Table 6.2 Change in the Vietnam/Non-Vietnam Odds Ratio Due to Adding Reported Childhood Behavior Problems and Drug Use in the Army to the Final Logistic Model Used to Predict Current "Poor Psychological Status"

Model	Year of Entry	
	1965-67 OR[a]	1968-71 OR
Final[b]	2.3	1.3
Final plus childhood behavior problems	2.4	1.3
Final plus drug use in Army	2.1	1.3

[a] Adjusted odds ratio for Vietnam relative to non-Vietnam.
[b] Covariates include place of service, year of entry, age at entry, race, enlistment GT score, and a place of service by year of entry interaction term.

status. Having been wounded was not associated with current poor psychological status. The prevalence of current poor psychological status was 12% for both veterans who had and had not been wounded.

6.4 CONCLUSION

To identify the participants who could be considered to have the poorest current psychological status, we combined findings from the DIS and MMPI. Among veterans who entered the Army in 1965-67, the prevalence of current poor psychological status among Vietnam veterans was about double the prevalence among veterans who did not serve in Vietnam, whereas among those who entered later, the prevalences were similar. Other factors related to current poor psychological status were age at entry into the Army, enlistment GT score, and race. None of these factors, however, confounded the association between service in Vietnam and current poor psychological status. Furthermore, the relative influence of military service in Vietnam on current poor psychological status was similar within different subgroups defined by these other risk factors. The increased prevalence of current poor psychological status among Vietnam veterans who entered the Army during 1965-67 did not appear to be accounted for by such self-reported characteristics as childhood behavior problems or drug use in the Army. These findings suggest that the relative effect of Vietnam service on subsequent psychological health, at least for those who entered the Army between 1965-67, was a general one for which most veterans who served in Vietnam were at risk.

CHAPTER 7

Neuropsychological Test Results

7. NEUROPSYCHOLOGICAL TEST RESULTS

7.1 INTRODUCTION

In this chapter, we present the results of the neuropsychological tests. The background of the tests and their descriptions are in Chapter 2. In the test battery, we evaluated concept formation and problem-solving abilities, memory functioning, manual dexterity, verbal abilities, visual-perceptual-motor functioning, and mental control and attention. Before the analysis, we hypothesized that Vietnam veterans would have relative deficits in the following areas: memory, mental control and attention, manual dexterity, arousal and activation, and conceptual and executive functions.

7.2 METHODS AND DATA QUALITY

The methods we used to administer and analyze the neuropsychological tests are discussed in the general description of study procedures in Chapter 2. The scores derived from the various neuropsychological tests are described in Appendix E.

We used both linear and logistic regression to analyze the neuropsychological data. We performed multiple linear regression analyses on all neuropsychological test scores. We performed analyses on both raw scores and scaled (or transformed) scores. Transformations for the scaled scores involved factors such as age correction and normalization for educational level. The correlation matrices of all scores from each test are in Appendix E. These matrices show that many of the scores used in standard practice are redundant. Because of this, we performed a series of exploratory factor analyses (see Appendix E). These analyses indicate the constructs that were assessed by the neuropsychological battery administered in the Vietnam Experience Study (VES). As such, they provide direction in grouping test scores into meaningful categories for the purposes of interpretation. We present the results according to the constructs provided by the factor analyses: verbal intelligence, visual-perceptual-motor, verbal recall and naming, conceptual and executive ability, verbal memory, nonverbal memory, and manual dexterity.

The linear regression analyses provided cohort means, adjusted for covariates if necessary, standard error (STE) of the means, differences in mean scores between cohorts, and 95% confidence intervals around these cohort differences. We also performed logistic regression analyses to compare the prevalence of veterans with neuropsychological deficits in the two cohorts. In these analyses, we first had to define what would constitute specific neuropsychological deficits. In this study, defining specific deficits was more difficult than in standard clinical practice. The battery of tests was not large enough to provide multiple measures of the same construct; nor could all constructs be assessed equally. Because of these limitations, we developed rather broad definitions of "deficits." This breadth ensured that all subjects with valid neuropsychological problems would be identified, although results for some subjects would be false positives. Thus, the prevalences of some deficits might be overestimated. The question in this study, however, is whether prevalences show relative differences between the Vietnam and non-Vietnam veterans. Determining the "true" prevalence of such problems is arbitrary because all possible case definitions must include a cutoff score as one of the criteria. Most criteria used in standard clinical practice have not been validated (Lezak, 1983). An example is the intelligence quotient (IQ) cutoff for defining the mentally retarded child, which is 2 standard deviations (SD) below the mean on a

standard IQ test. The 2-SD criterion is statistically defined and has little meaning or validity outside common usage. A 2.5-SD difference (or some other difference) could be equally well defended.

We used a systematic approach to develop criteria for neuropsychological deficits on all tests and constructs. As in clinical practice, we compared a veteran's test scores to his "predicted abilities." We used the general technical (GT) score at examination as the best indicator of a particular veteran's "predicted ability." We chose the GT score for two main reasons.

First, in standard neuropsychological practice, a general ability estimate, such as an IQ score, is the most commonly used comparison index. GT score is correlated with IQ, and it is a good indicator of general ability. Theoretically, a veteran's neuropsychological abilities should be at a level consistent with his general intelligence. It is when there are specific patterns of significant differences in these abilities, either strengths or deficiencies, compared with what one would expect (expectation = GT), that we can identify neuropsychological syndromes and deficits. In another sense, we are looking for veterans with specific residual deficits after the test results have been controlled for natural differences in intelligence and general abilities. Thus, a veteran whose intellectual abilities are below average, is not considered deficient in the ability measured by a particular test because he scores low on it. For him to be considered deficient in that ability, he has to score significantly lower on the test than would be expected on the basis of his general ability.

Second, the veterans' current scores (at the interview) and their induction scores have a significant correlation. On the average, over the 12 or more years since induction, these scores changed less than 0.1%. This small amount of change suggests that these scores were not significantly affected by the Vietnam experience and that they are stable and reliable. In addition, the GT score correlates very highly (r = .91) with our reading test score, Wide Range Achievement Test - Revised (WRAT-R), which was an alternative index for such comparisons. The only other option in this regard was to develop a test-independent index of expected performance and abilities based on demographic data, such as educational background, occupation, and socioeconomic status. Such indices, although useful in such comparisons when no alternatives are available, have numerous limitations, especially in a study such as this in which the Vietnam experience may have influenced each of these factors.

Each test score of interest was standardized to a population mean of 0 and a SD of 1, as was the GT test score for each veteran. The GT standardized score was then subtracted from the specific standardized test score. Any score that showed a difference greater than 1 in the direction of a deficit (representing 1 SD below the veteran's own ability level) was considered a "deficit" score. The relative differences in the prevalences of neuropsychological deficits were not altered by using different definitions of "deficits" (Appendix Tables F.1 and F.2).

7.3 RESULTS

Table 7.1 shows the arithmetic means and differences in means for the Vietnam and non-Vietnam veteran cohorts for all neuropsychological test scores evaluated. Table 7.2 shows the prevalences of veterans defined as having deficits, as described above, for individual test scores evaluated in this test battery.

Memory deficits were evaluated by using those test scores that loaded highly on the verbal and nonverbal memory factors. On the California Verbal Learning Test (CVLT), percent

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Table 7.1 Arithmetic Means and Mean Differences for Neuropsychological Test Results Among Vietnam and Non-Vietnam Veterans

Measure	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-Vietna	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
General Technical Test												
GT score—at induction	104.6 (.40)	107.6 (.47)	-3.0	-4.2,-1.8	107.5	107.4	0.0	-0.4, 0.4	107.0	106.9	0.1	-0.3, 0.5
GT score—at interview	109.4 (.43)	111.9 (.50)	-2.5	-3.8,-1.2	110.0	110.2	-0.2	-0.9, 0.6	108.7	107.7	1.0	0.3, 1.7
% change in GT score from induction to interview	0.1 (.00)	0.0 (.00)	0.0	0.0, 0.0	0.0	0.0	0.0	0.0, 0.0	0.0	0.0	0.0	0.0, 0.0
Weschler Adult Intelligence Scale (WAIS-R)												
Information—raw score	18.6 (.10)	19.4 (.12)	-0.8	-1.1,-0.4	19.3	19.3	0.0	-0.3, 0.2	19.3	19.0	0.3	0.1, 0.5
Information—standard score	9.9 (.05)	10.3 (.06)	-0.4	-0.6,-0.2	10.3	10.3	0.0	-0.1, 0.1	10.3	10.1	0.2	0.1, 0.3
Block design—raw score	29.3 (.20)	30.8 (.22)	-1.5	-2.0,-0.9	28.6	30.1	-1.5	-2.0,-1.0	28.3	29.8	-1.5	-2.0,-1.0
Block design—standard score	10.4 (.05)	10.7 (.06)	-0.3	-0.5,-0.2	10.2	10.5	-0.3	-0.5,-0.2	10.1	10.4	-0.3	-0.4,-0.1
Word List Generation												
Total verbal fluency (F, A, S)	34.6 (.21)	35.7 (.25)	-1.0	-1.7,-0.4	36.2	36.8	-0.6	-1.2, 0.0	36.4	37.7	-1.3	-1.9,-0.7
"F" verbal fluency	11.9 (.08)	12.2 (.10)	-0.3	-0.5, 0.0	12.6	12.8	-0.2	-0.5, 0.0	12.7	13.1	-0.4	-0.7,-0.2
"A" verbal fluency	10.3 (.08)	10.7 (.09)	-0.5	-0.7,-0.2	10.7	11.1	-0.3	-0.6,-0.1	10.8	11.2	-0.4	-0.7,-0.2
"S" verbal fluency	12.5 (.09)	12.8 (.10)	-0.3	-0.6, 0.0	12.9	13.0	-0.1	-0.3, 0.2	12.9	13.4	-0.5	-0.7,-0.2
Animal verbal fluency	20.5 (.10)	20.9 (.12)	-0.4	-0.7,-0.1	20.7	20.7	0.0	-0.3, 0.3	20.8	20.7	0.1	-0.2, 0.3
Total (FAS) errors	2.4 (.05)	2.2 (.05)	0.2	0.0, 0.3	2.5	2.3	0.1	0.0, 0.3	2.7	2.6	0.1	0.0, 0.2
Animal errors	0.6 (.02)	0.6 (.02)	0.0	0.0, 0.1	0.6	0.6	0.0	-0.1, 0.0	0.7	0.6	0.0	0.0, 0.1

Table 7.1 Arithmetic Means and Mean Differences for Neuropsychological Test Results Among Vietnam and Non-Vietnam Veterans — Continued

Measure	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-Vietna	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
Rey-Osterrieth Figure												
Copy	32.6 (.07)	32.9 (.07)	-0.3	-0.5,-0.1	32.4	32.8	-0.4	-0.6,-0.2	32.2	32.4	-0.2	-0.4, 0.0
Immediate recall	19.9 (.14)	20.4 (.15)	-0.6	-1.0,-0.2	20.0	20.0	0.0	-0.4, 0.4	19.6	19.1	0.5	0.1, 0.9
Delayed recall	20.0 (.13)	20.5 (.14)	-0.5	-0.9,-0.1	20.2	20.3	0.0	-0.4, 0.3	19.9	19.3	0.6	0.3, 1.0
Immediate decay (Immediate-copy)	-39.5 (.38)	-38.2 (.42)	-1.2	-2.3,-0.1	-38.6	-39.3	0.7	-0.3, 1.8	-39.6	-41.4	1.8	0.7, 2.9
Delayed decay (Delay-immediate)	6.3 (.92)	4.4 (.82)	1.9	-0.6, 4.4	5.4	7.0	-1.6	-4.1, 0.9	7.3	9.7	-2.5	-5.0, 0.0
Grooved Pegboard												
Time, dominant hand	73.7 (.24)	73.0 (.26)	0.7	0.0, 1.4	72.9	72.7	0.1	-0.5, 0.8	73.7	73.5	0.2	-0.4, 0.9
Time, nondominant hand	78.2 (.28)	77.0 (.30)	1.3	0.4, 2.1	77.8	77.4	0.4	-0.4, 1.2	78.9	78.9	0.0	-0.8, 0.8
Time, right hand	74.0 (.24)	73.2 (.26)	0.8	0.1, 1.5	73.2	73.2	-0.1	-0.7, 0.6	73.9	74.2	-0.3	-0.9, 0.4
Time, left hand	77.9 (.28)	76.8 (.30)	1.1	0.3, 1.9	77.5	76.9	0.6	-0.2, 1.4	78.7	78.2	0.5	-0.3, 1.3
Dominant hand-nondominant hand difference	-0.1 (.00)	-0.1 (.00)	0.0	0.0, 0.0	-0.1	-0.1	0.0	0.0, 0.0	-0.1	-0.1	0.0	0.0, 0.0
Right hand-left hand difference	-0.1 (.00)	-0.1 (.00)	0.0	0.0, 0.0	-0.1	-0.1	0.0	0.0, 0.0	-0.1	-0.1	0.0	0.0, 0.0
Wisconsin Card Sort												
Perseverations to countables	0.2 (.00)	0.1 (.00)	0.0	0.0, 0.0	0.2	0.1	0.0	0.0, 0.0	0.2	0.2	0.0	0.0, 0.0
Perseverations within category to countables	0.1 (.00)	0.1 (.00)	0.0	0.0. 0.0	0.1	0.1	0.0	0.0, 0.0	0.1	0.1	0.0	0.0, 0.0

Table 7.1 Arithmetic Means and Mean Differences for Neuropsychological Test Results Among Vietnam and Non-Vietnam Veterans — Continued

Measure	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-Vietna	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
Wisconsin Card Sort — Continued												
Correct responses to countables	0.8 (.00)	0.8 (.00)	0.0	0.0, 0.0	0.8	0.8	0.0	0.0, 0.0	0.8	0.8	0.0	0.0, 0.0
Shifts on feedback to countables	0.2 (.00)	0.2 (.00)	0.0	0.0, 0.0	0.2	0.2	0.0	0.0, 0.0	0.2	0.2	0.0	0.0, 0.0
Correct shifts on feedback to countables	0.1 (.00)	0.1 (.00)	0.0	0.0, 0.0	0.1	0.1	0.0	0.0, 0.0	0.1	0.1	0.0	0.0, 0.0
Times lost set to countables	0.0 (.00)	0.0 (.00)	0.0	0.0, 0.0	0.0	0.0	0.0	0.0, 0.0	0.0	0.0	0.0	0.0, 0.0
Mean number of trials per sort	21.4 (.27)	20.2 (.28)	1.2	0.4, 1.9	22.0	19.8	2.2	1.5, 2.9	23.5	20.7	2.8	2.0, 3.5
Compounds to countables	0.5 (.00)	0.5 (.00)	0.0	0.0, 0.0	0.5	0.5	0.0	0.0, 0.0	0.5	0.5	0.0	0.0, 0.0
Paced Auditory Serial Addition Test												
Total correct responses	108.3 (1.01)	109.5 (1.16)	-1.2	-4.2, 1.8	144.1	143.2	0.9	-1.8, 3.5	144.0	141.9	2.1	-0.6, 4.7
% correct responses	0.6 (.00)	0.6 (.00)	0.0	0.0, 0.0	0.7	0.7	0.0	0.0, 0.0	0.7	0.7	0.0	0.0, 0.0
Overall ranking	4.0 (.04)	4.0 (.04)	-0.1	-0.2, 0.1	5.3	5.2	0.0	-0.1, 0.1	5.3	5.2	0.1	0.0, 0.2
1st trial total correct	38.8 (.21)	39.1 (.24)	-0.3	-0.9, 0.3	43.8	43.6	0.3	-0.3, 0.8	44.1	43.3	0.7	0.2, 1.3
4th trial total correct	27.1 (.21)	27.7 (.24)	-0.6	-1.2, 0.0	27.1	26.6	0.5	-0.1, 1.0	26.9	26.2	0.7	0.1, 1.3
California Verbal Learning Test												
Total correct trial 1	6.2 (.03)	6.4 (.04)	-0.2	-0.3, 0.1	6.3	6.2	0.1	0.0, 0.2	6.3	6.2	0.1	0.0, 0.2
Total correct trial 5	10.9 (.05)	11.2 (.05)	-0.3	-0.4, -0.1	11.1	11.1	0.0	-0.2, 0.1	11.0	11.1	-0.1	-0.2, 0.1

Table 7.1 Arithmetic Means and Mean Differences for Neuropsychological Test Results Among Vietnam and Non-Vietnam Veterans — Continued

Measure	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-Vietna	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
California Verbal Learning Test — Continued												
Total correct trials 1-5	45.7 (.02)	47.0 (.20)	-1.3	-1.8,-0.8	46.2	46.3	0.0	-0.5, 0.5	45.8	45.7	0.1	-0.4, 0.6
Total correct Tuesday list	5.4 (.04)	5.7 (.04)	-0.2	-0.3,-0.1	5.5	5.5	0.0	-0.1, 0.1	5.4	5.5	-0.1	-0.2, 0.0
Total correct short delay free recall	9.4 (.05)	9.7 (.06)	-0.3	-0.4,-0.1	9.6	9.6	0.0	-0.2, 0.1	9.5	9.5	0.0	-0.1, 0.2
Total correct short delay cued recall	10.4 (.05)	10.7 (.06)	-0.3	-0.4,-0.1	10.4	10.5	0.0	-0.2, 0.1	10.4	10.4	0.0	-0.1, 0.2
Total correct long delay free recall	9.7 (.05)	10.1 (.06)	-0.4	-0.5,-0.2	10.0	9.9	0.0	-0.1, 0.2	9.8	9.9	-0.1	-0.2, 0.1
Total correct long delay cued recall	10.4 (.05)	10.8 (.06)	-0.4	-0.5,-0.2	10.5	10.6	0.0	-0.2, 0.1	10.4	10.5	-0.1	-0.2, 0.0
Total correct long delay recognition	13.8 (.04)	13.9 (.04)	-0.2	-0.3, 0.0	13.9	13.8	0.1	0.0, 0.2	13.9	13.8	0.1	0.0, 0.3
Total perseverations	5.6 (.10)	5.7 (.11)	0.0	-0.3, 0.2	6.0	6.2	-0.2	-0.5, 0.1	6.1	6.4	-0.3	-0.6, 0.0
Total intrusions	1.6 (.05)	1.6 (.06)	0.0	-0.1, 0.1	1.7	1.8	-0.1	-0.3, 0.0	1.8	1.8	0.0	-0.2, 0.1
Least squares regression line	11.4 (.11)	11.6 (.13)	-0.3	-0.6, 0.1	11.7	11.9	-0.2	-0.6, 0.1	11.6	11.8	-0.2	-0.5, 0.1
Primacy recall	0.3 (.00)	0.3 (.00)	0.0	0.0, 0.0	0.3	0.3	0.0	0.0, 0.0	0.3	0.3	0.0	0.0, 0.0
Recency recall	0.3 (.00)	0.3 (.00)	0.0	0.0, 0.0	0.3	0.3	0.0	0.0, 0.0	0.3	0.3	0.0	0.0, 0.0
% change trial 1 to Tuesday list	8.2 (.72)	7.3 (.77)	0.9	-1.2, 3.0	8.6	5.5	3.1	1.0, 5.1	10.0	4.3	5.7	3.6, 7.8
% change trial 5 to short delay free recall	13.0 (.44)	12.1 (.61)	0.9	-0.5, 2.4	12.7	11.2	1.5	0.0, 2.9	13.0	10.4	2.6	1.5, 4.0

Table 7.1   Arithmetic Means and Mean Differences for Neuropsychological Test Results Among Vietnam and Non-Vietnam Veterans — Continued

Measure	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-Vietna	Diff	95% CI	Vietnam	Non-Vietnam	Diff	95% CI
California Verbal Learning Test — Continued												
% change short delay cued recall to short delay free recall	13.3 (.45)	13.0 (.53)	0.3	-1.0, 1.7	11.9	12.9	-1.0	-2.4, 0.4	12.7	13.4	-0.7	-2.0, 0.7
% change short delay free recall to long delay free recall	-4.7 (.41)	-5.6 (.48)	0.9	-0.3, 2.1	-5.9	-5.6	-0.3	-1.5, 0.9	-5.0	-6.4	1.5	0.2, 2.7
% enhancement of semantic clustering	21.3 (1.41)	24.6 (1.60)	-3.2	-7.4, 0.9	24.2	30.0	-5.8	-10.0,-1.6	25.7	28.2	-2.5	-6.7, 1.7
% change long delay cued recall to long delay free recall	9.0 (.40)	9.0 (.43)	0.1	-1.1, 1.2	7.9	9.1	-1.2	-2.4, 0.0	8.8	9.2	-0.4	-1.5, 0.8
% change long delay recognition to long delay free recall	52.6 (1.09)	48.5 (1.16)	4.1	1.0, 7.3	50.9	52.4	-1.4	-4.5, 1.6	53.2	52.2	1.0	-2.1, 4.0
% change long delay recognition to long delay cued recall	39.6 (.81)	36.3 (.86)	3.3	1.0, 5.7	40.7	40.6	0.1	-2.2, 2.3	42.3	40.5	1.8	-0.4, 4.1
Wide Range Achievement Test (WRAT-R)												
Reading score — raw	60.2 (.29)	62.4 (.34)	-2.1	-3.0,-1.3	63.6	63.6	0.0	-0.7, 0.6	64.2	63.7	0.5	-0.1, 1.1
Grade equivalent	10.1 (.06)	10.5 (.07)	-0.4	-0.6,-0.2	10.6	10.6	0.0	-0.2, 0.1	10.6	10.6	0.0	-0.1, 0.2
Edinburgh Handedness Inventory	0.9 (.00)	0.9 (.00)	0.0	0.0, 0.0	0.9	0.9	0.0	0.0, 0.0	0.9	0.9	0.0	0.0, 0.0

[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.

Table 7.2 Percent and Number of Vietnam and Non-Vietnam Veterans With Neuropsychological Deficits (>1 Standard Deviation Below GT) and Odds Ratios

	Vietnam		Non-Vietnam		Crude Results		Model 1[a]		Model 2[b]	
Condition	%	No.	%	No.	OR	95% CI	OR	95% CI	OR	95% CI
GT Score at Interview[c]	17.4	434	15.8	311	1.1	1.0-1.3	1.1	0.8-1.3	1.0	0.8-1.3
Weschler Adult Intelligence Scale Information subtest	8.0	200	7.2	141	1.1	0.9-1.4	1.1	0.8-1.3	1.1	0.8-1.3
Block design subtest	14.8	368	15.8	311	0.9	0.8-1.1	0.9	0.8-1.1	0.9	0.8-1.1
Rey-Osterrieth Figure Copy	14.6	364	15.1	297	1.0	0.8-1.1	1.0	0.8-1.2	1.0	0.8-1.2
Immediate recall	17.4	433	18.0	355	1.0	0.8-1.1	1.0	0.9-1.2	1.0	0.9-1.2
Delayed recall	16.9	421	17.5	346	1.0	0.8-1.1	1.0	0.9-1.2	1.0[d]	0.9-1.2
% change, copy to immediate recall	18.2	453	19.5	384	0.9	0.8-1.1	1.0	0.9-1.2	1.0	0.9-1.2
% change, immediate recall to delayed recall	37.7	936	41.2	811	0.9	0.8-1.0	1.0	0.8-1.1	1.0	0.8-1.1
Wisconsin Card Sort Perseverations to countables	28.0	696	24.0	473	1.2	1.1-1.4	1.2	1.0-1.4	1.1[e]	0.9-1.3
Shifts on feedback to countables	27.2	678	24.7	487	1.1	1.0-1.3	1.1	0.9-1.3	1.0	0.9-1.2
Times lost set to countables	29.2	727	25.5	502	1.2	1.1-1.4	1.2	1.0-1.4	1.1	0-1.3
Average number of trials per sort	24.4	607	21.5	423	1.2	1.0-1.4	1.1	1.0-1.4	1.1	0.9-1.3
Paced Auditory Serial Addition Test Ranking	14.2	354	15.7	308	0.9	0.8-1.1	0.9	0.8-1.1	0.9	0.8-1.1
First trial total correct	12.0	299	12.9	254	0.9	0.8-1.1	0.9	0.8-1.1	1.0	0.8-1.2
Total correct across all trials	13.3	331	14.3	281	0.9	0.8-1.1	0.9[e]	0.8-1.1	0.9[e]	0.8-1.1
Percent correct across all trials	12.3	306	12.9	253	1.0	0.8-1.1	1.0	0.8-1.2	1.0	0.8-1.2
Word List Generation Total verbal fluency	16.8	418	18.3	360	0.9	0.8-1.1	1.0	0.8-1.2	1.0	0.9-1.2
California Verbal Learning Test Total correct trial 1	19.7	491	19.9	392	1.0	0.9-1.1	1.1	0.9-1.2	1.1	0.9-1.3
Total correct trial 5	17.6	437	18.1	357	1.0	0.8-1.1	1.0	0.9-1.2	1.0	0.9-1.2
Total correct trials 1-5	17.2	429	16.4	323	1.1	0.9-1.2	1.1	1.0-1.3	1.2	0-1.4
Total correct short delay free recall	18.7	465	19.0	374	1.0	0.8-1.1	1.1	0.9-1.3	1.1	0.9-1.3
Total correct long delay free recall	17.7	441	18.8	371	0.9	0.8-1.1	1.0[f]	0.8-1.2	1.0[f]	0.8-1.2
Total perseverations	22.8	567	21.1	416	1.1	1.0-1.3	1.1[g]	0.9-1.3	1.1[g]	0.9-1.3
Total intrusions	23.1	574	20.1	397	1.2	1.0-1.4	1.3[g]	1.0-1.6	1.2[g]	1.0-1.5
Least squares regression line	22.7	565	20.4	403	1.1	1.0-1.3	1.1	0.9-1.3	1.1	0.9-1.3
Primacy recall	23.3	581	26.3	519	0.9	0.7-1.0	1.0[f]	0.9-1.2	1.1[f]	0.9-1.2
Recency recall	24.4	607	28.9	569	0.8	0.7-0.9	0.9[e]	0.8-1.1	0.9[e]	0.8-1.1
% change trial 5 to short delay free recall	22.7	565	20.6	406	1.1	1.0-1.3	1.0	0.8-1.2	1.0	0.8-1.2
% change short delay free recall to long delay free recall	23.2	578	20.4	402	1.2	1.0-1.4	1.1	0.9-1.3	1.1	0.9-1.3
% enhancement semantic clustering	20.1	466	19.4	365	1.0	0.9-1.2	0.9	0.8-1.1	1.0	0.8-1.1
Wide Range Achievement Test Reading Score	7.2	178	6.7	133	1.1	0.8-1.3	1.1	0.8-1.4	1.1	0.8-1.4

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Table 7.2 Percent and Number of Vietnam and Non-Vietnam Veterans With Neuropsychological Deficits (>1 Standard Deviation Below GT) and Odds Ratios — Continued

| | 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
Grooved Pegboard										
Dominant hand	24.1	599	21.9	432	1.1	1.0-1.3	1.0	0.8-1.2	1.0	0.8-1.2
Nondominant hand	23.7	588	21.0	412	1.2	1.0-1.3	1.0	0.9-1.2	1.0	0.8-1.2
Edinburgh Handedness Inventory[h]	7.4	183	8.7	171	0.8	0.7-1.0	0.9	0.7-1.1	0.8	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] Represents percentage of cohort 1 standard deviation below GT mean (combined cohorts).
[d] Standardized for marital status.
[e] Standardized for type of enlistment.
[f] Standardized for age at entry into Army.
[g] Standardized for race.
[h] Cases defined as handedness value >.7.

change scores between short-delay free recall and long-delay free recall and between long-delay cued recall and long-delay free recall were used as indices of verbal memory. The percent change scores on the Rey-Osterrieth figure between copy and immediate recall and between immediate and delayed recall were used as indices of nonverbal memory. Other related scores were also assessed, but we present only those findings relevant to the comparison of results for Vietnam and non-Vietnam veterans.

Crude analysis of the mean cohort differences showed no significant effects for the two CVLT variables. Model 2 evaluation of the CVLT data showed a significant change in the difference in mean scores between cohorts, with the Vietnam veterans showing slightly less enhancement over time, but this difference was only 1.4% and would not be considered significant in a clinical setting. The crude means did differ significantly for the Rey-Osterrieth change scores between copy and immediate recall. The other Rey-Osterrieth scores did not show such a difference. This difference was very small, less than 1.2%, and is of doubtful clinical significance. It diminished after the results had been adjusted for covariates in Model 1. In Model 2, after adjustment for covariates, there was a reversed effect because the adjusted means showed that the non-Vietnam veterans had significantly greater change scores (1.8% difference). The raw scores from the recall components of the Rey-Osterrieth test showed a similar pattern.

Further analysis of various memory-related indices from the CVLT produced two findings of interest. For Model 1 and 2, Vietnam veterans showed slightly greater loss of information when their Trial 1 recall on Monday's list was compared with their recall on Tuesday's list and when their recall on Trial 5 of Monday's list was compared with their short-delay recall on Monday's list. Some observers have suggested that the former finding reflects vulnerability to proactive interference and that the latter finding reflects vulnerability to retroactive interference. The magnitude of these differences between cohorts are 3.1% and 1.5%, respectively (Model 1 adjusted means). Given that these effects do not appear to have influenced other memory-related factors, their meaning is open to question. Logistic analysis of cases with "deficiencies" in these areas showed no prevalence differences between cohorts for any of the Rey-Osterrieth or CVLT data. The ORs for Models 1 and 2 ranged

between 0.8 and 1.2 for both the CVLT and Rey-Osterrieth data. Overall, these results do not suggest significant differences in memory functioning, either verbal of nonverbal, between Vietnam and non-Vietnam veterans.

We used the scores from the Grooved Pegboard test to assess manual dexterity. Scores for Vietnam veterans showed that they had slightly slower (0.8-1.3 seconds) performance speeds with their nondominant and left hands, but we did not find these effects after we had adjusted the scores for Model 1 and 2 covariates. Results of logistic regression also showed no cohort differences. Overall, these results do not suggest deficits in manual dexterity in the Vietnam cohort.

To analyze conceptual and executive functions, we assessed those variables from the Wisconsin Card Sort test that "loaded" on the factor for these functions. The mean number of trials per sort showed that Vietnam veterans required more (1.2 to 2.8) cards per sorting condition compared with non-Vietnam veterans. None of the related error scores, such as loss of set or perseverations, showed such differences. With logistic regression, we found no cohort differences. These results do not suggest that Vietnam veterans were more likely to have the types of deficits that are most often seen in patients with frontal lobe deficits, such as losing set, perseverating, and getting stuck on the set.

We analysed two additional factors, verbal ability and visual-perceptual-motor functioning, although we had no a priori hypotheses that linked them to the Vietnam experience We indexed verbal intelligence or verbal abilities by the Word List Generation test and the WAIS-R information subtest. Total word generation scores were slightly lower for the Vietnam veterans, but scores for the information subtest were identical. On logistic regression, neither score showed a difference between cohorts. Overall, these results suggest no consistent, nor clinically meaningful difference in the verbal functioning of the Vietnam veterans compared with that of the non-Vietnam veterans.

For the analysis of visual-perceptual-motor functioning, we used the copy component of the Rey-Osterrieth figure and the WAIS-R block design subtest. Scores for the Vietnam veterans were slightly lower on the copy component of the Rey-Osterrieth test, although the difference in means was only 0.3 points for the crude comparison and 0.4 for the Model 1 analysis. With Model 2, results showed no significant effects. Our analysis of results of the WAIS-R block design subtest showed lower mean scores among Vietnam veterans, even for the Model 2 analysis. Again, the degree of these mean differences (0.3 scaled score points) is not clinically significant. In logistic regression analyses, we identified no significant cohort differences for either score. Overall, these results do not suggest that Vietnam veterans have deficits in visual-perceptual-motor functioning, although the means for Vietnam veterans on some related scores were minimally below the means for non-Vietnam veterans.

Finally, one additional task needs to be discussed. The Paced Auditory Serial Addition Test (PASAT) was designed to test mental control and attention, although in the factor analysis, it loaded on the verbal ability factor. Crude analysis of scores from this test showed no significant differences between cohorts. Model 1 analysis showed that Vietnam veterans' scores for PASAT fourth trial performances were slightly higher (better), and Model 2 analyses showed that all Vietnam veterans' scores for all performances were higher. Logistic analyses of these scores did not show significant differences between cohorts. Overall, these results do not suggest that Vietnam veterans showed greater deficits on this test, in fact, they

performed better than the non-Vietnam veterans. Since, as stated above, this task requires mental control and attention, in addition to verbal ability, our data do not suggest deficits in these areas either.

7.4 SUMMARY

Overall, the test results indicate that, concerning neuropsychological functions, Vietnam and non-Vietnam veterans do not differ. Although some differences were statistically significant, the degree of the differences between the cohorts would not be clinically important. The differences favoring the Vietnam veterans were almost as numerous as those favoring the non-Vietnam veterans. The results were very consistent across different types of data analysis (linear versus logistic regression), and for none of the covariates were interactions with place of service significant. General technical (GT) score at induction was a very significant covariate in all of the neuropsychological analyses, and, typically, the covariates of race and education also had important independent effects. Even without Model 1 and 2 covariates, significant cohort differences were few. Evaluation of results not specific to the original hypotheses did not yield significant new findings. Overall, especially given the statistical power of these analyses, we found no support for any of the *a priori* hypotheses suggesting neuropsychological deficits among Vietnam Veterans compared with non-Vietnam Veteran veterans.

CHAPTER 8

Synthesis

8. SYNTHESIS

In this chapter, we summarize the findings from the psychological and neuropsychological evaluations. We also discuss some issues that are pertinent to all analyses, including the study's strengths and limitations, the influence of combat and possible exposure to herbicides, and the relationship between the psychological findings and the veterans' physical health. Finally, we present some general conclusions based on the findings.

8.1 SUMMARY OF PSYCHOLOGICAL AND NEUROPSYCHOLOGICAL EVALUATIONS

In the Vietnam Experience Study (VES), we evaluated the psychological and neuropsychological status of Vietnam veterans 10 to 20 years after their military service. We used two different approaches to evaluate psychological status—the Diagnostic Interview Schedule (DIS) and the Minnesota Multiphasic Personality Inventory (MMPI). The DIS results indicated that Vietnam veterans were more likely than non-Vietnam veterans to meet criteria for current (*i.e.*, during the month before the examination) depression, anxiety, and alcohol abuse or dependence (Table 8.1). Few veterans (<1%) in either group met criteria for current drug abuse or dependence.

The MMPI results, although they do not provide diagnostic categories that exactly correspond to DIS categories, were generally in accord with the DIS results (Table 8.1). Significantly more Vietnam veterans had elevated scores on scales 1, 2, 3, and 7 (which

Table 8.1 Summary of Psychiatric and Psychological Findings in Vietnam and Non-Vietnam Veterans

	Vietnam %	Non-Vietnam %	OR[a]	95% CI
Psychiatric Conditions[b]				
Generalized anxiety	4.9	3.2	1.5	1.1-2.1
Depression	4.5	2.3	2.0	1.4-2.9
Alcohol abuse or dependence	13.7	9.2	1.5	1.2-1.8
Drug abuse or dependence	0.4	0.5	0.9	0.4-2.0
MMPI Elevations[c]				
Scale 1	15.6	9.1	1.7	1.4-2.1
Scale 2	25.1	17.3	1.6	1.3-1.8
Scale 3	8.9	5.9	1.5	1.2-2.0
Scale 4	15.7	14.7	1.0	0.9-1.2
Scale 5	12.7	12.9	1.1	0.9-1.3
Scale 6	9.1	7.2	1.3	1.0-1.7
Scale 7	16.5	10.9	1.6	1.3-1.9
Scale 8	16.3	9.2	2.0	1.6-2.4
Scale 9	13.7	13.5	1.1	0.9-1.3
Scale 0	11.0	8.3	1.3	1.0-1.6
Current "Poor Psychological Status"[d]				
Entry year 1965-67	13.0	5.6	2.3	1.6-3.2
Entry year 1968-71	10.9	8.8	1.3	0.8-2.0

[a] Odds ratios adjusted for the six entry characteristics, except for drug abuse or dependence, which is unadjusted.
[b] DIS criteria, in the month before examination.
[c] T scores ≥ 70, questionable profiles excluded.
[d] Defined as meeting DIS criteria for generalized anxiety, depression, or substance abuse in the last month and elevations on at least two of eight MMPI clinical scales (1-4, 6-9).

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provide the MMPI's best indication of anxiety, somatization, and depression) and on sca e 8 (which indicates unusual thoughts or behaviors usually related to distress or psychopathol-ogy). Scores for other clinical scales, including 4 and 9 (commonly associated with characteristics of addictive or antisocial personality), did not differ between Vietnam and non-Vietnam veterans. Analyses of scores for MMPI special and research scales supported the findings from the analyses of scores for the standard clinical scales.

We combined results from the DIS and MMPI to identify those veterans who could be considered to have the poorest current psychological status. Current "poor psychological status" occurred more frequently among Vietnam veterans than among non-Vietnam veterans, but the magnitude of the increase depended on the year of entry into the Army (Table 8.1). Among the men who entered the Army during 1965-67, Vietnam veterans were twice as likely to have current poor psychological status, but among the men who entered the Army after 1967, Vietnam and non-Vietnam veterans were almost equally likely to have current poor psychological status.

Post-traumatic stress disorder (PTSD) was of special interest. Using DIS criteria, we found that 15% of Vietnam Army veterans had experienced an episode of PTSD related to a combat event and that 2.2% had experienced combat-related PTSD as recently as the month before the examination. Among the veterans with valid profiles on the MMPI, 2.8% of the Vietnam veterans had elevated scores on the research scale related to PTSD.

We performed analyses to determine if the effect of Vietnam service varied within different subgroups of veterans as defined by various characteristics at entry into the Army. Other than the different relative risks for current poor psychological status according to year of entry, we identified few other subgroup differences for any of the other psychiatric or psychological conditions. Some results suggested that the relative risk of depression associated with Vietnam service may have been more pronounced among black veterans than among white veterans. In the DIS results, we found a statistically significant interaction between race and place of service for lifetime prevalence of depression. The risk estimate for black veterans, however, was based on small numbers and was not stable. We also found an interaction between race, place of service, and mean scores on MMPI scales related to depression, with the difference in mean scores being most pronounced between Vietnam and non-Vietnam veterans who were black. When we evaluated the proportion of veterans with elevated scores (T scores ≥70) on depression-related scales, however, we found that the relative risk associated with service in Vietnam was similar for black and white veterans. We found no interaction with race and place of service for current poor psychological status.

In the VES neuropsychological test battery, the following factors were evaluated: concept-formation and problem-solving abilities, memory functioning, manual dexterity, verbal abilities, visual-perceptual-motor functioning, and mental control and attention. The current mean general technical (GT) scores were significantly lower for the Vietnam veterans, a finding consistent with differences noted at entry into the Army. Adjusting the scores for Army entry characteristics, including induction GT scores, decreased this difference. More importantly, the increases in GT test scores since entry into service were similar for Vietnam and non-Vietnam veterans. We evaluated each veteran's results on each of the neuropsy-chological tests relative to his expected performance based on his GT test score. For all neuropsychological tests, the proportions of veterans with low test scores (below expected values) were similar in both groups (Table 8.2).

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Table 8.2 Prevalence of Selected Neuropsychological Deficiencies Among Vietnam and Non-Vietnam Veterans

| Measure[a] | Below Expected Value | | OR[b] |)5% CI |
	Vietnam %	Non-Vietnam %		
General Technical (GT) Score at Examination	17.4	15.8	1.1	0.9-1.3
CVLT Total Correct				
Trials 1-5	17.2	16.4	1.1	1.0-1.4
Short-delay free recall	18.7	19.0	1.1	0.9-1.3
Long-delay free recall	17.7	18.8	1.0	0.9-1.2
Grooved Pegboard (Seconds)				
Dominant hand	24.1	21.9	1.0	0.9-1.2
Nondominant hand	23.7	21.0	1.0	0.9-1.2
PASAT Total Correct Trial 1	12.0	12.9	0.9	0.8-1.1
RO Complex Figure				
Copy	14.6	15.1	1.0	0.8-1.2
Short-delay recall	17.4	18.0	1.0	0.9-1.2
Long-delay recall	16.9	17.6	1.0	0.9-1.2
WAIS-R				
Information subtest	8.0	7.2	1.1	0.9-1.3
Block design subtest	14.8	15.8	0.9	0.8-1.1
Wisconsin Card Sorting Test				
Average number of cards per sort	24.4	21.5	1.1	1.0-1.4
Word List Generation				
F, A, S total	16.8	18.3	1.0	0.8-1.2

[a] ACB = Army Classification Battery; CVLT = California Verbal Learning Test; PASAT = Paced Au:itory Serial Addition Test; RO = Rey-Osterrieth Test; WAIS-R = Wechsler Adult Intelligence Scale-Revised.
[b] Odds ratio adjusted for the six entry characteristics.

8.2 STUDY STRENGTHS AND LIMITATIONS

The validity of the VES findings should be considered in the light of the study's strengths and limitations. One of its greatest strengths lies in the method used to select the sa nple. We identified the study participants from a random sample of Vietnam-era Army veterans, using eligibility criteria designed to identify two cohorts that would be as similar as possible with regard to major health-influencing factors other than service in Vietnam. We considered comparability of paramount importance because it would increase the likelihood that any differences between the cohorts would be the result of service in Vietnam rather than of differences in preexisting physical or psychological health factors. We achieved comparability: the two groups of veterans were similar with regard to most relevant characte stics that could have influenced subsequent physical or psychological health.

Other strengths concern how the study was conducted. We put a great deal of emphasis on obtaining the most accurate information possible, while, at the same time, collecting the information from both cohorts in the same manner. The examination staff, including the psychology technicians, were never informed about whether any of the participants had served in Vietnam. They used accepted standardized tests and procedures that could be administered on a large scale. Only trained and qualified technicians administered the psychological and neuropsychological tests, and, throughout the study, their performance and the quality of the data they collected were closely monitored.

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A main potential limitation of this study was that the rate for Vietnam veterans' participating in the examination differed from the rate for non-Vietnam veterans. Detailed analyses of the factors that influenced participation, however, indicated that the veterans examined were similar to those selected for examination.

Another potential limitation lay in the large number of tests performed in the VES. The more tests performed, the greater the chances of identifying spurious associations. We tried to minimize this possibility by stating before the analysis hypotheses about which psycho-logical and neuropsychological differences we might expect to find between the two groups. In addition, we evaluated particular psychological and neuropsychological conditions by means of several different tests. For example, we evaluated psychological status by using both the Diagnostic Interview Schedule and the Minnesota Multiphasic Personality Inventory. Further, in the neuropsychological test battery, we included different tests that evaluate similar neuropsychological abilities. The consistency of findings across different tests indicates that results were unlikely to have been due to rare chance associations.

Another limitation of the study is that the "Vietnam experience" was not a single homogeneous experience for each of the veterans, but rather a heterogeneous set of a large variety of individual experiences. Some of the individual experiences that make up the Vietnam experience include combat, use of illicit drugs, exposure to harsh environmental conditions, exposure to infectious diseases, and exposure to herbicides and other chemi-cals. Loosely defined, factors not confined to service in Vietnam, such as the reception accorded veterans on their return home, could also be considered part of the Vietnam experience, especially in relation to possible psychological effects. In the VES we had little objective information on the specific components of each veteran's experiences in Vietnam or afterward. As such, we cannot adequately determine the reasons for the differences in psychological status that we identified. Two particular aspects of Vietnam veterans' experiences that have been a major focus of concern are combat and exposure to herbicides. We will deal with these aspects in the succeeding sections.

8.3 COMBAT AND CURRENT PSYCHOLOGICAL AND NEUROPSYCHOLOGICAL STATUS

In the VES we had no objective measure of the amount of combat that individual veterans experienced. We did, however, have two imperfect indicators of the amount of combat experienced. One indicator was the military occupational specialty (MOS) category. The two categories are tactical and nontactical. A tactical MOS, which includes jobs such as infantryman, armored vehicle crewman, artillery crewman, and combat engineer, provides an indirect indication of which men were likely to have participated in direct combat. We realize, however, that some men with nontactical MOSs would have experienced heavy combat and vice versa. Such misclassification could result in underestimating the associa-tion between level of combat and particular psychological conditions.

The other indicator of the amount of combat experienced came from the veterans' responses to the Combat Exposure Questionnaire. The distribution of responses to the questionnaire are presented in Appendix Table G.1. This questionnaire relies on men's recollections of events that occurred some 15 to 20 years earlier and thus is subject to differential recall. This recall bias could cause the association between combat and particular psychological or other health outcomes to be overestimated.

Although both indicators of combat exposure are imperfect, they probably are related to some extent to the actual combat experienced. Vietnam veterans with tactical MOSs did have higher self-reported combat exposure scores (mean = 34, out of a possible maximum score of 72) than those with nontactical MOSs (mean = 18).

For most psychiatric conditions and psychological problems, the relative differences in prevalences between Vietnam and non-Vietnam veterans were similar within the two MOS categories (Tables 8.3-8.5). The drug abuse or dependence results did suggest that relative prevalences between Vietnam and non-Vietnam veterans differed by MOS category, but these results are based on very small numbers (Table 8.3). Among Vietnam veterans, during the month before the examination combat-related PTSD occurred about twice as frequently among veterans with a tactical MOS as among those with a nontactical MOS (Table 8.3). Neuropsychological deficits occurred with similar frequency among Vietnam and non-Vietnam veterans regardless of MOS category (Table 8.6).

Analyses of the relationship between psychiatric or psychological conditions and reported combat experiences were restricted to Vietnam veterans since non-Vietnam veterans were not likely to have experienced combat. Several psychiatric and psychological conditions occurred more frequently with increasing scores on the combat exposure index. These conditions included anxiety, depression, alcohol abuse or dependence, and elevations on MMPI scales 1, 3, and 9 (Table 8.7). The prevalence of current poor psychological status among Vietnam veterans also increased with increasing combat exposure scores (Table 8.7).

Neuropsychological status was not associated with combat exposure score (Table 8.8). After the results had been adjusted for differences in background characteristics, the risk (odds ratio) of most neuropsychological deficits was relatively uniform across different levels of reported combat exposure.

From the above analyses, the results based on MOS category and those based on self-reported combat exposure provide different indications about the effect of combat on subsequent psychological health. According to MOS category, most psychological conditions were not related to level of combat. According to self-reported combat exposure, on the other hand, psychological problems were related to the reported level of combat. These findings, along with others, suggest that psychological or physical health problems may have influenced the reporting or recall of combat experiences. In Volume III (Medical Examinations), we showed that much of the association between self-reported combat exposure and certain medical conditions could be explained by differential reporting among

Table 8.3   Prevalence (%) During the Month Before Examination of Selected Psychiatric Conditions Among Vietnam and Non-Vietnam Veterans, by MOS Category

Condition	MOS Category	Vietnam	Non-Vietnam	Odds Ratio
Generalized anxiety	Tactical	4.9	3.8	1.3
	Nontactical	5.0	3.0	1.7
Depression	Tactical	4.6	2.0	2.4
	Nontactical	4.5	2.4	1.9
Alcohol abuse or dependence	Tactical	14.7	10.2	1.5
	Nontactical	13.2	8.9	1.5
Drug abuse or dependence	Tactical	1.0	0.4	2.4
	Nontactical	0.2	0.5	0.3
Combat-related PTSD	Tactical	2.8	N/A	—
	Nontactical	1.8	N/A	—

Table 8.4   Prevalence (%) of Elevated MMPI Clinical Scales[a] Among Vietnam and
Non-Vietnam Veterans, by MOS Category

Scale	MOS Category	Vietnam	Non-Vietnam	OR
1	Tactical	15.2	9.0	1.8
	Nontactical	15.8	9.1	1.9
2	Tactical	24.5	15.3	1.8
	Nontactical	25.4	18.0	1.6
3	Tactical	7.6	4.0	1.9
	Nontactical	9.5	6.6	1.5
4	Tactical	15.9	15.3	1.0
	Nontactical	15.7	14.5	1.1
5	Tactical	11.1	11.2	1.0
	Nontactical	13.5	13.5	1.0
6	Tactical	8.9	8.5	1.0
	Nontactical	9.3	6.7	1.4
7	Tactical	17.0	11.9	1.5
	Nontactical	16.2	10.6	1.6
8	Tactical	16.5	10.3	1.7
	Nontactical	16.1	8.8	2.0
9	Tactical	15.3	16.0	1.0
	Nontactical	12.9	12.6	1.0
0	Tactical	10.4	8.8	1.2
	Nontactical	11.3	8.2	1.4

[a]   Veterans with questionable profiles excluded.

those veterans who were symptomatic. A similar phenomenon may have occurred with respect to psychological symptoms. Those veterans who were experiencing psychological or other health problems may have been more likely to recall combat experiences, perhaps in an effort to determine a reason or "cause" for their problems.

In summary, with the exception of combat-related PTSD, we did not find a strong association between combat and psychological problems. This finding suggests that those Vietnam veterans who may have experienced more combat were not at a much greater relative risk of having subsequent psychological problems, other than combat-related P`SD, than those who may have experienced less combat.

8.4 THE ISSUE OF HERBICIDE EXPOSURE

One of the major concerns about the health of Vietnam veterans has focused on possible exposure to herbicides such as Agent Orange. An objective measure of herbicide exposure, such as a serum dioxin level, was not available at the time of the VES. In the telephone interview, however, we did ask the veterans a series of questions about possible exposure to herbicides in Vietnam. These questions and the herbicide exposure index are described in detail in Volume II (Telephone Interview). The distributions of responses to the herbicide exposure questions among examination participants are presented in appendix Table G.2.

Table 8.5   Prevalence (%) of Current "Poor Psychological Status"[a] Among Vietnam and
Non-Vietnam Veterans, by MOS Category

MOS Category	Vietnam	Non-Vietnam	OR
Tactical	12.6	8.0	1.7
Nontactical	11.6	7.1	1.7

[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)

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Table 8.6 Prevalence (%) of Selected Neuropsychological Deficits Among Vietnam ar d
Non-Vietnam Veterans According to MOS Category

Measure	MOS Category	Vietnam	Non-Vietnam	OR
ACB General Technical	Tactical	20.3	20.2	1.0
(GT) Score at	Nontactical	16.0	14.3	1.1
Examination				
CVLT Total Correct				
Trials 1-5	Tactical	17.1	12.8	1.4
	Nontactical	17.3	17.6	1.0
Short delay	Tactical	16.1	14.6	1.1
Free recall	Nontactical	20.0	20.4	1.0
Long delay	Tactical	17.2	14.6	1.2
Free recall	Nontactical	18.0	20.2	0.9
Grooved Pegboard				
Dominant	Tactical	25.8	28.3	0.9
	Nontactical	23.2	20.0	1.2
Nondominant	Tactical	24.6	27.1	0.9
	Nontactical	23.2	19.0	1.3
PASAT Total Correct	Tactical	12.3	12.1	1.0
Trial 1	Nontactical	11.9	13.2	0.9
RO Complex Figure				
Copy	Tactical	14.8	15.4	0.9
	Nontactical	14.5	14.7	1.0
Immediate recall	Tactical	16.5	16.6	1.0
	Nontactical	17.8	18.5	1.0
Delayed recall	Tactical	16.2	15.6	1.0
	Nontactical	17.3	18.2	0.9
Wais-R				
Information subtest	Tactical	8.0	8.0	1.0
	Nontactical	8.0	6.9	1.2
Block design subtest	Tactical	12.8	14.0	0.9
	Nontactical	15.8	16.4	1.0
Wisconsin Card				
Sorting Test				
Average cards	Tactical	26.2	25.1	1.1
Per sort	Nontactical	23.5	20.2	1.2
Word List Generation	Tactical	15.0	16.4	0.9
F, A, S total	Nontactical	17.7	18.9	0.9

Most of the psychiatric and psychological conditions evaluated showed a positive association with self-perceived exposure to herbicides in Vietnam (Table 8.9). The prevalences of Vietnam veterans who had anxiety, depression, or alcohol abuse or dependence increased with an increasing herbicide exposure index. Elevations on several MMPI scales, particularly 1, 3, 6, 8, and 9, were more prevalent with an increasing herbicide exposure index. The prevalence of current poor psychological status showed similar increases.

The neuropsychological test results were not associated with self-perceived exposure to herbicides (Table 8.10). After we adjusted the results for differences in the six service entry characteristics (age, race, year of entry, GT score, enlistment status, and MOS category), we found that the risk of most neuropsychological deficits was relatively uniform across categories of the herbicide exposure index. The one exception was the Paced Auditory Serial Addition Test (PASAT), for which the association between prevalence of deficits and the herbicide exposure index was positive.

Table 8.7 Prevalence of Selected Psychiatric and Psychological Findings Among Vietnam Veterans, by Level of Reported Combat Exposure

| | Combat Exposure Quartile | | | | | | | |
| | 1 | | 2 | | 3 | | 4 | |
	(%)	OR[b]	(%)	OR	(%)	OR	(%)	OR
Psychiatric Conditions[a]								
Generalized anxiety	(3.3)	1.0	(3.0)	0.7	(4.8)	1.2	(8.3)	1.9
Depression	(1.7)	1.0	(2.6)	1.0	(4.5)	1.7	(8.6)	3.2*
Alcohol abuse or dependence	(8.8)	1.0	(12.0)	1.1	(15.3)	1.5	(17.5)	1.4
MMPI Elevations[c]								
Scale 1	(9)	1.0	(14)	1.3	(17)	1.6*	(23)	2.0
Scale 2	(25)	1.0	(22)	0.8	(22)	0.9	(28)	1.0
Scale 3	(5)	1.0	(8)	1.4	(9)	1.8*	(13)	2.6*
Scale 4	(13)	1.0	(15)	1.0	(16)	1.1	(19)	1.2
Scale 5	(13)	1.0	(12)	1.0	(13)	1.2	(12)	1.3
Scale 6	(6)	1.0	(8)	1.2	(10)	1.5	(12)	1.7
Scale 7	(15)	1.0	(15)	0.8	(14)	0.8	(22)	1.2
Scale 8	(13)	1.0	(13)	0.8	(15)	0.9	(23)	1.5
Scale 9	(8)	1.0	(11)	1.2	(16)	2.0*	(19)	2.4*
Scale 0	(14)	1.0	(13)	0.9	(9)	0.5*	(9)	0.5*
Current "Poor Psychological Status"	(7.4)	1.0	(7.4)	0.7	(12.7)	1.3	(18.9)	1.9*

[a] DIS criteria in the month before examination.
[b] Odds ratio adjusted for the six entry characteristics plus self-perceived herbicide exposure and, for psychiatric conditions, reported drug use in Army. Participants with combat exposure scores in the first quartile form the referent category for computing odds ratios.
[c] Invalid profiles excluded.
* 95% confidence interval excludes 1.0.

Table 8.8 Prevalence of Selected Neuropsychological Deficits Among Vietnam Veterans, by Level of Reported Combat Exposure

| | Combat Exposure Quartile | | | | | | | |
| | 1 | | 2 | | 3 | | 4 | |
	(%)	OR[a]	(%)	OR	(%)	OR	(%)	OR
Current GT Score	(14)	1.0	(17)	1.2	(17)	1.2	(22)	1.2
CVLT								
Trials 1-5	(18)	1.0	(19)	1.2	(17)	1.0	(15)	1.1
Short-delay free recall	(20)	1.0	(22)	1.2	(18)	1.0	(16)	1.0
Long-delay free recall	(19)	1.0	(19)	1.1	(17)	1.0	(16)	1.1
Grooved Pegboard, secs.								
Dominant hand	(19)	1.0	(21)	1.0	(25)	1.4	(30)	1.5
Nondominant hand	(18)	1.0	(22)	1.2	(24)	1.3	(30)	1.5*
PASAT, Total Correct Trial 1	(13)	1.0	(11)	0.8	(11)	0.7	(13)	0.3
RO Complex Figure								
Copy	(16)	1.0	(16)	0.9	(15)	0.8	(12)	0.7
Immediate recall	(21)	1.0	(17)	0.9	(16)	0.9	(16)	1.0
Delayed recall	(21)	1.0	(16)	0.9	(15)	0.8	(16)	1.1
WAIS-R								
Information subtest	(8)	1.0	(8)	1.1	(7)	0.9	(9)	1.3
Block design subtest	(18)	1.0	(15)	0.9	(14)	0.8	(13)	0.9
Wisconsin Card Sorting Test Average number of cards per sort	(20)	1.0	(22)	0.9	(24)	1.1	(30)	1.1
Word List Generation F, A, S total	(20)	1.0	(17)	0.9	(17)	0.9	(13)	0.3

[a] Odds ratio adjusted for six entry characteristics and self-perceived herbicide exposure. Participants with combat exposure scores in the first quartile form the referent category for computing odds ratios.
* 95% confidence interval excludes 1.0.

Table 8.9 Prevalence of Selected Psychiatric and Psychological Findings Among Vietnam Veterans, by Level of Self-Reported Exposure to Herbicides

	Herbicide Exposure Index							
	1		2		3		4	
	(%)	OR[a]	(%)	OR	(%)	OR	(%)	OR
Psychiatric Conditions[b]								
Generalized anxiety	(3.0)	1.0	(4.7)	1.5	(6.8)	1.8*	(15.3)	4.1*
Depression	(1.5)	1.0	(4.5)	2.8*	(8.2)	4.4*	(14.7)	5.8
Alcohol abuse or dependence	(9.3)	1.0	(15.9)	1.6*	(17.6)	1.6*	(19.3)	1.4
MMPI Elevations[c]								
Scale 1	(9)	1.0	(16)	1.9*	(26)	3.2*	(29)	3.4*
Scale 2	(23)	1.0	(24)	1.1	(29)	1.3	(32)	1.5
Scale 3	(6)	1.0	(9)	1.5	(14)	2.2*	(19)	3.2*
Scale 4	(13)	1.0	(15)	1.1	(22)	1.7*	(21)	1.6
Scale 5	(12)	1.0	(13)	1.0	(14)	1.2	(14)	1.4
Scale 6	(6)	1.0	(9)	1.5	(13)	2.1*	(23)	3.6*
Scale 7	(14)	1.0	(15)	1.1	(23)	1.8*	(25)	1.8
Scale 8	(11)	1.0	(17)	1.7*	(24)	2.4*	(32)	3.0*
Scale 9	(10)	1.0	(14)	1.3	(19)	1.7*	(29)	2.4*
Scale 0	(12)	1.0	(9)	0.9	(11)	1.2	(12)	1.2
Current "Poor Psychological Status"	(6.3)	1.0	(13.1)	2.1*	(17.8)	2.6*	(27.5)	3.6*

[a] Odds ratio adjusted for the six entry characteristics plus self-reported combat exposure and, for psychiatric conditions, reported drug use in Army. Participants with herbicide exposure scores in the first quartile form the referent category for computing odds ratios.
[b] DIS criteria in the month before examination.
[c] Invalid profiles excluded.
* 95% confidence interval excludes 1.0.

The above results related to self-perceived herbicide exposure need to be interpreted cautiously, since they are based on participants' recollections about possible experiences that occurred 15-20 years before the study. As such, they are subject to differential recall, and at least three factors suggest that the herbicide exposure index was influenced by such recall.

First, results of the telephone interview (Volume II), showed that self-perceived herbicide exposure was positively associated with almost all reported medical conditions, many of which have never been suggested as being related to phenoxy herbicides. The nonspecificity of these associations suggests the possibility that differential recall may have biased these results.

Second, results of the analysis of the medical examination findings (Volume III), showed that perceived herbicide exposure was associated with symptomatic medical conditions, but not with subclinical abnormalities of which the veteran was not aware. These results suggest that the associations between reported health outcomes and perceived herbicide exposure are probably due to differential reporting between those who are symptomatic and those who are not.

Finally, in a companion study, the Centers for Disease Control (CDC) recently completed, we could not validate self-perceived exposure as an index of herbicide exposure by using more objective measures (Centers for Disease Control Veterans Health Studies, in press). In that study of enlisted Vietnam veterans, in which we measured serum dioxin levels as an indicator of past exposure to dioxin-containing herbicides, we found no association between self-reported herbicide exposure and levels of dioxin in serum. Furthermore, results of that study indicated that few Army ground troops were heavily exposed to dioxin-containing herbicides while in Vietnam.

Table 8.10 Prevalence of Selected Neuropsychological Deficits Among Vietnam Veterans, by Level of Self-Reported Exposure to Herbicides

	Herbicide Exposure Index							
	1		2		3		4	
	(%)	OR[b]	(%)	OR	(%)	OR	(%)	O[a]
Current GT Score	(18)	1.0	(15)	0.8	(18)	0.9	(31)	1.2
CVLT								
Trials 1-5	(18)	1.0	(17)	0.9	(16)	0.9	(14)	1.0
Short-delay free recall	(18)	1.0	(19)	1.1	(19)	1.2	(17)	1.4
Long-delay free recall	(19)	1.0	(18)	1.0	(17)	0.9	(14)	1.0
Grooved Pegboard, secs.								
Dominant hand	(24)	1.0	(22)	0.8	(26)	1.0	(36)	1.0
Nondominant hand	(23)	1.0	(20)	0.8	(25)	1.0	(41)	1.4
PASAT, Total Correct Trial 1	(11)	1.0	(12)	1.2	(13)	1.4	(21)	2.6*
RO Complex Figure								
Copy	(14)	1.0	(16)	1.3	(14)	1.3	(12)	1.
Immediate recall	(19)	1.0	(17)	0.9	(15)	0.8	(15)	1.0
Delayed recall	(19)	1.0	(16)	0.8	(16)	0.9	(12)	0.8
WAIS-R								
Information subtest	(9)	1.0	(8)	0.8	(8)	0.8	(4)	0.4
Block design subtest	(16)	1.0	(15)	1.0	(12)	0.9	(14)	1.1
Wisconsin Card Sorting Test								
Average number of cards per sort	(22)	1.0	(23)	1.2	(27)	1.3	(37)	1.2
Word List Generation								
F, A, S total	(17)	1.0	(17)	1.0	(16)	1.1	(13)	1.3

[a] Odds ratio adjusted for six entry characteristics and self-reported combat exposure. Participants with herbicide exposure scores in the first quartile form the referent category for computing odds ratios.
* 95% confidence interval excludes 1.0.

8.5 PSYCHOLOGICAL STATUS AND PHYSICAL HEALTH

In the telephone interview (Volume II) and medical examination health history (Volume III), Vietnam veterans reported many health conditions and symptoms more frequently than did other veterans. In the medical examination (Volume III), however, we detected few differences between Vietnam and non-Vietnam veterans on objective measures of current physical health. The discrepancy between the health histories and the medical examinations may be related to the increased stress and associated psychological sequelae experienced by Vietnam veterans. For many veterans, military service in Vietnam was undoubtedly a stressful experience. As we have shown, a greater proportion of Vietnam veterans were currently anxious and depressed. Stress can produce anxiety, depression, and a variety of somatic symptoms (Kellner, 1987). Persons who are anxious or depressed may have increased awareness of symptoms and heightened concern with physical health, and yet have no objective evidence of physical illness.

We were able to evaluate the possibility that the Vietnam veterans' higher prevalences of psychological problems, including anxiety and depression, may have contributed to their increased reporting of somatic symptoms. For this analysis, we evaluated the prevalence of reporting five or more physical health symptoms according to whether a veteran had a "poor" or "good" psychological status. The symptoms came from a list of 57 physical health symptoms that were asked about in the medical history questionnaire (see Volume III). Poor psychological status has been defined (Chapter 6). Good psychological status was defined as not meeting DIS criteria during the month before the examination for any of the following conditions: anxiety, depression, substance abuse disorder, and having an elevated score on no more than one MMPI scale.

In both the Vietnam and non-Vietnam cohorts, veterans with poor psychological status were more likely to report five or more symptoms than were veterans with good psychological status (Table 8.11). Within both psychological status categories, however, Vietnam veterans were more likely than non-Vietnam veterans to report five or more symptoms. This suggests that increased symptom reporting by Vietnam veterans cannot be totally explained by a greater prevalence of psychological problems.

Results of analyses in which the association between service in Vietnam and reporting five or more medical symtpoms was adjusted for differences in current poor psychological status (Table 8.12) also supports this conclusion. In these analyses, the odds ratio between service in Vietnam and reporting five or more medical symptoms changed little (from 1.6 to 1.5) after the results had been adjusted for poor psychological status. If psychological status had accounted for most of the difference in symptom reporting between Vietnam and non-Vietnam veterans, we would have expected the additional adjustment for psychological status to have moved the odds ratio much closer to 1.0.

These results suggest that the more prevalent psychological problems experienced by Vietnam veterans may account for some of their increased reporting of physical symptoms, but having served in Vietnam seems to add an additional factor of increased symptom awareness beyond that which could be attributed to having psychological problems such as anxiety and depression.

8.6 CONCLUSION

Since the time of the conflict, veterans and others have been concerned about how American military personnel who served in Vietnam have adapted to civilian life. Results of this study, conducted 15 to 20 years after the conflict, indicate that Vietnam veterans have adapted socially and economically in a manner similar to that of Army veterans who did not serve in Vietnam. At the time of the study, few men in either group of veterans were in jail, institutionalized, or mentally or physically incapacitated. At the time of the interview, three quarters of the men in both groups were married, and about 55% were married to their first wife. In addition, over 90% expressed satisfaction with their family and other personal relationships. Over 90% were also currently employed. After differences present at induction into the Army (such as GT scores) had been accounted for, the educational levels, types of occupations, and household incomes of the two groups were similar.

Although the outward indications are that the two groups of veterans have made similar adaptations to civilian life, the study results also indicate that more Vietnam veterans than non-Vietnam veterans are currently experiencing psychological problems. These mainly involve alcohol abuse or dependence, anxiety, and depression. Current drug abuse or dependence was not more prevalent among Vietnam veterans.

Table 8.11   Prevalence of Five or More Physical Symptoms Among Vietnam and Non-Vietnam Veterans According to Current Psychological Status

Current Psychological Status[a]	Vietnam		Non-Vietnam	
	N	%	N	%
Poor[b]	179	60.3	60	41.7
Good[c]	136	9.0	104	7.6

[a] Excludes those who did not meet the criteria for either "good" or "poor."
[b] Met DIS criteria in the past month for substance abuse or dependence, anxiety, or depression and had two or more elevated MMPI scales (excluding 5 and 0).
[c] Did not meet DIS criteria in the past month for substance abuse or dependence, anxiety, or depression and had no more than one elevated MMPI scale (excluding 5 and 0).

Table 8.12   Prevalence of Five or More Reported Medical Symptoms Among Vietnam and
Non-Vietnam Veterans, and Odds Ratios

	Vietnam		Non-Vietnam		Crude OR	Model 1[a] OR	Model 2[b] OR
	N	%	N	%			
≥5 Symptoms	529	21.2	275	13.9	1.7	1.6	1.5

[a]   Adjusted for six entry characteristics.
[b]   Adjusted for six entry characteristics and "poor psychological status."

Another major concern about the psychological health of Vietnam veterans has been related to PTSD. Using DIS criteria, we found that about 15% of Vietnam veterans had experienced combat-related PTSD at some time during or after military service and that about 2% had experienced the disorder as recently as the month before the examination.

For most psychological conditions, the effect of Vietnam service on current psychological status was similar within different subgroups of veterans. The main exception was that differences between Vietnam and non-Vietnam veterans for current poor psychological status were most pronounced among those veterans who entered the Army before 1968. Compared with veterans who entered the Army before 1968, the prevalence of current poor psychological status decreased among Vietnam veterans but increased among non-Vietnam veterans who entered the Army in 1968 or later. These results suggest that some change occurred around 1968. Unfortunately, we cannot specify what the change was. Nineteen sixty-eight has been described as "a tumultuous year of constantly shifting military and diplomatic fortunes, a year of torment at home and confusion abroad" (Dougan and Weiss, 1983). The changes that may have occurred around that time include not only changes in the nature of the Vietnam conflict, but also changes in American societal attitudes and perceptions about the conflict and changes in the attitudes or expectations of men entering the Army.

The only psychological condition that was strongly associated with objective indicators of level of combat was combat-related PTSD. For all other psychological conditions, including anxiety, depression, substance abuse, MMPI scale elevations, and current poor psychological status, the increased relative risk associated with service in Vietnam was not strongly associated with level of combat as indicated by MOS category. This finding suggests that veterans who were more likely to have experienced direct combat because they had tactical MOSs were not at any greater relative risk of having these subsequent psychological problems than veterans who were less likely to have experienced direct combat because they had nontactical MOSs.

Except for year of entry into the service, other background and military service characteristics did not alter the relative effect of Vietnam service on subsequent psychological status. For most psychological conditions, the relative effect of service in Vietnam was the same regardless of characteristics such as race, age at entry into the Army, type of enlistment, and induction GT score, as well as MOS category. This finding suggests that the relative effect of Vietnam service, at least for those who entered the Army between 1965-67, was a general one for which most veterans who served in Vietnam were at risk.

The increased prevalence of current psychological problems among Vietnam veterans does not appear to have been due to the characteristics of the men sent to Vietnam. On the basis of all available information, the characteristics of the two groups appear to have been similar. In particular, the racial distribution and prevalence of reported childhood behavioral problems were nearly identical. Furthermore, preservice prevalences of psychiatric symp-

toms, including anxiety, depression, and substance abuse, were similar in the two groups. The only difference relating to known entry characteristics was that those with higher entry GT scores seemed less likely to serve in Vietnam. This difference, however, was small and did not account for the differences in psychological findings between Vietnam and non-Vietnam veterans. In addition, the differences in psychological problems persisted in results of analyses adjusted for entry and service characteristics and certain current socioeconomic characteristics such as education and marital status.

The neuropsychological status of Vietnam veterans was similar to that of non-Vietnam veterans. In the medical examinations, neurologic findings and other objective measures of physical health were also generally similar for the two groups. These results indicate that the more prevalent psychological problems among Vietnam veterans were not due to their being in worse current physical health. The results of the medical examinations and neuropsychological tests can also be viewed as indicating that psychological problems have not had a large impact on objective measures of current physical health, although they may be related to Vietnam veterans' increased reporting of physical symptoms.

For many U.S. servicemen, military service in Vietnam was a stressful and psychologically difficult experience. Fifteen to twenty years afterward, more veterans who served in Vietnam have psychological and emotional problems compared with veterans who did not serve there. We do not want to minimize the importance or severity of these problems for those veterans who are experiencing them. At the same time, given common stereotypes of Vietnam veterans as psychologically disturbed and socially maladjusted, we should point out that psychological problems affect a minority of veterans. Viewed as a group, Vietnam veterans are functioning members of society whose level of social and economic achievement is similar to that of non-Vietnam veterans.

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APPENDIX A

*DSM-III Diagnostic Criteria for Selected Psychiatric Conditions**

DIAGNOSTIC CRITERIA FOR GENERALIZED ANXIETY DISORDER

A. Generalized, persistent anxiety is manifested by symptoms from three of the following categories:
   1. motor tension: shakiness, jitteriness, jumpiness, trembling, tension, muscle aches, fatigability, inability to relax, eyelid twitch, furrowed brow, strained face, fidgeting, restlessness, easy startle
   2. autonomic hyperactivity: sweating; heart pounding or racing; cold, clammy hand; dry mouth; dizziness; light-headedness; paresthesias (tingling in hands or feet); upset stomach; hot or cold spells; frequent urination; diarrhea; discomfort in the pit of the stomach; lump in the throat; flushing; pallor; high resting pulse and respiration rate
   3. apprehensive expectation: anxiety, worry, fear, rumination, and anticipation of misfortune to self or others
   4. vigilance and scanning: hyperattentiveness resulting in distractibility, difficulty in concentrating, insomnia, feeling "on edge," irritability, impatience
B. The anxious mood has been continuous for at least one month.
C. Not due to another mental disorder, such as a Depressive Disorder or schizophrenia.
D. At least 18 years of age.

DIAGNOSTIC CRITERIA FOR MAJOR DEPRESSIVE EPISODE

A. Dysphoric mood or loss of interest or pleasure in all or almost all usual activities and pastimes. The dysphoric mood is characterized by symptoms such as the following: depressed, sad, blue, hopeless, low, down in the dumps, irritable. The mood disturbance must be prominent and relatively persistent, but not necessarily the most dominant symptom, and does not include momentary shifts from one dysphoric mood to another dysphoric mood, e.g., anxiety to depression to anger, such as are seen in states of acute psychotic turmoil. (For children under six, dysphoric mood may have to be inferred from a persistently sad facial expression.)
B. At least four of the following symptoms have each been present nearly every day for a period of at least two weeks (in children under six, at least three of the first four).
   1. poor appetite or significant weight loss (when not dieting) or increased appetite or significant weight gain (in children under six, consider failure to make expected weight gains)
   2. insomnia or hypersomnia
   3. psychomotor agitation or retardation (but not merely subjective feelings or restlessness or being slowed down) (in children under six, hypoactivity)
   4. loss of interest or pleasure in usual activities, or decrease in sexual drive not limited to a period when delusional or hallucinating (in children under six, signs of apathy)
   5. loss of energy; fatigue
   6. feelings of worthlessness, self-reproach, or excessive or inappropriate guilt (either may be delusional)
   7. complaints or evidence of diminished ability to think or concentrate, such as slowed thinking, or indecisiveness not associated with marked loosening of associations or incoherence

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8. recurrent thoughts of death, suicidal ideation, wishes to be dead, or suicide attempt

C. Neither of the following dominate the clinical picture when affective syndrome (*i.e.*, criteria A and B above) is not present, that is, before it developed or after it has remitted:

1. preoccupation with a mood-incongruent delusion or hallucination
2. bizarre behavior

D. Not superimposed on either schizophrenia, schizophreniform disorder, or a paranoid disorder.

E. Not due to any organic mental disorder or uncomplicated bereavement.

DIAGNOSTIC CRITERIA FOR ALCOHOL ABUSE

A. **Pattern of pathological alcohol use:** need for daily use of alcohol for adequate functioning; inability to cut down or stop drinking; repeated efforts to control or reduce excess drinking by "going on the wagon" (periods of temporary abstinence) or restricting drinking to certain times of the day; binges (remaining intoxicated throughout the day for at least two days); occasional consumption of a fifth of spirits (to its equivalent in wine or beer); amnesia periods for events occurring while intoxicated (blackouts); continuation of drinking despite a serious physical disorder that the individual knows is exacerbated by alcohol use; drinking of nonbeverage alcohol.

B. **Impairment in social or occupational functioning due to alcohol use:** *e.g.*, violence while intoxicated, absence from work, loss of job, legal difficulties (*e.g.*, arrest for intoxicated behavior, traffic accidents while intoxicated), arguments or difficulties with family or friends because of excessive alcohol use.

C. Duration of disturbance of at least one month.

DIAGNOSTIC CRITERIA FOR ALCOHOL DEPENDENCE

A. Either a pattern of pathological alcohol use or impairment in social or occupational functioning due to alcohol use:

Pattern of pathological alcohol use: need for daily use of alcohol for adequate functioning; inability to cut down or stop drinking; repeated efforts to control or reduce excess drinking by "going on the wagon" (periods of temporary abstinence) or restricting drinking to certain times of the day; binges (remaining intoxicated throughout the day for at least two days); occasional consumption of a fifth of spirits (to its equivalent in wine or beer); amnesia periods for events occurring while intoxicated (blackouts); continuation of drinking despite a serious physical disorder that the individual knows is exacerbated by alcohol use; drinking of nonbeverage alcohol.

Impairment in social or occupational functioning due to alcohol use: *e.g.*, violence while intoxicated, absence from work, loss of job, legal difficulties (*e.g.*, arrest for intoxicated behavior, traffic accidents while intoxicated), arguments or difficulties with family or friends because of excessive alcohol use.

B. Either tolerance or withdrawal:

Tolerance: need for markedly increased amounts of alcohol to achieve the desired effect, or markedly diminished effect with regular use of the same amount.

Withdrawal: development of alcohol withdrawal (*e.g.,* morning "shakes" and maliase relieved by drinking) after cessation of or reduction in drinking.

DSM-III has no single category for drug abuse or dependence; instead, criteria are categorized by specific drugs. In this study, we used the following criteria:

DIAGNOSTIC CRITERIA FOR DRUG ABUSE

A. **Pattern of pathological use:** inability to cut down or stop use; intoxication throughout the day; use of substance, nearly every day for 2 weeks or more; amnesia periods for events that occurred while intoxicated.

B. **Impairment in social or occupational functioning due to substance use:** *e.g.,* fights, loss of friends, absence from work, loss of job, or legal difficulties (other than a single arrest due to possession, purchase, or sale of the substance).

C. Duration of disturbance of at least one month.

DIAGNOSTIC CRITERIA FOR DRUG DEPENDENCE

Either tolerance or withdrawal:

Tolerance: need for markedly increased amounts of the substance to achieve the desired effect, or markedly diminished effect with regular use of the same amount.

Withdrawal: development of withdrawal after cessation of or reduction in substance use.

DIAGNOSTIC CRITERIA FOR POST-TRAUMATIC STRESS DISORDER

A. Existence of a recognizable stressor that would evoke significant symptoms of distress in almost everyone.

B. Re-experiencing of the trauma as evidenced by at least one of the following:
   1. recurrent and intrusive recollections of the event
   2. recurrent dreams of the event
   3. sudden acting or feeling as if the traumatic event were reoccurring because of an association with an environmental or ideational stimulus

C. Numbing of responsiveness to or reduced involvement with the external world, beginning some time after the trauma, as shown by at least one of the following:
   1. markedly diminished interest in one or more significant activities
   2. feeling of detachment or estrangement from others
   3. constricted affect

D. At least two of the following symptoms that were not present before the trauma:
   1. hyperalertness or exaggerated startle response
   2. sleep disturbance
   3. guilt about surviving when others have not or about behavior required for survival
   4. memory impairment or trouble concentrating
   5. avoidance of activities that arouse recollection of the traumatic event
   6. intensification of symptoms by exposure to events that symbolize or resemble the traumatic event

APPENDIX B

Additional Results From
the Diagnostic Interview Schedule

Conditions and Symptoms	Vietnam (N = 2490)					Non-Vietnani (N = 1972)				
	No %	Low[a] %	DMA[a] %	Phys[a] %	Yes[a] %	No %	Low[a] %	DMA[a] %	Phys[a] %	Yes[a] %
Generalized Anxiety										
Ever nervous person	64.2	—	—	—	35.8	67.7	—	—	–	32.3
Ever had anxiety attack	85.1	5.9	0.5	0.3	8.2	91.3	3.7	0.3	(.3	4.5
≥1 mo. feeling anxious	75.2	—	—	—	24.8	81.6	—	—	–	18.4
Phobia										
Fear of heights	89.6	8.5	—	—	1.9	90.3	9.0	—	–	0.8
Fear of crowds	92.9	3.7	—	—	3.4	96.5	2.2	—	–	1.3
Fear of closed places	93.5	4.8	—	—	1.7	96.3	2.9	—	–	0.8
Fear of public speaking	89.5	7.7	—	—	2.8	91.7	6.6	—	–	1.7
Fear of storms	98.3	1.5	—	—	0.2	98.7	1.2	—	–	0.2
Fear of water	95.7	3.7	—	—	0.6	96.2	3.3	—	–	0.5
Fear of insects/rodents	92.6	6.4	—	—	1.0	93.8	5.9	—	–	0.3
Other fears	96.1	2.5	—	—	1.4	97.4	1.9	—	–	0.7
Depression										
≥2 wks depression	62.4	—	—	—	37.6	65.8	—	—	–	34.2
≥2 yrs depression	87.8	1.8	—	—	10.4	92.0	1.5	—	–	6.5
≥2 wks appetite loss	87.0	—	1.3	2.2	9.4	90.9	—	0.5	·.5	7.1
Weight loss	83.1	—	1.6	3.6	11.8	86.3	—	0.4	⁄.3	9.1
Weight increase	77.9	—	4.0	1.1	17.0	81.0	—	3.2	·.1	14.7
≥2 wks sleep loss	71.8	—	1.1	1.6	25.5	77.9	—	1.0	·.1	20.0
≥2 wks increased sleep	88.3	—	0.9	1.3	9.5	90.4	—	0.7	·.2	7.7
≥2 wks tired feeling	71.4	—	1.3	6.9	20.4	76.9	—	0.7	(.9	15.4
≥2 wks talked/moved slowly	91.7	—	0.8	3.0	4.6	93.5	—	0.4	(.3	2.8
≥2 wks restlessness	86.8	—	0.7	0.4	12.1	90.8	—	0.8	(.3	8.1
Loss of interest in sex	79.0	13.9	0.7	1.3	5.1	80.7	12.8	0.7	(.9	4.9
≥2 wks worthless feelings	84.3	—	—	—	15.7	87.8	—	—	–	12.2
≥2 wks trouble concentrating	79.4	—	1.4	0.9	18.2	84.0	—	1.1	·.5	13.5
≥2 wks slowed thinking	85.3	—	1.7	0.9	12.1	91.1	—	1.1	(.8	7.0
≥2 wks thoughts of death	70.4	—	—	—	29.6	75.2	—	—	–	24.8
≥2 wks wanting to die	91.8	—	—	—	8.2	94.1	—	—	–	5.9
Ever had suicide thoughts	80.9	—	—	—	19.1	83.5	—	—	–	16.5
Ever attempted suicide	96.5	—	—	—	3.5	97.1	—	—	–	2.9
Mania										
≥1 wk happy/excited/high	97.1	—	0.9	—	2.0	97.9	—	0.9	—	1.2
≥1 wk increased activity	94.3	—	1.0	—	4.7	96.1	—	0.7	—	3.2
≥1 wk spending sprees	92.2	—	2.4	—	5.4	94.7	—	1.6	—	3.7
≥1 wk increased interest in sex	81.2	—	1.7	—	17.1	85.1	—	1.2	—	13.7
≥1 wk rapid speech	94.9	—	0.7	—	4.5	96.8	—	0.6	—	2.6
≥1 wk racing thoughts	89.8	—	1.3	—	8.9	92.8	—	0.8	—	6.4
≥1 wk increased self-importance	98.2	—	0.3	—	1.5	98.4	—	0.3	—	1.3
≥1 wk lack of sleep	86.7	—	2.5	—	10.8	90.4	—	1.1	—	8.5
≥1 wk easily distracted	85.0	—	1.9	—	13.1	90.3	—	1.1	—	8.6
Schizophrenia										
Ever had paranoid delusions	90.7	5.5	0.6	0.0	1.3	92.0	4.7	0.5	().1	0.8
Ever had persecutory delusions	96.4	1.7	0.0	0.1	0.6	96.6	1.5	0.3	().1	0.3
Ever had visual hallucinations	96.0	2.6	0.4	0.0	0.9	96.3	2.7	0.3	().1	0.6
≥1 auditory hallucination(s)	96.6	2.0	0.2	0.0	1.2	97.8	1.3	0.2	().1	0.7
Alcohol Abuse and/or Dependence										
Family complains about drinking	62.5	2.0	—	—	35.5	67.5	1.8	—	—	30.6
Excessive drinker	63.6	—	—	—	35.0	67.0	—	—	—	31.0
≥1/5 liquor in 1 day	49.8	0.6	—	—	48.2	55.5	1.0	—	—	41.5
≥2 wks of 7 drinks per day	70.0	—	—	—	28.6	77.2	—	—	—	20.8

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Table B.1   Responses to Diagnostic Interview Schedule Questions Asked of All Veterans —
Continued

Conditions and Symptoms	Vietnam (N=2490)					Non-Vietnam (N=1972)				
	No %	Low[a] %	DMA[a] %	Phys[a] %	Yes[a] %	No %	Low[a] %	DMA[a] %	Phys[a] %	Yes[a] %
Alcohol Abuse and/or Dependence — continued										
≥2 mos. of 7 drinks (1x wk)	50.8	—	—	—	19.2	58.2	—	—	—	19.0
Subj. told he drinks too much	82.8	—	—	—	15.8	84.6	—	—	—	13.4
Wanted to stop drinking but can't	89.1	—	—	—	9.5	91.0	—	—	—	7.0
Attempts to control drinking	88.8	—	—	—	9.8	90.6	—	—	—	7.4
Needs a drink before breakfast	90.2	—	—	—	8.4	92.1	—	—	—	5.9
Job trouble due to drinking	90.1	—	—	—	8.5	92.7	—	—	—	5.3
Lost job due to drinking	94.6	—	—	—	4.0	95.0	—	—	—	3.0
Drunk driving arrest	74.8	—	—	—	23.8	77.8	—	—	—	20.2
Other drinking arrest	80.8	—	—	—	17.8	83.3	—	—	—	14.8
Physical fighting while drinking	65.3	—	—	—	33.3	68.7	—	—	—	29.3
Obsession										
Persistent unpleasant thoughts	92.4	—	—	—	7.6	95.0	—	—	—	4.9
Paranoid obsessions	97.4	—	—	—	2.6	97.6	—	—	—	2.4
Drug Abuse and/or Dependence										
Drug use to get high	33.6	—	—	—	66.4	37.3	—	—	—	62.6
Antisocial Personality										
Repeat a grade	66.9	—	—	—	33.1	67.2	—	—	—	32.7
Misbehavior in class	85.5	—	—	—	14.5	84.3	—	—	—	15.6
Expelled or suspended	72.0	—	—	—	28.0	71.7	—	—	—	28.3
Played hooky at least 2 x year	51.3	—	—	—	48.7	53.7	—	—	—	46.3
Trouble due to fighting at school	71.9	—	—	—	28.1	71.6	—	—	—	28.4
Trouble due to fighting	92.7	—	—	—	7.3	92.2	—	—	—	7.7
Ran away from home	89.8	—	—	—	10.2	88.5	—	—	—	11.4
Lying	86.5	—	—	—	13.5	87.1	—	—	—	12.9
Stealing	55.0	—	—	—	45.0	54.2	—	—	—	45.7
Destroyed property	84.8	—	—	—	15.2	85.3	—	—	—	14.6
Arrested as juvenile	84.3	—	—	—	15.7	84.5	—	—	—	15.5
Arrested after age 18	77.7	—	—	—	22.3	77.7	—	—	—	22.3
≥4 traffic tickets	53.8	—	—	—	46.2	55.6	—	—	—	44.3
Post-Traumatic Stress Disorder										
Dreams/recurrent thoughts of trauma	60.6	—	—	—	39.4	81.9	—	—	—	18.0
Sudden feeling trauma occurring	88.5	—	—	—	11.4	97.1	—	—	—	2.8
Detachment from others	93.2	—	—	—	6.7	94.9	—	—	—	5.1
Hyperalertness	82.2	—	—	—	17.7	93.9	—	—	—	6.0
Sleep disturbance	94.0	—	—	—	5.9	93.9	—	—	—	6.1
Survivor guilt	98.8	—	—	—	1.1	99.2	—	—	—	0.7
Difficulty concentrating	98.2	—	—	—	1.8	97.8	—	—	—	2.2
Avoidance of activities similar to trauma	96.9	—	—	—	3.1	97.4	—	—	—	2.5

[a]   No = no; Low = low level symptom; DMA = symptom due only to drugs, medications, or alcohol; Phys = symptom due only to physical illness; Yes = yes and not low level or due only to drugs, medications, alcohol, or physical illness. The number of questions for each diagnostic category vary, and some sections have more questions with skip patterns than others. Questions are listed in the order in which they appear in the Diagnostic Interview Schedule version used in the Vietnam Experience Study.

Table B.2 Lifetime Prevalence of Generalized Anxiety[a] Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	25.1	327	18.1	162
≥20	21.8	259	16.5	177
Year of Entry Into Service				
1965-1966	23.0	191	17.1	124
1967-1969	25.0	349	17.6	131
1970-1971	17.6	46	16.7	84
Race				
White	22.4	459	17.1	274
Black	26.2	75	18.0	43
Other	34.7	52	16.5	22
Type of Enlistment				
Draft	23.1	355	16.3	209
Volunteer	24.2	231	18.8	130
Primary Military Occupational Specialty				
Nontactical	23.2	381	16.6	244
Tactical	24.2	205	19.0	95
General Technical Score				
40-89	27.3	158	21.7	91
90-109	24.4	197	15.9	90
110-129	21.2	171	15.3	103
130-160	18.7	48	17.9	54
History of Childhood Behavior Problems				
<3	21.1	413	15.3	236
≥3	32.3	173	24.2	103
Regular Drug Use in the Army				
None	20.5	354	15.9	240
Marijuana only	27.2	140	20.4	57
Hard drugs	36.6	87	22.1	38

[a] With or without depression.

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Table B.3 Prevalence of Generalized Anxiety[a] During the Month Before Examination Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam %	Vietnam No.	Non-Vietnam %	Non-Vietnam No.
Age at Entry Into Service				
<20	5.8	76	3.5	31
≥20	4.0	47	3.0	32
Year of Entry Into Service				
1965-1966	6.0	50	2.3	17
1967-1969	4.7	66	3.2	24
1970-1971	2.7	7	4.4	22
Race				
White	4.6	95	3.1	49
Black	6.6	19	2.9	7
Other	6.0	9	5.3	7
Type of Enlistment				
Draft	4.7	72	2.9	37
Volunteer	5.4	51	3.8	26
Primary Military Occupational Specialty				
Nontactical	5.0	82	3.0	44
Tactical	4.8	41	3.8	19
General Technical Score				
40-89	8.3	48	5.0	21
90-109	4.7	38	2.5	14
110-129	4.2	34	2.8	19
130-160	0.8	2	3.0	9
History of Childhood Behavior Problems[a]				
<3	4.6	90	2.8	43
≥3	6.2	33	4.7	20
Regular Drug Use in the Army				
None	4.6	79	2.8	42
Marijuana only	4.9	25	4.3	12
Hard drugs	8.0	19	4.7	8

[a] With or without depression.

Table B.4 Lifetime Prevalence of Depression Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	13.1	170	9.9	89
≥20	11.9	141	6.3	68
Year of Entry Into Service				
1965-1966	12.2	101	6.9	50
1967-1969	13.1	183	8.7	65
1970-1971	10.3	27	8.4	42
Race				
White	11.8	242	8.8	140
Black	15.0	43	5.0	12
Hispanic and other	17.3	26	3.8	5
Type of Enlistment				
Draft	11.6	178	7.1	91
Volunteer	14.0	133	9.5	66
Primary Military Occupational Specialty				
Nontactical	11.8	193	7.5	111
Tactical	13.9	118	9.2	46
General Technical Score				
40-89	13.3	77	7.9	33
90-109	12.7	102	8.3	47
110-129	13.3	107	7.9	53
130-160	8.6	22	8.0	24
History of Childhood Behavior Problems				
<3	11.3	221	6.5	100
≥3	16.8	90	13.4	57
Regular Drug Use in the Army				
None	10.2	176	6.6	100
Marijuana only	15.2	78	11.8	33
Hard drugs	22.7	54	13.4	23

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Table B.5 Prevalence of Depression During the Month Before Examination Among Vietnam and Non-Vietnam Veterans According to Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	4.8	63	2.8	25
≥20	4.1	49	1.9	20
Year of Entry Into Service				
1965-66	3.9	32	1.4	10
1967-69	4.9	68	2.4	18
1970-71	4.6	12	3.4	17
Race				
White	3.6	73	2.2	35
Black	9.4	27	1.7	4
Hispanic and other	8.0	12	4.5	6
Type of Enlistment				
Draft	4.2	65	2.2	28
Volunteer	4.9	47	2.5	17
Primary Military Occupational Specialty				
Nontactical	4.4	73	2.4	35
Tactical	4.6	39	2.0	10
General Technical Score				
40-89	9.9	57	4.5	19
90-109	3.0	24	1.6	9
110-129	3.5	28	2.2	15
130-160	0.8	2	0.7	2
History of Childhood Behavior Problems				
<3	4.2	82	1.8	27
≥3	5.6	30	4.2	18
Regular Drug Use in the Army				
None	3.8	65	1.7	26
Marijuana only	4.9	25	4.6	13
Hard drugs	8.8	21	3.5	6

Table B.6 Lifetime Prevalence of Alcohol Abuse or Dependence Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	55.3	720	49.3	442
≥20	45.4	540	35.5	382
Year of Entry Into Service				
1965-1966	49.6	412	38.7	281
1967-1969	50.8	710	41.9	312
1970-1971	52.9	138	46.0	231
Race				
White	51.4	1055	41.8	669
Black	43.4	124	39.8	95
Hispanic and other	54.0	81	45.1	60
Type of Enlistment				
Draft	48.1	739	40.2	515
Volunteer	54.7	521	44.7	309
Primary Military Occupational Specialty				
Nontactical	50.2	824	39.9	588
Tactical	51.5	436	47.3	236
General Technical Score				
40-89	53.1	307	45.4	190
90-109	51.9	418	45.8	259
110-129	50.3	406	40.6	274
130-160	40.9	105.	31.2	94
History of Childhood Behavior Problems				
<3	44.5	869	35.0	542
≥3	73.0	391	66.4	282
Regular Drug Use in the Army				
None	43.8	756	36.4	550
Marijuana only	60.9	313	50.7	142
Hard drugs	76.5	182	73.3	126

Table B.7 Prevalence of Alcohol Abuse or Dependence During the Month Before Examination Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	16.3	212	11.6	104
≥20	10.9	129	7.3	78
Years of Entry Into Service				
1965-66	13.4	111	9.4	68
1967-69	14.1	197	7.9	59
1970-71	12.6	33	11.0	55
Race				
White	13.2	272	9.4	151
Black	15.0	43	6.7	16
Hispanic and other	17.3	26	11.3	15
Type of Enlistment				
Draft	12.6	194	8.4	108
Volunteer	15.4	147	10.7	74
Primary Military Occupational Specialty				
Nontactical	13.2	217	8.9	131
Tactical	14.6	124	10.2	51
General Technical Score				
40-89	15.9	92	10.0	42
90-109	14.1	114	11.3	64
110-129	13.1	106	9.0	61
130-160	10.5	27	5.0	15
History of Childhood Behavior Problems				
<3	10.0	196	6.5	100
≥3	27.1	145	19.3	82
Regular Drug Use in the Army				
None	9.7	167	6.6	100
Marijuana only	18.3	94	12.1	34
Hard drugs	31.9	76	27.9	48

Table B.8   Lifetime Prevalence of Drug Abuse or Dependence Among Vietnam and Non-Vietnam Veterans, by Selected Preservice and Military Service Characteristics

Characteristic	Vietnam		Non-Vietnam	
	%	No.	%	No.
Age at Entry Into Service				
<20	18.2	237	19.5	174
≥20	10.8	128	7.7	83
Years of Entry Into Service				
1965-66	10.1	84	7.7	56
1967-69	15.5	217	13.2	98
1970-71	24.5	64	20.6	103
Race				
White	14.0	288	12.2	195
Black	17.8	51	19.8	47
Hispanic and other	17.3	26	11.3	15
Type of Enlistment				
Draft	12.2	188	10.3	132
Volunteer	18.6	177	18.1	125
Primary Military Occupational Specialty				
Nontactical	14.2	233	11.8	174
Tactical	15.6	132	16.7	83
General Technical Score				
40-89	13.0	75	15.4	64
90-109	13.3	107	13.1	74
110-129	17.6	142	13.4	90
130-160	12.9	33	9.0	27
History of Childhood Behavior Problems				
<3	10.9	212	8.9	137
≥3	28.5	153	28.3	120

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Table B.9 Lifetime Prevalence of Psychiatric Conditions From the Diagnostic Interview Schedule According to Criteria in the Diagnostic and Statistical Manual, Version 3 (DSM-III)

Condition	Vietnam		Non-Vietnam	
	%	No.	%	No.
Post-Traumatic Stress Disorder (Any)				
None	84.5	2102	97.0	1911
Ever, not severe	5.1	126	1.0	19
Ever, severe	10.4	260	2.0	41
Generalized Anxiety				
Never	76.5	1904	82.8	1633
Ever, before age 18 only	0.1	2	0.0	0
Ever, meets DSM-III criteria	15.7	391	12.6	249
Ever, before 18 with depression or schizophrenia	0.0	1	0.0	0
Ever, with schizophrenia or depression	7.7	192	4.6	90
Depression				
Never	87.5	2179	92.0	1815
Ever, meets DSM-III criteria	11.0	273	6.6	131
Ever, during bereavement only	0.5	12	0.5	10
Ever, with schizophrenia	1.0	26	0.8	16
Depression: Single Episode				
Never	97.8	2434	97.7	1927
Ever, not manic, meets DSM-III criteria	2.3	56	2.3	45
Depression: Recurrent				
Never	91.7	2283	95.4	1881
≥1 Episode, not manic, meets DSM-III criteria	7.7	191	4.1	80
≥1 Episode, with schizophrenia	0.6	16	0.6	11
Depression: Bipolar				
Never	97.9	2437	99.1	1954
Manic and depressed, meets DSM-III criteria	1.2	29	0.4	8
Manic, depressed, with schizophrenia	0.5	13	0.4	7
Manic, not depressed, with schizophrenia	0.2	4	0.0	0
Not manic, depressed, with schizophrenia	0.3	7	0.2	3
Depression: Atypical Bipolar				
Never	98.6	2455	99.2	1957
Depressed, with hypomania, meets DSM-III criteria	1.0	26	0.5	10
Depressed, hypomania and schizophrenia	0.4	9	0.3	5
Dysthymia				
Never	93.4	2325	96.6	1905
Ever, meets DSM-III criteria	1.7	43	1.3	25
Ever, with depression	4.9	122	2.1	42
Mania				
Never	97.9	2437	99.1	1954
Ever, meets DSM-III criteria	1.7	42	0.8	15
Ever, with schizophrenia	0.4	11	0.2	3
Alcohol Abuse or Dependence				
Never	49.4	1230	58.2	1148
Abuse without dependence	18.8	468	18.5	364
Dependence without abuse	4.3	106	2.9	57
Both abuse and dependence	27.6	686	20.4	403
Drug Abuse or Dependence				
Never	85.3	2125	87.0	1712
Abuse without dependence	1.6	39	2.1	41
Dependence without abuse	7.7	192	6.7	131
Both abuse and dependence	5.4	134	4.3	85

Table B.9 Lifetime Prevalence of Psychiatric Conditions From the Diagnostic Interview Schedule According to Criteria in the Diagnostic and Statistical Manual, Version 3 (DSM-III) — Continued

Condition	Vietnam		Non-Vietnam	
	%	No.	%	No.
Antisocial Personality				
Never	77.0	1918	78.9	1555
Possible ≥2 childhood, ≥3 adult problems	12.1	300	11.3	223
Ever ≥3 childhood, ≥4 adult problems	9.7	242	9.1	180
Possible, with mania or schizophrenia	0.5	13	0.2	4
Ever, with mania or schizophrenia	0.7	17	0.5	9
Obsessive				
Never	98.3	2448	98.9	1949
Ever, meets DSM-III criteria	0.5	12	0.7	14
Ever, with depression or schizophrenia	1.2	30	0.4	8
Phobia				
Never	91.8	2285	95.9	1891
Ever, meets DSM-III criteria	6.4	159	3.6	70
Ever, with depression, schizophrenia, or obsession	1.9	46	0.6	11
Panic				
Never	96.6	2405	98.5	1942
Ever, meets DSM-III criteria	1.0	24	0.7	13
Ever, no depression, schizophrenia, or agoraphobia	2.5	61	0.9	17
Somatization Disorder (Past Year Only)				
Never	98.3	2448	99.3	1958
Ever, meets DSM-III criteria, questions from medical history questionnaire	1.7	42	0.7	14
Schizophrenia				
Never	98.6	2455	99.4	1961
Ever, meets DSM-III criteria	0.8	20	0.4	7
Ever, meets DSM-III criteria but no current symptoms	0.2	4	0.1	2
Ever, but do not meet hierarchy criteria	0.4	9	0.1	1
Ever, but no current symptoms and does not meet hierarchy criteria	0.1	2	0.1	1
Schizophreniform Disorder				
Never	99.8	2485	100.0	1972
Ever, meets DSM-III criteria	0.1	2	0.0	0
Ever, but does not meet hierarchy criteria	0.1	2	0.0	0
Ever, but does not meet hierarchy criteria and no current symptoms	0.0	1	0.0	0

Table B.10 Effect of DSM-III Exclusion Criteria on the Lifetime Prevalence of Psychiatric Conditions

Condition	No Exclusions					Exclusions					
	Vietnam		Non-Vietnam		Crude	Vietnam		Non-Vietnam		Crude	Type of
	%	No.	%	No.	OR	%	No.	%	No.	OR	Exclusion[a]
Anxiety Disorders											
Post-traumatic stress disorder (any)											
Never	84.5	2102	97.0	1911	5.8	—	—	—	—	—	None
Ever	15.5	386	3.0	60							
Generalized anxiety[b,c]											
Never	76.5	1904	82.8	1663	1.5	83.0	1904	86.8	1633	1.3	Schiz
Ever	23.5	586	17.2	339		17.0	391	13.2	249		Depr
Phobia[b]											
Never	91.8	2285	95.9	1891	2.1	92.3	2285	95.9	1891	2.0	Schiz
Ever	8.2	205	4.1	81		7.8	192	4.1	81		
Panic[b]											
Never	96.3	2397	98.3	1939	2.3	96.6	2397	98.4	1939	2.1	Schiz
Ever	3.7	93	1.7	33		3.4	85	1.6	32		
Obsession[b]											
Never	98.3	2448	98.9	1949	1.5	98.4	2430	99.0	1944	1.6	Schiz
Ever	1.7	42	1.1	22		1.6	40	1.0	20		
Affective Disorders											
Depression											
Never	87.5	2179	92.0	1815	1.7	88.9	2179	93.3	1815	1.7	Schiz
Ever	12.5	311	8.0	157		11.1	273	6.7	131		Bereav
Dysthymia											
Never	93.4	2325	96.6	1905	2.0	98.2	2325	98.7	1905	1.4	Depr
Ever	6.6	165	3.4	67		1.8	43	1.3	25		
Mania											
Never	97.9	2437	99.1	1954	2.4	98.3	2437	99.2	1954	2.2	Schiz
Ever	2.1	53	0.9	18		1.7	42	0.8	15		

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Table B.10 Effect of DSM-III Exclusion Criteria on the Lifetime Prevalence of Psychiatric Conditions — Continued

	No Exclusions					Exclusions					
	Vietnam		Non-Vietnam		Crude	Vietnam		Non-Vietnam		Crude	Type of
Condition	%	No.	%	No.	OR	%	No.	%	No.	OR	Exclusion[a]
Substance Use Disorders											
Alcohol abuse and/or dependence											
Never	49.4	1230	58.2	1148	1.4	—	—	—	—		None
Ever	50.6	1260	41.8	824		—	—	—	—		
Drug abuse and/or dependence											
Never	85.3	2125	87.0	1712	1.1	—	—	—	—		
Ever	14.7	365	13.0	257		—	—	—	—		None
Character Disorders											
Antisocial Personality											
Never	77.0	1918	78.9	1555	1.1	78.0	1918	79.4	1555	1.1	Schiz
Ever	23.0	527	21.1	416		22.0	542	20.6	403		Mania
Somatization Disorders[d]											
Somatization (past year)											
Never	98.3	2448	99.3	1958	2.4	—	—	—	—		None
Ever	1.7	42	0.7	14		—	—	—	—		

[a] Schiz = schizophrenia; Bereav = bereavement; Depr = Depression; Mania = Mania.
[b] Individuals with both depression and an anxiety disorder not excluded in this analysis.
[c] Individuals with symptoms of generalized anxiety disorder before the age of 18 are not excluded because symptoms could be associated with military service.
[d] Somatization section was deleted from the Diagnostic Interview Schedule. Diagnosis was made by applying DSM-III criteria to responses in the medical history questionnaire.

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Table B.11   Lifetime Prevalence of Psychiatric Conditions According to DIS Criteria Among Veterans Who Served in Vietnam, Korea, Germany, or CONUS[a]

Condition	Vietnam (N=2490) %	Korea (N=322) %	Germany (N=816) %	CONUS (N=834) %	P-value[b]	Referent = Germany and Korea Crude OR	95% CI	Referent = All Non-Vietnam Veterans Crude OR	95% CI
Anxiety Disorders									
Post-traumatic stress disorder (any)	15.5	1.9	2.8	3.7	0.23	7.0	4.8-10.3	5.8	4.4-7.7
Generalized anxiety	23.5	15.2	16.9	18.2	0.46	1.6	1.3-1.9	1.5	1.3-1.7
Phobia	8.2	4.4	5.0	3.1	0.15	1.8	1.3-2.4	2.1	1.6-2.7
Panic	3.7	1.9	2.2	1.1	0.20	1.8	1.1-2.8	2.3	1.5-3.4
Obsession	1.7	0.6	1.1	1.3	0.60	1.8	0.9-3.4	1.5	0.9-2.5
Affective Disorders									
Depression	12.5	9.6	7.1	8.2	0.36	1.7	1.3-2.2	1.7	1.4-2.0
Mania	2.1	0.3	1.1	1.0	0.44	2.5	1.2-4.8	2.4	1.4-4.0
Substance Use Disorders									
Alcohol abuse or dependence	50.6	41.9	43.4	40.2	0.42	1.4	1.2-1.6	1.4	1.3-1.6
Drug abuse or dependence	14.7	13.7	14.0	11.9	0.41	1.1	0.9-1.3	1.1	1.0-1.4
Somatization (Past Year)	1.7	0.0	1.1	0.6	0.12	2.2	1.0-4.4	2.4	1.3-4.4
Antisocial Personality	23.0	20.5	21.0	21.5	0.93	1.1	1.0-1.3	1.1	1.0-1.3
Schizophrenia	1.4	0.0	0.6	0.7	0.33	3.2	1.3-8.3	2.5	1.3-5.0

[a]   Continental United States.
[b]   Null hypothesis that lifetime prevalence is the same among veterans who served in Korea, Germany, and CONUS.

Table B.12 Crude ORs, and ORs Adjusted for Validity Scales From the MMPI for Selected DIS-Diagnosed Psychiatric Conditions (Lifetime Prevalence)

Condition	Crude Results OR	Crude Results 95% CI	Adjusted Results[a] OR	Adjusted Results[a] 95% CI
Anxiety Disorders				
Post-traumatic stress disorder (Any)	5.8	4.4-7.7	5.8	4.3-7.7
Generalized anxiety	1.5	1.3-1.7	1.5	3-1.7
Phobia	2.1	1.6-2.7	1.5	5-2.5
Panic	2.3	1.5-3.5	2.0	3-3.0
Depression	1.7	1.4-2.0	1.5	2-1.9
Substance Use Disorders				
Alcohol abuse and/or dependence	1.4	1.3-1.6	1.4	2-1.6
Drug abuse and/or dependence	1.1	1.0-1.4	1.1	0.9-1.3
Antisocial personality	1.1	1.0-1.3	1.1	0.9-1.2

[a] Adjusted for F scale (<70, ≥70), L scale (<70, ≥70), test-retest scale (<4, ≥4), F/K scale (<10, ≥10). Conditions with <100 cases in both cohorts combined are not included in this analysis.

Table B.13 Lifetime Prevalences of Symptoms of Generalized Anxiety and Depression Among Vietnam and Non-Vietnam Veterans

Symptom	Vietnam %	Vietnam No.	Non-Vietnam %	Non-Vietnam No.	Crude Results OR	Crude Results 95% CI
Generalized Anxiety						
Motor tension	24.1	601	17.6	347	1.5	1.3-1.7
Autonomic hyperactivity	20.0	498	12.8	253	1.7	1.4-2.0
Apprehensive expectation	24.8	617	18.4	363	1.5	1.3-1.7
Vigilance and scanning	23.3	581	17.3	341	1.5	1.3-1.7
Depression						
Dysphoria	39.1	973	35.2	695	1.2	1.0-1.3
Weight loss or gain	9.9	247	7.1	139	1.5	1.2-1.8
Sleep disturbance	15.1	375	10.9	215	1.4	1.2-1.7
Slow or restless	8.4	208	5.2	103	1.7	1.3-2.1
Sexual disinterest	3.2	79	2.7	54	1.2	0.8-1.7
Fatigue	9.4	235	6.6	130	1.5	1.2-1.8
Guilt	10.9	272	8.2	161	1.4	1.1-1.7
Trouble concentrating	12.8	318	8.1	160	1.7	1.4-2.0
Felt like wanting to die	8.2	203	5.9	117	1.4	1.1-1.8
Thought about suicide	19.1	476	16.5	326	1.2	1.0-1.4
Attempted suicide	3.5	87	2.9	58	1.2	0.9-1.7

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Table B.14   Lifetime Prevalences of Symptoms or Behaviors Related to Alcohol Abuse o: Dependence Among Vietnam and Non-Vietnam Veterans

Symptom or Behavior	Vietnam		Non-Vietnam		Crude Result:	
	%	No.	%	No.	OR	95% CI
Pathological Use						
≥1/5 liquor in 1 day	48.2	1199	41.6	819	1.3	1.2- 5
Wants to stop drinking but can't	9.5	237	7.0	138	1.4	1.1-'7
Attempts to control drinking	9.8	243	7.4	146	1.4	1.1-'7
Blackouts while drinking	28.9	720	25.9	511	1.2	1.0-'3
Continues drinking when physical illness may get worse	5.0	125	3.8	75	1.3	1.0-'.8
Can't do ordinary work without drink	5.8	144	3.5	69	1.7	1.3-2.3
Impairment in Social or Occupational Functioning						
Family complains about drinking	35.5	883	30.6	604	1.2	1.1-1.4
Others complain about drinking	15.8	394	13.4	264	1.2	1.0-1.4
Job or school trouble due to drinking	8.5	211	5.3	105	1.6	1.3-2.1
Lost job or expelled from school due to drinking	4.0	99	3.0	59	1.3	1.0-1.9
Had accident or arrested for drunk driving	23.8	592	20.2	398	1.2	1.1-1.4
Other drinking arrest	17.8	442	14.8	291	1.2	1.1-1.5
Physical fights while drinking	33.3	828	29.3	578	1.2	1.1-1.4
Tolerance or Withdrawal						
≥7 drinks/day for ≥2 wks	28.6	711	20.8	410	1.5	1.3-1.7
Drinks before breakfast	8.4	208	5.9	117	1.4	1.1-1.8
Shakes from lack of alcohol	12.1	300	9.6	190	1.3	1.1-1.6

Table B.15   Lifetime Prevalences of Symptoms or Behaviors Related to Drug Abuse or Dependence Among Vietnam and Non-Vietnam Veterans

Symptom or Behavior	Vietnam		Non-Vietnam		Crude Results	
	%	No.	%	No.	OR	95% CI
Pathologic Use						
Used each day for ≥2 wks.	24.1	601	20.3	400	1.2	1.1-1.4
Overdose or health problems due to drugs	4.0	100	3.2	63	1.3	0.9-1.7
Tried but couldn't cut down	4.4	110	3.6	71	1.2	0.9-1.7
Emotional problems due to drugs	12.7	316	10.4	205	1.3	1.0-1.5
Impairment in Social or Occupational Functioning Problems with family, friends, job, school, or police	7.5	187	6.8	134	1.1	0.9-1.4
Tolerance or Withdrawal Need larger amounts for effect	11.2	279	9.6	189	1.2	1.0-1.4
Withdrawal symptoms	6.8	169	5.0	98	1.4	1.1-1.3

APPENDIX C

Detailed Descriptions of Minnesota Multiphasic Personality Inventory Scales

MINNESOTA MULTIPHASIC PERSONALITY INTERVIEW

The Minnesota Multiphasic Personality Inventory (MMPI) is a standardized inventory designed to "provide in quantitative form a set of evaluations of personality status and emotional adjustment. Each subject is asked to answer 566 different items either True or False as they apply to him, although he may also indicate that some of them do not apply" (Dahlstrom *et al.* 1972). Standard computerized scoring provided scores for 4 validity indicators and 10 clinical or personality scales. In this study we obtained scores for numerous special subscales and research scales (described below). We obtained scores for the following validity, clinical, and special scales: (note: all descriptions were taken from Volume I, *Clinical Interpretation*, of *An MMPI Handbook, Revised Edition* (Dahlstrom WG, Welsh GS, Dahlstrom LE. Minneapolis: University of Minnesota, 1972), and do not represent comprehensive interpretive statements):

STANDARD VALIDITY SCALES

Cannot Say (?) Scale - represents the total number of items the veteran omitted or double-marked. "The most likely cause of an excessive number of Cannot Say responses is that the person completing the test has been unable to comprehend the content of many of the MMPI statements (p.103)." "A second important basis for large numbers of unanswered items is failure to enlist the full cooperation of the test subject." (p.103) "A related problem but one which is likely to take a somewhat different form of expression is the tendency to omit items defensively." (p.103) Since 96.8% of the veterans in this study received 0 scores on this scale, and since only 8 subjects had scores over 30 (a level that may weaken the scoring and interpretation of the other scales), we did not use the Cannot Say scale in the total analysis. The 8 subjects whose scores were so elevated also had elevated scores on other validity scales (L and F) and were therefore identified as having invalid profiles.

L Scale - "is a fifteen item scale designed to identify deliberate or intentional efforts to evade answering the test frankly and honestly." (p. 109) "The content refers to denial of aggression, bad thoughts, weakness of character or resolve, poor self-control, prejudices, and even minor dishonesties." (p. 109) High scores on the L scale typically suggest a "suppressive effect" on clinical profile elevations. "Valid elevations in the high to markedly elevated ranges are most likely to be generated by subjects who are honestly describing themselves as they see themselves. They tend, therefore, to be overly conventional, socially conforming, and prosaic." (p. 158) "Less frequently, an elevated L scale indicates that the subject has deliberately slanted his test answers to create a special impression of freedom from any psychological problem or characterlogical fault (p. 158)." A T-score ≥70 was used as a case definition.

F scale - "This scale has variously been designated as the frequency (or infrequency) scale, the confusion scale, and sometimes merely as the validity scale. It was designed to detect unusual responding or atypical ways of answering test items." (pp. 112-113) "Efforts to hide serious psychopathology and deliberately fake a good test record may lead to very low F scale scores (p. 159)." Moderately high levels may be related to "difficulties in reading and interpreting the test statements or comprehending the test instructions, severe neurotic or moderate psychotic reactions which lead the test subjects to report these unusual feelings and experiences, or behavioral disturbances that affect test cooperation." (p. 160) "Very high F scale values are rare among neurotic or intact psychotic patients but are given by more severely disorganized psychotic patients, severly disturbed alcoholics on the brink of

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delirium tremens, very uncooperative subjects with behavior problems, or persons with marginal reading comprehension." (p. 160) A T-score ≥85 was used for case definition.

K scale - "The development of the K scale was devoted to increasing the sensitivity of the validity indices on the test, to identify the impact of more subtle score-enhancing or score-diminishing factors, and to providing a means of statistically correcting the values of the clinical scales themselves to offset the effect of these factors on the clinical profile ' (p. 120) All clinical scale scores in this research were K-corrected, as is standard practice. "Markedly low T scores on K raise the immediate concern that the subject has fabricated his answers on the test or exaggerated his problems to create the impression that he is undergoing a serious emotional disturbance. Obviously, the motivation for such test slanting may arise from deliberate malingering, from special pleading for help or attention, or from a general state of panic in which the subject believes for the moment that his world or his control over his destiny is rapidly disintegrating." (p. 164) "Moderately elevated and markedly elevated K scores, therefore, are generally indicative of consistent efforts on the part of these test subjects to maintain an appearance of adequacy, control, and effectiveness." (p. 166) A T-Score of >70 was used as a case definition.

ALTERNATIVE VALIDITY SCALES

Carelessness Scale - This scale is made up of 24 pairs of items that have similar content but are asked about in different manners. A high score on this scale suggests that a veteran has not been consistent (reliable) in his responses. A subject who had a score greater than 5 on this scale was classified as "unreliable" (case definition).

Test-Retest Scale (T-R) - This scale is comprised of 16 items which are repeated within the MMPI. A high score on this scale suggests that a veteran has not been reliable in his responses. A subject with a score greater than 5 on this scale was classified as 'unreliable' (case definition).

STANDARD CLINICAL SCALES

Note that the case definition for all clinical scales was T-Score ≥70.

Scale 1 (Hs) - "The first scale published on the MMPI was an attempt to measure the personality characteristics related to the neurotic pattern of hypochondriasis. Persons diagnosed to have this disorder show abnormal concern for bodily functions. Their worries and preoccupations with physical symptoms typically persist in the face of strong evidence against any valid physical infirmity or defect." (p. 178) "The classic picture of hypochondriacs also includes egocentricity, immaturity, and lack of insight into the emotional basis for their preoccupations with somatic processes." (p. 178) "The more frequent diagnostic implications of high scale 1 scores are (a) various somatic reactions like hypochondriasis and neurasthenia, (b) depressive reactions with important anxiety features like reactive depression, involutional melancholia, and agitated depression, (c) hysterias, both anxiety hysteria and conversion hysteria, and (d) anxiety state, anxiety condition, and the like." (p. 183)

Scale 2 (D) - "The second scale in the clinical profile was established empirically to measure the degree and depth of the clinical symptom pattern of depression. This mood state is characterized generally by pessimism of outlook on life and the future, feelings of hopelessness or worthlessness, slowing of thought and action, and frequently by preoccupation with death and suicide." (p. 184) "With psychiatric populations, scale 2 generally

reflects disturbance and discomfiture about failure to achieve satisfactions and a: justment."
(p. 188) "Scale 2 appears in a variety of combinations with other scales in the profile; the
behavioral, characterlogical, and prognostic implications of elevations on scale 2 depend
upon the other features of the MMPI curve." (p. 189)

Scale 3 (Hy) - "This scale was developed to aid in the identification of patien s using the
neurotic defenses of the conversion form of hysteria. These patients appear to use physical
symptoms as a means for solving difficult conflicts or avoiding mature responsibilities. This
resort to physical disorder may appear only under stress." (p. 191)

Scale 4 (Pd) - "This scale was developed to measure the personality characteristics of the
amoral and asocial subgroup of persons with psychopathic personality disorders. The major
features of this personality pattern include a repeated and flagrant disregard for social
customs and mores, an inability to profit from punishing experiences as shown in repeated
difficulties of the same kind, and an emotional shallowness in relation to others, particularly
in sexual and affectional display." (p. 195)

Scale 5 (Mf) - "Scale 5 was designed to identify the personality features related to the
disorder of male sexual inversion. The feminism of these men appears in their values,
attitudes and interests, and styles of expression and speech, as well as in sexual
relationships." (p. 201) "High 5 males in the normal population were characterized by their
peers as sensitive and prone to worry, idealistic and peaceable, sociable and curious, and
as having general aesthetic interests". (p. 205)

Scale 6 (Pa) - "This scale was developed to evaluate the clinical pattern of paranoia."
"The concept of paranoia involves a set of delusional beliefs, frequently including delusions
of reference, influence, and grandeur." (p. 207)

Scale 7 (Pt) - "This scale was derived in the evaluation of the neurotic pattern of
psychasthenia, or the obsessive-compulsive syndrome. The personality features i cluded, in
addition to the obsessive ruminations and the compulsive behavioral rituals, are some forms
of abnormal fears, worrying, difficulties in concentrating, guilt feelings, and excessive
vacillation in making decisions." (p. 211)

Scale 8 (Sc) - "The psychotic pattern of schizophrenia for which this scale was derived is
very heterogeneous and contains many contradictory behavioral features. This may be in
part a result of the way that the pattern is identified in terms of bizarre or unusual thoughts
or behavior. Most commonly, persons showing this psychiatric reaction are chara terized as
constrained, cold, and apathetic or indifferent. Other people see them as remote and
inaccessible, often seemingly sufficient unto themselves. Delusions with varying : egrees of
organization, hallucinations, either fleeting or persistent and compelling, and disorientation
may appear in various combinations." (p. 215)

Scale 9 (Ma) - "The personality pattern for which this scale was derived is the affective
disorder hypomania. Three features characterize this pattern: overactivity, emotional excite-
ment, and flight of ideas. The mood may be good-humored euphoria but may on occasion
be irritable, and temper outbursts are frequent." (p. 220)

Scale 0 (Si) - This scale measures a "person's uneasiness in social situations or n dealing
with others." (p. 225) This scale was developed in relationship to social in oversion-
extroversion. "The high scorer on scale 0 also denies many impulses, temptat ons, and
mental aberrations. The conservative nature of many of the replies is striking, an: a strong
self-depreciatory trend is evident." (p. 225)