4. DIAGNOSTIC INTERVIEW SCHEDULE RESULTS

4.1 INTRODUCTION

In this chapter, we present results on psychiatric conditions among Vietnam and non-Vietnam veterans, as assessed by using the Diagnostic Interview Schedule (DIS). The DIS is a standardized questionnaire designed to assess the lifetime occurrence of certain psychiatric conditions according to criteria developed by the American Psychiatric Association. These criteria were published in 1980 in the third revision of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III).

As indicated in Chapter 1, we reasoned that five conditions might be more prevalent among Vietnam veterans than among veterans who did not serve in Vietnam: generalized anxiety, depression, alcohol abuse or dependence, drug abuse or dependence, and post-traumatic stress disorder (PTSD). Generalized anxiety and depression were chosen because symptoms of these conditions often follow stressful events, and alcohol and drug abuse disorders were chosen because these substances are often used to alleviate stress-related symptoms. PTSD, a diagnostic category included in the DSM for the first time in 1980, is characterized by symptoms of anxiety and depression and recurrent dreams or flashbacks of a precipitating traumatic event that is outside the range of usual human experience.

For all five selected conditions, we present the results of detailed analyses, including comparisons of the occurrence of these conditions over veterans' entire lifetimes and the presence of the conditions during the month before the examination. Lifetime prevalence, along with information on the onset of symptoms in relation to the service period and the duration of symptoms, reflects the overall effect of Vietnam service, whereas current prevalence reflects the effects that remain 15 to 20 years later. For six other conditions—phobia, panic, obsession, schizophrenia, antisocial personality, and somatization—which were not specified before analysis as being of primary interest, we present the results of less detailed analyses that compare prevalences of the conditions in the two groups over the veterans' lifetimes.

Further details on results and issues related to data quality and validity are presented in tables in Appendix B. Results of responses to individual questions from the DIS according to place of service are presented in Table B.1. Prevalences of selected conditions among Vietnam and non-Vietnam veterans within different subgroups of veterans as defined by the six entry characteristics (race, year of entry, age at entry, military occupational specialty (MOS), type of enlistment, and general technical (GT) score) and certain military history characteristics are presented in Tables B.2-B.8.

The results presented in this chapter focus on comparisons between groups of Vietnam and non-Vietnam veterans. Issues that relate only to Vietnam veterans, such as possible exposure to herbicides and the influence of combat, are dealt with in Chapter 8 (Synthesis).

4.2 METHODS AND DATA QUALITY

In Chapter 2, we described in detail the general methods used in the VES psychological and psychiatric evaluations. Here we discuss methodological issues unique to the DIS and issues relevant to the validity and quality of the DIS data as collected in the VES.

As noted in Chapter 2, we used DIS version III-A, with certain modifications. We expanded questions on symptoms related to the five conditions selected for detailed evaluation by

adding questions on symptoms in the past month. The choice of the 1-month time interval was arbitrary, although it was based on a desire to limit the interval to a recent one over which participants' recall of symptoms may have been more accurate. Diagnostic criteria for psychological conditions considered in this report are provided in Appendix A. All conditions were defined by using the DIS, except for somatization, which was defined by applying DSM-III criteria to responses from the medical history questionnaire administered as part of the participants' medical evaluations.

For the DIS analyses, we used the statistical methods presented in Chapter 2. The focus was on comparing prevalences of conditions in Vietnam and non-Vietnam veterans to determine strengths of associations by using the odds ratio (OR) measure. Results for three levels of analyses are generally presented: unadjusted, adjusted for possible differences in the six entry characteristics (Model 1), and adjusted for the six entry characteristics and other characteristics reported at the interview, such as marital status, education, childhood behavioral problems and, in some cases, the use of alcohol or illicit drugs (Model 2).

We conducted a number of analyses to evaluate how certain aspects of diagnostic categorization and analysis may have influenced the results. In the standard usage of the DIS, symptoms of some conditions (*e.g.*, depression) are not counted if they are not considered bothersome or if they are due to the use of alcohol, drugs, medications, or physical illness. Data in Table B.1 indicate that neither Vietnam nor non-Vietnam veterans often reported symptoms with these constraints.

We performed most analyses on the major diagnostic categories as determined by the DIS. Most of the major categories comprise several subcategories of conditions, and the prevalences of these conditions are shown in Table B.9.

Standard DIS definitions for many diagnoses exclude individuals who meet criteria for the condition if they also meet diagnostic criteria for conditions considered to be more serious, such as schizophrenia. On the basis of their responses to DIS questions, only 35 (1.4%) Vietnam and 11 (0.6%) non-Vietnam veterans ever met DSM criteria for schizophrenia. In Table B.10, ORs for the lifetime prevalence of various conditions are presented with and without exclusions of individuals who met criteria for certain other diagnoses. For most conditions, relatively few veterans are excluded, so that the two ORs estimates are nearly the same. For ease of presentation, all results presented in this chapter are without exclusions, unless otherwise noted.

The non-Vietnam comparison group includes men who served in Germany, Korea, and the continental United States (CONUS). Since the active duty experiences of these men were not the same, the prevalence of psychiatric conditions might have differed among the three groups. Data in Table B.11 indicate that the lifetime prevalence of psychiatric conditions is similar among men who served in Germany, Korea, and CONUS. Restriction of the comparison group to men who served overseas did not substantially alter the magnitude of the Vietnam-non-Vietnam ORs for various psychiatric conditions. Thus, the non-Vietnam referent group used in all analyses includes those men who served in all three locations.

Motivation to answer the questions on the DIS may have differed between Vietnam and non-Vietnam veterans. To address this concern, we compared ORs for lifetime prevalences of selected conditions with ORs adjusted for selected validity scales from the Minnesota Multiphasic Personality Inventory (scales F, L, K, and test-retest), which give some indication of those veterans who may have been providing questionable responses. The proportion of veterans who showed questionable responses on the basis of elevations on these scales

was similar in the two groups and, as indicated in Table B.12, adjustment for results on these scales did not substantially alter the ORs for the DIS conditions of interest.

We also evaluated how interviewer, test order, and time period during which veterans participated in the examinations influenced the relative findings for the two cohorts. Results of analyses presented in Supplement B (Medical and Psychological Data Quality) indicate that, in general, these three factors did not alter or confound the association between place of service and generalized anxiety, depression, or substance use disorders that occurred over the veterans' lifetimes. For PTSD, we found a significant association with the study time period, but not with interviewer or test order. In the first quarter of the study, both the combat exposure scores and the lifetime prevalence of PTSD were greater for Vietnam veterans. After the first quarter, combat exposure scores and the lifetime prevalence of PTSD no longer differed by time period.

4.3 RESULTS

4.3.1 Anxiety, Depression, and Substance Use Disorders

Over their lifetimes, Vietnam veterans have experienced more conditions meeting DIS diagnostic criteria for generalized anxiety, depression, and alcohol abuse or dependence than non-Vietnam veterans (Table 4.1). The most prevalent condition in both groups was alcohol abuse or dependence, for which, at some time in their lives, 50.6% of Vietnam veterans and 41.8% of non-Vietnam veterans had met diagnostic criteria. The lifetime prevalence of illicit drug abuse or dependence was similar for the two groups (14.7% among Vietnam veterans and 13.1% among non-Vietnam veterans). The magnitude of these associations changed little after we adjusted the results for differences in the six entry characteristics or other characteristics that could be related to psychological status, such as history of childhood behavior problems, education, and marital status. Furthermore, we found that, except in one instance, the six entry characteristics and other characteristics did not alter the relative differences in prevalences of these conditions between Vietnam and non-Vietnam veterans. A significant interaction was identified between race, place of service, and depression. We will explore this interaction in greater detail later in this section. The general lack of interaction for other conditions indicates that associations between service in Vietnam and psychiatric conditions were similar within different subgroups of veterans as

Table 4.1 Lifetime Prevalences of Generalized Anxiety, Depression, and Substance Use Disorders Among Vietnam and Non-Vietnam Veterans

							Multivariate Results			
	Vietnam		Non-Vietnam		Crude Results		Model 1[a]		Model 2[b]	
Condition[c]	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Generalized anxiety	23.5	586	17.2	339	1.5	1.3-1.7	1.4	1.2-1.6	1.4	1.2-1.6
Depression	12.5	311	8.0	157	1.6	1.3-2.0	1.5[d]	1.2-1.9	1.5[d]	1.2-1.9
Alcohol abuse or dependence	50.6	1260	41.8	824	1.4	1.3-1.6	1.4	1.2-1.5	1.4	1.2-1.6
Drug abuse or dependence	14.7	365	13.1	257	1.1	1.0-1.4	1.2	1.0-1.4	1.2	1.0-1.5

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and education, marital status, and a history of ≥3 childhood behavior problems. For generalized anxiety and depression, Model 2 also included current alcohol and current drug use.
[c] DSM-III criteria.
[d] Standardized for race (black and Hispanic combined).

defined by race, age at entry, enlistment status (volunteered or drafted), MOS, enlistment GT score, and history of childhood behavioral problems.

In Table 4.2, we compare lifetime prevalences for specific subcategories that make up the four diagnostic categories of interest. The various subcategories of anxiety and depression were all similarly elevated among Vietnam veterans. Generalized anxiety alone without depression was the most prevalent of these conditions in both groups (15.3% versus 12.0%), followed by anxiety and depression (8.2% versus 5.2%), and depression alone without generalized anxiety (4.3% versus 2.7%). The increase in lifetime prevalence for alcohol use disorders among Vietnam veterans was due primarily to dependence (31.8% of Vietnam veterans versus 23.3% of non-Vietnam veterans), whereas abuse only without dependence occurred with similar frequency in the two groups (18.8% versus 18.5%).

The different subcategories of drug use disorders occurred with similar frequency in the two groups. In both groups, drug dependence was the more prevalent condition, having affected 13.1% of Vietnam veterans and 11.0% of non-Vietnam veterans. Few veterans in either group met criteria for drug abuse only without dependence (1.6% versus 2.1%).

Overall, 62.3% of Vietnam veterans and 52.1% of non-Vietnam veterans had experienced at least one of the conditions. Of the specific combinations of disorders, the largest difference between Vietnam and non-Vietnam was for anxiety or depression *and* a substance use disorder (19.0% versus 12.0%).

Onset of symptoms of psychiatric conditions was most elevated in Vietnam compared with non-Vietnam veterans during the 2 years immediately following entry into the Army (Figures 4.1-4.2). The prevalences of symptoms of generalized anxiety, depression, and substance use disorders were similar in the two groups of veterans before entry into the Army. Beginning in the 2-year period following entry into active duty, however, onset of symptoms of generalized anxiety, depression, and alcohol abuse or dependence all occurred with greater frequency among Vietnam veterans. Onset of symptoms continued to be greater among Vietnam veterans in subsequent time periods, although differences were small. For

Table 4.2 Lifetime Prevalences of Subcategories of Generalized Anxiety, Depression, and Substance Use Disorders Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam	
Condition[a]	**%**	**No.**	**%**	**No.**
Generalized Anxiety Only	15.3	381	12.0	236
Depression Only	4.3	106	2.7	54
Both Generalized Anxiety and Depression	8.2	205	5.2	103
Substance Use Disorders				
Alcohol				
Abuse only	18.8	468	18.5	364
Dependence	31.8	792	23.3	460
Drug				
Abuse only	1.6	39	2.1	41
Dependence	13.1	326	11.0	216
Summary				
No conditions	37.7	939	47.1	928
Anxiety or depression	8.8	220	7.9	156
Substance use disorder	34.5	859	33.0	651
Anxiety or depression and substance use disorder	19.0	472	12.0	237

[a] DSM-III criteria.

Figure 4.1 First Occurrence of Symptons of Anxiety and Depression In Relation to Service Period

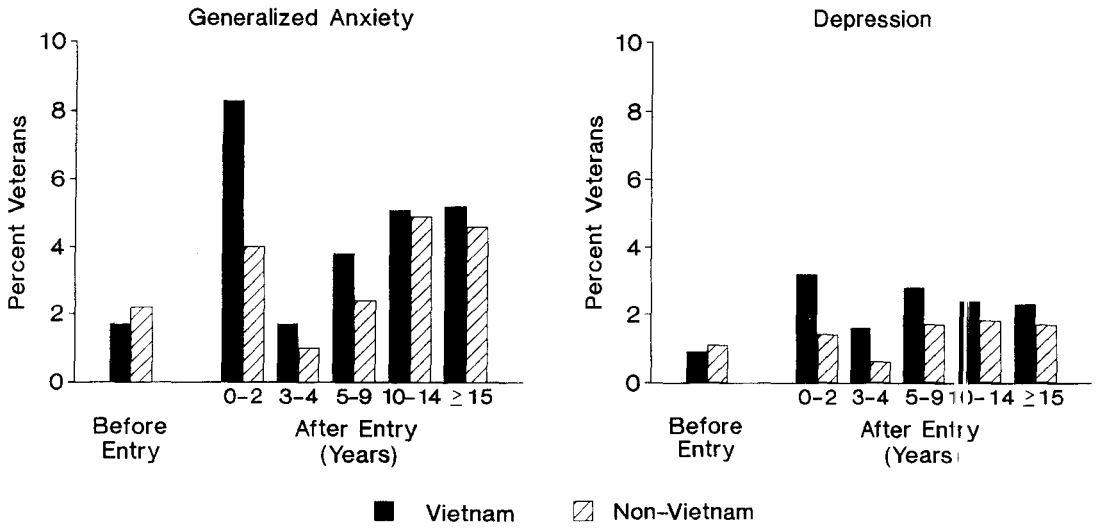
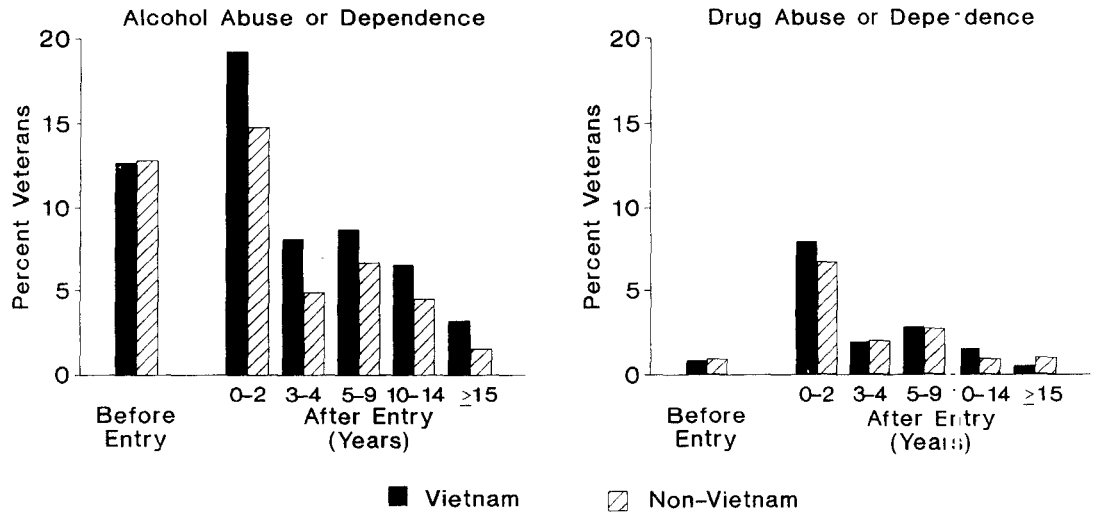


Figure 4.2 First Occurence of Symptoms of Substance Use Disorders In Relation to Service Period



drug abuse or dependence, results for Vietnam veterans showed a small excess of symptoms with onset during the 2 years following entry into the Army, but in later time periods occurrence rates were similar for the two groups of veterans. These findings indicate that the prevalences of psychiatric symptoms were similar in the two groups before entry into the Army and that the increases in lifetime prevalences for anxiety, depression, and alcohol abuse or dependence were mainly accounted for by onset of symptoms during or shortly after active duty.

Among veterans who had ever had symptoms meeting DIS criteria for generalized anxiety or depression, symptoms tended to last longer among Vietnam than among non-Vietnam

veterans. As indicated in Figure 4.3, among veterans who had ever experienced generalized anxiety, non-Vietnam veterans were more likely than Vietnam veterans to have had symptoms that lasted for 2 years or less, whereas Vietnam veterans were more likely to have had symptoms that lasted longer than 2 years. For depression, similar results were found (Figure 4.3). For alcohol or drug use disorders, however, the duration of symptoms tended to be similar for the two groups (Figure 4.4).

To evaluate the current prevalence of the selected psychiatric conditions, we analyzed conditions meeting DIS criteria during the month before the examination. As with lifetime prevalences, current prevalences of generalized anxiety, depression, and alcohol abuse or dependence were all greater for Vietnam veterans (Table 4.3). The most prevalent condition

Figure 4.3 Duration of Symptons For Vietnam and Non-Vietnam Veterans With Generalized Anxiety or Depression

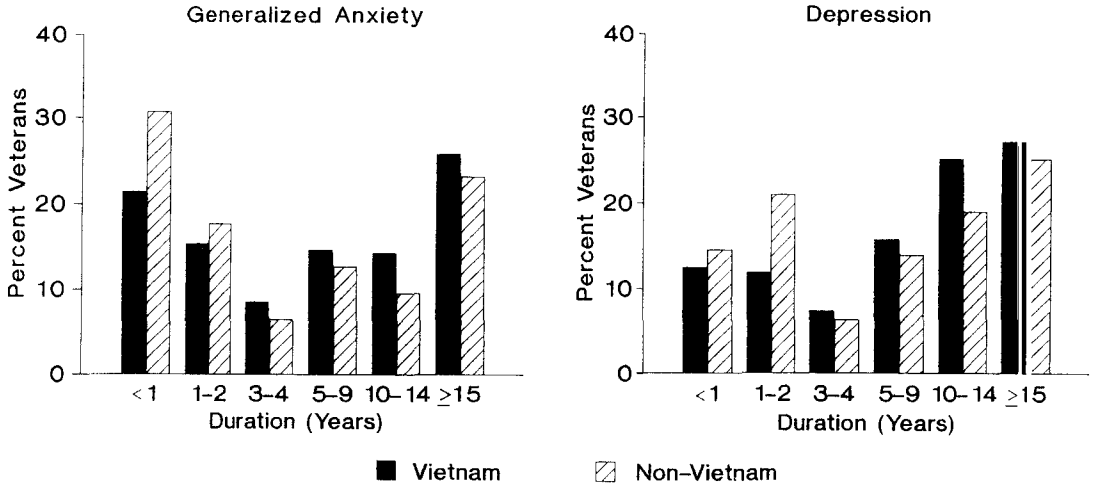


Figure 4.4 Duration of Symptons for Vietnam and Non-Vietnam Veterans With Substance Jse Disorders

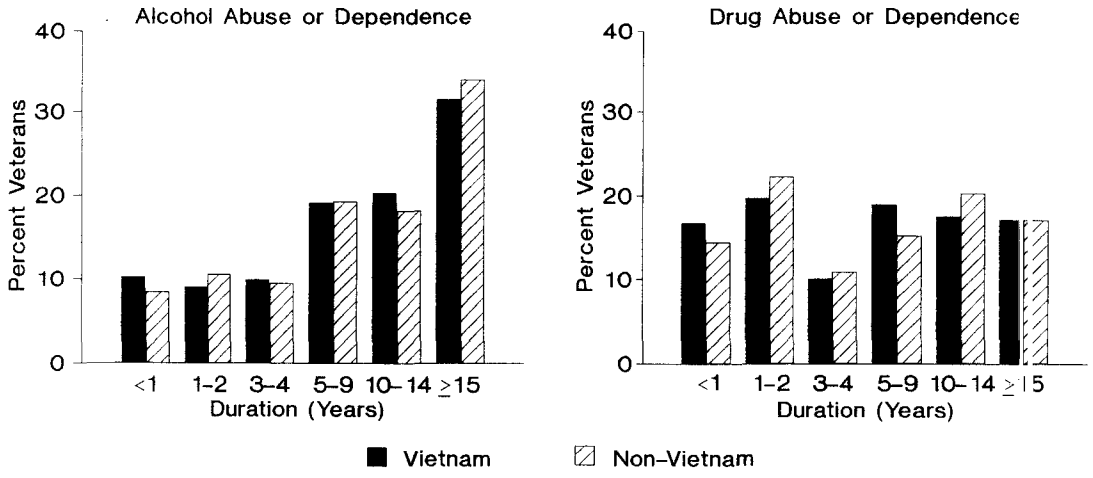


Table 4.3 Prevalences of Generalized Anxiety, Depression, and Substance Use Disorders During the Month Before Examination Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results: Model 1[a]		Multivariate Results: Model 2[b]	
Condition[c]	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Generalized anxiety	4.9	123	3.2	63	1.6	1.2-2.1	1.5	1.1-2.1	1.5	1.1-2.0
Depression	4.5	112	2.3	45	2.0	1.4-2.9	2.0	1.4-2.9	2.0	1.4-3.0
Alcohol abuse or dependence	13.7	341	9.2	182	1.6	1.3-1.9	1.5	1.2-1.8	1.5	1.2-1.8
Drug abuse or dependence	0.4	11	0.5	10	0.9	0.4-2.1	–	–	–	–

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and education, marital status, and a history of ≥3 childhood behavior problems. For generalized anxiety and depression, Model 2 also included current alcohol and current drug use.
[c] DSM-III criteria.

in both groups was alcohol abuse or dependence, for which 13.7% of Vietnam veterans met DIS criteria during the month before the examination compared with 9.2% of non-Vietnam veterans. The prevalence of veterans who met criteria for generalized anxiety was about 1.5 times greater among Vietnam veterans than among non-Vietnam veterans (4.9% versus 3.2%), and current depression occurred about twice as often among Vietnam veterans as among non-Vietnam veterans (4.5% versus 2.3%). Few veterans (about 0.5%) in either cohort met criteria for drug abuse or dependence during the month before the examination.

Table 4.4 provides more detail on the prevalences of current conditions among Vietnam veterans compared with non-Vietnam veterans. The subcategories of anxiety and depression that occurred more frequently among Vietnam veterans compared with non-Vietnam veterans were generalized anxiety and depression occurring together (2.1% versus 1.0%) and depression alone without generalized anxiety (2.4% versus 1.3%). Generalized anxiety

Table 4.4 Prevalences of Subcategories of Generalized Anxiety, Depression, and Substance Use Disorders During the Month Before Examination Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam	
Condition[a]	%	No.	%	No.
Generalized Anxiety Only	2.9	71	2.2	43
Depression Only	2.4	60	1.3	25
Both Generalized Anxiety and Depression	2.1	52	1.0	20
Substance Use Disorders				
Alcohol				
Abuse only	2.9	72	2.0	40
Dependence	10.8	269	7.2	142
Drug				
Abuse only	0.4	10	0.3	6
Dependence	<0.1	1	0.2	4
Summary				
No conditions	80.8	2012	86.9	1714
Anxiety or depression	5.2	130	3.4	68
Substance use disorder	11.9	295	8.6	170
Anxiety or depression and substance use disorder	2.1	53	1.0	20

[a] DSM-III criteria.

without depression occurred with similar frequency in the two groups (2.9% versus 2.2%). As with lifetime prevalence, the increase in prevalence of alcohol abuse or dependence during the month before the examination among Vietnam veterans was due primarily to alcohol dependence (10.8% versus 7.2%), whereas the difference for alcohol abuse alone was less (2.9% versus 2.0%). Most of the small number of veterans in either group who met criteria for drug abuse or dependence in the month before examination met criteria for abuse only. Overall, 19.2% of Vietnam veterans and 13.1% of non-Vietnam veterans had at least one of the conditions during the previous month. The most prevalent of the possible combinations of conditions, and the one with the largest difference between cohorts, was substance use disorder without anxiety or depression (11.9% versus 8.6%).

As previously noted (Table 4.1), there was an interaction between race and place of service for lifetime prevalence of depression. The prevalences of depression over the veterans' lifetimes and during the month before the examination within the three race categories are shown in Table 4.5. The relative difference in the lifetime prevalence of depression between Vietnam and non-Vietnam veterans was more pronounced among black veterans (OR=3.3) and veterans who were neither white nor black (OR=5.4) than among white veterans (OR=1.4). The association between Vietnam military service and current depression was more pronounced among black veterans (OR=6.1) than among white veterans (OR=1.6) or veterans of other races (OR=1.8). The ORs among blacks, however, were based on small numbers of veterans, particularly black non-Vietnam veterans who had depression (N=4); thus, the OR estimate was unstable, and the interaction between race and place of service was not statistically significant.

To further evaluate the depression findings within the different racial groups, we examined the distribution of the various types of affective disorders, including depression, by race and place of service (Table 4.6). Recurrent unipolar depression was the most prevalent subtype in all place of service and race categories, except among non-Vietnam veterans of "Hispanic and other" races. Recurrent unipolar depression was also the subtype that accounted for most of the excess in Vietnam veterans compared with non-Vietnam veterans. In contrast, the prevalence of single episodes of unipolar depression was similar in Vietnam and non-Vietnam veterans in all three race groups. For bipolar disorder, atypical bipolar disorder, and depression with psychotic symptoms, the excess among Vietnam veterans compared with non-Vietnam veterans was considerably greater among blacks and Hispanics and other races than among whites.

Table 4.5 Prevalence of Depression During the Veterans' Lifetimes and During the Month Before Examination According to Race and Place of Service

	Lifetime Prevalence[a]						Month Before Examination[b]					
	Vietnam		Non-Vietnam				Vietnam		Non-Vietnam			
	%	No.	%	No.	OR	95% CI	%	No.	%	No.	OR	95% CI
White	11.8	242	8.8	140	1.4	1.1-1.7	3.6	73	2.2	35	1.6	1.1-2.4
Black	15.0	43	5.0	12	3.3	1.7-6.5	9.4	27	1.7	4	6.1	2.1-17.8
Hispanic and other	17.3	26	3.8	5	5.4	2.0-14.4	8.0	12	4.5	6	1.8	0.7-5.0

[a] For the crude OR, the homogeneity chi square (with two degrees of freedom) for race, place of service, and the lifetime prevalence of depression is 0.002.

[b] For the crude OR, the homogeneity chi square (with two degrees of freedom) for race, place of service, and depression in the month before examination is 0.06.

Table 4.6 Lifetime Prevalences of Subtypes of Affective Disorders Among Vietnam and Non-Vietnam Veterans, by Race

	White				Black				Hispanic and Other			
	Vietnam (N=2054)		Non-Vietnam (N=1600)		Vietnam (N=286)		Non-Vietnam (N=239)		Vietnam (N=150)		Non-Vietnam (N=133)	
Condition[a]	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
With psychotic symptoms	0.8	17	0.8	12	2.5	7	0.8	2	4.0	6	1.5	2
Bipolar disorder	1.3	27	0.8	12	3.5	10	0.4	1	3.3	5	1.5	2
Atypical bipolar disorder	1.0	20	0.5	8	2.1	6	0.8	2	0.0	0	0.0	0
Recurrent unipolar depression	6.6	134	4.2	67	7.0	20	2.1	5	9.3	14	0.0	0
One episode unipolar depression	2.1	44	2.3	37	1.4	4	0.8	2	1.3	2	1.5	2
Dysthymia	1.5	31	1.1	17	1.1	3	1.3	3	3.3	5	3.0	4
Depression, other	0.2	5	0.5	8	0.7	2	0.0	0	0.0	0	0.0	0
Any affective disorder	13.5	278	10.1	161	18.2	52	6.3	15	21.3	32	7.5	10
DSM-III depression[b]	11.8	242	8.8	140	15.0	43	5.0	12	17.3	26	3.8	5

[a] Veterans in the psychotic symptoms group met DSM-III criteria for major depression, mania, or dysthymia and also had psychotic symptoms. All veterans with mania also met criteria for bipolar disorder.

[b] Totals for any affective disorder and DSM-III depression are not the same because 63 veterans with dysthymia only do not meet criteria for depression, and 17 veterans with bipolar disorder met full criteria for mania, but only partial criteria for depression.

In addition to evaluating the diagnostic categories, we also analyzed the specific symptoms or behaviors making up the diagnostic categories for those conditions of primary interest. Focusing on symptoms that were reported to have occurred during the month before examination, we found that all symptoms of anxiety and depression were more prevalent among Vietnam veterans (Table 4.7). The largest relative differences between the two groups were for guilt and being slow or restless. The ORs for symptoms of generalized

Table 4.7 Prevalences of Symptoms of Generalized Anxiety and Depression During the Month Before Examination Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam		Crude Results	
Symptom	%	No.	%	No.	OR	95% CI
Generalized Anxiety						
Motor tension	4.9	123	3.1	61	1.6	1.2-2.2
Autonomic hyperactivity	3.7	91	2.1	41	1.8	1.2-2.6
Apprehensive expectation	—[a]	—	—[a]	—	—	—
Vigilance and scanning	4.7	117	3.4	67	1.4	1.0-1.9
Depression						
Dysphoria	14.7	138	9.8	66	1.6	1.2-2.2
Weight loss or gain	6.3	157	4.9	96	1.3	1.0-1.7
Sleep disturbance	13.6	339	8.8	173	1.6	1.4-2.0
Slow or restless	6.5	161	3.5	69	1.9	1.4-2.5
Sexual disinterest	4.8	120	3.5	68	1.4	1.0-1.9
Fatigue	9.3	231	5.4	107	1.8	1.4-2.3
Guilt	4.7	117	2.4	48	2.0	1.4-2.8
Trouble concentrating	6.9	171	4.4	87	1.6	1.2-2.1
Felt like wanting to die	6.6	163	4.7	92	1.4	1.1-1.9
Thought about suicide	1.5	37	1.3	25	10.2	0.7-2.0
Attempted suicide	0.0	0	0.0	0	—	—

[a] Because of questionnaire design, veterans were not asked if they had apprehensive expectation in the past month. Veterans who ever reported apprehensive expectation and who reported the other three types of symptoms in the month before interview were considered to have generalized anxiety in the month before interview.

anxiety and depression had a relatively narrow range, indicating that component symptoms of these conditions were all relatively more prevalent in the Vietnam than in the non-Vietnam group. When we examined lifetime occurrences of the individual symptoms or behaviors related to generalized anxiety and depression, we found similar relative differences between Vietnam and non-Vietnam veterans (Table B.13). Of particular note, similar proportions of Vietnam (3.5%) and non-Vietnam (2.9%) veterans reported having ever attempted suicide (OR = 1.2, 95% CI = 0.9-1.7).

During the month before the examination, Vietnam veterans reported more symptoms and behaviors of alcohol use disorders than non-Vietnam veterans (Table 4.8). The most commonly reported items in both groups were drinking a fifth of liquor or more in one day (4.6% of Vietnam versus 3.3% of non-Vietnam veterans), attempts to control drinking (3.0% versus 2.3%), and drinking seven or more drinks per day for a period of 2 weeks or longer (3.9% versus 2.6%). The lifetime occurrences of alcohol abuse or dependence symptoms and behaviors are shown in Table B.14. We found generally similar excesses among Vietnam veterans compared with non-Vietnam veterans for most symptoms and behaviors.

Table 4.8 Prevalences of Symptoms or Behaviors Related to Alcohol Abuse or Dependence During the Month Before Examination Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam		Crude Results	
Symptom or Behavior	**%**	**No.**	**%**	**No.**	**OR**	**95% CI**
Pathological Use						
≥1/5 liquor in 1 day	4.6	115	3.3	64	1.4	1.1-2.0
Wants to stop drinking but can't	1.8	45	0.8	15	2.4	1.3-4.3
Attempts to control drinking	3.0	74	2.3	46	1.3	0.9-1.9
Blackouts while drinking	1.3	32	1.3	26	1.0	0.6-1.6
Continues drinking when physical illness may get worse	1.0	26	1.0	19	1.1	0.6-2.0
Can't do ordinary work without drink	0.4	11	0.3	5	1.7	0.6-5.0
Impairment in Social or Occupational Functioning						
Family complains about drinking	4.3	108	3.1	61	1.4	1.0-2.0
Others complain about drinking	1.9	47	1.3	25	1.5	0.9-2.4
Job or school trouble due to drinking	0.4	10	0.2	3	2.6	0.7-9.6
Lost job or expelled from school due to drinking	<0.1	1	0.1	1	–	
Had accident or arrested for drunk driving	0.3	7	0.2	4	1.4	0.4-4.7
Other drinking arrest	<0.1	1	0.2	4	–	
Physical fights while drinking	0.3	8	0.4	7	0.9	0.3-2.5
Tolerance or Withdrawal						
≥7 drinks/day for ≥2 wks	3.9	96	2.6	51	1.5	1.1-2.1
Drinks before breakfast	1.0	26	0.5	10	2.1	1.0-4.3
Shakes from lack of alcohol	1.5	36	0.6	11	2.6	1.3-5.1

Except for daily use for a period of 2 weeks or longer, few veterans reported any other symptoms or behaviors of drug abuse or dependence during the month before the examination (Table 4.9). Daily use of illicit drugs for a period of 2 weeks or longer was reported by more Vietnam than non-Vietnam veterans (5.2% versus 3.8%). When we evaluated symptoms over the veterans' entire lifetimes, we found that Vietnam veterans reported symptoms or behaviors of illicit drug abuse or dependence more frequently than non-Vietnam veterans (Table B.15). Daily use of illicit drugs for a period of two weeks or more at some time during the veteran's lifetime was reported by 24% of Vietnam veterans and 20% of non-Vietnam veterans. Emotional problems due to drug use were reported by 13% of Vietnam and 10% of non-Vietnam veterans (OR = 1.3, 95% CI = 1.0-1.5). Drug overdoses or health problems due to drugs were reported by 4% of Vietnam veterans and 3% of non-Vietnam veterans (OR = 1.3, 95% CI = 0.9-1.7).

The types of drugs the veterans reported using are presented in Table 4.10. For nearly all types of drugs, Vietnam veterans reported having used them at some time in their lives more frequently than non-Vietnam veterans. Marijuana was reported to be the most commonly used drug in both groups (48% of Vietnam and 43% of non-Vietnam veterans). The drugs for which there was the greatest relative difference in reported use between the two groups were heroin (6.3% versus 3.7%, OR = 1.8) and other opiates (8.5% versus 6.0%, OR = 1.5). Among veterans who met DIS criteria for drug abuse or dependence, marijuana was the drug most frequently cited as having caused a veteran "problems" in the past year (6.8% of Vietnam veterans and 5.7% of non-Vietnam veterans). The next most frequent problem drug was cocaine (1.3% in each group).

4.3.2 POST-TRAUMATIC STRESS DISORDER (PTSD)

Post-traumatic stress disorder (PTSD) occurred more frequently among Vietnam veterans, and the increased prevalence was attributable to combat-related events (Table 4.11). Similar percentages of Vietnam (1.8%) and non-Vietnam (2.6%) veterans ever met criteria for PTSD related to events other than combat (*e.g.*, natural disasters). Overall, 366 (14.7%) Vietnam and 11 (0.6%) non-Vietnam veterans ever met criteria for combat-related PTSD. We reviewed

Table 4.9 Prevalences of Symptoms or Behaviors Related to Drug Abuse or Dependence During the Month Before Examination Among Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam		Crude Results	
Symptom or Behavior	**%**	**No.**	**%**	**No.**	**OR**	**95% CI**
Pathologic Use						
Used each day for ≥2 wks.	5.2	129	3.8	75	1.4	1.0-1.8
Overdose or health problems due to drugs	0.3	8	0.3	5	1.3	0.4-3.9
Tried but couldn't cut down	0.3	7	0.6	11	0.5	0.2-1.3
Emotional problems due to drugs	0.4	10	0.4	7	1.1	0.4-3.0
Impairment in Social or Occupational Functioning						
Problems with family, friends, job, school, or police	<0.1	1	0.2	4	–	
Tolerance or Withdrawal						
Need larger amounts for effect	0.4	11	0.5	9	1.0	0.4-2.3
Withdrawal symptoms	0.2	4	0.2	3	–	

Table 4.10 Percent and Number of Vietnam and Non-Vietnam Veterans Who Reported Use of Specific Drugs According to Whether They Had Used the Drugs Five or More Times In Their Lifetimes and Whether They Had "Problems" With Drugs In the Past Year

	Used Five or More Times in Lifetime						Had "Problems" With Drugs in the Past Year[a]					
	Vietnam		Non-Vietnam				Vietnam		Non-Vietnam			
Type of Drug	%	No.	%	No.	OR	95% CI	%	No.	%	No.	OR	95% CI
Marijuana, hashish, pot, grass	47.8	1190	43.4	855	1.2	1.1-1.3	6.8	170	5.7	113	1.2	0.9-1.5
Amphetamines, stimulants, uppers, speed	20.8	519	18.3	361	1.2	1.0-1.4	0.8	20	0.4	7	2.3	1.0-5.4
Barbiturates, sedatives, downers, sleeping pills, seconal, quaaludes	9.7	242	9.0	178	1.1	0.9-1.3	0.2	5	0.1	2	–	–
Tranquilizers, valium, librium	8.8	218	8.3	163	1.1	0.9-1.3	0.3	8	0.1	1	–	–
Cocaine, coke	14.8	368	13.8	271	1.1	0.9-1.3	1.3	32	1.3	25	1.0	0.6-1.7
Heroin	6.3	156	3.7	72	1.8	1.3-2.3	0.3	8	0.3	6	1.1	0.4-3.0
Other opiates (opium, codeine, demerol, morphine, methadone, darvon)	8.5	212	6.0	118	1.5	1.2-1.8	0.1	3	0.1	2	–	–
Psychedelics (LSD, mescaline, peyote, psilocybin, DMT, PCP)	10.5	261	11.0	216	1.0	0.8-1.2	0.2	5	0.1	1	–	–
Other	1.2	29	1.3	25	0.9	0.5-1.6	0.1	3	0.0	0	–	–

[a] From the drug abuse and dependence section of the DIS. Only veterans who ever met DSM-III criteria for drug abuse or dependence were asked if they had "problems" (unspecified) with drugs in the past year. Others were assumed not to have problems.

Table 4.11 Lifetime Prevalences of Combat-Related and Other Types of Post-Traumatic Stress Disorder (PTSD) In Vietnam and Non-Vietnam Veterans

	Vietnam		Non-Vietnam	
	%	No.	%	No.
Combat-related	14.7	366	0.6	11[a]
Other	1.8	45	2.6	51

[a] Place of service verified as non-Vietnam.

the military records of the 11 non-Vietnam veterans with combat-related PTSD a second time to confirm that they had not been misclassified by place of service. These 11 may have given inappropriate responses or they may have been referring to training exercises that simulate combat.

Subsequent analyses were restricted to combat-related PTSD (PTSD-C) among Vietnam veterans. Symptoms of PTSD-C had been experienced by 50.1% of Vietnam veterans at some time during or after active military duty, and 14.7% ever experienced symptoms that met DSM-III criteria for PTSD-C (Table 4.12). During the month before the examination,

Table 4.12 Prevalences of Combat-Related Post-Traumatic Stress Disorder (PTSD-C) and Associated Symptoms During the Veterans' Lifetimes and During the Month Before Examination, Vietnam Veterans Only

	Vietnam Veterans (N=2490)	
	Lifetime %	Month Before Examination %
Combat-Related PTSD[a]	14.7	2.2
Symptoms of PTSD		
Criterion B		
Recurrent thoughts or dreams	32.4	7.6
Felt as if event recurring	9.4	1.9
Criterion C		
Lost ability to care about others or lost interest in usual activities	17.1	5.1
Criterion D		
Jumpy or easily startled	45.1	10.6
Trouble sleeping	34.6	3.4
Ashamed of being alive	8.1	1.3
Forgetful or trouble concentrating	13.6	0.4
Avoid situations that remind	28.8	7.3
Symptoms get worse in situations that remind	17.3	3.3
No Symptoms	49.9	79.2

[a] To meet DIS criteria for combat-related PTSD, a veteran had to report a combat-related traumatic event (Criterion A), at least one reexperiencing symptom (Criterion B), a numbing symptom (Criterion C), and at least two symptoms of autonomic arousal (Criterion D). All symptoms were related specifically to the traumatic event.

20.8% of the Vietnam veterans had experienced symptoms of PTSD-C, and 2.2% met full criteria for the diagnostic category.

Symptoms of PTSD are divided into three categories. Criterion B, reexperiencing the traumatic event, is unique for PTSD, whereas Criteria C and D include symptoms of anxiety and depression. Among the Criterion B symptoms, recurrent thoughts or dreams were reported about four times more frequently than feelings that the traumatic event was happening again (*i.e.*, flashbacks). About one-third of the Vietnam veterans said they had ever experienced recurrent thoughts or dreams at some time, and 7.6% reported that they had had them in the month before the examination (Table 4.12). Flashbacks had been experienced at some time by 9.4% of Vietnam veterans, and 1.9% had had them during the month before examination. For criteria C and D, being jumpy and easily startled was the most common lifetime (45.1%) and current (10.6%) symptom, whereas the least common symptoms were being ashamed to be alive, for which lifetime prevalence was 8.1%, and being forgetful or having trouble concentrating, for which the current prevalence was 0.4%.

The onset, intensity, and duration of symptoms among the 366 Vietnam veterans who ever met criteria for PTSD-C are shown in Table 4.13. Nearly half reported having symptoms the same day the traumatic event occurred, and only 4.4% reported first having symptoms more than 3 years after the event. About 9.5% said they had had symptoms less than once a month, and 56.3% said they had had symptoms at least a few times a week for over 3 years. Of the affected veterans, 31.2% told a doctor about problems related to PTSD-C symptoms, and 5.5% told another health professional. About one-fourth had taken medications more than once for PTSD-C symptoms. Most (58.7%) indicated that PTSD-C symptoms had interfered with their life or with activities "a lot."

Certain preservice and service characteristics were associated with the lifetime prevalence of PTSD-C (Table 4.14). These included MOS category, GT score at enlistment, history of childhood behavior problems, and use of illicit drugs in the Army. The lifetime prevalence of PTSD-C was 19.7% among veterans who had a tactical MOS compared with 12.1% among those who had a nontactical MOS. We observed a strong trend toward a higher prevalence of PTSD-C with decreasing GT scores at enlistment, with the prevalences ranging from 8.6% for the men with the highest GT scores to 19.2% among those with the lowest scores. Men who reported having had three or more childhood behavioral problems had a prevalence of PTSD-C of 21.1% compared with 13.0% for men who reported fewer childhood behavioral problems. Lifetime prevalences of PTSD-C according to reported regular use of illicit drugs in the Army were 11.6% for men who did not report such drug use, 19.8% for men who reported use of marijuana only, and 26.1% for men who reported use of hard drugs. Lifetime prevalence of PTSD-C was not associated with year of entry into the service or race. The prevalence of PTSD-C varied somewhat according to age at entry into the Army and enlistment status (volunteered or drafted), but for both of these associations, the 95% confidence interval of the OR included 1.0.

Having PTSD-C during the month before the examination was associated with age at entry into the Army and with reported use of hard drugs in the Army (Table 4.15). The prevalence of PTSD-C was higher for men who had a tactical MOS (2.8%) than for men who had a nontactical MOS (1.8%), but the 95% confidence interval of the OR included 1.0. There was a trend between current PTSD-C and GT scores at enlistment, with prevalences ranging from 0.8% for men with the highest scores to 4.2% for men with the lowest scores. Results showed

Table 4.13 Characteristics of Vietnam Veterans Who *Ever* Met DSM-III Criteria for Combat-Related *Post-Traumatic Stress Disorder (PTSD-C)*

Characteristic[a]	PTSD-C Ever (N=366) %
Onset of Symptoms	
Same day	47.0
That week	13.4
That month	9.6
Within 6 months	10.7
Within 1 year	6.6
Within 3 years	8.5
More than 3 years	4.4
Experienced Symptoms at Least a Few Times a Week	
Never that often	3.8
>1 week	3.0
>1 week to ≤1 month	2.7
>1 month to ≤6 months	8.2
>6 months to ≤1 year	8.0
>1 year to ≤3 years	18.0
>3 years	56.3
Last Had Any Symptoms	
<2 weeks ago	41.3
2 weeks to <1 month ago	23.8
1 month to <6 months ago	7.1
6 months to <1 year ago	5.2
≥1 year ago	22.7
Ever Told Health Professional About Problems Related to PTSD-C	
Doctor	31.2
Other	5.5
Ever Took Medications More Than Once for PTSD-C Symptoms	24.6
PTSD-C Symptoms Interfered With Life or With Activities a Lot	58.7

[a] Categories taken from DIS questionnaire.

no association between PTSD-C and year of entry, type of enlistment, and history of childhood behavior problems. The association with race was difficult to evaluate because few nonwhite veterans had current PTSD-C.

Since PTSD symptom criteria C and D include symptoms of anxiety and depression, Vietnam veterans who ever met criteria for PTSD should also be more likely to have met criteria for generalized anxiety, depression, and, perhaps, substance disorders. The lifetime prevalence of all these conditions was higher among Vietnam veterans with PTSD-C than among veterans who did not meet criteria for PTSD-C or among non-Vietnam veterans (Tables 4.16 and 4.17). Vietnam veterans who ever had PTSD-C were two to three times more likely to have alcohol abuse or dependence, three to five times more likely to have generalized anxiety, and five to nine times more likely to have depression. In all cases, associations were stronger for current than for lifetime prevalence. When current (i.e., during the month before examination) PTSD-C was compared with the current prevalence of other conditions, the few men who met the criteria for PTSD-C in the past month were also more likely to meet criteria for the other conditions in the previous month, with 66% also meeting

Table 4.14 **Lifetime Prevalence of Combat-Related PTSD (PTSD-C) Among Vietnam Veterans According to Selected Demographic, Preservice, and Military Service Characteristics**

	Vietnam			
Characteristic	**%**	**No.**	**OR**	**95% CI**
Age at Entry Into Service				
<20	16.1	209	1.0	(Referent)
≥20	13.2	157	0.8	0.6-1.0
Year of Entry Into Service				
1965-66	14.2	118	1.0	(Referent)
1967-69	15.6	218	1.1	0.9-1.4
1970-71	11.5	30	0.8	0.5-1.2
Race				
White	14.7	301	1.0	(Referent)
Black	14.7	42	1.0	0.7-1.4
Hispanic and other	15.3	23	1.1	0.7-1.7
Type of Enlistment				
Draft	13.6	209	1.0	(Referent)
Volunteer	16.5	157	1.3	1.0-1.6
Primary Military Occupational Specialty				
Nontactical	12.1	199	1.0	(Referent)
Tactical	19.7	167	1.8	1.4-2.2
General Technical Score				
40-89	19.2	111	1.5	1.1-1.9
90-109	14.0	113	1.0	(Referent)
110-129	14.6	118	1.1	0.8-1.4
130-160	8.6	22	0.6	0.4-0.9
History of Childhood Behavior Problems[a]				
<3	13.0	253	1.0	(Referent)
≥3	21.1	113	1.8	1.4-2.3
Regular Drug Use in the Army[b]				
None	11.6	200	1.0	(Referent)
Marijuana only	19.8	102	1.9	1.5-2.5
Hard drugs	26.1	62	2.7	1.9-3.7

[a] From the DIS questionnaire.
[b] From the telephone interview.

criteria for anxiety or depression and 39% also meeting criteria for alcohol abuse or dependence. These findings indicate that the elevated prevalence of anxiety, depression, and alcohol use disorders for Vietnam veterans compared with non-Vietnam veterans is concentrated among Vietnam veterans who also met criteria for PTSD-C.

4.3.3 OTHER CONDITIONS

Some conditions from the DIS were not evaluated in great detail because they are rare among men of this age group or because results from previous research do not indicate that they should be particular problems among Vietnam veterans. These conditions were phobia, panic, obsession, schizophrenia, antisocial personality, and somatization. Phobia, panic, and obsession are all forms of anxiety disorders and all were more prevalent among the Vietnam veterans, with ORs ranging from 1.5 to 2.3 (Table 4.18). Of the specific phobias evaluated, each was more prevalent among Vietnam than non-Vietnam veterans, except fear

Table 4.15 Prevalence of Combat-Related Post-Traumatic Stress Disorder (PTSD-C) During the Month Before Examination Among Vietnam Veterans According to Selected Demographic, Preservice, and Military Service Characteristics

	Vietnam			
			Crude Results	
Characteristic	%	No.	OR	95% CI
Age at Entry Into Service				
<20	3.0	39	1.0	(Referent)
≥20	1.3	15	0.4	0.2-0.8
Year of Entry Into Service				
1965-66	2.3	19	1.0	(Referent)
1967-69	2.1	30	0.9	0.5-1.7
1970-71	1.9	5	0.8	0.3-2.3
Race				
White	1.9	39	1.0	(Referent)
Black	3.5	10	1.9	0.9-3.8
Hispanic and other	3.3	5	1.8	0.7-4.6
Type of Enlistment				
Draft	1.9	29	1.0	(Referent)
Volunteer	2.6	25	1.4	0.8-2.4
Primary Military Occupational Specialty				
Nontactical	1.8	30	1.0	(Referent)
Tactical	2.8	24	1.6	0.9-2.7
General Technical Score				
40-89	4.2	24	2.6	1.3-5.2
90-109	1.6	13	1.0	(Referent)
110-129	1.9	15	1.2	0.5-2.4
130-160	0.8	2	0.5	0.1-2.1
History of Childhood Behavior Problems[a]				
<3	2.1	40	1.0	(Referent)
≥3	2.6	14	1.3	0.7-2.4
Regular Drug Use in the Army[b]				
None	1.8	31	1.0	(Referent)
Marijuana only	1.8	9	1.0	0.5-2.1
Hard drugs	5.5	13	3.2	1.6-6.1

[a] From the DIS questionnaire.
[b] From the telephone interview.

of storms (Table B.1). Lifetime prevalence of schizophrenia was also greater among Vietnam veterans (1.4%) than non-Vietnam veterans (0.6%), although few veterans were affected in either group (Table 4.18).

Of the six other conditions evaluated, antisocial personality was the most prevalent in both groups and was the one for which prevalences were most similar for Vietnam and non-Vietnam veterans (23.0% versus 21.1%). To meet DSM-III criteria for antisocial personality, participants needed to report three or more childhood behavior problems (*i.e.*, occurring before age 15) and four or more adult behavior problems, at least one of which occurred between ages 18 and 25. As shown in Chapter 3, the two cohorts reported childhood behavior problems with similar frequency (28%). Thus, the small increase in the prevalence of antisocial personality among Vietnam veterans compared with non-Vietnam veterans reflects a slight increase in the prevalence of adult behavior problems (26.7% versus 23.6%), as shown in Table 4.19. Among both Vietnam and non-Vietnam veterans, the behaviors reported most frequently were drunk driving or four or more moving violations, job

Table 4.16 Lifetime Prevalences of Generalized Anxiety, Depression, and Substance Use Disorders Among Non-Vietnam Veterans, Vietnam Veterans Who Never Had PTSD-C[a], and Vietnam Veterans Who Had PTSD-C During Their Lifetimes

	Non-Vietnam		Vietnam Ever had PTSD-C			
			No		Yes	
Condition	%	No.	%	No.	%	No.
Generalized anxiety	17.2	339	19.8	421	45.1	35
Depression	8.0	157	8.8	186	34.2	25
Alcohol abuse or dependence	41.8	824	47.3	1004	70.0	56
Drug abuse or dependence	13.0	257	12.8	272	25.4	03

[a] Combat-related post-traumatic stress disorder.

Table 4.17 Prevalences of Generalized Anxiety, Depression, and Substance Use Disorders During the Month Before Examination Among Non-Vietnam Veterans, Vietnam Veterans Who Never Had PTSD-C[a], and Vietnam Veterans Who Had PTSD-C During Their Lifetimes

	Non-Vietnam		Vietnam Ever Had PTSD-C			
			No		Yes	
Condition	%	No.	%	No.	%	No.
Generalized anxiety	3.2	63	3.3	71	14.2	52
Depression	2.3	45	2.3	48	17.5	64
Alcohol abuse or dependence	9.2	182	11.5	245	26.2	96

[a] Combat-related post-traumatic stress disorder.

Table 4.18 Lifetime Prevalences of Selected Psychiatric Conditions Among Vietnam and Non-Vietnam Veterans

							Multivariate Results			
	Vietnam		Non-Vietnam		Crude Results		Model 1[a]		Model 2[b]	
Condition[c]	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Phobia	8.2	205	4.1	81	2.1	1.6-2.7	1.9	1.4-2.5	1.9	1.4-2.5
Panic	3.4	85	1.5	30	2.3	1.5-3.5	2.3	1.5-3.6	2.3	1.5-3.6
Obsession	1.7	42	1.1	22	1.5	0.9-2.6	1.6	0.9-2.8	1.6	0.9-2.8
Schizophrenia	1.4	35	0.6	11	2.5	1.3-5.0	3.0	1.4-6.0	—	—
Antisocial personality	23.0	572	21.1	416	1.1	1.0-1.3	1.1	0.9-1.2	1.1	0.9-1.3
Somatization (past year)[d]	1.7	42	0.7	14	2.4	1.3-4.4	2.5	1.3-4.8	2.5	1.3-4.8

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and education, marital status, current alcohol use, current drug use, and history of childhood behavior problems.
[c] DSM-III criteria.
[d] DSM-III criteria applied to information from medical history questionnaire administered during the medical examination.

Table 4.19 Percent and Number of Vietnam and Non-Vietnam Veterans Reporting Adult Behavior Problems (After Age 18) and Odds Ratios, by Type of Problem

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results			
							Model 1[a]		Model 2[b]	
Adult Behavior Problem[c]	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Job problems	50.6	1260	48.3	953	1.1	1.0-1.2	1.1	1.0-1.2	1.1	0.9-1.2
Neglect children	2.4	59	1.7	33	1.4	0.9-2.2	1.5	0.9-2.3	1.4	0.9-2.3
Arrested (nontraffic), prostitution, pimping, or selling drugs	20.0	499	18.7	368	1.1	0.9-1.3	1.1	0.9-1.2	1.0	0.9-1.2
Marital or relationship problems	45.6	1135	42.9	846	1.1	1.0-1.3	1.1	0.9-1.2	1.1	0.9-1.2
Fights	50.0	1245	45.6	899	1.2	1.1-1.3	1.1	1.0-1.3	1.1	1.0-1.3
Debt problems	2.7	67	2.2	44	1.2	0.8-1.8	1.2	0.8-1.8	1.1	0.8-1.7
No regular place to live (≥1 mo.)	12.7	317	11.9	234	1.1	0.9-1.3	1.1	0.9-1.3	1.0	0.9-1.3
Used an alias or lied often	6.8	170	6.9	137	1.0	0.8-1.2	1.0[d]	0.8-1.3	0.9[d]	0.7-1.2
Drunk driving or >4 moving violations	57.0	1419	53.1	1048	1.2	1.0-1.3	1.2	1.0-1.3	1.1	1.0-1.3
≥4 Adult behavior problems	26.7	665	23.6	466	1.2	1.0-1.4	1.1	1.0-1.3	1.1	0.9-1.3

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and education, marital status, current alcohol use, and current drug use.
[c] Taken from the Antisocial Personality Section of the Diagnostic Interview Schedule. Exact age at which behavior occurred was not asked.
[d] Standardized for military occupational specialty.

problems, fights, and marital or relationship problems, whereas those reported least frequently were debt problems and neglect of children. For most problems, the ORs for Vietnam service were in the 1.1-1.2 range.

During the year before the examination, the prevalence of somatization was 1.7% for Vietnam veterans and 0.7% for non-Vietnam veterans (Table 4.18). Prevalence estimates refer to the year before examination, because information on symptoms was taken from the medical history questionnaire. The low prevalences in each group reflect the relatively stringent criteria for somatization in the DSM-III. Further information on reported medical symptoms is in Volumes II and III of this monograph.

4.4 SUMMARY

Using the DIS to evaluate the occurrence of psychiatric conditions, we found that the occurrence of nearly all conditions was increased for veterans who served in Vietnam compared with veterans who did not serve there. In particular, of the conditions selected for detailed evaluation, Vietnam veterans were more likely to meet diagnostic criteria for anxiety, depression, and alcohol abuse or dependence. The preservice prevalences of these disorders were similar among Vietnam and non-Vietnam veterans. The onset of symptoms of these conditions was higher among Vietnam veterans compared with non-Vietnam veterans following entry into active duty, with the largest relative increases occurring during

and shortly after active military service. Prevalences of the conditions during the month before the examination were lower than lifetime prevalences, but the magnitudes of the associations with Vietnam service were similar. The prevalence of veterans who met criteria for drug abuse or dependence either over their entire lifetimes or during the month before examination was similar for the two groups of veterans. Fewer than 1% of veterans in either group met criteria for drug abuse or dependence during the month before the examination.

Analyses of combat-related PTSD were restricted to Vietnam veterans. Overall, we found that 15% of Vietnam veterans had had symptoms meeting DIS criteria for combat-related PTSD at some time during or after military duty and that about 2% had had combat-related PTSD during the month before the examination. Men who had a tactical MOS were more likely to have had combat-related PTSD than men who had a nontactical MOS.

The identified associations between military service in Vietnam and psychiatric conditions were not confounded by demographic or military entry characteristics such as race, MOS, GT score at enlistment, enlistment status (drafted or volunteered), year of entry into the Army, or age at entry into the Army. Nor were they confounded by such factors as marital status or education. With the exception of depression, the magnitude of the association between place of service and these conditions was similar for various subgroups of veterans defined by these characteristics. The results did suggest that the risk of depression associated with service in Vietnam was more pronounced among nonwhite veterans, but the risk estimates for nonwhites were unstable because relatively few of them were in the study.

CHAPTER 5

Minnesota Multiphasic Personality Inventory Results

5. MINNESOTA MULTIPHASIC PERSONALITY INVENTORY RESULTS

5.1 INTRODUCTION

In this chapter, we present the results, for the two groups of veterans, of the psychological evaluation based on the Minnesota Multiphasic Personality Inventory (MMPI). The MMPI is a self-administered, standardized questionnaire that provides a quantitative evaluation of personality, emotional status, and level of psychopathology. In Chapter 2, we gave some background information on the MMPI, and in Appendix C, we describe the various validity and clinical scales, clinical subscales, relevant research scales, and primary code types (scale patterns) evaluated in the Vietnam Experience Study (VES) analysis.

As indicated in Chapter 1, we reasoned that five conditions might be more prevalent among Vietnam veterans than among veterans who did not serve in Vietnam: generalized anxiety, depression, alcohol use disorders, drug use disorders, and post-traumatic stress disorder (PTSD). In the analysis, we emphasized results related to these conditions.

5.2 METHODS AND DATA QUALITY

The VES procedures are described in detail in Chapter 2. Here we discuss some methodological issues unique to the MMPI and issues related to the validity and quality of the MMPI data.

Because each of the standard clinical scales within the MMPI assesses multiple factors, we used a multistep approach in analyzing the data. In all analyses, both continuous and discrete characteristics of the data were evaluated. We analyzed continuous data, such as the T-scores (standardized scores) from the clinical scales, using linear regression approaches, typically MANCOVA (Multivariate Analysis of Covariance). Arithmetic means and standard errors (STE) of the means are provided for the Vietnam and non-Vietnam cohorts. In addition, differences in mean scores (Vietnam minus non-Vietnam) and 95% confidence intervals (CI) for these mean score differences (and covariate-adjusted mean differences) are provided for the crude, Model 1, and Model 2 covariate analyses (see Chapter 2). To identify differential results for subgroups of veterans, we evaluated all covariates for interaction with place of service (Vietnam versus non-Vietnam). For example, if among veterans with low intelligence quotients (IQs), the relative differences between Vietnam and non-Vietnam veterans were different from those among veterans with high IQs, an interaction could be said to occur. If, on the other hand, results for veterans with low IQs were different from results for veterans with high IQs, but the differences were the same for Vietnam and non-Vietnam veterans, then, although IQ would have a main effect, no interaction with place of service could be said to occur.

We used logistic regression analysis (see Chapter 2) to evaluate the risk of having more severe psychological problems. These analyses focused on the relative prevalences of veterans with high scores on the various scales. In general, we dichotomized individual scales at raw scores or T-scores representing 2 standard deviations above the male MMPI standardization, or normative, population means for that scale. T-score values of 70 or above are representative of this criterion.

We also combined results on different MMPI scales to develop case definitions based on code-type analysis, which identified veterans who had various combinations (patterns) of elevated scales. For example, a veteran who had elevations on scales 2 and 4 only was identified as a 24 code type. All combinations of code types from the two cohorts were

reviewed and all singlets (only one scale elevated), doublets (two scales elevated), and other combinations (three or more elevated scales) that occurred at a rate of 0.5% or more in both cohorts combined were included in these analyses. All other combinations were placed in an "other" code-type category for group evaluation.

The use of both linear and logistic regression analyses provided a dual evaluation of the relevant hypotheses. Because cohort difference may be exhibited as either mean differences or differences in the proportion of cases with more extreme scores, each approach focuses on different characteristics of the cohorts' results.

The specific analysis of the MMPI was approached in a step-by-step manner. First, the validity of each cohort's results was evaluated by using the standard validity scales (L, F, and K) and two additional scales that assessed the reliability of a participant's responses. The Carelessness (Care) scale assessed the consistency of a veteran's responses by comparing his responses to the same questions asked in different ways. The test-retest (T-R) scale also assessed consistency by comparing a veteran's responses to the questions that are asked twice in the MMPI. Through this analysis, a veteran's MMPI results were judged either "valid" or "invalid." The results for veterans who had T-scores on the L scale greater than or equal to 70, on the K scale greater than 70, on the F scale greater than or equal to 80, or on both the Care and T-R scales greater than or equal to 70 were defined as "invalid" or "questionable" profiles. All analyses were performed for: 1) the sample of all veterans (with both valid and invalid profiles included) and 2) for only the sample of veterans with valid profiles. The results and discussion that follow focus on analyses for veterans with only valid MMPI profiles, because these results provided the most valid indication of these veterans' current psychological functioning. We found similar relative differences between the cohorts, however, in the analyses that included veterans with questionable profiles (see Appendix Tables D.1-D.14).

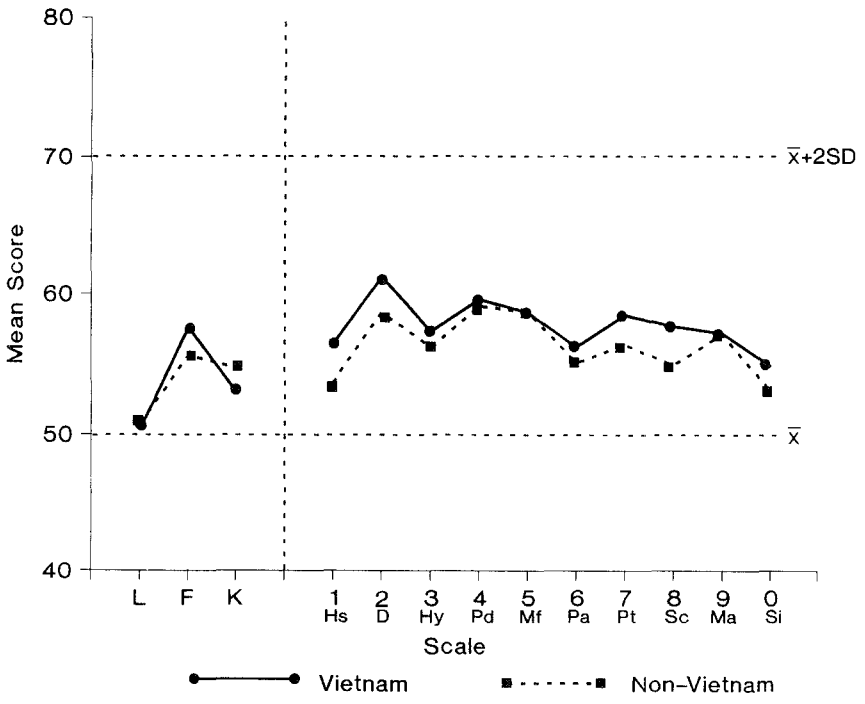
After we had analyzed the validity and reliability scales of the MMPI, we addressed the specific hypotheses of this study by conducting an additional series of analyses. For example, to assess whether the Vietnam veterans showed more depression, or depressive symptomatology, compared with non-Vietnam veterans, we evaluated their results on individual clinical scales, subscales, special scales, and code types that assess depression or depressive symptomatology. First, we evaluated cohort differences on scale 2 (Depression) and second, we evaluted cohort differences on depression's obvious and subtle item scales. Then to provide a more detailed analysis of the type and content of depressive items, we assessed the Harris and Lingoes subscales for depression (D1-D5). Through these analyses of single scales, a picture of the type of depressive content and any differences between cohorts can be described. Because the original depression scale (scale 2) has some limitations in identifying depression or depressive symptomatology, we focused an additional series of analysis on special research scales related to depression (*e.g.*, Wiggins Depression Content scale). Finally, we analyzed relevant depression code types (*e.g.*, 21, 23). Through this step-by-step analysis, we obtained a multimethod evaluation of the relevant hypotheses.

5.3 RESULTS

5.3.1 MMPI Profile Validity

All standard validity scales (L, F, K) means fell between T-scores of 50 and 60, the average range for the MMPI standardization sample norms (Figure 5.1, Table 5.1). Linear regression analysis showed a significant interaction between race and place of service. Analyses within the different racial groups showed that F scale means (T-score difference of <2.0) for white Vietnam veterans were slightly higher than means for white non-Vitnam veterans, even after they had been adjusted for covariates (Table 5.2). In addition, the K-scale means (mean T-score difference of <2.0) were slightly lower, even after adjustment for covariates. These cohort differences, although statistically significant, are so small that they would be of little individual clinical importance. The differences on the L, Carelessness (Care), or Test-Retest (T-R) scales were not significant. We obtained similar results for black veterans (Table 5.2), with the exception that when the L scale was adjusted for Model 2 covariates, black Vietnam veterans had significantly lower scores (mean T-score difference of 2.6) than the black

Figure 5.1 MMPI Profiles[a] by Place of Service



[a] Invalid profiles removed from clinical scales.

Table 5.1 Arithmetic Means and Mean Differences for MMPI Validity Scales Among Vietnam and Non-Vietnam Veterans

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**
MMPI L scale	50.5 (.15)	50.9 (.17)	-0.4	-0.9, 0.0	50.9	51.5	-0.7	-1.1,-0.2	50.4	50.4	0.0	-0.5, 0.4
MMPI F scale	57.6 (.21)	55.7 (.22)	1.9	1.3, 2.5	58.7	56.5	2.3	1.7, 2.9	61.5	58.9	2.6	2.0, 3.1
MMPI K scale	53.2 (.19)	55.0 (.22)	-1.8	-2.3,-1.2	53.6	54.9	-1.2	-1.8,-0.7	52.4	53.6	-1.2	-1.7,-0.6
Carelessness scale	1.3 (.03)	1.2 (.03)	0.1	0.1,0.2	1.6	1.4	0.1	0.1,0.2	1.8	1.6	0.2	0.1,0.2
Test-retest scale	1.3 (.03)	1.1 (.03)	0.1	0.1, 0.2	1.4	1.3	0.1	0.0, 0.2	1.6	1.5	0.1	0.0, 0.1

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.2 Arithmetic Means and Mean Differences for MMPI Validity Scales Among Vietnam and Non-Vietnam Veterans, by Race

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
Race = White												
MMPI L scale	50.1 (.15)	50.4 (.18)	-0.3	-0.7, 0.2	50.1	50.5	-0.4	-0.8, 0.1	49.6	49.2	0.5	0.0, 0.9
MMPI F scale	57.0 (.22)	55.2 (.23)	1.8	1.2, 2.4	57.0	56.1	1.0	0.3, 1.6	60.4	58.8	1.6	1.0, 2.2
MMPI K scale	53.4 (.21)	55.4 (.24)	-1.9	-2.6,-1.3	53.4	54.8	-1.5	-2.1,-0.9	52.4	54.1	-1.7	-2.3,-1.1
Carelessness scale	1.4 (.03)	1.2 (.03)	0.2	0.1, 0.3	1.4	1.3	0.0	0.0, 0.1	1.7	1.6	0.1	0.0, 0.2
Test-retest scale	1.2 (.03)	1.0 (.03)	0.2	0.1, 0.3	1.2	1.2	0.1	0.0, 0.1	1.4	1.4	0.1	0.0, 0.1
Race = Black												
MMPI L scale	51.7 (.49)	52.6 (.57)	-0.9	-2.3, 0.6	48.8	51.2	-2.4	-3.9,-1.0	47.0	49.7	-2.6	-4.1,-1.2
MMPI F scale	59.4 (.72)	56.7 (.67)	2.7	0.8, 4.7	56.5	54.2	2.3	0.3, 4.2	60.2	57.1	3.1	1.2, 5.0
MMPI K scale	52.2 (.55)	53.4 (.63)	-1.2	-2.8, 0.4	54.1	55.8	-1.6	-3.3, 0.0	51.5	53.2	-1.7	-3.3,-0.1
Carelessness scale	1.8 (.08)	1.6 (.09)	0.2	0.0, 0.5	1.4	1.5	0.0	-0.3, 0.2	1.6	1.6	0.0	-0.2, 0.3
Test-retest scale	1.9 (.10)	1.8 (.11)	0.1	-0.2, 0.4	1.6	1.4	0.2	0.0, 0.5	1.7	1.4	0.3	0.0, 0.6
Race = Other												
MMPI L scale	53.2 (.72)	54.2 (.77)	-1.1	-3.1, 1.0	52.2	51.5	0.6	-1.4, 2.7	52.4	51.3	1.1	-0.9, 3.1
MMPI F scale	62.7 (1.15)	60.0 (1.18)	2.6	-0.6, 5.9	59.5	58.7	0.8	-2.4, 4.0	61.8	59.6	2.3	-0.9, 5.4
MMPI K scale	51.8 (.82)	52.6 (.84)	-0.8	-3.1, 1.5	54.2	53.7	0.4	-1.8, 2.7	53.0	52.6	0.4	-1.8, 2.6
Carelessness scale	2.0 (.13)	1.8 (.15)	0.2	-0.2, 0.5	1.7	1.7	0.0	-0.3, 0.4	1.7	2.2	-0.5	-0.9,-0.1
Test-retest scale	1.7 (.14)	1.6 (.13)	0.1	-0.2, 0.5	1.2	1.3	0.0	-0.4, 0.3	1.1	1.8	-0.6	-1.0,-0.3

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

non-Vietnam veterans, but they had higher (0.3) T-R scale scores. Results of an analysis for the other race (mostly Hispanic) veterans showed no significant differences between cohorts.

About 11% of either cohort showed suggestions of questionable or invalid profiles (Table 5.3). Overall, 1.9% of the Vietnam veterans had elevated scores on the L scale, 5.2% on the F scale, 2.9% on the K scale, 8.3% on the Care scale, and 8.0% on the T-R scale. Logistic regression of these individual scales showed no cohort differences and no significant ($p<.01$) interactions with any of the covariates and place of service.

Overall, the analysis of MMPI profile validity in the VES shows no cohort differences of clinical significance. The maximum mean differences found in any analysis was only three T-score points. All means for all scales were in the average range compared with the MMPI normative standardization sample. Mean differences by race and place of service were related to slightly different patterns of scale elevations between cohorts, but this did not lead to different clinical interpretations. In the main analyses, we excluded veterans with the above described validity scale elevations. Given that the percentage of participants excluded from each cohort was almost identical, these exclusions should not affect results comparing cohorts, but they would lower the mean scale scores and the prevalences of veterans with elevated scores. This is so because, typically, veterans with "invalid" profiles were those with the highest number of scale elevations. To be sure that excluding invalid profiles did not alter relative cohort differences, we performed additional analyses on the entire sample (including invalid profiles). For the most part, results were similar. In a few instances, they were different, and we will note those differences in the discussion that follows.

5.3.2 Generalized Anxiety and Depression

In most analyses of the MMPI, anxiety and depression are difficult to separate. Consequently, we addressed the hypotheses concerning these disorders and related symptoms jointly. In general, results from the first three clinical scales (1, 2, and 3 - the neurotic triad), their interrelationships, and relationships with other scales provide the MMPI's best indicators of anxiety and depression. Codetypes containing these scales are typically interpreted as representing anxiety or depression symptomatology. In addition, these scales contain indices of bodily concerns, somatization, and related medical complaints.

Table 5.3 Percent and Number of Vietnam and Non-Vietnam Veterans With Elevated MMPI Validity Scales and Odds Ratios

							Multivariate Results			
	Vietnam		Non-Vietnam		Crude Results		Model 1[a]		Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
MMPI L scale (≥70)	1.9	48	2.2	43	0.9	0.5-1.3	0.8	0.5-1.3	0.8	0.5-1.3
MMPI F scale (≥80)	5.2	129	4.0	79	1.3	1.0-1.7	1.2	0.9-1.7	1.2	0.9-1.6
MMPI K scale (>70)	2.9	73	4.4	87	0.7	0.5-0.9	0.7	0.5-1.0	0.7	0.5-1.0
Carelessness scale (>70)	8.3	206	6.5	128	1.3	1.0-1.6	1.2	1.0-1.6	1.2	0.9-1.5
Test-retest (>70)	8.0	200	6.5	128	1.3	1.0-1.6	1.1	0.9-1.4	1.1	0.9-1.4
Invalid profiles[c]	10.8	269	11.1	218	1.0	0.8-1.2	0.9	0.8-1.1	0.9	0.7-1.1

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.
[c] Invalid profiles were those who met L or F or K scale criteria, or those who met both Carelessness and Test-retest criteria.

Overall, for all of the first three clinical scales related to depression, the mean differences were significant (Figure 5.1, Table 5.4). The magnitude of these differences were no greater than 3.7 T-score points, with Vietnam veterans scoring higher, especially after the Model 2 adjustments. Mean scores ranged from 53 to 62, which is in the normal MMPI range.

For the mean scores on these scales (Table 5.4), the interaction between race and place of service was significant. Among white veterans, there were small, but statistically significant, differences between Vietnam and non-Vietnam veterans on scales 1 and 2 mean scores (Table 5.5). Among black veterans, however, differences were larger for all three scales (Table 5.6), with the Vietnam group having higher scores. The mean differences between the two black cohorts were between 3 and 9 T-score points; such differences are clinically meaningful. On these scales, mean scores for black Vietnam veterans were between 57 and 66, which are considered moderately elevated scores. Mean scores for the black non-Vietnam veterans were in the expected range for the MMPI normative sample. These cohort differences were most pronounced after the Model 2 adjustments had been made. Scores for other race Vietnam veterans (Table 5.7) also showed significant elevations on scales 1 and 2. On unadjusted and Model 1 comparisons, means for scales 1 and 2 were higher, but after the Model 2 adjustments, they were higher only on scale 2, with the magnitude of the differences being about 4 T-score points.

Contrary to the results of linear regression analysis, results of logistic regression analysis of the MMPI clinical scales related to anxiety and depression showed no significant race by place of service interaction (Table 5.8). Overall, for scale 1, 15.6% of the Vietnam and 9.1% of the non-Vietnam veterans had elevated scores, for scale 2, 25.1% of the Vietnam and 17.3% of the non-Vietnam veterans had elevated scores, and for scale 3, 8.9% of the Vietnam and 5.9% of the non-Vietnam veterans had elevated scores. The crude odds ratios (ORs) of 1.9 for the association between scale 1 elevations and Vietnam service, of 1.6 for scale 2, and of 1.5 for scale 3 are similar to the estimates for Models 1 and 2. When all invalid profiles are included in the analyses, the ORs are not notably affected (Appendix Table D.5).

We also performed additional subscale analyses relevant to the above scales. Comparison of the Obvious and Subtle subscales for scales 2 and 3 showed a very consistent pattern of higher mean scores on the Obvious subscales for the Vietnam veterans compared with the non-Vietnam veterans (Table 5.9). On the Subtle subscales, Vietnam veterans did not have higher mean scores in the crude, Model 1, or Model 2 analyses. All mean scores on both Obvious and Subtle subscales were within 1 standard deviation (SD) of the normative sample means, and the mean differences were less than 2 raw score points. The results of logistic regression were similar (Table 5.10). The crude, Model 1, and Model 2 ORs for both Obvious subscales were between 1.7 and 1.8, whereas for the Subtle subscales they were ≤ 1.0. These results consistently show that the Vietnam veterans' scores for the Obvious items were higher than the non-Vietnam veterans' scores. The Subtle items on these scales were, however, the same.

There is some debate about the interpretation of the Subtle and Obvious subscales. Subtle items are typically considered to be those whose content is not easily identified as abnormal, and, therefore, they are not likely to be exaggerated by the respondent. Obvious items are considered to be those whose psychopathological content is transparent, and therefore, they are more likely to be exaggerated by the respondent. With elevated scores on Obvious but not Subtle items, the interpretation may suggest a distressed, susceptible, or exaggerated profile. On the other hand, some suggest that the Subtle items are not sensitive to

Table 5.4 Arithmetic Means and Mean Differences for MMPI Clinical Scales Among Vietnam and Non-Vietnam Veterans With Invalid Profiles Removed

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
MMPI Scale												
Scale 1 (Hs)	56.4 (.26)	53.7 (.25)	2.8	2.0, 3.5	56.0	53.1	2.9	2.2, 3.7	56.9	53.4	3.5	2.8, 4.2
Scale 2 (D)	61.2 (.29)	58.7 (.29)	2.6	1.7, 3.4	60.2	57.0	3.3	2.4, 4.1	62.4	58.8	3.7	2.9, 4.5
Scale 3 (Hy)	57.3 (.20)	56.2 (.21)	1.1	0.5, 1.7	56.5	55.1	1.3	0.8, 1.9	57.0	55.2	1.8	1.2, 2.4
Scale 4 (Pd)	59.6 (.23)	59.1 (.25)	0.4	-0.2, 1.1	60.0	59.1	0.9	0.2, 1.6	63.0	62.4	0.6	-0.1, 1.2
Scale 5 (Mf)	58.7 (.20)	58.7 (.23)	0.0	-0.6, 0.6	59.2	58.8	0.4	-0.2, 0.9	60.9	60.2	0.7	0.2, 1.3
Scale 6 (Pa)	56.2 (.20)	55.1 (.22)	1.0	0.4, 1.6	57.0	54.8	2.2	1.6, 2.8	58.4	56.3	2.1	1.6, 2.7
Scale 7 (Pt)	58.5 (.25)	56.5 (.25)	2.1	1.4, 2.8	58.5	55.2	3.2	2.5, 3.9	60.3	56.8	3.5	2.8, 4.2
Scale 8 (Sc)	57.7 (.27)	54.9 (.26)	2.9	2.1, 3.6	59.7	55.4	4.3	3.6, 5.1	62.6	57.6	5.0	4.3, 5.8
Scale 9 (Ma)	57.2 (.23)	57.1 (.26)	0.1	-0.6, 0.7	60.0	60.4	-0.4	-1.1, 0.2	62.2	62.9	-0.7	-1.3, 0.0
Scale 0 (Si)	54.9 (.23)	53.2 (.25)	1.7	1.0, 2.3	53.1	51.1	2.0	1.3, 2.6	52.8	50.5	2.3	1.6, 2.9

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.5 Arithmetic Means and Mean Differences for MMPI Clinical Scales Among Vietnam and Non-Vietnam Veterans With Invalid Profiles Removed, White Veterans

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
MMPI Scale												
Scale 1 (Hs)	56.1 (.28)	53.7 (.28)	2.4	1.6, 3.1	55.1	54.1	1.0	0.2, 1.8	55.8	54.4	1.4	0.6, 2.2
Scale 2 (D)	61.1 (.32)	59.0 (.32)	2.1	1.2, 3.0	60.3	59.3	1.0	0.1, 1.9	62.9	61.7	1.2	0.3, 2.1
Scale 3 (Hy)	57.4 (.21)	56.7 (.23)	0.7	0.1, 1.3	56.7	56.7	0.0	-0.6, 0.7	57.2	57.1	0.1	-0.5, 0.7
Scale 4 (Pd)	59.4 (.25)	59.2 (.28)	0.2	-0.6, 0.9	59.3	60.1	-0.8	-1.5,-0.1	63.1	64.1	-0.9	-1.6,-0.2
Scale 5 (Mf)	58.9 (.22)	59.1 (.25)	-0.2	-0.8, 0.5	58.9	58.5	0.5	-0.2, 1.1	61.7	61.1	0.5	-0.1, 1.1
Scale 6 (Pa)	56.1 (.21)	55.4 (.24)	0.7	0.1, 1.4	56.2	55.2	1.1	0.4, 1.7	58.3	56.9	1.4	0.8, 2.1
Scale 7 (Pt)	58.3 (.27)	56.7 (.28)	1.6	0.8, 2.4	57.7	57.4	0.3	-0.5, 1.1	60.1	59.1	0.9	0.2, 1.7
Scale 8 (Sc)	57.1 (.29)	54.6 (.28)	2.5	1.7, 3.3	57.3	55.5	1.8	1.0, 2.6	61.2	58.0	3.1	2.3, 3.9
Scale 9 (Ma)	56.3 (.25)	55.9 (.27)	0.4	-0.3, 1.1	56.8	56.5	0.3	-0.5, 1.0	59.7	59.4	0.3	-0.4, 1.0
Scale 0 (Si)	55.1 (.25)	53.6 (.28)	1.5	0.8, 2.2	54.5	53.9	0.6	-0.1, 1.3	53.8	52.8	1.0	0.3, 1.8

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.6 Arithmetic Means and Mean Differences for MMPI Clinical Scales Among Vietnam and Non-Vietnam Veterans With Invalid Profiles Removed, Black Veterans

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
MMPI Scale												
Scale 1 (Hs)	58.0 (.86)	53.3 (.72)	4.7	2.4, 7.0	59.1	54.2	4.9	2.7, 7.2	62.3	53.1	9.3	7.0,11.6
Scale 2 (D)	62.1 (.82)	56.3 (.78)	5.8	3.6, 8.1	63.5	56.4	7.1	4.8, 9.3	65.9	57.1	8.8	6.5, 11.0
Scale 3 (Hy)	56.9 (.66)	53.3 (.60)	3.5	1.8, 5.3	57.8	55.1	2.6	0.8, 4.4	59.8	54.2	5.6	3.8, 7.4
Scale 4 (Pd)	61.3 (.70)	59.7 (.72)	1.6	-0.4, 3.6	61.6	59.7	1.8	-0.1, 3.8	63.5	61.7	1.8	-0.1, 3.8
Scale 5 (Mf)	58.6 (.58)	57.2 (.65)	1.4	-0.3, 3.1	61.5	58.1	3.4	1.8, 5.0	61.7	57.3	4.5	2.9, 6.1
Scale 6 (Pa)	56.1 (.70)	53.3 (.62)	2.8	0.9, 4.6	54.8	53.0	1.8	0.0, 3.6	56.1	53.9	2.2	0.4, 4.0
Scale 7 (Pt)	59.9 (.80)	55.8 (.66)	4.1	2.0, 6.1	61.5	54.9	6.7	4.6, 8.7	63.7	56.8	6.9	4.8, 9.0
Scale 8 (Sc)	61.3 (.93)	56.7 (.82)	4.6	2.1, 7.1	61.3	55.6	5.7	3.3, 8.2	63.9	57.3	6.6	4.2, 9.0
Scale 9 (Ma)	62.4 (.67)	63.9 (.82)	-1.5	-3.6, 0.6	61.6	62.7	-1.1	-3.2, 1.0	63.7	65.1	-1.4	-3.5, 0.6
Scale 0 (Si)	53.3 (.63)	51.6 (.58)	1.7	0.0, 3.4	52.6	51.8	0.9	-0.8, 2.6	52.4	51.5	0.9	-0.8, 2.7

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.7 Arithmetic Means and Mean Differences for MMPI Clinical Scales Among Vietnam and Non-Vietnam Veterans With Invalid Profiles Removed, Veterans of Races Other Than White or Black

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
MMPI Scale												
Scale 1 (Hs)	58.9 (1.13)	53.9 (1.12)	5.0	1.9, 8.1	58.7	53.2	5.5	2.4, 8.6	57.1	55.0	2.1	-1.0, 5.3
Scale 2 (D)	61.5 (1.17)	58.1 (1.16)	3.4	0.2, 6.7	60.3	55.4	4.9	1.9, 7.9	60.3	56.0	4.3	1.3, 7.3
Scale 3 (Hy)	56.8 (.84)	54.4 (.91)	2.5	0.0, 4.9	56.6	56.3	0.3	-2.1, 2.7	57.7	56.3	1.5	-1.0, 4.0
Scale 4 (Pd)	59.3 (1.09)	57.2 (1.13)	2.0	-1.1, 5.1	59.2	55.1	4.1	1.0, 7.2	62.2	60.3	1.9	-1.1, 4.9
Scale 5 (Mf)	55.9 (.83)	56.4 (.95)	-0.6	-3.0, 1.9	56.2	57.5	-1.3	-3.7, 1.1	56.4	57.4	-1.0	-3.3, 1.4
Scale 6 (Pa)	57.3 (.99)	55.5 (1.03)	1.8	-1.0, 4.6	57.2	53.5	3.7	0.8, 6.5	57.9	56.2	1.7	-1.2, 4.5
Scale 7 (Pt)	59.6 (1.06)	54.3 (1.03)	5.3	2.4, 8.2	58.8	53.0	5.9	3.1, 8.7	58.8	55.5	3.3	0.5, 6.1
Scale 8 (Sc)	60.9 (1.16)	55.2 (1.17)	5.7	2.4, 8.9	59.7	53.3	6.4	3.2, 9.6	60.8	58.6	2.1	-1.0, 5.3
Scale 9 (Ma)	60.4 (1.04)	61.0 (1.02)	-0.6	-3.5, 2.3	61.1	61.3	-0.2	-3.1, 2.7	63.5	64.5	-1.0	-3.8, 1.8
Scale 0 (Si)	54.6 (1.00)	50.8 (.92)	3.9	1.2, 6.5	52.9	48.5	4.4	1.8, 7.0	50.1	47.6	2.5	-0.1, 5.0

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.8 Percent and Number of Vietnam and Non-Vietnam Veterans With Elevated MMPI Clinical Scales (T≥70), Invalid Profiles Removed, and Odds Ratios

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results			
							Model 1[a]		Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
MMPI scale 1 (Hs)	15.6	346	9.1	159	1.9	1.5-2.3	1.7	1.4-2.1	1.7	1.4-2.1
MMPI scale 2 (D)	25.1	557	17.3	303	1.6	1.4-1.9	1.6	1.3-1.9	1.6	1.3-1.9
MMPI scale 3 (Hy)	8.9	197	5.9	104	1.5	1.2-2.0	1.5	1.2-2.0	1.5	1.2-2.0
MMPI scale 4 (Pd)	15.7	349	14.7	258	1.1	0.9-1.3	1.0	0.9-1.3	1.0	0.9-1.3
MMPI scale 5 (Mf)	12.7	282	12.9	226	1.0	0.8-1.2	1.1	0.9-1.3	1.1	0.9-1.4
MMPI scale 6 (Pa)	9.1	203	7.2	126	1.3	1.0-1.6	1.3	1.0-1.7	1.4	1.[illegible]-1.7
MMPI scale 7 (Pt)	16.5	366	10.9	192	1.6	1.3-1.9	1.6	1.3-1.9	1.6	1.3-1.9
MMPI scale 8 (Sc)	16.3	361	9.2	161	1.9	1.6-2.3	2.0	1.6-2.4	1.9	1.6-2.4
MMPI scale 9 (Ma)	13.7	305	13.5	236	1.0	0.9-1.2	1.1	0.9-1.3	1.0	0.9-1.3
MMPI scale 0 (Si)	11.0	244	8.3	146	1.4	1.1-1.7	1.3	1.0-1.6	1.3	1.0-1.6

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

actual psychological difficulties and that, therefore, persons who have pathological conditions would not be expected to have elevated scores. In our study, the fact that all scores for Obvious subscales were elevated compared with scores for the Subtle subscales lends support to the former interpretation, because it would be difficult to expect individuals to have elevated scores across all areas.

On analysis of the Harris and Lingoes subscales for scales 2 and 3 (Table 5.11), the Vietnam veterans showed minimally higher scores on subjective depression (D1), physical malfunctioning (D3), mental dullness (D4), and brooding (D5) on scale 2. Results for the psychomotor retardation scale (D2) showed no differences between groups of veterans. All means for both cohorts fell within 1 standard deviation (SD) of the normative mean. The magnitudes of the differences were typically less than 1 raw score point. On the scale 3 subscales, means for non-Vietnam veterans were actually higher for denial of social anxiety (Hy1), need for affection (Hy2), and inhibition of aggression (Hy5). Means for the Vietnam veterans were higher for the lassitude-malaise (Hy3) and somatic complaints (Hy4) subscales. Again, all of these scores are within an SD of the normative means, and the mean differences are all less than 1 raw score point. These differences would not be clinically significant at an individual level.

Logistic regression of subscale elevations (≥70) showed the same pattern of results (Table 5.12). For all of the depression subscales (D1-D5), the percentage of Vietnam veterans with elevated scores (6.1% to 17.1%) was greater than the percentage of non-Vietnam veterans (3.5% to 10.7%). Crude, Model 1, and Model 2 ORs ranged between 1.4 and 1.8. Only the results for lassitude-malaise (Hy3) and somatic complaints (Hy4) subscales of clinical scale 3 showed significant cohort differences. Vietnam veterans were more likely than non-Vietnam to have elevated scores on these two subscales. Results for these subscales are consistent with those for the depression subscales.

We also analyzed results for the special research scales relevant to anxiety, depression, and somatic complaints (Table 5.13). Scores for Vietnam veterans were significantly higher on both the TSC Body Symptoms and Tension scales compared with non-Vietnam veterans.

Table 5.9 Arithmetic Means and Mean Differences for MMPI Obvious/Subtle Subscales Among Vietnam and Non-Vietnam Veterans, Invalid Profiles Removed

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**
Scale 2 obvious (D)	9.9 (.12)	8.7 (.12)	1.2	0.9,1.5	9.6	8.1	1.5	1.1,1.8	10.7	9.1	1.6	1.3,1.9
Scale 2 subtle (D)	11.4 (.06)	11.6 (.06)	-0.1	-0.3,0.0	11.3	11.4	-0.1	-0.3,0.1	11.1	11.2	-0.1	-0.2,0.1
Scale 3 obvious (Hy)	7.4 (.10)	6.3 (.09)	1.1	0.9, 1.4	7.1	5.8	1.3	1.0,1.5	7.8	6.4	1.4	1.1,1.6
Scale 3 subtle (Hy)	14.7 (.09)	15.3 (.10)	-0.6	-0.8,-0.3	14.5	15.1	-0.6	-0.8,-0.3	14.1	14.5	-0.4	-0.7,-0.1
Scale 4 obvious (Pd)	7.0 (.09)	6.4 (.09)	0.6	0.4,0.9	7.3	6.4	0.9	0.6,1.1	8.6	7.8	0.7	0.5,1.0
Scale 4 subtle (Pd)	10.3 (.05)	10.5 (.06)	-0.2	-0.3,0.0	10.2	10.4	-0.2	-0.4,-0.1	10.3	10.6	-0.3	-0.5,-0.2
Scale 6 obvious (Pa)	3.1 (.05)	2.8 (.06)	0.4	0.2,0.5	3.5	3.1	0.5	0.3,0.6	4.0	3.6	0.4	0.3,0.5
Scale 6 subtle (Pa)	7.0 (.05)	7.0 (.06)	0.0	-0.2,0.1	6.8	6.6	0.3	0.1,0.4	6.8	6.5	0.3	0.2,0.5
Scale 9 obvious (Ma)	7.5 (.06)	7.1 (.07)	0.4	0.2,0.6	7.8	7.5	0.3	0.1,0.5	8.4	8.1	0.3	0.1,0.5
Scale 9 subtle (Ma)	9.5 (.06)	9.7 (.07)	-0.2	-0.4,0.0	10.3	10.6	-0.4	-0.5,-0.2	10.6	11.1	-0.5	-0.7,-0.3

[a] Model 1 contains the six entry characteristics and interactions with place of service.

[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.10 Percent and Number of Vietnam and Non-Vietnam Veterans With Elevated MMPI Obvious/Subtle Subscales (T≥70), Invalid Profiles Removed, and Odds Ratios

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results			
							Model 1[a]		Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Scale 2 obvious (D)	13.3	295	8.1	142	1.7	1.4-2.1	1.7	1.3-2.1	1.7	1.3-2.1
Scale 2 subtle (D)	5.0	112	5.0	88	1.0	0.8-1.3	1.0	0.8-1.4	1.0	0.7-1.4
Scale 3 obvious (Hy)	13.4	297	7.9	138	1.8	1.5-2.2	1.7	1.4-2.2	1.7	1.4-2.2
Scale 3 subtle (Hy)	4.8	107	6.7	117	0.7	0.5-0.9	0.7	0.5-1.0	0.7	0.5-1.0
Scale 4 obvious (Pd)	10.8	240	7.5	132	1.5	1.2-1.9	1.5	1.2-1.8	1.5	1.1-1.8
Scale 4 subtle (Pd)	11.4	230	13.5	214	0.8	0.7-1.0	0.8	0.7-1.0	0.8	0.7-1.0
Scale 6 obvious (Pa)	3.8	85	2.6	46	1.5	1.0-2.1	1.4	1.0-2.1	1.4	1.0-2.1
Scale 6 subtle (Pa)	7.3	163	8.3	146	0.9	0.7-1.1	0.9	0.7-1.1	0.9	0.7-1.2
Scale 9 obvious (Ma)	9.8	218	7.5	131	1.3	1.1-1.7	1.4	1.1-1.8	1.4	1.1-1.8
Scale 9 subtle (Ma)	3.1	69	5.0	87	0.6	0.4-0.8	0.7	0.5-0.9	0.6	0.5-0.9

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

All means were within 1 SD of the normative means, and the magnitude of the mean differences was no more than 2 raw score points for both scales. Findings for the Welsh Anxiety (A) scale were similar, but not for the Repression scale (R), for which there were minimal cohort differences. We also found differences for the Manifest Anxiety Scale, Wiggins Depression, Organic Symptoms, and Poor Health Content scales. On all of these special scales related to anxiety, depression, and somatic concerns, the mean scores for Vietnam veterans were slightly higher, although, since most differences were less than 2 raw score points, the clinical significance of these differences is uncertain, .

Results for logistic regression analyses (Table 5.14) were consistent with those for linear regression analyses. All of the special research scales identified in the above paragraph showed crude, Model 1, and Model 2 ORs ranging between 1.3 and 2.4. The percentage of Vietnam veterans with such elevations ranged between 5.1% (Wiggins Depression scale) and 13.3% (TSC Tension scale).

The results of code-type analyses indicate that few veterans had pathological profiles related to anxiety and depression. Looking at all code types that contain scales 1, 2, or 3 (Table 5.15), only the High Point 2 (only scale 2 elevated) and the 2, 7, 8 combination showed significantly higher occurrences for the Vietnam cohort. About 4.5% of the Vietnam veterans and 3.0% of the non-Vietnam veterans had the High Point 2 code type, but less than 1.0% in either cohort had the 2, 7, 8 combination. Analysis of the Gilberstadt-Duker prototypes showed even lower occurrence rates and no significant differences between cohorts (Table 5.16).

In summary, these results show that the Vietnam and non-Vietnam groups of veterans are, on the average, functioning in the normal range on almost all indices of anxiety, depression, and somatization compared with the male normative population used to develop the MMPI. In almost all instances, the Vietnam veterans had higher scores compared with the non-Vietnam veterans, although most of these mean differences would not be clinically significant. The exception to these findings occurred for black and other race Vietnam veterans, who showed clinically and statistically significant elevated scores on scales 7 and

Table 5.11 Arithmetic Means and Mean Differences for MMPI Subscales Among Vietnam and Non-Vietnam Veterans, Invalid Profiles Removed

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**
Harris and Lingoes Subscales												
Subjective depression (D1)	7.9 (.10)	7.0 (.10)	1.0	0.7, 1.2	7.6	6.4	1.2	0.9, 1.5	8.2	7.1	1.1	0.9, 1.4
Psychomotor retardation (D2)	6.3 (.04)	6.2 (.04)	0.2	0.1, 0.3	6.2	6.1	0.1	0.0, 0.2	6.3	6.1	0.2	0.1, 0.3
Physical malfunctioning (D3)	3.2 (.03)	3.0 (.03)	0.3	0.2, 0.3	3.1	2.9	0.3	0.2, 0.3	3.3	3.0	0.3	0.2, 0.4
Mental dullness (D4)	3.0 (.06)	2.5 (.05)	0.5	0.4, 0.7	2.9	2.2	0.7	0.6, 0.9	3.4	2.6	0.8	0.6, 0.9
Brooding (D5)	2.2 (.04)	1.8 (.04)	0.4	0.2, 0.5	2.2	1.7	0.5	0.4, 0.6	2.5	2.0	0.5	0.4, 0.6
Denial of social anxiety (Hy1)	3.2 (.04)	3.5 (.05)	-0.3	-0.4,-0.1	3.4	3.8	-0.4	-0.5,-0.2	3.3	3.6	-0.3	-0.4,-0.2
Need for affection (Hy2)	6.1 (.05)	6.4 (.06)	-0.3	-0.5,-0.1	5.9	6.3	-0.3	-0.5,-0.2	5.8	6.0	-0.2	-0.4,-0.1
Lassitude-malaise (Hy3)	3.0 (.06)	2.4 (.06)	0.6	0.4, 0.8	2.9	2.1	0.8	0.6, 0.9	3.3	2.5	0.8	0.6, 1.0
Somatic complaints (Hy4)	3.2 (.06)	2.5 (.05)	0.7	0.5, 0.9	3.0	2.4	0.7	0.5, 0.8	3.3	2.6	0.7	0.6, 0.9
Inhibition of aggression (Hy5)	3.0 (.03)	3.2 (.03)	-0.2	-0.2,-0.1	2.9	3.0	-0.1	-0.2, 0.0	2.8	2.8	-0.1	-0.1, 0.0
Family discord (Pd1)	2.3 (.04)	2.2 (.04)	0.1	0.0, 0.2	2.3	2.1	0.2	0.1, 0.3	2.5	2.4	0.2	0.0, 0.3
Authority problems (Pd2)	5.6 (.04)	5.6 (.04)	0.0	-0.1, 0.1	5.4	5.4	0.0	-0.1, 0.1	5.9	5.9	0.0	-0.1, 0.1
Social imperturbability (Pd3)	7.0 (.06)	7.4 (.06)	-0.4	-0.6,-0.3	7.5	7.9	-0.4	-0.6,-0.3	7.5	7.9	-0.4	-0.6,-0.3
Social alienation (Pd4a)	5.8 (.06)	5.5 (.06)	0.2	0.0, 0.4	6.0	5.6	0.4	0.2, 0.5	6.6	6.3	0.3	0.1, 0.5
Self-alienation (Pd4b)	4.7 (.06)	4.2 (.06)	0.5	0.3, 0.7	4.8	4.2	0.5	0.4, 0.7	5.4	5.1	0.3	0.2, 0.5
Persecutory ideas (Pa1)	2.1 (.04)	1.9 (.04)	0.2	0.1, 0.3	2.5	2.3	0.2	0.1, 0.3	2.7	2.5	0.2	0.0, 0.3
Poignancy (Pa2)	2.5 (.03)	2.3 (.04)	0.2	0.1, 0.3	2.6	2.2	0.4	0.3, 0.5	2.8	2.4	0.4	0.3, 0.5
Naivete (Pa3)	4.1 (.05)	4.3 (.05)	-0.2	-0.3, 0.0	4.0	4.0	-0.1	-0.2, 0.1	3.8	3.8	0.0	-0.1, 0.1

Table 5.11 Arithmetic Means and Mean Differences for MMPI Subscales Among Vietnam and Non-Vietnam Veterans, Invalid Profiles Removed — Continued

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
Social alienation (Scla)	2.9 (.05)	2.5 (.06)	0.4	0.2, 0.5	3.2	2.7	0.5	0.4, 0.7	3.6	3.0	0.6	0.4, 0.7
Emotional alienation (Sc1b)	1.1 (.02)	0.9 (.02)	0.2	0.1, 0.2	1.1	0.8	0.3	0.2, 0.3	1.3	1.0	0.3	0.2, 0.4
Lack of ego mastery, cognitive (Sc2a)	1.8 (.04)	1.3 (.04)	0.5	0.4, 0.6	1.9	1.3	0.6	0.5, 0.7	2.3	1.7	0.6	0.5, 0.7
Lack of ego mastery, conative (Sc2b)	2.4 (.05)	1.9 (.05)	0.5	0.4, 0.6	2.4	1.8	0.7	0.5, 0.8	2.9	2.1	0.8	0.6, 0.9
Lack of ego mastery, defective inhibition (Sc2c)	1.6 (.03)	1.3 (.03)	0.3	0.2, 0.4	1.7	1.4	0.3	0.2, 0.4	1.9	1.7	0.2	0.1, 0.3
Bizarre sensory experiences (Sc3)	2.5 (.06)	1.8 (.05)	0.7	0.6, 0.9	2.8	1.9	0.8	0.7, 1.0	3.2	2.4	0.8	0.7, 1.0
Amorality (Ma1)	1.9 (.03)	1.9 (.03)	0.0	0.0, 0.1	2.2	2.2	0.0	-0.1, 0.1	2.5	2.6	-0.1	-0.2,-0.1
Psychomotor acceleration (Ma2)	5.5 (.04)	5.4 (.05)	0.2	0.0, 0.3	5.6	5.5	0.1	0.0, 0.2	5.9	5.9	0.0	-0.1, 0.1
Imperturbability (Ma3)	3.2 (.04)	3.4 (.04)	-0.3	-0.4,-0.2	3.6	3.8	-0.2	-0.4,-0.1	3.6	3.8	-0.2	-0.3,-0.1
Ego inflation (Ma4)	3.0 (.03)	2.9 (.04)	0.1	0.0, 0.2	3.2	3.2	0.1	0.0, 0.2	3.4	3.3	0.1	0.0, 0.2

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.12 Percent and Number of Vietnam and Non-Vietnam Veterans With Elevated MMPI Subscales (T≥70), Invalid Profiles Removed, and Odds Ratios

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results			
							Model 1[a]		Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Harris and Lingoes Subscales										
Subjective depression (D1)	13.5	300	8.0	140	1.8	1.5-2.2	1.7	1.4-2.2	1.7	1.4-2.2
Psychomotor retardation (D2)	13.9	309	9.9	174	1.5	1.2-1.8	1.5	1.2-1.8	1.5	1.2-1.8
Physical malfunctioning (D3)	6.1	136	3.5	62	1.8	1.3-2.4	1.6	1.2-2.2	1.6	1.1-2.2
Mental dullness (D4)	17.1	379	10.7	188	1.7	1.4-2.1	1.6	1.3-2.0	1.6	1.3-2.0
Brooding (D5)	7.4	164	5.1	90	1.5	1.1-1.9	1.5	1.1-1.9	1.5	1.1-1.9
Denial of social anxiety (Hy1)	15.8	351	18.8	329	0.8	0.7-1.0	0.8	0.7-1.0	0.8	0.7-1.0
Need for affection (Hy2)	8.4	186	11.6	203	0.7	0.6-0.9	0.7	0.6-0.9	0.8	0.6-1.0
Lassitude-malaise (Hy3)	12.1	268	7.8	137	1.6	1.3-2.0	1.6	1.2-1.9	1.5	1.2-1.9
Somatic complaints (Hy4)	8.6	192	3.4	59	2.7	2.0-3.7	2.8	2.0-3.8	2.7	2.0-3.8
Inhibition of aggression (Hy5)	2.7	60	3.9	68	0.7	0.5-1.0	0.7	0.5-1.1	0.7	0.5-1.0
Family discord (Pd1)	5.9	131	5.5	96	1.1	0.8-1.4	1.1	0.8-1.4	1.1	0.8-1.4
Authority problems (Pd2)	15.1	335	15.1	264	1.0	0.8-1.2	1.0	0.8-1.2	1.0	0.8-1.2
Social imperturbability (Pd3)	1.7	38	2.7	48	0.6	0.4-1.0	0.7	0.4-1.1	0.8	0.5-1.2
Social alienation (Pd4a)	7.2	159	4.0	71	1.8	1.4-2.4	1.8	1.3-2.4	1.8	1.3-2.4
Self-alienation (Pd4b)	11.6	257	6.8	119	1.8	1.4-2.3	1.8	1.4-2.2	1.8	1.4-2.2
Persecutory ideas (Pa1)	3.4	76	2.3	40	1.5	1.0-2.2	1.5	1.0-2.2	1.5	1.0-2.3
Poignancy (Pa2)	4.8	107	3.1	54	1.6	1.1-2.2	1.6	1.1-2.3	1.6	1.2-2.3
Naivete (Pa3)	7.4	164	8.1	142	0.9	0.7-1.1	1.0	0.8-1.2	1.0	0.8-1.3
Social alienation (Sc1a)	4.1	92	2.2	38	2.0	1.3-2.9	2.0	1.4-3.0	2.0	1.4-3.0
Emotional alienation (Sc1b)	1.9	43	1.0	18	1.9	1.1-3.3	1.8	1.0-3.3	1.9	1.0-3.4
Lack of ego mastery, cognitive (Sc2a)	12.4	275	7.1	124	1.9	1.5-2.3	1.8	1.4-2.3	1.8	1.4-2.3
Lack of ego mastery, conative (Sc2b)	10.9	243	6.8	119	1.7	1.3-2.1	1.6	1.3-2.1	1.6	1.3-2.1
Lack of ego mastery, defective inhibition (Sc2c)	5.6	124	3.5	61	1.6	1.2-2.2	1.7	1.2-2.4	1.7	1.2-2.4
Bizarre sensory experiences (Sc3)	6.0	134	2.3	40	2.8	1.9-3.9	2.8	1.9-4.1	2.7	1.9-4.0
Amorality (Ma1)	3.5	77	3.6	64	0.9	0.7-1.3	1.0	0.7-1.4	0.9	0.6-1.3
Psychomotor acceleration (Ma2)	30.1	669	29.1	510	1.1	0.9-1.2	1.0	0.9-1.2	1.0	0.9-1.1
Imperturbability (Ma3)	2.1	47	3.5	62	0.6	0.4-0.9	0.6	0.4-0.9	0.6	0.4-0.9
Ego inflation (Ma4)	6.1	136	5.4	95	1.1	0.9-1.5	1.2	0.9-1.5	1.2	0.9-1.5

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

2 compared with their non-Vietnam counterparts. The ORs for all of these analyses ranged between 1.3 and 2.0. These results were generally consistent across all clinical scales, subscales, and special scales. Code-type analysis showed that very few veterans have combinations of elevated MMPI clinical scales that indicate classic depression or anxiety disorder, although elevated scores on scale 2 alone suggest greater depressive symptomatology in the Vietnam cohort. Furthermore, among Vietnam veterans, the incidence of the 2, 7, 8 combination was higher. This combination may be indicative of chronic depression, anxiety, obsession, difficulty in thinking, and general malaise and discontent, which investigators have suggested to be related to PTSD (Fairbank, *et al.*, 1983).

Overall, Vietnam veterans had more anxiety, depression, health concerns, and somatization symptoms and disorders than the non-Vietnam veterans, and these findings persisted after we had eliminated those MMPI profiles of questionable validity. Nearly 10% of the Vietnam cohort showed signs of such difficulties compared with about 7%-8% of the

Table 5.13 Arithmetic Means and Mean Differences for MMPI Special Scales Among Vietnam and Non-Vietnam Veterans, Invalid Profiles Removed

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**
MacAndrew Alcoholism Scale	24.5 (.10)	24.3 (.11)	0.2	-0.1, 0.5	25.0	24.8	0.1	-0.1, 0.4	26.2	26.2	0.0	-0.2, 0.3
Emotional Di sturbance Scale	4.3 (.07)	3.5 (.07)	0.8	0.6, 1.0	4.5	3.5	1.0	0.8, 1.2	5.2	4.1	1.1	0.9, 1.3
TSC Body Symptoms Scale	6.7 (.11)	5.2 (.11)	1.5	1.2, 1.8	7.1	5.3	1.8	1.5, 2.1	7.8	5.8	2.0	1.7, 2.3
TSC Tension Scale	11.0 (.13)	9.8 (.13)	1.2	0.8, 1.6	11.4	10.1	1.3	0.9, 1.7	12.5	11.2	1.3	0.9, 1.7
Welsh Anxiety Scale	11.7 (.18)	10.1 (.18)	1.6	1.1, 2.1	12.3	10.2	2.1	1.6, 2.6	14.0	11.9	2.1	1.6, 2.7
Welsh Repression Scale	16.6 (.09)	16.4 (.10)	0.2	-0.1, 0.5	16.2	15.9	0.3	0.0, 0.6	15.8	15.4	0.4	0.1, 0.7
Drug Abuse Scale	16.8 (.09)	16.6 (.09)	0.2	0.0, 0.5	17.3	16.4	0.9	0.7, 1.1	19.1	18.0	1.1	0.9, 1.3
Manifest Anxiety Scale	15.1 (.18)	13.5 (.19)	1.6	1.1, 2.1	15.2	13.1	2.0	1.5, 2.6	16.6	14.5	2.2	1.6, 2.7
Ego Strength (ES)	53.1 (.21)	54.9 (.21)	-1.8	-2.4,-1.2	53.0	55.0	-2.1	-2.6,-1.5	51.9	54.3	-2.4	-3.0,-1.9
PTSD Scale	11.2 (.16)	9.3 (.15)	1.8	1.4, 2.3	11.8	9.6	2.2	1.8, 2.7	13.3	11.2	2.2	1.7, 2.6
Wiggins Content Scales												
Social maladjustment	11.7 (.13)	10.9 (.14)	0.9	0.5, 1.3	10.9	9.9	1.0	0.6, 1.3	11.0	9.7	1.3	0.9, 1.6
Depression	7.1 (.11)	6.2 (.11)	0.9	0.6, 1.2	7.9	6.4	1.4	1.1, 1.8	9.2	7.7	1.5	1.2, 1.8
Feminine interests	8.9 (.07)	9.1 (.08)	-0.2	-0.4, 0.0	9.5	9.7	-0.2	-0.4, 0.0	9.8	10.0	-0.2	-0.4, 0.0
Poor morale	7.0 (.11)	6.3 (.11)	0.7	0.4, 1.0	7.0	6.2	0.9	0.6, 1.2	7.9	6.9	1.0	0.7, 1.3
Religious fundamentalism	6.1 (.06)	6.2 (.08)	-0.1	-0.3, 0.1	6.1	6.3	-0.2	-0.4, 0.1	5.2	5.4	-0.3	-0.4, 0.1

Table 5.13 Arithmetic Means and Mean Differences for MMPI Special Scales Among Vietnam and Non-Vietnam Veterans, Invalid Profiles Removed — Continued

	Crude Arithmetic Means (STE)		Crude Results		Multivariate Results Model 1[a] Adjusted Means				Multivariate Results Model 2[b] Adjusted Means			
Measure	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**	**Vietnam**	**Non-Vietnam**	**Diff**	**95% CI**
Wiggins Content Scales — Continued												
Authority conflicts	10.5 (.09)	10.0 (.10)	0.4	0.2, 0.7	10.8	10.6	0.2	0.0, 0.5	11.8	11.6	0.2	0.0, 0.4
Psychoticism	8.2 (.10)	7.4 (.11)	0.8	0.5, 1.1	9.9	8.8	1.1	0.8, 1.4	10.9	9.8	1.1	0.7, 1.4
Organic symptoms	6.4 (.11)	5.0 (.10)	1.4	1.1, 1.7	6.9	5.2	1.7	1.4, 2.0	7.8	5.9	1.8	1.5, 2.1
Family problems	4.2 (.05)	4.1 (.06)	0.1	-0.1, 0.2	4.5	4.4	0.1	0.0, 0.3	5.2	4.9	0.3	0.2, 0.5
Manifest hostility	9.1 (.09)	8.4 (.10)	0.7	0.4, 0.9	9.4	8.8	0.7	0.4, 1.0	10.4	9.6	0.7	0.5, 1.0
Phobias	7.1 (.08)	6.5 (.09)	0.6	0.4, 0.9	7.1	6.7	0.4	0.2, 0.6	7.3	7.0	0.3	0.1, 0.6
Hypomania	12.8 (.08)	12.5 (.09)	0.3	0.1, 0.5	12.8	12.9	-0.1	-0.3, 0.2	13.5	13.5	0.0	-0.3, 0.2
Poor health	5.4 (.08)	4.5 (.08)	0.9	0.7, 1.1	5.8	4.8	1.0	0.8, 1.3	6.4	5.2	1.2	0.9, 1.4

[a] Model 1 contains the six entry characteristics and interactions with place of service.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, current drug use, and interactions with place of service.

Table 5.14 **Percent and Number of Vietnam and Non-Vietnam Veterans With Elevated MMPI Special Scales (T≥70), Invalid Profiles Removed, and Odds Ratios**

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results: Model 1[a]		Multivariate Results: Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
MacAndrew Alcoholism Scale (Mac)	33.2	738	30.5	535	1.1	1.0-1.3	1.1	0.9-1.2	1.0	0.9-1.2
Emotional Disturbance Scale (ED)	12.7	282	7.5	131	1.8	1.4-2.2	1.7	1.4-2.1	1.7	1.4-2.2
TSC Body Symptoms Scale (BS)	9.9	220	4.8	84	2.2	1.7-2.8	2.1	1.6-2.8	2.1	1.6-2.8
TSC Tension Scale (Ten)	13.3	296	7.9	139	1.8	1.4-2.2	1.7	1.4-2.1	1.7	1.4-2.1
Welsh Anxiety Scale (A)	5.9	131	3.0	53	2.0	1.5-2.8	2.1	1.5-2.9	2.1	1.5-2.9
Welsh Repression Scale (R)	4.0	89	3.2	56	1.3	0.9-1.8	1.3	0.9-1.8	1.2	0.9-1.8
Drug Abuse Scale (DA)	25.6	569	22.9	401	1.2	1.0-1.3	1.2	1.0-1.4	1.2	1.0-1.4
Manifest Anxiety Scale (Mas)	10.4	230	6.0	105	1.8	1.4-2.3	1.7	1.4-2.2	1.7	1.3-2.2
Ego Strength (ES)	96.9	2152	98.7	1732	0.4	0.2-0.6	0.4	0.2-0.6	0.4	0.2-0.7
PTSD Scale	2.8	62	0.8	14	3.6	2.0-6.4	4.0	2.2-7.3	4.0	2.2-7.3
Wiggins Content Scales										
Social maladjustment (Soc)	19.9	443	16.8	295	1.2	1.0-1.5	1.2	1.0-1.4	1.2	1.0-1.4
Depression (Dep)	5.1	113	2.5	44	2.1	1.5-3.0	2.2	1.5-3.1	2.1	1.5-3.1
Feminine interests (Fem)	1.2	27	1.7	29	0.7	0.4-1.2	0.8	0.4-1.3	0.8	0.5-1.4
Poor morale (Mor)	3.6	80	2.0	35	1.8	1.2-2.7	1.9	1.2-2.8	1.8	1.2-2.8
Religious fundamentalism (Rel)	4.2	94	5.8	102	0.7	0.5-1.0	0.7	0.6-1.0	0.8	0.6-1.0
Authority conflicts (Aut)	2.5	55	3.4	59	0.7	0.5-1.1	0.7	0.5-1.0	0.7	0.5-1.0
Psychoticism (Psy)	3.3	74	2.3	41	1.4	1.0-2.1	1.7	1.1-2.5	1.7	1.1-2.5
Organic symptoms (Org)	10.4	231	4.7	82	2.4	1.8-3.1	2.3	1.7-3.0	2.2	1.7-2.9
Family problems (Fam)	6.5	144	5.9	103	1.1	0.9-1.4	1.2	0.9-1.5	1.1	0.9-1.5
Manifest hostility (Hos)	1.0	23	0.9	15	1.2	0.6-2.3	1.2	0.6-2.3	—	—
Phobias (Pho)	9.7	216	7.1	124	1.4	1.1-1.8	1.3	1.0-1.7	1.3	1.0-1.7
Hypomania (Hyp)	2.3	50	2.2	39	1.0	0.7-1.5	1.0	0.7-1.6	1.0	0.6-1.5
Poor health (Hea)	5.9	132	2.9	51	2.1	1.5-2.9	2.0	1.4-2.8	2.0	1.4-2.8

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

non-Vietnam veterans. Among racial minority groups, Vietnam veterans may exhibit moderately more difficulties comparewith non-Vietnam veterans in areas related to anxiety and depression.

5.3.3 Substance Abuse or Dependence

The MMPI was not originally developed to assess alcohol or drug abuse. Nonetheless, a number of scales (4,9) tend to show elevated scores among alcoholics and drug abusers. In addition, several codetypes (49/94, 14/41, 24/42, 34/43, 46/64) tend to show correlations with alcohol abuse, whereas other combinations (49/94, 48/84, 89/98) show correlations with drug abuse. A number of special scales for identifying alcoholics (MacAndrew Alcoholism scale) and drug abusers (Drug Abuse scale) have also been developed. High scores on these scales are not always indicative of substance abuse, although the rates of these conditions among those with high scores tend to be high.

Mean scores on scales 4 and 9 were not significantly different between cohorts, although the means for both groups were moderately high (Figure 5.1, Table 5.4). We found similar relative differences between Vietnam and non-Vietnam veterans in the different racial categories (Tables 5.5-5.7). The proportion of veterans with elevated scores on scales 4 and 9 was similar in the two cohorts (Table 5.8).

Analyses of results for the Obvious and Subtle subscales for scales 4 and 9 showed significant differences on the Obvious items, with a higher mean for Vietnam veterans, but no differences on the Subtle items (Table 5.9). We found a similar pattern of results in analyses

Table 5.15 Percent and Number of Vietnam and Non-Vietnam Veterans With MMPI Code Types, Invalid Profiles Removed, and Odds Ratios

							Multivariate Results			
	Vietnam		Non-Vietnam		Crude Results		Model 1[a]		Model 2[b]	
MMPI Code Types	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
Scale 1 elevation	2.1	46	1.2	21	1.7	1.0-2.9	1.3	0.8-2.3	1.3	0.8-2.3
Scale 2 elevation	4.5	101	3.0	52	1.6	1.1-2.2	1.5	1.1-2.1	1.5	1.0-2.1
Scale 3 elevation	0.5	10	0.3	5	1.6	0.5-4.6				
Scale 4 elevation	2.7	59	3.3	58	0.8	0.6-1.2	0.8	0.5-1.1	0.8	0.5-1.1
Scale 5 elevation	4.5	99	5.2	92	0.8	0.6-1.1	1.0	0.7-1.4	1.1	0.8-1.5
Scale 6 elevation	0.9	20	0.7	13	1.2	0.6-2.5	1.2	0.6-2.4		
Scale 7 elevation	0.5	11	0.5	8	1.1	0.4-2.7				
Scale 8 elevation	0.6	13	0.3	6	1.7	0.7-4.5				
Scale 9 elevation	4.8	107	6.1	107	0.8	0.6-1.0	0.8	0.6-1.1	0.8	0.6-1.0
Scale 0 elevation	1.7	38	2.4	42	0.7	0.5-1.1	0.6	0.4-1.0	0.6	0.4-1.0
Types 1,2/2,1	0.7	15	0.3	6	2.0	0.8-5.1				
Types 1,3/3,1	0.7	15	0.6	10	1.2	0.5-2.6	1.2	0.5-2.7		
Types 4,7/7,4	0.2	4	0.2	4	0.8	0.2-3.2				
Types 2,4/4,2	0.7	16	0.7	12	1.1	0.5-2.2	1.0	0.5-2.1		
Types 2,5/5,2	0.6	13	0.4	7	1.5	0.6-3.7				
Types 2,7/7,2	0.6	14	0.7	13	0.8	0.4-1.8	0.7	0.3-1.5		
Types 2,0/0,2	1.0	22	1.3	22	0.8	0.4-1.4	0.8	0.4-1.5		
Types 4,8/8,4	0.2	5	0.1	1	4.0	0.5-33.9				
Types 4,9/9,4	0.9	19	0.9	16	0.9	0.5-1.8	1.1	0.6-2.2		
Types 4,5/5,4	0.2	5	0.4	7	0.6	0.2-1.8				
Types 5,0/0,5	0.2	5	0.3	6	0.7	0.2-2.2				
Types 5,9/9,5	0.5	12	0.8	14	0.7	0.3-1.5	0.8	0.4-1.8		
Types 7,0/0,7	0.3	6	0.3	5	0.9	0.3-3.1				
Types 8,9/9,8	0.7	15	0.5	9	1.3	0.6-3.0				
Type 1,2,3	0.7	15	0.4	7	1.7	0.7-4.2				
Type 1,2,7	0.3	6	0.1	2	2.4	0.5-11.8				
Type 1,4,6	0.0	1	0.0	0						
Type 2,4,8	0.1	3	0.2	3	0.8	0.2-3.9				
Type 2,7,0	0.6	13	0.5	8	1.3	0.5-3.1				
Type 2,7,8	0.9	19	0.2	4	3.6	1.3-11.1				
Type 2,4,7,8	0.2	4	0.3	5	0.6	0.2-2.4				
Type 1,2,7,8,9,0	0.0	1	0.0	0						
Type 1,2,3,7,8	0.2	5	0.2	3	1.3	0.3-5.5				
Other Code Types	24.4	543	17.4	305	1.5	1.3-1.8	1.5	1.3-1.8	1.5	1.3-1.8

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

in which we compared the prevalences for veterans with elevations according to subtle and obvious items on these two scales (Table 5.10).

We also evaluated the Harris and Lingoes subscales for both scales 4 and 9 (Table 5.11). For scale 4, the means were similar for family discord (Pd1), authority problems (Pd2), social imperturbability (Pd3), and social alienation (Pd4a). The means for Vietnam veterans were slightly higher for the self-alienation (Pd4b) subscale, although the mean difference was less than 0.5 raw score points. Both cohorts' means on these subscales fell within 1 standard deviation (SD) of the normative means. The means for the scale 9 subscales showed no cohort differences, and all of the means were within 1 SD of the normative means. Logistic analysis (Table 5.12) showed ORs of 1.8 for the social alienation (Pd4a) and self-alienation (Pd4b) subscales, and the analysis for scale 9 subscales showed no significant differences.

Analysis of the special research scales relevant to alcohol and drug abuse showed similar results (Table 5.13). We found no cohort differences for the MacAndrew Alcoholism scale, although both cohorts had mean scores that were over 1 SD above the normative sample

Table 5.16 Percent and Number of Vietnam and Non-Vietnam Veterans With Gilbertstadt-Duker Prototypes on MMPI, Invalid Profiles Removed, and Odds Ratios

	Vietnam		Non-Vietnam		Crude Results		Multivariate Results: Model 1[a]		Multivariate Results: Model 2[b]	
	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
MMPI Code Types										
1,2,3	0.1	3	0.0	0						
1,3,2	0.3	6	0.2	4	1.2	0.3-4.2				
1,3,8	0.0	1	0.0	0						
4	2.7	59	3.3	58	0.8	0.6-1.2	0.8	0.5-1.1	0.8	0.5-1.1
9	4.8	107	6.1	107	0.8	0.6-1.0	0.8	0.6-1.1	0.8	0.6-1.0
2,7	0.5	11	0.3	6	1.5	0.5-3.9				
4,3	0.1	3	0.1	1	2.4	0.2-22.8				
4,9	0.5	10	0.4	7	1.1	0.4-3.0				
7,8	0.0	0	0.0	0						
8,6	0.0	1	0.1	1	0.8	0.0-12.6				
8,9	0.3	7	0.1	2	2.8	0.6-13.3				
2,7,4	0.0	0	0.2	3	0.0					
2,7,8	0.0	0	0.1	1	0.0					
Combinations										
27,274,278	0.4	11	0.6	11	0.8	0.3-1.8				
4,43,49	3.5	87	3.9	77	0.9	0.7-1.2	0.9	0.6-1.2	0.9	0.6-1.2
78,86,89,824,8123	0.4	11	0.2	3	2.9	0.8-10.5				
123,1234,1237,132,137, 138	0.5	12	0.3	5	1.9	0.7-5.4				

[a] Model 1 contains the six entry characteristics.
[b] Model 2 contains the six entry characteristics and marital status, education, current alcohol use, and current drug use.

means. The Drug Abuse scale showed slight cohort differences (less than 1 raw score point), with the scores for Vietnam veterans being more elevated. This difference would not be clinically significant at an individual level. Both cohort means were elevated (more than 1 SD) above the normative population means on the Drug Abuse scale. Neither the MacAndrew Alcoholism scale nor the Drug Abuse scale showed significant ORs (Table 5.14), regardless of the analysis model. On the MacAndrew Alcoholism scale 30%-33% of the veterans had elevated scores, and on the Drug Abuse scale, 22%-25%. Code-type analysis showed no significant differences between cohorts for any code-type combinations containing scales 4 or 9 (Table 5.15).

Overall, these MMPI results do not support the hypothesis that rates for alcohol or drug abuse or related symptomatology are higher among Vietnam veterans. In both cohorts, however, a large percentage of veterans have indications of a tendency to abuse alcohol or drugs.

5.3.4 Post-traumatic Stress Disorder

No standard MMPI clinical scale can be used to identify persons with post-traumatic stress disorder (PTSD). However, a single research scale, developed by Keane and associates (1984), has been shown to discriminate between hospitalized patients with PTSD and other Veterans Administration patients. Recently, however, researchers have questioned the usefulness and validity of this diagnostic scale (Gayton *et al.*, 1986; Watson *et al.*, 1986). Code types with combinations of scales 2 and 8 have also been linked to PTSD (Fairbank, *et al.*, 1983).

Vietnam veterans had higher mean scores on Keane's PTSD scale compared with non-Vietnam veterans (Table 5.13). The mean differences between cohorts were small (<2.0

raw score points) given the overall mean scores (30 was the criterion score defining scale elevations for PTSD in the Keane study). ORs for the PTSD scale were elevated (3.6, crude; 4.0, Models 1 and 2) with 2.8% of the Vietnam veterans so classified (Table 5.14). Code types 28/82 did not occur frequently enough (<5 cases) for analysis, although Vietnam veterans did show increased evidence (OR=3.7) of 2, 7, 8 combination code types (Table 5.15).

Overall, these results suggest a greater prevalence of symptoms and complaints related to PTSD among the Vietnam veterans.

5.3.5 Other MMPI Results

We did not evaluate some psychological conditions in great detail. These were conditions (1) for which we had little reason to expect differences between the two groups, (2) which are rare in men of the VES age group, or (3) for which the MMPI does not provide adequate evaluation. For completeness, in this section we present the MMPI results related to such conditions. In addition, to address the issue of nonspecific psychological distress, we present results on a number of MMPI scales related to general psychopathology.

No specific scales on the original MMPI assess phobic behaviors. The most relevant is scale 7, which assesses obsessive-compulsive and related behaviors, such as abnormal fears. A high score on this scale, however, does not clearly indicate that a person has a phobia. The Wiggins Phobia Content scale is the only special scale related to phobias.

Analysis of the results for scale 7 shows only a slightly higher mean for Vietnam veterans (Table 5.4) compared with non-Vietnam veterans (Model 2 difference <3.5 T-score points). Although all three race groups show this difference, the mean differences (Model 2) for whites (0.9), blacks (6.9), and other racial groups (3.3) vary widely. For this scale, the means for black Vietnam veterans are moderately higher than the means for black non-Vietnam veterans. ORs for the crude, Model 1, and Model 2 analyses of this scale are all 1.6 (Table 5.8). Scale 7 has subscales. Results for the Wiggins Phobia Content scale (Table 5.13) also showed a slightly higher mean for Vietnam veterans compared with non-Vietnam veterans (<1.0 raw score point). ORs were 1.3-1.4 for the three models (Table 5.14). Means for both groups were within 1 standard deviation (SD) of the normative sample mean. For code types containing scale 7, prevalence rates for the two cohorts were the same (Table 5.15).

Overall, results for the MMPI show limited direct evidence for a higher incidence of phobias in the Vietnam cohort compared with the non-Vietnam cohort. For scale 7, the means for black Vietnam and non-Vietnam veterans seem to differ slightly, but this difference may be due to factors other than phobias that this scale assesses. The MMPI has no subscales or additional research scales for us to use in addressing this hypothesis, and the strength of these conclusions is therefore limited.

Scale 4, and its relationships to other scales, has traditionally been used as an indicator of antisocial personality or psychopathic deviancy. The results of our analyses for this scale were presented above under the Substance Abuse section. Those results did not suggest a higher occurrence of scale 4 elevated scores—suggestive of antisocial personality—among Vietnam veterans compared with non-Vietnam veterans; there are, however, signs that, in both groups, the proportion of men with this personality type may be higher than expected.

As for nonspecific psychological distress, the means for Vietnam veterans are significantly higher than means for non-Vietnam veterans on scale 8, which assesses mental confusion, social alienation, and unusual experiences. The differences in the means ranged between 2.9 to 5.0 points, depending on the analysis performed (Table 5.4). Means for the Vietnam

cohort were between 58 and 63, and those for the non-Vietnam cohort were between 55 and 58. Differences between the two groups were similar for all race groups, with the mean levels for black Vietnam veterans being the highest (Table 5.6). The scores for about 16% of the Vietnam veterans and 9% of the non-Vietnam veterans were elevated on scale 8. ORs for the crude, Model 1, and Model 2 analyses are between 1.9 and 2.0; these are the largest ORs for any of the standard clinical scales.

Results of the subscale analysis (Table 5.11) of scale 8 showed that mean scores for Vietnam veteran were higher for all 6 subscales (Sc1a, Sc1b, Sc2a, Sc2b, Sc2c, and Sc3). For each scale, these mean differences are all less than 1.0 raw score point, which would be of little clinical significance. All of the Vietnam veterans' means on these subscales were at or below the normative sample means. The non-Vietnam veterans' means were even lower. ORs for all of these subscales (Table 5.12), regardless of analysis model, ranged between 1.6 (lack of ego mastery, conative, Sc2b) and 2.8 (bizarre sensory experiences, Sc3). The Sc3 subscale may relate to PTSD-like symptoms and feelings of alienation (depersonalization, estrangement).

The Wiggins Psychoticism Content scale may also be related to generalized distress. On this scale, the scores for Vietnam veterans were slightly elevated compared with scores for non-Vietnam veterans (Table 5.13). The mean difference between the cohorts was about .0 raw score point, which is not clinically significant. On this scale means for both cohorts were at the normative sample mean. The crude OR was 1.4, but Model 1 and 2 ORs were .7 (Table 5.14).

These results suggest a slight increase among Vietnam veterans in mental confusion, social alienation, and unusual experiences. These results may be related to PTSD symptoms or feelings of alienation, or they may suggest more severe psychopathology.

In addition, a few special scales address general emotional problems and emotional stability. For the Emotional Disturbance (Ed) scale (Table 5.13), the means for Vietnam veterans were slightly higher than the means for non-Vietnam veterans. The mean difference was about 1.0 raw score point. ORs for this scale (Table 5.14) were between 1.7 and 1.8.

On the Ego Strength scale, scores for Vietnam veterans were slightly lower than those for non-Vietnam veterans (Table 5.13). Given that higher scores on this scale suggest better psychological adaptability and functioning, the results are consistent with those for the Ed scale, and this consistency suggests that Vietnam veterans are functioning slightly less well than their non-Vietnam counterparts. Results for the Wiggins Social Maladjustment Content scale (Table 5.13) were similar. On all three of these more general scales, means for both cohorts were in the expected range.

Finally, analyses of results for all of the very low prevalence code types combined (Table 5.15) showed a higher percentage of such nonspecific types in the Vietnam groups (24.4%) than in the non-Vietnam groups (17.4%). A related analysis of the number of elevated ($T \geq 70$) scores for scales within a veteran's MMPI profile (Tables 5.17 and 5.18) also showed a higher number of multiple elevated scores in the Vietnam veteran cohort than in the non-Vietnam cohort, with or without the invalid profiles being included in the analysis.

In summary, these results suggest that Vietnam veterans are experiencing more psychological difficulty than non-Vietnam veterans. These difficulties include mild, nonspecific problems and more specific signs of confused thinking, sociability problems, alienation, and bizarre experiences, which may be related to PTSD symptoms.

Table 5.17 Number of Elevated MMPI Clinical Scales (T≥70), With Invalid Profiles Removed, by Place of Service

	Vietnam (N=2221)		Non-Vietnam (N=1754)	
Frequency	%	No.	%	No.
0	45.1	1002	51.6	905
1	22.7	504	23.0	404
2	11.0	245	10.5	184
3	6.1	135	5.5	97
4	5.2	116	3.8	67
5	3.7	82	2.6	45
6	2.8	63	1.2	21
7	1.9	42	1.2	21
8	1.1	24	0.5	8
9	0.3	7	0.1	2
10	0.1	1	0.0	0

X^2 (10) = 40.2, p<.001.

Table 5.18 Number of Elevated MMPI Clinical Scales (T≥70), Omitting Mf and Si Scales, and With Invalid Profiles Removed, by Place of Service

	Vietnam (N=2221)		Non-Vietnam (N=1754)	
Frequency	%	No.	%	No.
0	51.5	1144	59.6	1045
1	20.3	451	19.6	344
2	10.0	222	8.4	147
3	6.1	136	5.1	90
4	4.4	98	3.5	62
5	3.5	78	1.8	32
6	2.5	56	1.1	20
7	1.1	25	0.7	12
8	0.5	11	0.2	3

X^2 (8) = 43.8, p<.001.

5.4 SUMMARY

A quick review of the analytical results for the hypotheses that we addressed suggests that, for the MMPI, scores for the Vietnam veterans are elevated compared with scores for their non-Vietnam peers on indices of anxiety, depression, tension, social alienation, mental confusion, general malaise, and bizarre experiences. The differences between cohorts were not great. For both groups, mean scores on most scales were within 1 standard deviation of the normative sample's means, and differences in means between cohorts were in the 1- to 2-point range. For most elevated scores and other indications of more severe psychological problems, the prevalences were below 10% in both cohorts, except for findings related to alcohol abuse and drug abuse (25%-30%) and findings related to anxiety or depression (15%). About 2.8% of the Vietnam veterans had elevations on the MMPI research scale related to PTSD.

The results were generally consistent for both linear and logistic regression analyses. Rarely did the means or ORs change appreciably when the results were adjusted by other covariates. The results remained consistent, regardless of whether invalid MMPI profiles were included or distribution transformations were used. In addition, we found almost no significant interaction between covariates and place of service.

Results did suggest that minority Vietnam veterans may be having greater difficulty than their non-Vietnam peers in psychological functioning. They had the highest mean scores on

scales related to anxiety and depression, and their scores differed most from those of their comparison group. In addition, they also showed greater indications of various problems (mental confusion, bizarre experiences, social alienation).

The prevalence of several psychological conditions was higher among Vietnam veterans than among non-Vietnam veterans, but, in general, the magnitude of this difference was low. These findings could be indicative of PTSD, chronic anxiety or depression, nonspecific stress reaction, alienation, or malaise. Since we evaluated these men 15 to 20 years after their military service, the findings could reflect residuals of earlier, more severe psychological problems, which the veterans have intergrated into their lives and psychological states.

CHAPTER 6

Risk of Poor Psychological Status

6. RISK OF POOR PSYCHOLOGICAL STATUS

6.1 INTRODUCTION

In the previous chapters, we presented the results of the many analyses conducted to evaluate the veterans' psychological health. In these analyses, we took different approaches to psychiatric and psychological evaluation, using the Diagnostic Interview Schedule (DIS) and the Minnesota Multiphasic Personality Inventory (MMPI), evaluation of past as well as current symptoms and conditions, and evaluation of standard clinical measures and newer research measures of psychological status. In general, the results consistently showed that psychological problems, particularly those related to anxiety, depression, and alcohol use disorders, were more prevalent among Vietnam veterans than among non-Vietnam veterans. Despite the consistency of the findings, they do not clearly indicate the severity of psychological problems occurring more frequently among Vietnam veterans.

In this chapter, we combine findings from the DIS and MMPI to determine Vietnam veterans' relative risk of having more severe psychological problems. The analyses focus on those veterans who had a particular set of findings that would usually raise concern in a typical clinical assessment and lead to further evaluation and, perhaps, treatment.

6.2 METHODS

6.2.1 Definition of Current "Poor Psychological Status"

We identified veterans who could be considered to have the poorest current psychological status by using a definition developed by first selecting sets of findings from the DIS and MMPI results that would be of clinical concern. We then evaluated combinations of these sets of conditions in the two cohorts combined. Our goal was to identify a sufficient number of participants who met the definition to allow robust statistical analyses, and yet the number needed to be small enough to indicate that the condition could clearly be considered outside the normal range. On the basis of these considerations, we defined current "poor psychological status" as meeting full DIS criteria for generalized anxiety, depression, or substance abuse in the past month *and* elevated scores on at least two of eight clinical scales (1-4, 6-9) from the MMPI. Overall, findings for about 10% of the study participants fit these criteria.

6.2.2 Statistical Analysis

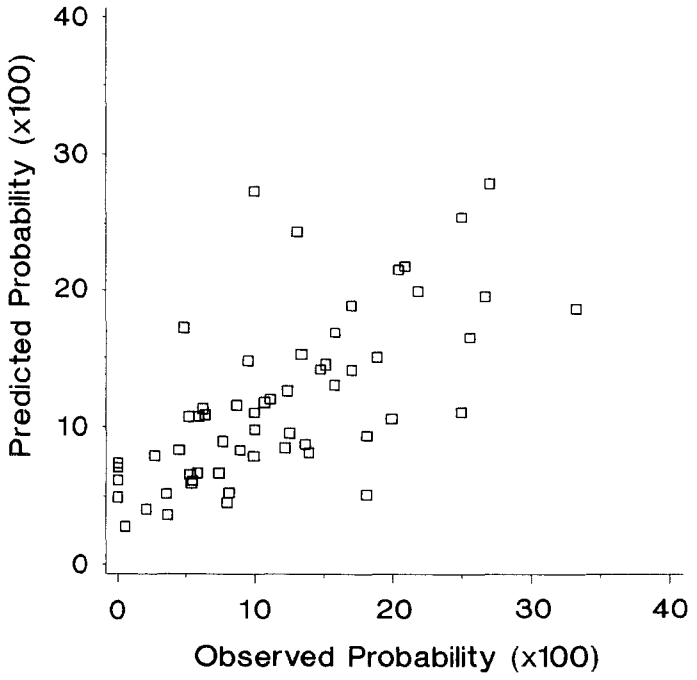
The purpose of the analysis was to determine which Army entry characteristics, including place of service, were predictive of current poor psychological status. The analysis differed from the standard analytical approach described in Chapter 2. In most analyses described thus far, the primary concern was with obtaining valid estimates of the association between service in Vietnam and particular psychological conditions or test results. As such, all six entry characteristics were maintained in the multivariate models regardless of their statistical significance. The analysis of current poor psychological status, on the other hand, focused on developing a predictive model of current poor psychological status. As such, a parsimonious logistic model was developed that retained only statistically significant variables.

In developing the logistic model, we categorized continuous variables and determined relevant 2- and 3-way interactions of the log odds of having current poor psychological status. An initial model containing the six entry characteristics and relevant interactions was

fit to the data. We derived the final model by using backward selection, maintaining only terms that, on the basis of a likelihood ratio test, were significant at the 5% level. A comparison of the predicted probabilities of current poor psychological status derived from the final model versus the observed probabilities indicates that the final model performs well in predicting current poor psychological status (Figure 6.1).

In addition to place of service, the six entry characteristics—race, age at entry, year of entry, type of enlistment, enlistment general technical (GT) score, and military occupational specialty (MOS)—were also evaluated for their relationship to current poor psychological status. Objective information on these characteristics was abstracted from military records. After we had selected a model based on these characteristics, we also evaluated characteristics that were derived from information reported by the veterans at the examination.

Figure 6.1 Observed and Predicted Probability[a] of Having Poor Psychological Status



[a] Probabilities based on fewer than 10 observations not included

These included reported childhood behavior problems and drug use in the Army. Because these self-reported characteristics are subject to differential recall, they were not included in the primary model.

6.3 RESULTS

Current poor psychological status was more prevalent among Vietnam veterans, particularly those who entered the army before 1968 (Table 6.1). Among veterans who entered the Army in 1965-67, the prevalence of current poor psychological status for Vietnam veterans was about double the prevalence for veterans who did not serve in Vietnam. Among those who entered the Army during 1968-71, on the other hand, the difference in prevalence of current poor psychological status between Vietnam and non-Vietnam veterans was small and not statistically significant.

Other demographic and service entry characteristics that were associated with current poor psychological status were race, age at enlistment, and enlistment GT score. Regardless of whether or not a veteran had served in Vietnam, current poor psychological status was more prevalent among veterans who were not white, had been young (<19) at the time they enlisted, or had lower GT scores at enlistment (Table 6.1). Other entry characteristics, including MOS, were not associated with current poor psychological status. The prevalence of current poor psychological status among Vietnam veterans was 13% for those with a tactical MOS and 12% for those with a nontactical MOS.

The same proportional increase in current poor psychological status associated with service in Vietnam was found within different subgroups defined by race, age at enlistment,

Table 6.1 Risk Factors Associated With Current "Poor Psychological Status"[a]

Factor	Prevalence of "Poor Psychological Status"		OR[b]	95% CI
	%	N		
Place of Service and Entry Year				
Year of Entry 1965-67				
Non-Vietnam	5.6	51	1.0	referent
Vietnam	13.0	163	2.3	1.6-3.2
Year of Entry 1968-71				
Non-Vietnam	8.8	93	1.0	referent
Vietnam	10.9	134	1.3	0.8-2.0
Other Risk Factors				
Race				
White	8.8	322	1.0	referent
Nonwhite[c]	14.7	119	1.4	1.1-1.8
Age at Enlistment				
<19	16.3	105	1.9	1.5-2.4
19-24	8.7	326	1.0	referent
>24	12.7	10	1.4	0.7-2.8
Enlistment GT Score				
<88	16.1	142	1.9	1.6-2.2
88-101	12.4	110	1.3	1.2-1.4
102-113	9.5	88	1.0	referent
114-124	8.1	70	0.8	0.7-0.8
>124	3.4	29	0.6	0.5-0.7

[a] "Poor psychological status" defined as meeting full DIS criteria for generalized anxiety, depression, or substance abuse in the past month *and* elevations on at least two of eight MMPI clinical scales (1-4, 6-9).
[b] Adjusted for all other risk factors in table.
[c] Nonwhite includes blacks, Hispanics, American Indians, Asians, and Pacific Island Americans.

and GT score at enlistment (Figure 6.2). Although proportional differences remain the same, absolute differences in the risk of current poor psychological status between Vietnam and non-Vietnam veterans necessarily vary as the underlying risk varies. For example, in a high-risk group of veterans (nonwhite, <19 at entry, and GT scores of 88-101), who entered the Army during 1965-67, doubling the prevalence from 14% for non-Vietnam veterans to 28% for Vietnam veterans results in an absolute difference of 14%. On the other hand, in a low-risk group (white, 19-24 at entry, GT scores of 114-124), doubling the prevalence from 5% for non-Vietnam to 10% for Vietnam veterans results in an absolute difference of 5% in the prevalence of poor psychological status. Thus, the absolute difference in risk between Vietnam and non-Vietnam veterans diminishes as the risk moves downward from nonwhite veterans who, at enlistment, had been young and had had low GT scores to white veterans who, at enlistment had been older and had had high GT scores.

In secondary analyses that included reported childhood behavior problems and drug use in the Army, both characteristics were found to be significant independent predictors of having a current poor psychological status. In the two cohorts combined, the prevalence of current poor psychological status was 19% among those who reported three or more childhood behavior problems compared with 7% among those who reported less than three such problems. The prevalence of current poor psychological status was 7%, 13%, and 26% among those who reported no drug use, use of marijuana only, and use of hard drugs, respectively, while in the Army.

Neither of these factors, however, confounded the association between place of service and current poor psychological status. When reported childhood behavior problems or drug use in the Army was added to the final logistic model (along with year of entry, age at entry, race, and GT score), the Vietnam relative to non-Vietnam odds ratio for having a current poor psychological status changed little (Table 6.2).

Among Vietnam veterans only, we also evaluated the association between having been wounded in Vietnam, as reported by the veteran, and having a current poor psychological

Figure 6.2 Predicted Probability of Poor Psychological Status