

Mental Health Risk and Social Ecological Variables Associated with Educational Attainment for Gulf War Veterans: Implications for Veterans Returning to Civilian Life

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Abstract This study examines how post-secondary educational attainment among young veterans of the first gulf war affects their mental health status. The all-volunteer military attracts recruits by offering them veterans' educational benefits. Education should help veterans adjust to civilian life. Few studies have shown whether education following military service helps improve veterans' mental health, however. Viewing resiliency, life span and life course, and social geography theories through the lens of social ecology, it is hypothesized that selected contextual factors in the personal, interpersonal, and organizational domains could mediate or moderate the relationship between education and veterans' mental health. Informational social networks showed an association with obtaining mental illness treatment. Recent treatment for post-traumatic stress disorder (PTSD) showed an association with use of veterans' educational benefits. Residing with a small nuclear family in conjunction with having higher levels of health and educational benefits and a higher family income was associated with higher educational attainment.

Introduction

President Truman in 1944 passed a law credited with helping WWII veterans settle back into civilian life. The Servicemen's Readjustment Act, or the GI Bill, helped veterans take their educations further than they would have without the law, according to historical and economic research (American Forces Information Service 1996).

Through the GI Bill, WWII veterans, conscripts and volunteers, also helped expand the middle class and democratized higher education (Asch et al. 2000; Beard and Beard 1960; Bound and Turner 2002).

Veterans from today's all-volunteer military forces (AVF) look to the GI Bill for the same reasons. The promise of support for post-secondary education and help returning to civilian life helped many soldiers' and marines' decide to enter into military service (Asch et al. 2000; Angrist 1993; National Priorities Project 2006).

Variability in distribution of education, variations in educational waivers and exemptions, and variations in age and marital/family status of troop cohorts at different periods, both within and between these eras limit generalized comparisons between the conscription and volunteer eras (U.S. Department of Defense nd). Debates over the impact of this entitlement on military recruitment and retention in the AVF era, as compared to the conscription era, have shaped the current legislative deliberations on updating the GI Bill (Asch et al. 2000; Fernandez 1982; Humes 2006, 2008; Lehrer 2000; McChesney 2008; White 2004).

Society has an obligation to meet the needs of service members returning to civilian life in the community, including the special needs of those returning with service-connected impairments and disabilities. The obligation to make good on our promise of increased opportunity through higher education has also figured in the discussion of changes in the GI Bill. However, the potential social ecological effects of these policies on community institutions, such as our universities and colleges, have received less attention. The recent enactment of legislation expanding veterans' educational benefits calls for increased analysis of these potential effects, particularly for those veterans returning with changed health status, for their families, their communities, and the institutions serving them (Bryant 2008).

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To address this need, this paper examines social ecological mechanisms that may moderate or mediate the impact of mental illness risk factors on veterans' post-secondary educational attainment. The study utilizes a broad social ecological framework (Smith-Osborne 2009; Diamond 1997; Revenson et al. 2002; Rotmans and Rothman 2003; Thoits 1983), drawing on resiliency (Smith-Osborne 2007; Murray 2003; Richardson 2002; Rutter 1987, 1993), life span/life course (Elder 1986; Erikson 1980; Vaillant 1993), and social geography theories (Auge 1995; Bourdieu 1989; DeCerteau 2002; Gieryn 2000; Lefebvre 1991; Ritzer 2003; Simmel 1997; Tilly 1984).

Success in education may not be the only measure of a positive transition to civilian life, but it is a means to improved quality of life and to finding their place in their host communities (Druss and Rosenheck 1998; Ren et al. 1999; Rosenheck et al. 1999). Associations between lower educational attainment and lower mental health status (including mental health) and benefits appear across the life span, suggesting that educational attainment may help protect health (Berger and Leigh 1989; Boyle et al. 2007; Edwards and Grossman 1979; Grossman 1975; Huurre et al. 2006; Kessler et al. 1995; Hunt-McCool and Bishop 1998; Perri 1984; Shakotko et al. 1981; Shakotko and Grossman 1982; Wolfe 1985).

Educational attainment may also influence other ways veterans find satisfaction in their return to civilian life. Veterans' goals and intentions as active servicemen and servicewomen help define whether they consider their new lives successful. So, too, do the expectations imposed by the social environment into which they return (Angrist 1993, 1998; Angrist and Johnson 2000; Dole et al. 2007). Besides success in education, other outcomes include vocational advancement, qualification for and assumption of leadership roles in career and community niches, and upward social mobility, as well as meaningful, productive, and satisfying participation in civic, faith-based, family, and friendship networks in the community. However, we have little research to go on regarding whether veterans' mental illness treatment helps them start over again when it comes to higher education (Savoca and Rosenheck 2000).

Conflicting perspectives on definitions of student mental health and relevant institutional mission/responsibilities affect the interface of student mental health status with the college as a community institution. The interface is further influenced by the degree to which long-standing campus policies and practices related to student conduct reflect the current mental-health-care knowledge base and state-of-service systems (Smith-Osborne 1999). When student mental health problems are defined as developmental, schools may offer brief, on-campus stress-management services, or no services at all (DuPaul et al. 2001; Kirk and

Dollar 2002; Mrdjenovich and Bischof 2003). Students who become disruptive or experience academic failure may have to leave.

But student mental health issues may be defined as disabling, rather than developmental. A school may offer disability services within the limits of its resources. If they want to reenter college after medical leave or academic failure, students with disabilities must prove that their disability played a role in any academic and social problems they experience (Konur 2007; Paul 2000; Szulecka et al. 1986). This definition is the one on which the Veterans Administration (VA) may be relying to ensure educational attainment for returning veterans with depression, addictions, PTSD, traumatic brain injury, and co-occurring conditions (Church 2008a; T.E. Church, personal communication, February 28, 2008; Langbein 2008, transcript question 19, p. 32).

Veterans of the wars in Iraq and Afghanistan [i.e., Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF)], documented with increased rates of PTSD, Traumatic Brain Injury, and complex multiple disabilities will soon find themselves in this college environment (Cooper 2008; Dole et al. 2007; Kang and Hyams 2005; Langbein 2008; Smith et al. 2008). To elucidate associations among mental illness risk and social ecological factors that have implications for OEF/OIF veterans' educational attainment, the most recent and most similar veteran cohort for which comprehensive data were available were selected for study: the cohort of veterans from the first gulf war, or "Desert Storm." The gulf war cohort resembles the OEF/OIF veteran cohort as AVF combatants in the Middle East. Both cohorts had a much larger proportion of women than prior veteran cohorts, and "advancing their education" topped the list of reasons members of both cohorts joined the military (Angrist and Johnson 2000; Congressional Budget Office 2007; Fernandez 1980; National Priorities Project 2006; U.S. Department of Veterans Affairs [VA] 2001; West et al. 1993).

Similarities between the current and the previous generation of fighters end there. Today's cohort has a higher proportion of active duty members relative to National Guard and Reserves (with both groups having similar health outcomes), a higher proportion of members entering with a high school diploma, more exposure to environmental toxins and biological agents, higher incidence of multisymptom chronic illness (aka Gulf War Syndrome), decreased combat exposure, decreased urban combat exposure, and lower number of tours of duty.

Research Objectives

The research questions guiding this study are:

1. What is the effect of mental health status on post-service post-secondary educational attainment for veterans?
2. What mechanisms moderate the effect of mental health status on post-secondary educational attainment?
3. What mechanisms mediate the effect of mental health status on that outcome?

One theory suggests that innate traits guard against traumatic responses to combat. Research based on this theory tends to examine social ecological variables as risk factors or conditions of adversity and psychopathology (i.e., mental health status) as an outcome (e.g., Seligman 1995; Werner 1992; Werner and Smith 1992; Wolin and Wolin 1993). By contrast, this study focuses on ecological variables as protective factors: that is, moderating and mediating effects for mental illness risk factors (Revenson et al. 2002) across the full Desert Storm cohort available for secondary data analysis. A separate study of this cohort focused on disabilities and the relationship of the presence of disabilities on use of educational benefits will be reported elsewhere. This use of a broad social ecological conceptual focus within a resiliency framework, with the support of the extant literature on the Gulf War cohort's outcomes, allows consideration of the effects of contextual factors as predictors, such as social networks, social support, income, community system access, and benefits.

Similarly, this study investigated educational attainment in relation to life choices of the population under study and to their resiliency and their successful reintegration into the civilian community. Therefore, the selection of predictors of interest built on the literature about civilians' successful enrollment in higher education. Here we looked at civilians at risk for developing mental illness or mental health symptoms.

Method

Sample

A secondary data analysis for a sample of 2,075 Gulf War-era veterans extracted from the 2001 National Survey of Veterans public use data set was conducted to investigate ecological domains. This NSV was the most recent survey of a nationally representative sample of veterans commissioned by the VA. The veterans survey included only those who had completed active duty service (or had a medical discharge) and had received an honorable discharge. This study sample included 349 females and 1,726 males, 71% Caucasian and 29% minority, 75% between the ages of 18 and 36 at the start of the war. The average level of educational attainment was 14.15 years, indicating some

college education. Sixty-nine percent of those studied were married and living with their spouse, and 65.3% had children. Thirteen percent had received treatment in the past month for PTSD, substance abuse, or other mental illness diagnoses, with 6% having received such treatment from the VA and 7% from other sources. The veterans survey did not include any standardized measures for depression or other mental illness symptoms. On a composite scale of psychosocial function constructed for this study, however, (see below), with a range of 6–30 (higher scores indicating higher functioning), the sample ($n = 2,064$) had a mean score of 24.42 ($SD = 4.75$). Out of a possible maximum of six sources of informational social support (variables created for this study), the sample ($n = 2,025$) had a mean of 1.61 sources ($SD = 0.79$). Similarly, the veteran survey did not reference any general veteran population means to which to compare these variables. Forty-nine percent stated they had a disabling condition. Of these individuals, 93% (46% of the entire sample) stated that the disability had to do with service and had been rated. The mean disability rating was 15.86% ($SD = 23.9%$).

Measures and Data Analysis

Variables utilized in descriptive analyses were unmodified items from the NSV interview questionnaire. Most independent variables utilized in multivariate analyses were unmodified items from the NSV interview questionnaire. Psychosocial functioning was assessed by a composite Likert scale computed from six items in the Health Background Module of the National Survey of Veterans. The six self-reported items addressed whether emotional problems in the past 4 weeks, such as depression or anxiety, had interfered with productivity and carefulness at work, social interaction, and activities of daily living, as well as level of energy, level of calm, and low mood. Four of the items were reverse coded so that the higher values on the scale indicate higher levels of functioning (DeVaus 2002). The scale was analyzed for internal reliability Cronbach's alpha and unidimensionality of the construct with item-total correlations (Cohen et al. 2003, pp.129–130). All correlations were greater than .3, so no items were dropped from the scale. Cronbach's alpha for the composite scale equaled .87, indicating a satisfactory level of reliability.

The outcome indicator in logistic regression analysis was use or non-use of the GI Bill and use or non-use of non-VA financial aid. The outcome indicator in multiple regression analyses was the highest grade completed at the time of interview (approximately 10 years their service in the Gulf War). Hierarchical logistic and multiple regression analyses, following the method of Cohen et al. (2003), were done to explore the hypothesized relationships. Although we would have liked to control for educational before or during

military service in the regression models, this variable was not captured by the NSV. A priori power analyses using Power and Precision 2 software (Borenstein et al. 2001) found a sample size of 400 sufficient for a power of .80 with a small effect size for each of the planned statistical analyses described in this data analysis section. In analyses of mental health service utilization, moderators, and organizational domain mediators, the number of predictors was reduced as much as possible to preserve the power to detect small effect sizes, and in the case of the moderator/mediator analyses, which were exploratory in nature, a more liberal significance criterion ($p < .10$) was used to allow “following a potentially productive lead,” as recommended by Black (1999, p. 397). Statistical analyses were conducted using Windows SPSS 14.0 software.

Results

Descriptive Statistics

Table 1 displays descriptive statistics for key predictor variables entered into regression models. The majority of the sample was male (83.2%), non-minority (71.1%), had an average annual family income of \$56,641.57 ($SD = \$37,787.61$), of which some came from an average of 2.37 ($SD = 1.22$) non-labor sources, an average educational attainment of 14.15 years ($SD = 2.14$), and was married and living with spouse (69%).

Mental Health Status and Pursuit of Education

A hierarchical logistic regression analysis addressed educational attainment, “activated,” “put into operation” or “expressed” as the respondents’ use of the GI Bill for obtaining a bachelor’s or graduate degree, as the dependent variable ($N = 2,032$). The predictors are: age, gender, minority status, annual family income, psychosocial functioning, mental health treatment, and the interactions of psychosocial functioning with gender and with psychiatric treatment. The final model was significant ($X^2 = 92.16$; $p < .0005$), with a small predictive efficiency of 3.3%. Sociodemographic predictors, except for annual family income, and the service utilization predictors of treatment for substance abuse and for other mental health conditions were not significant. The model suggested the likelihood of a Gulf War veteran ever using his or her VA educational benefits for post-secondary education was positively related to the use of financial aid offered by organizations other than the VA and to being treated for PTSD in the past year. The odds of a veteran who used financial aid besides the VA’s also using VA post-secondary educational benefits were 2.59 times greater than the odds for a veteran who did

Table 1 Descriptive statistics for predictor variables ($n = 2,075$)

Type	Number	Percent
Used VA educational benefits		
Yes	633	30.5
No	1,442	69.5
Used VA educational benefits for college ($N = 633$)		
Yes	470	74.2
No	163	25.8
Used non-VA sources of college financial aid		
Yes	451	21.7
No	1,624	78.3
Number of non-VA aid sources used ($N = 451$)		
1 source	321	71.2
2 sources	105	23.3
3 or more sources	25	1.2
Average non-VA aid sources 1.35 ($SD = 0.63$) range 1–5		
Presence of disabling condition ($N = 2,061$)		
Yes	1,021	49.5
No	1,040	50.5
Presence of a service-related condition ($N = 1,007$)		
Yes	955	94.8
No	52	5.2
Have a service-connected disability rating ($N = 2,056$)		
Yes	1,099	53.5
No	957	46.5
Treated past year: PTSD ($N = 2063$)		
Yes	129	6.3
No	1,934	93.7
Treated past year: drug/alcohol ($N = 2,073$)		
Yes	30	1.4
No	2,043	98.6
Treated past year: other mental health problems ($N = 2,071$)		
Yes	225	10.9
No	1,846	89.1
Ever used VA vocational rehabilitation ($N = 1,218$)		
Yes	265	21.8
No	953	78.2

not use financial aid from sources outside the VA. The odds of a veteran who was treated for PTSD in the past year of using the GI Bill was 2.14 times greater than the odds for veterans who were not treated. Income and benefit use had a negative association, so that the less money a family had, the greater the odds that they would use the GI Bill.

We explored this possible connection between recent treatment and use of VA benefits with a hierarchical logistic regression analysis. The analysis looked for associations between any of the hypothesized mechanisms and the likelihood of obtaining mental illness treatment. The predictors here are age, gender, minority status,

psychosocial functioning, home ownership, social support, non-VA financial aid, GI Bill use, and importance of vocational rehabilitation to education. The dichotomous dependent variable was use of mental health services within the past year. The overall model was significant ($X^2 = 23.57$; $p = .04$), with a predictive efficiency of 25.2%. The expected risk factor of mental illness status measured by the level of psychosocial functioning was significant ($p = .01$), whereby the odds of obtaining recent treatment was lower for respondents with higher psychosocial functioning (i.e., receiving treatment was .81 times more likely for every one-fifth point decrease in functioning). However, the overall use of mental health services in the past year showed no significant association with use of the GI Bill ($p = .63$). The model also suggests that these veterans' likelihood of having recently obtained mental health treatment related positively to the interpersonal domain mechanism of social support, so that the odds of obtaining treatment were 2.62 times greater ($p = .04$) for each additional source of social support utilized.

Moderator Analyses

Table 2 shows the summary results of a hierarchical multiple regression analysis ($N = 187$) testing the moderating effects of selected variables and interactions from three domains. As recommended by Cohen et al. (2003, p. 261ff.), continuous variables used in the interactions were centered to aid in interpretation. As this research question was exploratory, the significance level was set to $p < .10$.

Age at the beginning of the first Gulf War, minority status, and gender were entered first in a stepwise regression procedure. In the next step, mental health status and total annual family income were entered. On subsequent steps, variables that represented social ecological levels and domains (social support, health insurance, non-VA financial aid, and VA educational benefits) were entered along with an interaction term pairing each variable with mental health status. This type of analysis addressed Rutter's stipulation

(cited in Rolf, Masten, Cicchetti, Neuchterlein, and Weintraub 1990) that the protective mechanism must have an effect or magnified effect on the resilient outcome only in the presence of the risk factor, and the method of Cohen et al. (2003), that a significant interaction between the moderator and the IV indicates moderation.

The final model was significant ($F = 5.31$; $p < .0005$) and accounted for 30.2% of the variance (Adjusted $R^2 = 24.5\%$). Significant main effects were total annual family income and use of VA educational benefits for college ($B = .99$; $p = .04$ and $B = 1.53$; $p < .0005$). Significant, positively associated interactions were found between mental health status, two organizational domain variables: level of health insurance ($B = .34$; $p = .01$) and number of sources of non-VA financial aid used for college ($B = .47$; $p = .09$).

Mediator Analyses

In accordance with Baron and Kenny's (1986) methodology, mediation analyses were performed to assess which protective factors mediated the relationship between mental health status and post-secondary educational attainment. In each domain of potential mediators, the hypothesized protective factors were entered as independent variables to predict mental health status (as the dependent variable). This methodology concludes full mediation when independent variables are significantly related to the mediators, the risk factor is significantly related to the dependent variable, and the association of the risk factor with the outcome is reduced to close to zero in the presence of the protective factors.

All the final models for the personal domain factors were significant, indicating the requirements for establishing mediation were met (see Table 3). The Beta coefficient for mental health status was reduced from .10 to .01, which demonstrates full mediation by the personal domain factors, with the salient component being total annual family income (Sobel test statistic = 7,017.90; $p < .0005$).

Table 2 Final model of hierarchical multiple regression analysis for moderating effects of protective mechanisms on mental health status ($N = 187$)

Variable	B	SE B	β	t	p	ΔR^2	R^2	Model	
								F	p
						.03	.30	5.31	<.0005
Total income	1.00	.00	.17	2.12	.04				
Level health insurance	.43	.20	.16	2.15	.03				
Mental health by insurance	.34	.19	.19	2.65	.01				
Non-VA financial aid	.49	.28	.37	5.53	<.0005				
Mental health by financial aid	.47	.20	.13	1.73	.09				
VA educational benefits	1.53	.28	.14	1.71	.09				

All the final models for the interpersonal domain factors were significant, with the Beta coefficient reduced from .10 to .09, indicating partial mediation (see Table 3). The important component was living with spouse (Sobel test statistic = 2.58; $p = 0.01$) and children (Sobel test statistic = 2.67; $p = 0.01$).

All the final models for the organizational domain were significant, thus meeting the requirements for establishing mediation. In addition, the Beta coefficient for mental health status was reduced from .10 to .01, demonstrating a full mediation effect (see Table 3). However, the Sobel test statistic, the test for each mediator of the hypothesis that the mediated effect equals zero, did not reach significance for any of the three mediators tested separately. This result suggests that the mediators act together as a set, since the final models were significant.

Discussion

Study findings suggest that level of health insurance and of non-VA financial aid moderate the effect of mental health status risk on educational attainment. At the same time,

personal income, intact nuclear family, and the combination of the GI Bill, other financial aid, and lack of VA mental health utilization may mediate that association. The negative association of VA mental illness treatment with educational attainment may show similarities with other studies whose findings suggest that a high proportion of veterans with lower health status and lack of other sources of health benefits may depend almost solely on VA health services (Richardson et al. 2002; Rosenheck et al. 1999). If so, this mediation finding parallels study moderator analyses, and with the literature suggesting the association between higher health status and higher educational attainment for veterans. In addition, it shows that combat veterans' use of health care mirrors that of the general population (Grossman 1975; Huurre et al. 2006; Iowa Persian Gulf Study Group 1997; Perri 1984; Smith-Osborne 2008). The negative association with VA care could, alternatively, reflect lower health status and documented higher use of VA care by veterans with environmental exposures associated with Gulf War Syndrome, symptoms of which may overlap with PTSD and other mental illnesses (Research Advisory Committee on Gulf War Veterans' Illnesses 2008; Smith-Osborne 2008).

Table 3 Multiple regression analyses for mediating effects on mental health status risk factor for educational attainment

Variable	<i>B</i>	SE <i>B</i>	β	<i>t</i>	<i>p</i>	<i>R</i> ²	Model	
							<i>F</i>	<i>p</i>
Personal domain mediation								
DV = Highest grade								
<i>N</i> = 2,067								
Model 1						.16	128.32	<.0005
Mental health	.02	.004	.01	.38	.71			
Home ownership	−.03	.10	−.01	−.34	.74			
Total income	1.00	.00	.40	18.16	<.0005			
Interpersonal domain mediation								
DV = Highest grade								
<i>N</i> = 2,019								
Model 1						.03	15.59	<.0005
Mental health	.18	.05	.09	3.83	<.0005			
Social support	.30	.06	.11	5.00	<.0005			
Marital status	.30	.11	.06	2.82	.01			
Number of dependents	−.13	.04	−.08	−3.42	.001			
Organizational mediation								
DV = Highest grade								
<i>N</i> = 206								
Model 1						.18	11.19	<.0005
Mental health	.02	.17	.01	.12	.90			
VA educ. benefits	1.95	.32	.39	6.02	<.0005			
Non-VA financial aid	.36	.20	.12	1.79	.08			
VA MH treatment	−.52	.91	−.04	−.57	.57			

Additionally, in this sample, the likelihood of ever using the GI Bill was greater when former members of the military had other sources of college financial aid, and when soldiers and marines had recent treatment for PTSD. Like previous literature, recent PTSD treatment showed an association with a denser informational social network (Benotsch et al. 2000).

This finding suggests that when healthier veterans receive treatment for PTSD outside the VA health care system, that action influences further educational attainment. Any considerations of such an outcome must include findings about use of VA mental illness treatment and the protective effect of higher levels of health insurance. Further, these findings underscore the importance of timely intervention not only for relief of mental illness symptoms, but also for engagement of veterans' primary support systems and enhancement of concrete resources. Overall findings suggest a tested model of resiliency displayed in Fig. 1.

Recent literature has documented that, as college costs rise, the Montgomery GI Bill covers smaller proportions of a complete college education, even at high-value public colleges (Asch et al. 2000). With such dwindling government assistance, many more veterans likely will require financial aid outside the VA system to meet their educational goals with their GI Bill benefits. The reduction in military force following Desert Storm may have damaged the actual or perceived value of GI Bill benefits to this cohort in the 10 years of eligibility following military service. The primary data set of these study findings have limitations of, including lack of data on educational attainment before military service and educational benefit

use during active duty military service. Limitations also include related associations between duration of service and use of educational benefits during and after active duty. However, it could be anticipated that the more generous provisions of the newly enacted Post 9/11 legislation may decrease the importance both of family income as a mediator and non-VA financial aid as a mediator and a moderator of mental illness risk for OIF/OEF veterans, as well as address the shortfall in educational benefits of National Guard and Reserve troops as compared to the regular active duty military (All the Benefits of Service 2005; Merrow 2008). In contrast, Reservists and National Guard members, who represent a much higher proportion of the current cohort than of Desert Storm, may place lower priority on educational benefits as a motivation for military service than the active duty members targeted in Defense Department (DoD) studies of enlistment motivation. If their major incentive for service is income supplementation or other non-educational benefits, they may make relatively lower use of the GI Bill, and different protective factors mediating their mental illness risk factors may be important to their preferred, non-education related resilient outcomes. Educational outcomes for the OIF/OEF cohort, as compared with the Desert Storm cohort, will be further influenced by their different types and rates of service-connected disabilities. This sample reported high prevalence of service-connected disabilities, but at a relatively low average rating; however, this average could have been an artifact of the lack of substantiation until recently of Gulf War Syndrome as a real and disabling service-connected condition, perhaps depressing rates of educational

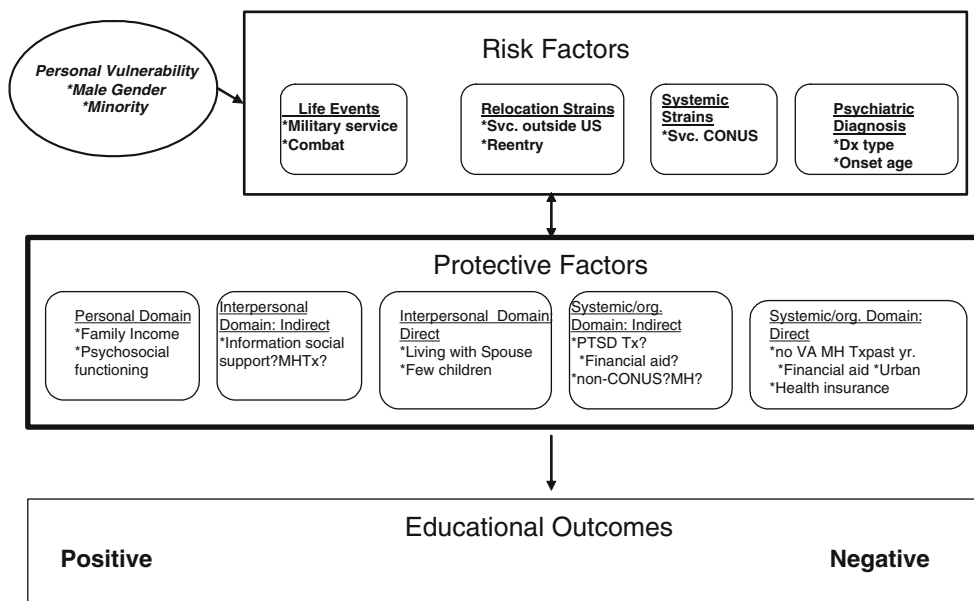


Fig. 1 Tested final model of resiliency

attainment among cohort members whose disability status remained officially undocumented.

The need to prepare for the return of OIF/OEF veterans to America's college campuses is receiving widespread discussion among higher education institutions, and some have been inaugurating new programs or enhancing existing ones designed to serve veterans, particularly those with disabilities not defined as severe and persistent mental illness (Becker et al. 2002; Bobkoff 2008; Church 2008; Zdechlik 2005). While actively collaborating to implement an expanded service delivery system for veterans with traumatic brain injury and those in need of polytrauma rehabilitation (Langbein 2008; Cooper 2008), the DoD and Department of Veterans Affairs have not yet addressed the need to intensify or expand supported education services to enable veterans with these and other service-related disabilities, as well as those with psychiatric disorders (diagnosed or undiagnosed) and subclinical symptoms, to participate fully in higher education institutions in their communities (Andrews et al. 1998). Rather, the DoD and VA anticipate that VA educational benefits, Chapter 31 services for disabled veterans, and accommodations implemented via campus offices of disability services will suffice (Langbein 2008). However, campus offices vary widely in their staffing levels, coordination with local providers, and accommodation resources, and their primary function is to document disabilities' educational impact and facilitate educational accommodations, not to coordinate benefits (Church 2008). Campus disability offices are typically well-integrated with on-campus providers, including college counseling centers and health centers, and interface with community providers primarily to obtain required documentation of the identified disability and recommendations for accommodation (Ofiesh et al. 2002; Paul 2000). However, campus disability offices are in a position to identify undiagnosed issues affecting learning, in addition to or adjunctive to the primary disability, and so can serve as a gateway to service coordination for veterans, particularly on campuses with targeted support programs for veterans. Concomitantly, targeted campus veterans programs (which are not dependent on fee-for-service reimbursements) can offer case management, treatment, and service coordination, driven by resiliency, rather than diagnosis, for veterans within a social ecological context. Examples of such programs refer to and receive referrals from DoD and VA entities as well as providing direct services themselves. They are proliferating, although they vary greatly in their rigor and range of impact (Alvarez 2008; Zdechlik 2005).

More effort to foster informational social networks is needed, and could include help designing and applying individualized packages of combined financial aid for veterans. Multiple sources of health insurance also

represent a denser network of health benefits, which may reduce the risk impact of lowered psychosocial functioning by increasing access to treatment from a variety of sources. Student veterans could be counseled to consider taking advantage of student health insurance and student health and counseling services on campus. Such services reduce the stigma of mental illness, since they emphasize resiliency rather than diagnosis, and since they do not depend on third party reimbursement. Such services would be in addition to veterans' health benefits and health insurance through employers of self or spouse.

The finding regarding the association between recent PTSD treatment and use of the GI Bill may indicate the importance of alleviating two seemingly opposite symptoms of PTSD among veterans: attention and memory deficits and hyper arousal symptoms. Alleviating these symptoms could have particular consequences for engagement and success in higher education.

Given the increased rates of PTSD and TBI among current OIF/OEF veterans (Hoge et al. 2006, 2007, 2008), a knowledge and practice base in psychosocial rehabilitation, health disparities, and social benefits management for vulnerable populations may be needed in university offices of disability services, university advising offices, and university health centers. More specialized and intensive supported education programs tailored for the needs of veterans, on the continuum from subclinical cognitive and psychiatric symptoms to disabilities, could be piloted within higher education institutions, adapted from existing university-based supported education models for students with severe and persistent mental illness (e.g., Megivern 2002; Megivern et al. 2003; Mowbray 1999; Mowbray et al. 2004; Smith-Osborne 2005; Unger 1994; Unger and Pardee 2002). Wellness-oriented DoD behavioral health programs for active-duty fighters (Orsingher et al. 2008; Parrish 2008) and campus-based supported education programs for veterans, regardless of disability status (Vaughn 2008), are using approaches consonant with the findings of this study. Such programs, rather than being diagnosis-driven, combine clinically rigorous assessment and evidence-based treatment of symptoms and conditions with ecologically relevant mobilization of social networks and health promoting contexts targeted to soldiers' and veterans' desired outcomes/life trajectories. Alternatives to a diagnostic focus in such programs are used as skills acquisition and application and mutual personal and environmental fitness enhancement (e.g., Salzer et al. 2003). In a supported education program, for example, the possible identification and documentation of a disability to obtain accommodations would be only one of several steps taken to enhance the fit between an individual veteran and the social ecology of a particular class within a particular department on a particular campus. Disorders and symptoms such as TBI, depression, PTSD,

and substance misuse, which may overlap and present in multiple ways, would be addressed in the presenting context nested within the functional demands and resources of the larger social ecology. If the first presentation is in the context of the campus substance abuse program, that program would provide intervention and also make a referral to the supported education program for veterans. The supported education program could provide and coordinate services to address other aspects of student functioning, acting as a “personal trainer” to optimize levels of student veteran performance and success. It could also act as a change agent to shape the institutional and larger environmental context to fit the needs of the student veteran.

Additionally, the VA service system could pilot supported education programming, preferably through a coordinated joint program under both the medical and vocational rehabilitation branches. Implementation of pilot programs should receive support from interagency agreements with community colleges and university systems. Colleges that already have initiatives to support student-veterans and educational systems in places with large concentrations of veterans should get priority for such collaboration. Such pilot programs would be consistent with the VA’s rehabilitation mission, and could be initiated incrementally as an expansion of current vocational rehabilitation services. The high proportion of the sample reporting rated service-connected disabilities suggests that eligibility issues for supported education under the rubric of vocational rehabilitation would not be a significant problem in a pilot phase. However, findings suggest that programs for non-disabled veterans with psychiatric symptoms and disorders are also needed if society is to make good on its recruitment promises to veterans.

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