure represents their military career, starting with premilitary characteristics that lead an individual to join, followed by a box representing their characteristics at entry. The central box, military experiences, includes aspects of service that may be central determinants of positive or negative outcomes later in life. The next box, pathways, enumerates various postmilitary experiences, such as material or social benefits, and various midlife outcomes that might be affected by service. The final box indicates later-life outcomes of military service; again, no directionality is assumed here.

Table 1 provides more detail on the spectrum of possible outcomes. For example, the GI Bill allowed many veterans to achieve higher education and affordable housing, serving as a pathway to higher socioeconomic status (SES). At the same time, mental health and substance abuse problems due to service can result in substantial rates of unemployment and homelessness. Rather than asking whether military service has long-term effects, the more appropriate questions are, for whom does military service have long-term positive and/or negative effects, in which domains,

and why? The next two sections explore answers to these and related questions by illuminating sociocultural dynamics and individual-level processes, respectively.

Sociocultural Dynamics and Long-term Outcomes of Military Service

Figure 2 offers an example of how sociocultural dynamics shape long-term outcomes of an individual's service. Military service is placed in the middle of the figure, as a

Table 1. Long-term Outcomes of Military Service, by Domain

Physical health	Mental health	Social/economic well-being
Symptoms or ratings	Well-being/ Quality of life	Educational attainment
Health care use/cost	Cognition	Occupational functioning
Disease prevalence/ incidence	Resilience or posttraumatic growth	Income/wealth
Injury/disability	Substance use/ abuse	Family and friendships
Mortality	Suicide	Civic attitudes/ political engagement
	Mental symptoms or disorders	Crime

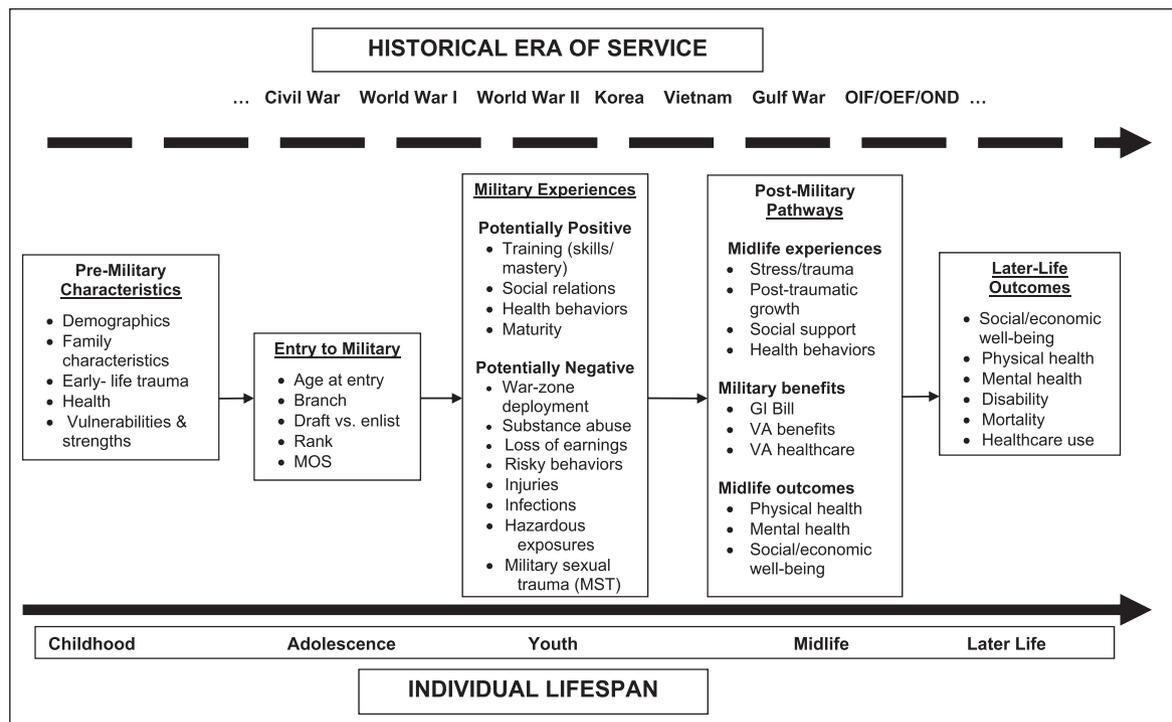


Figure 1. Model of long-term outcomes of military service. Note: OEF/OIF/OND = Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn

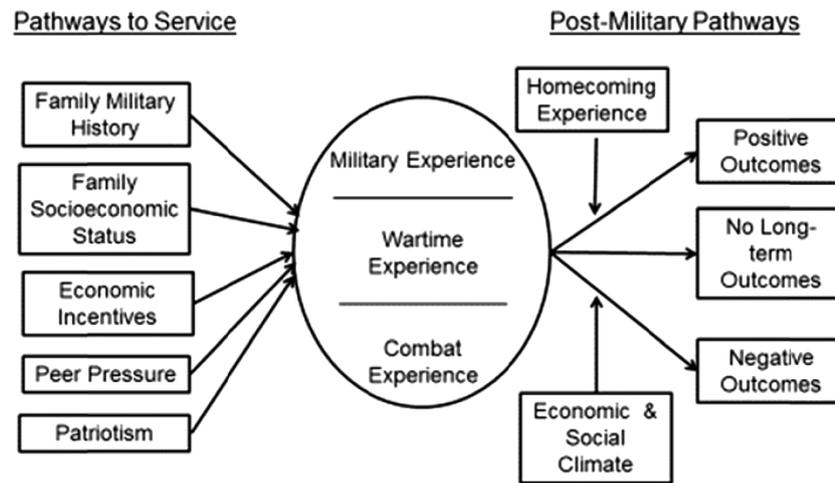


Figure 2. Sociocultural dynamics and long-term outcomes of military service.

“lens” refracting the different social pathways that lead individuals into service. As a result of their experiences, including those of wartime and combat, individuals can have various outcomes in later life, which can be positive, negative, or null. These outcomes are affected by moderating factors such as the homecoming experience or the prevailing social and economic climate.

The center oval suggests that “military service” should be conceptualized in multiple ways: effects stem from service generally (e.g., in times of peace), from service in wartime, and from combat. Although not indicated in the figure, military service across these three levels also has many specific dimensions—not only objective aspects of service (such as when, how long, where, and in what branch veterans served or what rank and duties they held), but also subjective aspects of service, which frame how veterans interpret and evaluate the objective aspects.

The left side of the figure demonstrates that pathways into service can be shaped by sociocultural factors such as the military history and SES of one’s family of origin, perceived economic incentives (income, benefits), or public support for war and patriotism, among other factors. For example, military service in one family generation might make it more likely in a subsequent generation. At the same time, family military history might work against the likelihood that successive generations will serve. Consider, for example, evidence from the families in the longitudinal Berkeley and Oakland Studies (Elder, 1999). Most of the boys, who were born in the 1920s, eventually served in WWII or the Korean War; they supported the Vietnam War and believed in the obligation of men to serve their country. Many of their sons, who came of age during the Vietnam era, denounced the war and their fathers’ service. Conflict over the Vietnam War was a significant source of intergenerational tension in 20% of these families, and it was particularly high in families where the sons protested the war and resisted or served resentfully (Settersten, 2006).

Similarly, the SES of family of origin can lead young people to be more or less drawn to service. For many young

people, especially from disadvantaged backgrounds or who are not college bound, the military is no longer a second-chance institution but a first choice (Kelty, Kleykamp, & Segal, 2010). Regardless, the military often becomes a gateway to a better future. This role of the military is not new. Indeed, WWII represented a “structural intervention” into the lives of more than 10 million American men, allowing them to overcome disadvantaged backgrounds at a crucial time—as they came into adulthood and emerged from families that suffered extreme hardship during the Great Depression (Elder, 1999; Sampson & Laub, 1996). This effect is nicely illustrated by Louis Zamperini’s life as described in *Unbroken* (Hillenbrand, 2010).

On the right side of the figure, long-term effects of service can ultimately result in positive, null, or negative outcomes. The negative effects of combat on mental health, especially PTSD, have been studied extensively. However, many veterans with PTSD early in their lives overcome it, and some grow from it, whereas others who manage to keep PTSD symptoms at bay for decades see it surface later in life when they are faced with challenges of aging (Davison et al., 2006, 2015). Between 5% and 25% of troops developed PTSD based on their service in different eras (Magruder & Yeager, 2009; Spiro, Schnurr, & Aldwin, 1994); the obverse of the PTSD prevalence indicates that the majority of troops did not develop PTSD. Deployment and combat can also have negative effects on physical health (e.g., hazardous exposures, traumatic brain injury).

Another example of sociocultural dynamics on the right side involves WWII. By allowing men who served to shed their disadvantaged pasts and enter the middle class early in life through the GI Bill’s provisions for education and housing, they and their families reaped cumulative advantages of better employment and higher lifetime earnings. This “bridging” effect of military service—in which it serves as route to social mobility at an important juncture—is also reflected in the degree to which American veterans of WWII and the Korean War appraise their

service very positively and see it as a turning point in their lives (e.g., [Settersten, Day, Elder, & Waldinger, 2012](#)).

Such positive effects are moderated by sociocultural factors such as homecoming experiences (e.g., support received from family or community) or the larger economic and social climate (e.g., labor market opportunities for veterans). For example, such positive social and economic effects are likely specific to veterans of WWII and the Korean War rather than to veterans of the Vietnam War, given its unique (negative) social climate and narrow range of recruitment ([Wright, Carter, & Cullen, 2005](#)).

Relative to veterans of America's other wars, WWII veterans were more actively and fully integrated into the labor force, and the civic life of the nation, upon their return. WWII was a popular war, and the training and rehiring of veterans might have been especially generous. The "screening hypothesis" ([Lakhani, 1998](#)) suggests that employers use knowledge about veteran status in hiring. For American veterans of WWII, this may have been positive, but negative for veterans of the Korean War and especially for veterans of the Vietnam War, given the starkly different political and public sentiments surrounding these wars. From a policy standpoint, the benefits of service were far more generous for veterans of WWII and the Korean War than for veterans of the Vietnam War, further accentuating over time the more positive outcomes of service for these men. Such differences illustrate how the long-term outcomes of service can differ across wars and conflicts and in response to the social climate and economic reward structure enveloping particular periods of service. It remains to be seen whether and how the new GI Bill will reward or penalize veterans of recent conflicts in the long run.

Individual-level Processes and Long-term Outcomes of Military Service

Although the resources and risks that veterans experience occur within a sociocultural context, they unfold across the individual's life span. This section focuses on individual-level processes through which positive and negative trajectories emerge from military service. As discussed earlier, military service is a "hidden variable" that affects the aging process and provides a context for studying optimal versus impaired aging. On the one hand, those entering the military are screened on the basis of mental and physical health (the "healthy soldier" effect). Those who are deployed are further screened (the "healthy warrior" effect; [Larson, Highfill-McRoy, & Booth-Kewley, 2008](#)). Such selection effects create health differentials between veterans and civilians, and within veterans differing on deployment. A meta-analysis of the effects of service on mortality found that veterans experienced about 25% lower risk of mortality than civilians ([McLaughlin, Nielsen, & Waller, 2008](#)), and this "healthy soldier" effect can last as long as 30 years ([Waller & McGuire, 2011](#)). Thus, it is not surprising that 81% of veterans described themselves as aging successfully ([Pietrzak, Tsai, Kirwin, & Southwick, 2014](#)),

compared with 30%–60% in general samples ([Aldwin & Igarashi, 2015](#)). On the other hand, veterans who sustain serious psychological or physical injury can be at higher risk for impaired aging, with higher rates of physical and psychiatric disability, and mortality, up to 50 years later ([Elder, Shanahan, & Colerick Clipp, 1997](#); [Spiro et al., 1997](#)).

The long-term outcomes of military service vary among veterans, depending upon their exposure to trauma and their resilience to it. Resilience is a multidimensional construct defined as positive adaptation in the face of adversity, reflecting individual factors as well as familial and sociocultural contexts ([Lerner et al., 2012](#); [Ungar, 2011](#); [Vogt, King, & King, 2014](#)). Building on an ecological model of resilience ([Aldwin & Igarashi, 2012](#)), we focus on how resilience can affect the long-term effects of military service.

As shown in the left-hand portion of [Figure 3](#), military stressors—such as combat exposure, being a prisoner of war (POW), or experiencing military sexual trauma—can result in PTSD, which not only can last for decades but also is associated with increased risk of morbidity and mortality ([Schnurr, Wachen, Green, & Kaltman, 2014](#)). However, there is also evidence for posttraumatic growth (PTG) stemming from such stressors, including higher levels of mastery and social support and better coping skills and health. PTSD and PTG can co-occur within a person ([Park, Aldwin, Fenster, & Snyder, 2008](#)), as shown in the figure. Protecting military personnel from developing PTSD, and shifting the balance toward PTG, would have positive effects on their long-term health and well-being.

Not everyone who faces military-related stressors develops PTSD. Prevalence estimates range from 5% to 30%, depending upon the war and population ([IOM, 2013](#); [Magruder & Yeager, 2009](#); [Spiro et al., 1997](#)). As depicted in [Figure 3](#), coping efficacy, personality characteristics, and other factors grouped under "generalized resistance resources" (GRRs; [Antonovsky, 1979](#)) can moderate the relationship between military stressors and PTSD. Indeed,

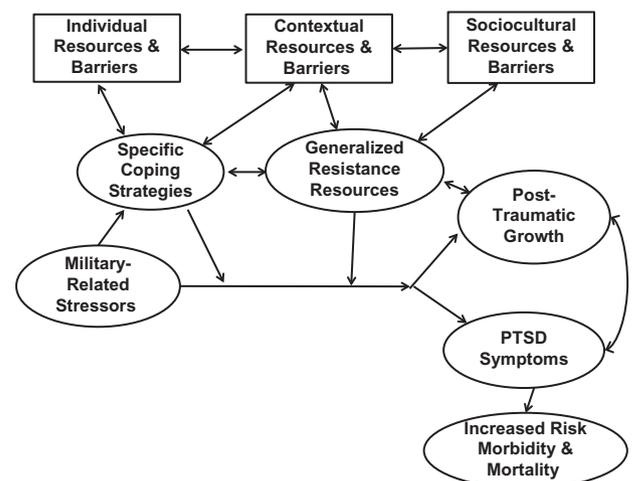


Figure 3. Individual-level processes and long-term outcomes of military service.

combat exposure is less predictive of PTSD than are the problem-focused coping strategies used to deal with the trauma (see Aldwin, 2007). Military stressors can lead to the development of more effective coping strategies, which can moderate the relationship between stress and PTSD or PTG. Successfully coping with stressors over time can elevate existing GRRs or lead to new ones, such as stronger social support networks.

Although coping is generally considered an individual-level process, it does not occur in a social vacuum. The top section of Figure 3 shows that resources and barriers in both immediate and larger sociocultural contexts (Ungar, 2011) shape the development of coping strategies and GRRs, as do person-specific factors such as intelligence, emotional stability, and physical health. Among soldiers, GRRs that promote resilience include positive emotions and realistic optimism, social support, cognitive flexibility, self-regulation, and physical fitness (King et al., 2012; Southwick, Douglas-Palumberi, & Pietrzak, 2014). Among Special Forces, resilience was associated with maintenance of positive emotions, positive self-image, and hopefulness under extreme stress (Vythilingam et al., 2009). Psychological fitness is as important as physical fitness in soldiers' performance and ability to withstand stress (Bates et al., 2010).

It is therefore important to understand both individual and contextual factors that promote effective coping strategies and how to promote such strategies in the military context. Coping and resilience resources not only protect veterans from the effects of military stress but can be a lifelong resource to promote optimal aging (see Jennings, Aldwin, Levenson, Spiro, & Mroczek, 2006; King et al., in press).

Discussion and Implications

We close by considering the relevance of our model for two contexts: (1) further research and the data necessary to support it and (2) policy implications regarding veterans' health and well-being.

Research and Data Needs

Our model places military service at the center of investigation, embedding it within the context of the individual's life course and sociohistorical context, tracing its effects on a broad spectrum of long-term outcomes, and identifying processes and mechanisms that create these outcomes. We emphasized that the varied experiences of military service can lead to wide array of positive, null, or negative outcomes and that these effects can cumulate over time, accentuating individual differences in later life and generating inequality into old age.

As in other areas of gerontology, models of long-term human aging often outpace available data, and no single study can address all aspects of an overarching model such as we propose. We have provided a perspective for

advancing theories and research on military service and aging and specified some specific sociocultural and individual processes that bring about its long-term outcomes. Perhaps most importantly, in emphasizing the possibility of positive and null outcomes, our model and examples will encourage investigators to recognize and assess these outcomes as a counterpoint to the predominant focus on negative outcomes.

We have identified a number of longitudinal studies of both community and veteran samples that include information on military service (Supplementary Appendix A). Although many of them have rich data on outcomes, most have little information on military service, asking only whether a respondent served in the military, and sometimes, when. Further information on military experience, such as whether and where one was deployed, is often not available. Even fewer studies contain veterans' subjective appraisals of military service and its effects on their lives.

As our models make clear, a more complete account of the impact of military service on aging must include characteristics of both the person and their context before (and after) they enter the military (Figures 1–3). As is true of any longitudinal study, it is difficult to ascertain the effects of service if little is known about individuals before they enter. Similarly, data on postservice experiences are often retrospective, and their links to military service can be weakened by the passage of time.

To foster a research agenda on veterans' aging, we developed a short (19-item) module to assess military service (Supplementary Appendix B). Items were selected from existing measures, thus allowing comparisons with extant data. By including this module in new or ongoing studies, our field will be better positioned to trace the influence of military experience on veterans' aging.

Another notable feature of our model is that it emphasizes those who share given military experiences (e.g., combat) do not necessarily have the same long-term outcomes. Thus, a "common" experience can lead to different outcomes for different veterans, and for an individual veteran, that experience can carry positive, null, or negative effects at different points in life. Thus, much can be learned from systematic comparisons across wars and cohorts; between men and women and between different racial/ethnic groups; and by the location, types, duration, and timing of service in veterans' lives.

Most of what is known about the long-term effects of service is based on WWII and Korean War veterans and increasingly on aging Vietnam War veterans. But as history continues to make clear, each war is different, as are those who serve. The nature of the U.S. military has changed since the introduction of the AVF at the end of Vietnam War. The military and veteran populations have become more diverse in terms of gender, race, and ethnicity but less diverse in terms of SES. What we learn about veterans based on those who served in the Vietnam War or earlier may be less applicable to more recent veterans, and it may be some years before we can evaluate these differences and

their impact on veterans' aging. This makes the need for data all the more pressing.

Policies and Programs

The impact of military service on morbidity and mortality is clear in the case of injuries or casualties. But there are other, less direct ways that service affects mortality—for example, through providing free tobacco, leading to lifelong smoking and premature mortality (Bedard & Deschênes, 2006) or through combat-related PTSD, leading to heart disease (Kubzansky, Koenen, Spiro, Vokonas, & Sparrow, 2007). Military service also has long-term effects on social (e.g., family functioning), economic (e.g., earnings), and psychological (e.g., depression, PTSD, suicide) outcomes. Although much is known about negative outcomes in these domains, less is known about positive outcomes and how they affect aging and health or how to promote positive outcomes.

Programs are underway to promote psychological resilience among military personnel (Southwick et al., 2014), focusing on management of specific stressors as well as general stress-related skills. These include repetitive exposure to realistic scenarios and promoting mastery by increasing perceptions of control. Such strategies teach soldiers to appraise situations as challenges rather than threats and to apply problem-focused coping and better emotional regulation. Although these programs have not been adequately evaluated (Steenkamp, Nash, & Litz, 2013), studies of Vietnam War POWs suggest that resilience can be enhanced among military personnel and can have long-term protective effects (King et al., in press; Park, Kaiser, Spiro, King, & King, 2012). Combining stress management with promotion of better health behaviors among active duty troops would pay long-term dividends for the health and well-being of aging veterans.

During numerous interviews with veterans, we have been privileged to speak with survivors of Pearl Harbor, Midway, German concentration camps, and the Bataan death march. We are in awe of veterans' courage, resilience under stress, and altruism. We have also listened to veterans who killed their officers or fellow soldiers, or smothered injured POWs to avenge the deaths of comrades and loved ones. Even worse are collective atrocities, including Abu Ghraib and My Lai. Litz and colleagues (2009, p. 697) referred to witnessing or participating in such actions as a "moral injury," defined as "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations." Experiencing moral injury is a strong predictor of PTSD and other mental health problems (Maguen & Litz, 2012). We are learning how to treat moral injuries (Drescher et al., 2011), which often involves forgiveness, social reintegration, and reparations. Resilience training for soldiers should include a focus on moral courage (Olsthoorn, 2007), with a view toward preventing atrocities. This will not only protect veterans' (and others') well-being but could also actively promote their successful aging.

In conclusion, adopting a long-term view on military service emphasizes that its effects can be positive as well as negative; that these effects can occur in multiple domains and change over time and can present as negative at one point in the life course and positive in another; and that longitudinal studies are necessary to evaluate the long-term impacts of service. As today's soldiers become tomorrow's veterans, we must carefully evaluate how the expansion of the military to include more women and minorities will change what we know about veterans' aging.

Supplementary Material

Supplementary material can be found at: <http://gerontologist.oxfordjournals.org>

Funding

Preparation of this article was supported by the National Institute on Aging (R24-AG039343 to A. Spiro and C. M. Aldwin) and a Senior Research Career Scientist Award from the Clinical Science Research and Development Service, U.S. Department of Veterans Affairs (to A. Spiro).

Acknowledgments

We thank Bethany Harmon for her help with references; Shannon Mejia, Han-Jung Ko, and Lewina O. Lee for their help with identifying and reviewing various public use data sets; and Danny Kaloupek and members of the Stress, Health and Aging Research Program at VA Boston Healthcare System for their help developing the survey measure of military experiences. We would also like to thank our colleagues in the Lifespan Outcomes of Military Service network for their contributions to our thinking over the past several years. The views expressed in this article are those of the authors and do not necessarily represent the views of the U.S. Department of Veterans Affairs.

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