

Psychiatric and Non-Psychiatric Predictors of Disability Discharge Disposition
for Navy Personnel with a Mental Health Problem:
A Replication and Extension

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Summary

Problem

Kilbourne, Chesson, and Hilton (1988) found that Physical Evaluation (PE) Board determinations for back-problem cases were related to severity of the problem and length of service. An important question is whether Navy PE Boards uniformly invoke these same two criteria regardless of the type of medical problem. If so, those back-problem results should replicate in the analysis of a different type of medical problem.

Objective

The main purpose of this study was to examine the extent to which severity of mental health diagnosis (i.e., psychotic [functional and organic] versus nonpsychotic) and length of service predict medical discharge disposition (severance pay versus temporary disability retirement). There was also interest in examining the extent to which mental health diagnoses were consistent from time of hospitalization to time of last PE Board determination. Lastly, this study provided an opportunity to elaborate on the contribution of entitlement costs to the total costs of medical care.

Approach

The approach of this study was to analyze data from the Navy Enlisted Career/Medical History File regarding the type of medical disability discharge awarded by PE Boards to active duty, enlisted Navy personnel with a mental health problem, in relation to severity of diagnosis, length of service, pay-grade, presence of a secondary diagnosis, and number of hospital admissions. The sample (N=1,485) consisted of all incidences of PE Board dispositions of either severance pay or temporary disability retirement between 1981 and 1984, inclusive, for active duty, enlisted Navy personnel who had been hospitalized with a mental health problem as the primary diagnosis.

Findings

Findings indicated that severity of mental health diagnosis and length of service significantly predicted medical discharge disability. Hence, results for mental health problems replicated results for back problems, wherein the same two primary criteria (i.e., the severity rule and the 20-year service rule) considered by PE Boards significantly predicted medical discharge

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disposition. This replication provides substantial evidence of uniform determination procedures by Navy PE Boards, as well as additional empirical support for the notion of considering entitlement benefits in the total costs of medical care. It was also found that nonpsychotic primary diagnoses at time of hospitalization were likely to shift to psychotic diagnoses by the time of last PE Board determination.

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Introduction

In a recent analysis of U.S. Navy Physical Evaluation (PE) Board medical discharge dispositions (i.e., severance pay versus temporary disability retirement) for back-problem cases, Kilbourne, Chesson, and Hilton (1988) found that discharge dispositions were related to the severity of the back problem and the individual's length of service. The severity rule (i.e., a minimum of 30% level of disability) for awarding disability compensation was more determinant for individuals with less than twenty years of service, while the 20-year rule (i.e., a minimum of 20 years of service creditable for retirement) was more determinant for those with twenty years or more of service. These findings were consistent with PE Board regulations ((SECNAVISNT 1850.4B [7 Dec. 87], Appendix B--SS 1201, SS 1202, SS 1203, SS 1204, SS 1206) and provided support for the argument that costs of entitlement should be considered in addition to medical and administrative costs when attempting to assess the total costs of medical problems of active duty, enlisted Navy personnel.

The Kilbourne, et al. (1988) study prompts several questions of interest. One concerns whether the findings for back-problem cases generalize to other medical problems as well. The underlying question is: Do Navy PE Boards uniformly invoke the severity and twenty-year rules to determine disability compensation regardless of the type of medical problem? If so, then findings and implications of the Kilbourne, et al. (1988) back problem study should replicate in an analysis based on a different type of medical problem. For such a replication, mental health problems might pose a tough-case test because mental health diagnoses are generally less reliable (Faust & Ziskin, 1988) than medical diagnoses. Clinical trials with mental health professionals, for

example, have indicated that for specific categories of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (1980) (the leading diagnostic manual for mental health practitioners in the United States) there is often more disagreement than agreement (Drake & Vaillant, 1985; Lieberman & Baker, 1985; Mellso, Varghese, Joshua, & Hicks, 1982). Further, Kolb, Gunderson, and Coben (1982) found in their study of a small sample of Navy personnel hospitalized for mental problems, a shift in diagnosis from time of admission to time of discharge. Therefore, clinical uncertainty concerning a specific diagnostic category increases the likelihood that PE Boards may, in turn, make a faulty determination. For example, if a given diagnosis implies a 30% or greater disability and is incorrect (e.g., a false positive), then temporary disability retirement could be mistakenly awarded.

A second question of interest is prompted by the Kolb, et al. (1982) findings just mentioned. Would a similar shift across time in mental problem diagnoses be indicated for a larger sample of active duty, enlisted Navy personnel? A third question of interest is whether mental health problem discharges from the Navy would imply the same entitlement costs as back-problem medical discharges. That is, Kilbourne, et al. (1988) concluded in their discussion of Navy PE Board determinations that costs of entitlement should be considered in addition to medical and administrative costs when attempting to assess the total costs of the medical care of active duty, enlisted Navy personnel. (Their reasoning was largely based on the fact that disabled Navy personnel with 20 years of service creditable for retirement are awarded a tax exemption on their military retirement which is equivalent to the percent level of disability established [e.g., a 30% disability signifies a 30% tax exemption].) A replication of their findings would strengthen that costs argument and shed light on some of the costs of mental health problems to the U.S. Navy.

Hence, three objectives defined the present study. One objective was to examine the extent to which the Kilbourne, et al. (1988) findings with back problems would generalize to mental health problems. More specifically, do the severity and 20-year rules predict the awarding of severance pay versus temporary disability retirement to active duty enlisted, Navy personnel with a mental health problem? A second objective was to identify and evaluate any shift in diagnosis from time of hospitalization to time of last PE Board

determination. The third objective was to evaluate costs of entitlement, especially as a result of loss of tax revenue to the U.S. government, in light of Navy mental-health problem medical discharges.

Methods

Subjects

The sample (N=1,450) consisted of all incidences of PE Board dispositions of either severance pay or temporary disability retirement between 1981 and 1984, inclusive, for active duty, enlisted Navy personnel who had been hospitalized with a mental health problem as a primary diagnosis. Data were obtained from the Navy Enlisted Career/Medical History File (NECMHF). NECMHF is based on two compiled files. One is the Service History File, which consists of demographic and military-service history data from Navy Military Personnel Command in Arlington, Virginia. The other is the Medical History File, which contains hospitalization, death, Medical Board action, and Physical Evaluation Board action data from Naval Medical Data Services Center in Bethesda, Maryland. NECMHF is compiled and maintained by the Naval Health Research Center, San Diego, California (Garland, Helmkamp, Gunderson, Gorham, Miller, McNally, & Thompson, 1987).

Coding

Mental-problem primary diagnosis at time of hospitalization was treated as an ordinal variable (psychotic diagnosis [generally more severe and chronic--organic and functional] versus nonpsychotic diagnosis [less likely to be severe and chronic]).² Also treated as ordinal variables, as in the Kilbourne, et al. (1988) study, were medical discharge disposition (severance pay [a one-time benefit] versus temporary disability retirement [an extended benefit]), paygrade (E1, E2-E4, E5-E6, and E7-E9), and length of service (less than 20 years of service versus 20 years or more of service). Two control variables--presence of secondary diagnosis (no versus yes) and admission history (first admission case versus multiple admission case)--were treated as categorical variables.

Results

An analysis of the cross-tabular frequency distributions of medical discharge disposition by severity of diagnosis, length of service, and paygrade revealed significant relationships among these variables (the p values for all chi square tests were $\leq .0001$). The proportional reductions of error (Kendall

tau-b)³ in predicting medical discharge disposition from each of the predictor variables were significant ($p < .0001$). Knowledge of an individual's length of service alone would reduce the errors in predicting medical discharge disposition by 23%, while knowledge of paygrade or diagnostic severity alone would each reduce prediction errors by 11%.

Using the partial tau-b procedure to control for a third variable (Agresti & Agresti, 1979; Blalock, 1979), the relationship between severity of diagnosis and medical discharge disposition remained statistically unchanged when controlling for paygrade ($\bar{r}_b = .12$), presence of secondary diagnosis ($\bar{r}_b = .10$), and admissions history ($\bar{r}_b = .11$). The relationship between length of service and medical discharge disposition remained statistically unchanged when controlling for severity of diagnosis ($\bar{r}_b = .27$), presence of secondary diagnosis ($\bar{r}_b = .29$), and admission history ($\bar{r}_b = .24$). The relationship between paygrade and medical discharge disposition remained statistically unchanged when controlling for severity of diagnosis ($\bar{r}_b = .18$), presence of secondary diagnosis ($\bar{r}_b = .21$), and admission history ($\bar{r}_b = .12$).

On the other hand, the tau-b analysis indicated a significant interaction between medical discharge disposition, paygrade, and length of service. The relationship between length of service and medical discharge disposition was weakened by 17% when controlling for paygrade ($\bar{r}_b = .19$). The relationship between paygrade and medical discharge disposition was weakened by 18% when controlling for length of service ($\bar{r}_b = .09$). While both associations remained positive and reduced about the same amount after controlling for the other, the association between length of service and medical discharge disposition remained twice as strong. Thus, length of service is a better statistical predictor (Blalock, 1979) of medical discharge disposition. Additionally, the relationship between severity of diagnosis and medical discharge disposition was weakened by approximately 46% ($\bar{r}_b = .06$) when controlling for length of service. Table 1 shows the effect of the control variables on the relationship between the predictor variables and medical discharge disposition.

A close inspection of the partial-association tables clarified the nature of these effects. Paygrade levels E5 and above were more likely than lower paygrade levels to have twenty years of service creditable for retirement, and could, therefore, more likely benefit from the twenty-year rule entitling them to temporary disability retirement. Figure 1 shows the positive relationship between paygrade and percent receiving temporary disability retirement for

those with twenty years or more of service in the U.S. Navy. Figure 2 shows that psychotic diagnosis had a positive effect upon temporary disability retirement award for individuals with less than twenty years of service. This is compared to individuals with twenty years of service creditable for retirement who received temporary disability retirement independent of the severity of diagnosis.

Table 1

Effect of Control Variables on Relationships of
Medical Discharge Disposition with Predictor Variables^a

	<u>Medical Discharge Disposition</u>	<u>Control Variables</u>				
		<u>Severity</u>	<u>LOS</u>	<u>Paygrade</u>	<u>Presence of Secondary Diagnosis</u>	<u>Admission History</u>
Severity of diagnosis (at time of hospitalization)	.11	--	.06	.12	.10	.11
Length of Service	.23	.27	--	.19	.29	.24
Paygrade	.11	.18	.09	--	.21	.12

^aAll table values represent tau-b coefficients of medical discharge disposition with the row (predictor) variable.

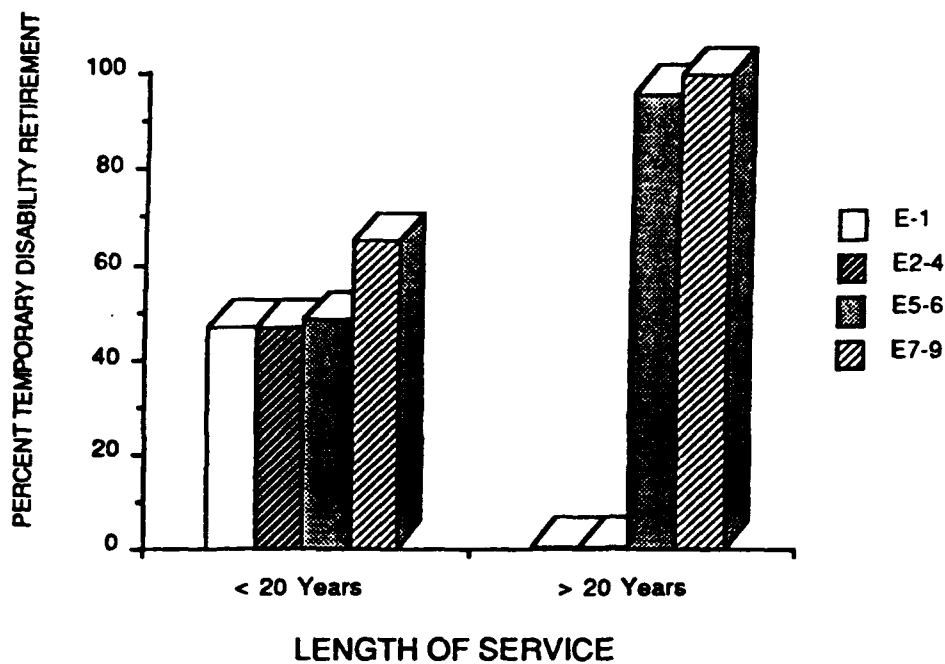


Figure 1. Percent Receiving Temporary Disability Retirement by Length of Service and Paygrade.

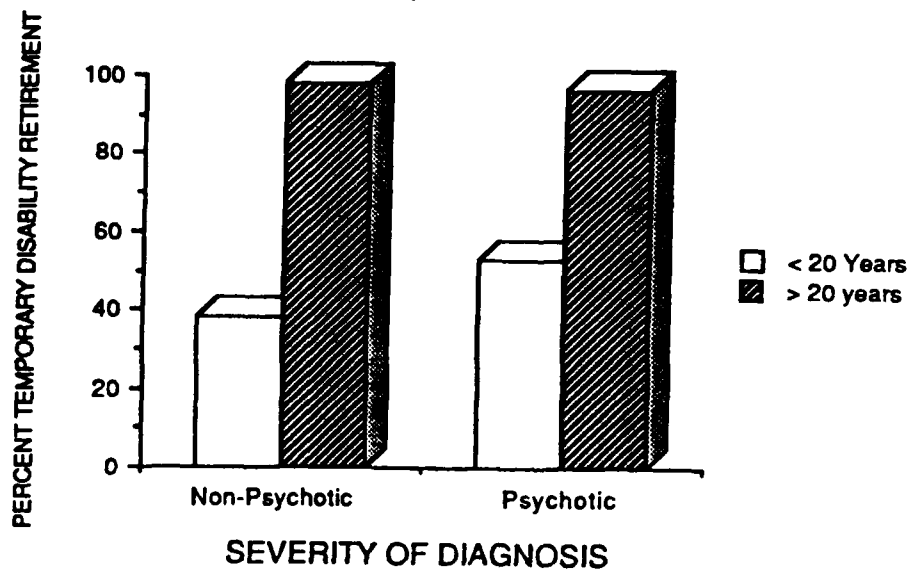


Figure 2. Percent Receiving Temporary Disability Retirement by Severity of Diagnosis and Length of Service.

In order to better understand the relationship between medical discharge disposition and the variables of severity of diagnosis, length of service, paygrade, and age, a multiway contingency analysis was performed. Specifically, a logit model was employed in which medical discharge disposition was treated as a dichotomous dependent variable whose outcome was affected by severity of diagnosis and length of service--age and paygrade were treated as covariates (continuous variables). Goodness of fit measures (Pearson Chi Square=.40, df= 1, p=.53 and Likelihood Ratio Chi Square=.37, df=1, p=.55) were nonsignificant, indicating that the data fit the model well. The low adjusted residuals (<.7) provided further confirmation of the adequacy of the model. Contrast comparisons confirmed that: 1) active duty, enlisted Navy personnel with twenty years or more of service as opposed to those with less than twenty years of service were more likely to receive temporary disability retirement ($Z=-5.55$, $p<.001$), and 2) active duty, enlisted Navy personnel with a psychotic mental diagnosis as opposed to those with a nonpsychotic diagnosis at time of hospitalization were more likely to receive temporary disability retirement, as well ($Z=-5.20$, $p<.001$).

The data indicated that shifts in diagnosis from time of hospitalization to time of last PE Board determination (on average, a period of about 9 months for those cases which received either severance pay or temporary disability) were not infrequent. The lambda reliability coefficient,⁴ computed to assess the degree of interdiagnostic agreement between psychotic versus nonpsychotic diagnoses at time of hospitalization and psychotic versus nonpsychotic diagnoses at time of last PE Board determination for those receiving either severance pay or temporary disability retirement, was low (lambda reliability=.28). Table 2 shows the greater stability of psychotic than nonpsychotic diagnoses across time, and the general convergence toward psychotic diagnoses.

Given the differential stability of psychotic versus nonpsychotic primary diagnoses from time of hospitalization to time of last PE Board determination, severity of diagnosis was recoded as psychotic versus nonpsychotic diagnoses at time of last PE Board determination. The tau-b analyses (see Table 3) indicated the same pattern of relationships between the predictor variables and medical discharge disposition except that primary diagnosis at time of last PE Board determination was a stronger predictor of medical discharge disposition ($t_b=.15$, $p<.0001$), as it was less influenced by length of service.

Similarly, a logit analysis was then conducted with age and paygrade as covariates. Both Chi Squares were nonsignificant (Likelihood Ratio Chi Square=.08, df=1, p=.78; Pearson Chi Square=.08, df=1, p=.78), and all adjusted residuals were less than .30, indicating that the model fit the data well. Contrast comparisons confirmed again that: 1) active duty, enlisted Navy personnel with twenty years or more of service as opposed to those with less than twenty years of service were more likely to receive temporary disability retirement ($Z=-5.75$, $p<.001$), and 2) active duty, enlisted Navy personnel with psychotic primary diagnoses as opposed to those with nonpsychotic primary diagnoses at time of last PE Board determination were more likely to receive temporary disability retirement, as well ($Z=-6.77$, $p<.001$).

Table 2

**Diagnostic Consistency: Diagnosis at Time of Hospitalization Versus
Diagnosis at Time of Last Physical Evaluation Board**

		Primary Diagnosis (PE Board)		
		Nonpsychotic	Psychotic	
Primary Diagnosis (Hospital)	Nonpsychotic	251 (50%)	247 (50%)	498
	Psychotic	34 (4%)	918 (96%)	952

1450

Note: lambda reliability = .28

Table 3

**Effect of Control Variables on Relationships of
Medical Discharge Disposition with Predictor Variables^a**

	<u>Medical Discharge Disposition</u>	<u>Control Variables</u>				
		<u>Severity</u>	<u>LOS</u>	<u>Paygrade</u>	<u>Presence of Secondary Diagnosis</u>	<u>Admission History</u>
Severity of diagnosis (at time of last PE board)	.15	--	.12	.15	.12	.15
Length of Service	.24	.32	--	.19	.29	.25
Paygrade	.11	.26	.09	--	.21	.12

^aAll table values represent tau-b coefficients of medical discharge disposition with the row (predictor) variables.

Discussion

The present study found that severity of diagnosis and length of service were significant predictors of type of medical discharge (e.g., severance pay versus temporary disability retirement) awarded by Navy Physical Evaluation Boards to active duty, enlisted Navy personnel with a mental health problem. Psychotic diagnoses at time of hospitalization and at time of last PE Board determination were reliable predictors of receiving temporary disability retirement. These findings replicated the previous findings by Kilbourne, et al. (1988) which found that two primary criteria (i.e., the 30%-disability or severity rule and the 20-years-service rule) are considered by PE Boards in their determination of medical disability award. Together, the earlier findings and the replication provide substantial evidence of uniform determination procedures practiced by Navy PE Boards in accordance with U.S. Navy Instructions (SECNAVISNT 1850.4B [7 Dec. 87], Appendix B--SS 1201, SS 1202, SS 1203, SS 1204, SS 1206).

Similar to the earlier Kilbourne, et al. (1988) study, the present study found, using the partial tau-b procedure, an interaction between medical discharge disposition, length of service, and paygrade. Paygrades E5 and above were more likely to have twenty years of service creditable for retirement and, therefore, to benefit from the twenty-year rule that awards previously injured Navy personnel with temporary disability retirement. And, similar to the Kilbourne, et al. (1988) study, an interaction emerged between severity of diagnosis, medical discharge disposition, and length of service; individuals with less than 20 years of service were more likely to receive temporary disability retirement as a function of the severity (i.e., psychotic versus non-psychotic) of their mental problem. Additionally, in the present study, a logit analysis showed that length of service and severity continued to predict medical discharge disposition when both paygrade and age were simultaneously treated as covariates.

A difference in the present study, which was not assessed in the earlier study by Kilbourne, et al. (1988), was a shift in diagnostic category from time of hospitalization to time of last PE Board determination. The shift in diagnosis occurred primarily for nonpsychotic disorders. For those cases receiving either severance pay or temporary disability retirement, approximately 4% of all hospital-admission psychotic diagnoses shifted to nonpsychotic diagnoses at the time of last PE Board, while approximately 50% of all hospital-admission nonpsychotic diagnoses shifted to psychotic diagnoses. Certain types of mental problem diagnoses were stable across time. Hospital-admission primary diagnoses of schizophrenia and affective psychosis, for example, were stable (lambda reliability=.80). The more stable mental problem diagnoses--the psychotic diagnoses--better predicted Navy PE Board determination of temporary disability retirement for active duty, enlisted Navy Personnel with less than twenty years of service.

The shift in diagnosis from time of hospitalization to time of last PE Board determination has implications for understanding the stability of different types of clinical diagnoses, as well as the consequences to organizations which rely on such diagnoses. It deserves further investigation. The present study cannot provide a categorical explanation of that shift, but can suggest several plausible possibilities. These include that some cases with nonpsychotic diagnoses at time of hospitalization: 1) may have progressively deteriorated (this is consistent with the literature concerning some

personality disorders and substance abuse disorders [Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised, 1987]), 2) may have been relabeled psychotic because they had not improved (Becker, 1963; Goffman, 1961; Scheff, 1966; Schur, 1971), 3) may not have had specified the level of certainty of diagnosis on Axes I and II of the DSM-III (e.g., diagnosis deferred, provisional diagnosis, or rule-out), or 4) may have been initially mis-diagnosed as a result of extraneous factors or the diagnostician's idiosyncrasies (Faust & Ziskin, 1988).

Lastly, the present study demonstrates again that entitlement by law contributes to the costs of health care. However, the best way to reduce these entitlement costs, which are officially sanctioned by the Navy community and the larger society, is prevention. Though early detection, prompt treatment, and aftercare are important to cost containment, it is probably in the area of primary prevention (e.g., family planning, health education, and healthy work environments) where the greatest inroads on entitlement savings can be made (Coleman, Butcher, & Carson, 1984). A Navy-wide mental-health-education program, for example, can help prevent mental health problems and insure the force readiness of active duty, enlisted Navy personnel. This, in turn, can reduce other costs (e.g., those associated with hospitalization and medical discharge). Cost savings by the U.S. Navy in one area (e.g., entitlement programs) could be re-channelled into other areas. Given extant political pressures to reduce the federal budget deficit, the reduction of spending for costly entitlement programs through the implementation of a cost-effective prevention program by the U.S. Navy may favorably influence 'who gets what' as competition intensifies for scarce entitlement funds.

Postscript--Theoretical Implications

From a theoretical perspective, the present study suggests that, for this setting, the sufficient conditions (i.e., a formal or informal rule-reward structure) by which individuals attribute entitlement to themselves and others (Kilbourne, et al., 1988) are the same in principle for mentally normal and abnormal individuals. Social observation theory (Kilbourne, in press) contends that individuals observe and evaluate themselves in relation to normative expectations and social standards, and, consequently, the self cannot be fully understood apart from our relationships with others or the social context (Mead, 1934; McCall & Simmons, 1966; Stryker & Gottlieb, 1981). While there were no direct measures of self-entitlement in the present study, the

fact is that even psychotic, active duty, enlisted personnel must apply to a Navy PE Board (and contend that they meet the criteria for a medical disability disposition based on their mental health condition) in order to receive a medical discharge. They have, then, the basis for knowing whether they have been determined mentally disabled. (There are, of course, many misconceptions of so-called mental illness [Coleman, et al., 1984], not the least of which is the belief that severely disturbed individuals are "out of it" or not aware of what is going on around them [Ullman & Krasner, 1969].) If a source of authority, such as a PE Board, determines an individual to be mentally disabled, then he or she can claim, in turn, to themselves and to others, an official justification for their aberrant behavior and any forthcoming entitlement benefits (Spector & Kitsuse, 1987). Similarly, the present interpretation is compatible with interdependence theory (Kelley & Thibaut, 1978; Nacoste, 1987; Thibaut & Walker, 1975; Walker & Lind, 1984) in regard to how active duty, enlisted Navy personnel explain the distribution of a scarce commodity (i.e., a medical discharge award). Thus, the official and ritualized sanctioning of mental disability within a particular social context (i.e., a PE Board proceeding) provides the basis for some individuals to acquire a new social identity (i.e., mentally disabled) and to redefine themselves according to a corresponding set of social rules and expectations.

Footnotes

1 Brock Kilbourne is a research associate with the National Research Council, National Academy of Sciences, and a licensed psychologist (CA. #PV10467). Susan Hilton is a research psychologist and a member of the Health Psychology Department, Naval Health Research Center. Jerry Goodman is a sociologist and a statistical consultant with the Naval Health Research Center, San Diego.

2 A substantial body of empirical research indicates that psychotic disorders are more chronic and severe than nonpsychotic disorders (Diagnostic and Statistical Manual of Mental Disorders [DSM-III-R], 1987; Manderscheid & Barrett, 1987). In both the DSM-III (1980, pp. 367-368) and the DSM-III-R (1987, pp. 404-405), psychosis is considered a "gross impairment in reality testing," not a separate disorder. Psychotic features are included in several disorders, such as schizophrenia, delusional disorder, mood disorder, and certain organic mental disorders. Also, in a study comparing diagnoses in the emergency room with those during a subsequent inpatient hospitalization, Lieberman and Baker (1985) found that alcoholism, psychosis, and depression were the most reliable diagnoses. These broad diagnoses tend to be more easily recognized because of their dramatic presentation and frequent occurrence. A variable indicating a psychotic versus nonpsychotic diagnostic distinction at time of hospitalization, then, might be expected to predict, as a measure of severity, PE Board determinations of disability compensation for active duty, enlisted Navy personnel with a mental health problem.

Within the mental disorders section of the Navy Enlisted Career/ Medical History File, the psychotic diagnostic codes or those including psychotic features were: senile and presenile dementia, alcoholic psychosis, psychosis associated with intracranial infection, psychosis associated with other cerebral conditions, psychosis associated with other physical conditions, schizophrenia, affective psychosis, paranoid states, other psychosis, and unspecified psychosis. The nonpsychotic diagnostic codes were: neuroses, personality disorders, sexual deviation, alcoholism, simple drunkenness, drug dependence, drugs improper use of, history of opiate or

synthetic morphine like analgesic abuse past eight months, history of other drug abuse past eight months, no history of drug abuse past eight months, other drug addiction, physical disorder of presumably psychogenic origin, special symptoms not elsewhere classified (NEC), transient situational disturbance, character and behavior intelligence disorder NEC and unspecified, behavior disorders of childhood, mental disorder not specified psychotic associated with physical condition, borderline mental retardation, borderline intelligence, mild mental retardation, moron, moderate mental retardation, severe mental retardation, imbecility, profound mental retardation, idiocy, unspecified mental retardation, other and unspecified types of mental retardation, medical or special examination, follow-up examination with no need care or limited care, social maladjustment without manifest psychiatric disorder, nervousness and debility, and observation without need for medical care.

- 3 Kendall's tau-b has a proportional reduction in error interpretation and can be used to compute a summary partial tau-b measure (tau-b-bar) to control for third variables of any scale (Agresti, 1977; Agresti & Agresti, 1979).
- 4 Lambda reliability can be used whenever two classifications contain the same classes (e.g., test-retest). Rule A predicts the "same" class or values in the diagonal of the table. Rule B predicts from the modal classes and is usually taken to be an average modal classification (Goodman & Kruskal, 1963).

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