PREDICTION OF INCIDENTS IN A FORENSIC PSYCHIATRIC FACILITY USING DEMOGRAPHIC AND PSYCHOLOGICAL TEST VARIABLES AND IDENTIFICATION OF NATURALLY OCCURRING SUBGROUPS OF FORENSIC INPATIENTS USING CLUSTER ANALYSIS OF MINNESOTA MULTIPHASIC PERSONALITY INVENTORY PROFILES

By

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Al caro Zio Gianni

con ammirazione, e gratitudine.

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Psychologists and psychiatrists often render opinions regarding the potential dangerousness of individuals in the context of forensic evaluations and involuntary commitment proceedings. However, early research suggested predictions of dangerousness resulted in high false positive rates. In 1984, it was suggested the early research was overgeneralized and suggested using multivariate and actuarial methods in more acutely disturbed populations.

The present research investigated the ability of multiple regression analyses of demographic and psychological test data to identify residents with high base rates of involvement in institutional and violent incidents in a maximum security forensic facility. Data were collected for 451 male residents, the majority of which were incompetent to stand trial.

A blockwise stepwise multiple regression procedure was used to develop equations predictive of total incident rate, two types of

aggressive incident rates, use of force incident rates, and fighting incident rates. Regression models identified groups of residents with a 75% base rate of incidents, and a slightly greater than 50% base rate of violent incidents.

Cluster analysis of Minnesota Multiphasic Personality Inventory (MMPI) profiles has been a useful methodology to identify subgroups of criminal offenders. The present investigation attempted to identify naturally occurring subgroups of forensic inpatients by cluster analyzing 188 MMPI profiles. Results of the analyses indicated a possible six cluster and a possible three cluster solution. Analyses failed to validate the six cluster solution.

Significant between group differences were found for the three cluster solution. The group MMPI profiles differed in terms of overall profile elevation. The highest MMPI profile elevation group had the longest mean length of treatment, greatest proportion of residents involved in use of force incidents, and greatest proportion of residents with substance abuse histories.

The present study also examined between group differences for residents involved and not involved in incidents. Differences with respect to race, education, diagnosis, and test results were found and discussed in the context of previous research.

CHAPTER ONE

INTRODUCTION

Overview of the Literature on Prediction of Violence

In recent years, research on the prediction of violence has been sparse. Research in the area of forensic psychology shifted away from an early focus on the prediction of violence, to the rights of involuntarily commited patients, and later to the characteristics of insanity acquitees. These shifts often paralleled political and social concerns of the times. Research in the area of prediction of violent behavior has been relatively neglected despite the American Psychiatric Association's (1977) description of this as one of the most important areas for research in the interface of psychiatry and the law.

Monahan's (1981) frequently cited book, Predicting Violent Behavior, may have had an adverse impact on research efforts to attempt such predictions. His review, which included a focus on several large scale studies of chronically institutionalized patients, and studies with overall low incidence rates of violence, was grossly overinterpreted as indicating that predictions of violence could not be made, or at most are only accurate one out of three times. Monahan (1984) concurred that

his review had been overgeneralized by other professionals and made an appeal for renewed efforts in the area.

Monahan (1984) as well as others (Shah, 1978) suggested the use of multivariate models which focus on short term predictions of violent behavior within populations known to have high base rates or histories of violence. Meehl (1954, 1986) has long advocated the development of statistical models of prediction. Meehl argued that such models outperformed clinical predictions and were more explicit and testable.

Renewed research interest in prediction of violent behavior has been stimulated by recent events. The increase in the number of mentally ill involved in the criminal justice system, the notoriety of Hinkley's assassination attempt on President Reagan, and the Tarasoff decision have captured media attention with respect to violent behavior by the mentally ill and has renewed interest in determinations of dangerousness.

The present study attempted to identify a group of individuals with a greater than average frequency of institutional violence by applying a multivariate multiple regression model. The use of a stepwise regression model allowed for reduction of the number of possible predictor variables by selecting only those variables at each stage which added significantly to the variance accounted for. This technique is suited for research that is primarily predictive or exploratory in purpose.

A second goal of the present research was to provide additional information on the characteristics of a population of forensic

inpatients which consisted mostly of individuals adjudicated incompetent to stand trial. This group has been somewhat neglected in forensic research. Identification of subgroups of forensic inpatients was attempted by a cluster analysis of Minnesota Multiphasic Personality Inventory (MMPI) profiles. This methodology was previously successful in identifying groups of criminal offenders (Megargee & Bohn, 1979).

Historical Background

Research conducted in the interface of psychiatry and the law has shifted in focus over time. Steadman (1984) noted that much of the earliest research conducted in the early 1960s focused on the definition of insanity and the implementation of the insanity defense. Research found that variations of the insanity plea such as the M'Naughton rule, the ALI test, mens rea, or the Durham rule had little effect in the number of people who were found not guilty by reason of insanity (NGBRI). Insanity acquittals were found to be successful in approximately 2% of the cases in which insanity was raised as a defense regardless of the particular test which was applied (Johnson, 1975).

Research conducted in the late 60s shifted in focus to the civil rights issues of those persons involuntarily hospitalized. This led to research examining forensic and civil commitment proceedings and the assumed dangerousness of the commited forensic patient. Much of this research led to the release of many individuals who had been involuntarily hospitalized for many

years. Monahan's (1981) review which included studies of these released patients suggested that predictions of dangerousness resulted in error at least two out of three times.

Much of the research in the 70s examined the social, demographic and psychological characteristics of insanity acquitees. Steadman (1984) noted that an inverse relationship exists between the amount of research conducted and the size of the forensic population. Insanity acquitees which comprise approximately 8% of the mentally ill forensic population have been the most studied, while mentally disordered sex offenders, those adjudicated incompetent to stand trial, and the mentally ill inmate have been largely ignored.

Research in the 70s and early 80s has neglected the prediction issue despite the fact that since 1970 most states have switched the requirements for involuntary commitment from one that focused on need for treatment to one that uses dangerousness as a criterion (Monahan, 1984). Steadman (1984) emphasized that there is a large gap between what has been thought to be securely documented in the area of prediction of dangerousness and what evidence there exists.

Despite pessimism about the accuracy of predictions of violence such predictions have been a historical part of the legal process. Determinations of dangerousness are often embedded in prognostic statements, classifications, and placements within the correctional system (Shah, 1978).

Clinicians concerns about the potential dangerousness of the clients they are treating have been raised by the litigious medico-legal climate. The Tarasoff decision (Tarasoff vs Regents, the University of California, 1976), which is frequently overinterpreted as creating a clinician's "duty to warn" potential victims, made the prediction issues more salient. Although the same court revised the language to read that a more general duty to exercise reasonable care exosts (Givelber, Bowers, & Blitch, 1985), the controversy concerning clinicians' ability to predict violent behavior and their responsibility with regards to potential victims spread to other states and raised issues concerning possible malpractice suits (Ridgewood Financial Institute, 1985).

The increase in the rate of psychiatric patients with histories of arrest or violent behavior has renewed research interest with respect to the dangerousness of the mentally ill. The number of the mentally ill who are involved in the criminal justice system has increased. Monahan (1981) reported that in 1947 fifteen percent of New York patient releases had prior arrests compared to 40% in 1975. A similar trend is evident in England. Hinton (1983) reported that in English "security hospitals" there was a 75% increase in admission rates for psychopathic disorders between 1961 and 1970.

Perhaps as a consequence of deinstitutionalization, more mentally ill individuals are being arrested. Research conducted after the 1950s indicates that discharged psychiatric patients had higher

arrest rates than the general population whereas research prior to that time indicated the reverse was true (Monahan, 1981). Sosowsky (1978) reported that patients admitted to a psychiatric hospital without a criminal record had subsequent arrest rates three times that of the general population, and were arrested five times as often as the general population for violent crimes.

Rubin (1972) reviewed the literature available at that time and concluded that the reversal in the arrest rates of the mentally ill was attributable to the increased coexistence of antisocial behavior and mental illness for young, poor, unemployed, and unskilled males. Teplin (1984) reported that for similar offenses mentally disordered citizens are more likely to be arrested than other citizens and suggested that the trend toward deinstitutionalization was a factor in this process.

Some of the neglect with respect to research involving prediction of violence may be a result of the overgeneralization from early research that clinicians had little ability or expertise in making such predictions. The five studies which Monahan (1984) described as forming the core of "first generation" research on predictions of violence examined predictions that those released from long-term custodial institutions would engage in violent behavior. The disappointing results of these attempts were most likely attributable to the low base rates of the target behavior, treatment effects, aging, and unspecified effects of long term institutionalization.

Early Research on the Prediction of Dangerousness

Monahan (1984), whose review of the efficacy of clinical predictions of dangerousness led to much of the pessimism about attempts at prediction, criticized the overgeneralization and uncritical acceptance of this "first-generation" of research. This research suffers from flaws such as attempting to predict rare events, studying borderline cases, generalizing pre-hospitalization predictions to post-treatment and release behavior, and in some studies did not involve any actual prediction by clinicians at all.

Ethical considerations prohibit the release of individuals everyone agrees to be dangerous. This constraint necessarily limits investigations of post-release violence to examining the behavior of those individuals for whom there was some disagreement about. This most likely yields biased underestimates of the efficacy of prediction. A criticism of some studies is that predictions made concerning need for immediate hospitalization due to dangerousness were overgeneralized and applied to post-treatment and post-release behavior.

Since the studies reviewed by Monahan have been described as forming the core of the early research, and the cause for the overgeneralization that violence cannot be predicted, they are briefly reviewed here.

Kozol, Boucher, and Garofolo (1972) conducted a five year follow up study of 592 male offenders. Most were convicted of sex crimes. Of these offenders, 226 were initially judged by the

psychiatric staff to be dangerous and were subsequently committed to treatment. The court eventually released 49 offenders contrary to the prediction of dangerousness by the psychiatric staff. During the five year follow up period only 8% of those released without a prediction of dangerousness committed a serious assaultive offense compared to 35% of those released by the court against the psychiatrist's advice.

The rate of false positives in the Kozol et al. study has sometimes been cited as evidence of clinicians inability to predict violent behavior. However, the predictions yielded a group of individuals which were four to five times as likely to commit a serious offense than the overall base rate. A further criticism of this study was that it yielded a biased underestimate of the efficacy of clinical predictions since the identified dangerous group consisted of "borderline" cases. The "dangerous" group actually consisted of only the 20% of cases predicted dangerous by the clinicians for which the court disagreed (Litwack, 1985).

Another set of frequently cited studies followed up on the court-ordered release of large numbers of institutionalized individuals presumed to be dangerous. These studies were more reflective of global or political predictions rather than actual individually made clinical predictions.

The first of these studies eventually led to the release of other chronically institutionalized patients which were being hospitalized for indefinite periods of time because of

"dangerousness" and led to legal reforms of the laws which had allowed this practice to exist. In this first study one thousand institutionalized patients held past expiration of their sentences without a hearing were transferred to civil hospitals by court order. Steadman and Cocozza (1974) reported the follow-up of the "Baxtrom" patients.

At the time of transfer, the average age of the Baxtrom patients was 47. These patients had a mean length of 15 years of continuous hospitalization. Twenty percent of these patients were assaultive at any time during the next four years of civil commitment. Those eventually released were followed for two and one half years. During this period of freedom only 8% were convicted of any crime.

A "Legal Dangerousness Scale" was constructed in an attempt to predict subsequent violent arrests. The scale was based on the presence of a juvenile record, number of previous arrests, presence of prior convictions for violent crimes, and severity of the admitting offense. Although only one of three patients identified by the scale as dangerous were eventually rearrested for a violent crime, this was four times the overall rearrest rate for the Baxtrom patients.

In the Baxtrom study, Steadman and Cocozza (1974) found that few patients over 50-years-old were rearrested for a violent crime. Seventeen of the twenty arrested for violent crimes after their release were less than 50-years-old and had a score greater than five on the above Legal Dangerousness scale.

In a study of Pennsylvania prisoners who won suit for release partially as a consequence of the Baxtrom decision, Thornberry and Jacoby (1979) found that 14% of 438 long-term institutionalized patients engaged in behavior injurious to other persons within 4 years after their release. Similar to the Baxtrom patients, the "Dixon" patients had a mean age of 47 years and were institutionalized for a mean of 14 years.

Approximately one of four of the 418 Dixon patients eventually released were rearrested in a median release time of 30 months. Fourteen percent of the released Dixon patients were rearrested or rehospitalized for violent behavior.

As in findings reported from the Baxtrom study, the younger Dixon patients were more likely to be arrested. Forty percent of the patients younger than 35-five-years old were rearrested. Nearly one in four of these younger patients were rearrested for violent offenses.

A major criticism of the Baxtrom and Dixon studies is that they did not directly address the efficacy of clinical prediction of violent behavior. These studies did not attempt individual determinations of dangerousness; instead they challenged the public opinion that these patients as a group were a threat to society. In fact, the facility which housed the Dixon patients employed only one psychiatrist and no Ph.D. psychologists (Thornberry & Jacoby, 1979). Litwack (1985) suggested these studies are more appropriately described as studies of "political prediction" than as attempts at clinical prediction.

In a more successful attempt at identifying a group of individuals committing post-release offenses, the State of Maryland (1978) published data for 421 patients treated for 3 years or more at the Patuxent Institution. The court released 286 patients despite a determination of dangerousness by the psychiatric staff. Of those patients released directly from the hospital, 46% showed a new offense on their FBI rapsheet within three years after release. Thirty-nine percent of those "conditionally released" indicated an offense within the three year period. Only 7% of the 135 individuals the staff found "safe" showed such an offense.

The results of the state of Maryland study were challenged by conflicting data which were reported by Steadman (1977). Steadman (1984) reanalyzed the data and found that 31% of the patients recommended for release were arrested for a violent crime in comparison with 41% of those predicted to be dangerous, making the original data equivocal. The state of Maryland study can also be criticized since the dangerous group was likely to be a biased sample of all individuals predicted to be dangerous by the clinicians because the group consisted of only the subset of individuals for which the court disagreed.

In a study of institutional and post-release violence, a group of 257 patients adjudicated incompetent to stand trial in New York between 1971 and 1972 were followed by Cocozza and Steadman (1976). Patients were examined by two pyschiatrists whose initial finding of dangerousness permitted placement in a facility

administered by the Department of Correctional Services and a finding of nondangerousness permitted placement to a civil psychiatric hospital. The average age of this sample was 31 years.

Of these individuals adjudicated incompetent to stand trial, 60% were predicted dangerous and 40% were predicted not to be dangerous. The judge disagreed with these predictions in 34 cases, adjudicating as dangerous 26 the psychiatrists had not predicted to be dangerous. These disagreements were not discarded in the reported findings. Subjects were followed in the hospital and in the community for three years if they were released.

The adjudications of dangerousness were more successful at identifying individuals likely to be violent in the hospital than those which would eventually be rearrested for a violent crime. Those predicted or adjudicated to be dangerous were slightly more likely to be assaultive in the hospital than those not adjudicated as dangerous (42% versus 36%).

Ninety-six of of the 154 adjudicated dangerous by the court and 70 of the 103 adjudicated nondangerous were eventually released. Forty-nine percent of those identified as dangerous versus 54% of those not identified as dangerous were rearrested. Fourteen percent of the "dangerous" individuals were rearrested for a violent offense in comparison to 16% of those adjudicated not to be dangerous, indicating little difference in the rearrest rates of these two groups.

Although Cocozza and Steadman (1976) interpreted their study as clearly indicating no psychiatric expertise in predicting who will be dangerous existed, Litwack (1985) criticized the study as a general study of clinical prediction of violent behavior. He indicated that the clinician's predictions were that individuals were of immediate danger to themselves or others if left at liberty and were not predictions of the likelihood of institutional violence or the eventual risk of violence after they were treated and released.

The inclusion of individuals judged not to be dangerous by the clinicians but adjudicated so by the court as dangerous is another criticism of the Cocozza and Steadman study as a pure study of clinical prediction. The results are biased by inclusion of residents predicted nondangerous by the clinicians in the dangerous group.

This first generation of research suggested that the global prediction that chronically institutionalized individuals are all dangerous is unwarranted. These studies also indicate that while clinicians may be able to identify subsamples of individuals much more likely to exhibit violent behavior than the base rate, low base rates of violent behavior in the population result in a large number of false positives. Certain demographics such as age, presence of a juvenile record, number of previous arrests, presence of prior convictions, and severity of admitting offense were correlates of violent behavior in these studies.

Longitudinal Research of the Correlates of Violent Behavior

While research concerning the clinical prediction of violent behavior has been sparse, there is a substantial literature which has researched the characteristics and histories of violent individuals or groups of individuals by following large groups of individuals over time. This research has generally found that number of previous arrests, history of past violent behavior, race, and socioeconomic status are correlated with subsequent violent arrests.

Studies examining the role of early childhood predictors of violence place importance on the presence of fighting in childhood and juvenile arrest records. Justice, Justice, and Kraft (1974) reviewed 1500 references of violence in the psychiatric literature and found that childhood fighting, temper tantrums, problems in school, and inability to get along with others were behaviors reported to correlate with later violence.

The association between early violent behavior and later aggression was also supported in a longitudinal study of 400 males from age 8 to 19. In this sample Lefkowitz, Eron, Walder, and Heusmann (1977) reported that aggression at age 8 was the single best predictor of aggression at age 19.

In a large study, the records of all boys born in Philadelphia in 1945 and still living there between their 10th and 18th birthday were examined by Wolfgang, Figlio, and Sellin (1972). Thirty-five percent of the boys had at least one reported contact with the police by age 18. Race and

socioeconomic status were most predictive of delinquency. Thirty percent of white males compared to 50% of nonwhite males had such contact. Twenty-six percent of the high socioeconomic status boys compared to 45% of the low socioeconomic status boys had such a contact. Wolfgang (1977) reported a follow-up study which found that by age 30 only 5% of the sample was arrested only as adults. Individuals with a juvenile record were four times more likely to be arrested as adults than those without a juvenile record.

A strong relationship between the number of previous arrests and subsequent violent behavior was evident in the above study. One of three of those with at least one reported contact with police by age 18 was arrested as an adult by age 30. The probability of being arrested a fifth time given four prior arrests was 0.90. The probability of being arrested for an FBI index offense given four prior arrests was 0.36. Given 10 prior arrests there was a 0.42 probability of an FBI index arrest. Similar findings were found in a Washington, DC, research project which analyzed the arrest records of 45,000 defendants. In this study, the probability of rearrest with five or more previous arrests approached almost certainty (Shah, 1978).

Not all criminal groups have high rates of violent rearrests. Monahan (1981) reported that an "Assaultive Risk Screening Sheet" was used by the Michigan Department of Corrections in 1978 to predict arrest for a new violent crime. The study analyzed 350 variables for 2200 males released on

parole in 1971 over a 14 month period of time. A small subgroup (5%) of individuals with a 40% recidivism rate was identified by checking type of crime, nature of institutional behavior, and presence of arrest before age 15. The overall base rate of violent arrests was 10% in the Michigan study. Murphy (1980) replicated this study and found a 32% recidivism rate for the identified high risk group.

A series of three studies using 4,146 California Youth Authority wards conducted by the California Department of Correction was reported by Wenk, Robison, and Smith (1972). Only 6% of the youths studied had been commited due to a violent offense. A scale was developed which identified a small subgroup 14% of which subsequently commited a violent act while on parole. Only 5% of the nonidentified group commited such an act. The use of the scale resulted in an 86% false positive rate.

Twenty percent of the Youth Authority parolees were assigned to a potentially aggressive category in a second study (Wenk, Robison, and Smith, 1972). The rate of conviction and imprisonment for this group during a one year follow up was only three per thousand. Finally, 4000 of the youth authority wards were followed for 15 months after their release. Prediction of violence based on prior crime as well as 100 other variables failed to yield better than a 95% false positive rate. The poor results of the Youth Authority studies illustrate the difficulty predicting low base rate events accurately.

In the longitudinal studies above fairly consistent results were found. Presence of a juvenile record, number and type of previous arrests, race, socioeconomic status, and childhood behavioral difficulties were associated with later arrests and violent behavior.

Psychological Test Correlates of Violent Behavior

Psychological and demographic variables have been used in a number of studies to discriminate between offenders who have commited various types of crimes on the assumption that these variables would also predict to future behavior. While most studies examined group differences in present test results, some studies have examined the predictive validity of various psychological tests. The Rorschach, a projective technique, and the MMPI, an objective test are frequently used tests which have generated considerable research interest.

Rorschach

The Rorschach is a projective technique, first introduced in 1921 (Rorschach, 1921), in which the subject is asked to report what the subject sees when presented each of 10 ambiguous ink blots. Exner (1974) reviewed a variety of scoring systems (e.g., Beck, Beck, Levitt, & Molish, 1961; Hertz, 1951; Klopfer, Ainsworth, Klopfer, & Holt, 1954; Piatrowski, 1957; and Rapaport, Gil, & Schaefer, 1946) and, borrowing freely from these, developed the Comprehensive Rorschach System (Exner, 1974). Exner's system provided a more standardized method which led to

renewed research interest and instruction in the use of the test (Hertz, 1987; Ritzler & Alter, 1986; and Piotrowski, Sherry, & Keller, 1985).

The Rorschach has been frequently used to aid in the discrimination between violent and nonviolent persons (e.g., Finney, 1955; Rose & Bitter, 1980; Shagoury, 1971). A number of Rorschach indices, described below, have been correlated with anger, aggression, and psychopathology.

Rorschach R is defined as the number of responses to the cards. It is generally interpreted as an index of responsiveness to the environment. High numbers of responses correlate with intelligence and productivity, while a low number of responses is suggestive of defensiveness, depression, and possibly malingering (Exner, 1974).

The Rorschach variable X+% is the percentage of total responses whose form conforms to the physical features of the blot. It is considered one of the most important determinants and is generally interpreted as a measure of the ability to perceive the environment conventionally and realistically (Exner, 1974; and Ogdon, 1977). An X+% below 70% is considered to raise questions about perceptual accuracy and reality testing (Exner, 1974). Low percentages have been associated with the responses of murderers (Wolfgang & Ferracuti, 1967) and proved useful in discriminating property versus homicide offenders (Shagoury, 1971).

The Rorschach variable M refers to the presence of human movement in a percept and has been a frequently researched Rorschach variable (Exner, 1974). The frequency and quality of M have been interpreted as representing internalization, empathy, inhibition of impulses, and the ability to bridge inner resources with external reality (Exner, 1974). It is considered an index of emotional development since children exhibit low frequencies (Ames, Metraux, & Walker, 1971). Davids (1973) reported that the frequency of M discriminated between behavioral aggression ratings of institutionalized boys.

When M is associated with bad form (M-), the likelihood of psychopathology increases (Beck, 1965; Phillips & Smith, 1953) and suggests deficient social skills and poor interpersonal relationships (Weiner, 1966). The presence of M- with any notable frequency (Phillips & Smith, 1953; Weiner, 1966) or when the ratio M-/M is greater than 1:3 (Phillips & Smith, 1953) suggests an increasing probability of psychosis.

The percentage of human responses, h%, reflects interest and sensitivity to others (Exner, 1974). Rorschach M and h% were found to aid in discrimination between a homicide group and a property crime group (Shagoury, 1971). The ratio W/M, an index of aspirations versus capacity (Exner, 1974) and was found to be the most powerful discriminator between aggressive and nonaggressive alcoholics (Haramis & Wagner, 1980).

The use of color as a response determinant is often interpreted as an index of affective control and as related to

expression of anger or aggression (Klopfer, Ainsworth, Klopfer, & Holt, 1954; Phillips & Smith, 1953; Schaefer, 1948; Exner, 1974). The use of color was one of the indices which discriminated between behavioral aggression ratings of institutionalized boys (Davids, 1973).

Rorschach weighted Sum C, which is coded as the sum (1/2FC + CF + 1.5C), represents the sum and quality of the subjects color responses. Sum C is generally interpreted as reflective of responsiveness to emotional features of the environment (Ogdon, 1977). Sum C has been found to be a useful variable in discriminating between groups of defendants some of which received psychological evaluation or raised the insanity plea (Boehnert, 1983) Sum C also was useful in discriminating between a property crime and a homicide group (Shagoury, 1971).

The actual content of what is perceived has also been subject of research with respect to aggressive behavior. A wide variety of measures of pathological or hostile content have been used in the literature (i.e., Elizur, 1949; Kane, 1955; Wolf, 1957; Sommer & Sommer, 1958; Goldfried, Stricker, & Weiner, 1971; Rose & Bitter, 1980; Shagoury, 1971). Although little or no research is available contrasting these indices, certain contents have been hypothesized to correlate with aggressive or deviant behavior.

Percepts with a content of blood, sex, religion, food, and anatomy percepts are believed to be related to sexual,

aggressive, and primitive needs and impulses (Exner, 1974; Phillips & Smith 1953; Rapaport et al., 1946). The content of blood is believed to reflect sadistic and destructive impulses (Phillips & Smith 1953; Rapaport et al., 1946), and sensitivity and concern with the expression of destructive impulses (Phillips & Smith, 1953; Rapaport et al., 1946; Davids, 1973). Religious content is infrequent and believed to be associated with preoccupation with good and evil and represent displacement of sexual preoccupation and guilt (Phillips & Smith, 1953). Sexual content is also rare in nonpatient samples and reflects psychopathology. Blood responses are frequent in the records of schizophrenics (Phillips & Smith, 1953).

The Rorschach has been successful at discriminating between groups of aggressive and nonaggressive individuals. Shagoury (1971) used a combination of psychological variables in a discriminant function analysis to differentiate between a homicide group and a property crime group. Rorschach Sum C, pathological content, M, negative form level, and the percentage of human responses were reported to be the most sensitive discriminators.

Rorschach protocals of alcoholics were analyzed using a stepwise discriminant function analysis (Haramis & Wagner, 1980). The procedure resulted in the accurate classification of 83% to 87% of the alcoholics into aggressive and nonaggressive categories. The most powerful discriminator was the ratio W/M.

In another study (Rose & Bitter, 1980), a destructive content scale was reported to help discriminate between groups of released offenders which did well in the community for three years and rapists who reoffended within six months of their release.

Minnesota Multiphasic Personality Inventory (MMPI) Predictors

The MMPI is a 566 item true-false personality instrument developed at the University of Minnesota in 1941 by Hathaway and McKinley (Dahlstrom, Welsh, & Dahlstrom, 1972). It is probably the most frequently administered and researched personality assessment instrument (Greene, 1980). It is used cross-culturally and cross-nationally (Butcher & Pancheri, 1976). Ease and economy of administration have made the MMPI a frequently used assessment instrument in prison settings (Megargee & Bohn, 1979).

The MMPI yields a profile which consists of three validity and ten clinical scales. The three validity scales, which assess test-taking attitude, consist of the "L" (Lie), "F" (Frequency or Infrequency), and "K" (Correction) scales.

The ten clinical scales were derived in an empirical manner to discriminate between a criterion group of individuals meeting certain diagnostic criteria and a control group taken from the Minnesota population (Greene, 1980). The ten scales consist of "Hs" (Hypochondriasis--Scale 1), "D" (Depression--Scale 2), "Hy" (Hysteria--Scale 3), "Pd" (Psychopathic deviate--Scale 4),

"Mf" (Masculinity-femininity--Scale 5), "Pa" (Paranoia--Scale 6), "Pt" (Psychasthenia--Scale 7), "Sc" (Schizophrenia--Scale 8), "Ma" (Hypomania--Scale 9), and "Si" (Social Introversion--Scale 0).

Research utilizing the MMPI has been voluminous. Its frequent use with correctional populations for screening and classification has stimulated much research using the instrument to discriminate between groups of offenders (Megargee & Bohn, 1979).

An attempt to discriminate between inmates who had commited violent offenses and those who had not was made by applying discriminant function analysis to 141 MMPI profiles of adult male inmates at a maximum security prison (Jones, Beidleman, & Fowler, 1981). An equation based on elevations on MMPI scales F, 6, 7, and 8 correctly classified 72.9% of the violent inmates and 80.6% of the nonviolent inmates. Significant differences between violent and nonviolent groups on these scales have been reported in a number of studies (e.g., Oliver & Mosher, 1968; Panton, 1959, 1962; Potash, 1956).

Correct classification of 95% of 80 male prisoners into a group with an arrest record of two or more assaults and a group which did not have such a record was achieved by the use of a neuropsychological test battery (Spellacy, 1978). Use of the MMPI alone to discriminate between these two groups resulted in a correct classification rate of 79%. The inmates with previous records of assaults were characterized by

higher elevations on scales F and 6, and lower scores on scales K and 5.

Scale score differences between a group of inmates with histories of violent arrests and those with nonviolent arrests were also reported by Deiker (1974). Profiles of 168 male prisoners in a county jail or state correctional institution were analyzed and yielded significant differences between a group of inmates with crimes of threat, murder, or battery and a group with mostly property offenses on scales F, K, 4, 7, 8, and 9. Deiker suggested that a naysaying response bias may have contributed to these results.

The MMPI profiles of 450 male and female offenders found guilty and referred for a dispositional evaluation were examined by McReary (1976). Assaultive offenders were found to have significantly higher scale 9 scores than nonassaultive offenders. A larger percentage of offenders with a 4-8/8-4 profile type were assaultive than offenders with other profile types (4-3, 4-2, and 4-9).

Lothstein and Jones (1978) found that elevations on scales F, 4, 6, 7, 8, and 9 characterized a group of adolescent prisoners. The profile type 8-4 was characteristic of the violent adolescents. In another study, the sum of scales F, 4, and 9 was 1.5 standard deviations greater in a sample of juvenile delinquents than a sample from the general population. This sum demonstrated a reliability coefficient of 0.78 in a study of 426

nineteen year olds in the general population, indicating the profile was stable across time (Huesman, 1978).

Intelligence Test Results

The hypothesis that intelligence interacts with personality variables was advanced by Heilbrun (1979) who suggested that psychopathy predicts violence for less intelligent criminals. Heilbrun found that in a sample of 76 white Georgia state prisoners 76% of the offenders with a low IPAT IQ and high psychopathy scores had been charged with murder or rape. Holland (1981) reported a failure to replicate Heilbrun's findings. Hinton (1983) reviewed the literature concerning the predictive validity of intelligence with respect to violent behavior and found conflicting evidence.

Summary of Test Correlates of Violent Behavior

Classification rates using psychological tests have yielded more promising results than the limits of prediction suggested by the early studies reviewed by Monahan (1981).

The studies reviewed suggest psychological test indicators such as Rorschach color responses, human movement and content, form quality, and pathological content correlate with aggressive behavior. Studies utilizing the MMPI as a predictor consistently report elevations on scales F, 4, 6, 7, 8, and 9 and low scores on scale K. The use of intelligence measures as a predictor has yielded less consistent results.

Cluster Analytic Approaches to Classification

One approach to identifying subgroups of offenders has been the use of cluster analysis of MMPI data. This approach was successful at identifying subgroups of individuals differing with respect to type of crime commited and differing with respect to institutional behavior including violence. Megargee and Bohn's cluster analytically derived classification system (1979) stimulated considerable validational research, which suggested that this method of classification compares favorably with other offender classification systems. Cluster analysis of MMPI profiles has also been successful at identifying subgroups of murderers (Anderson & Holcomb, 1983).

Megargee and Bohn (1979) developed a classification system of criminal offenders by performing cluster analysis of offender MMPIs. The classification system consisted of 10 groups based on MMPI profile characteristics. The groups were derived from a hierarchical profile analysis of three groups of 100 profiles each from inmates at a federal medium security facility in Tallahassee, Florida. The classification system was refined and cross validated using 1214 additional inmates. Significant differences between the groups for the number of subjects in each group who were involved in violent and nonviolent disciplinary infractions were found. Significant differences between the groups were also found for reincarceration rates.

Edinger (1979) replicated these findings using 2000 male federal prisoners and 1500 female state prisoners. Several later studies

used cluster analysis to classify individuals in other settings, replicating some of Megargee's original groups and identifying new ones (e.g., Quinsey, 1980; Nichols, 1979; Mrad, Kabacoff, & Duckro, 1983).

Some failures to replicate between group differences of Megargee's groups with respect to institutional behavior have been reported. Megargee's classification system was not effective at predicting which of 520 inmates from a federal penitentiary would exhibit antisocial or aggressive behavior (Louscher, Hosford, & Moss, 1983). Although significant between group differences were found in number of disciplinary reports, no pair wise differences emerged.

The relative efficacy of 4 classification systems, including Megargee's, in predicting inmate institutional adjustment in a penitentiary setting was examined by Hanson, Moss, Hosford, and Johnson (1983). Hanson et al. examined demographic variables, Megargee typology, security designation, and custody classification data on 337 male inmates. Canoconical correlations indicated the single best measure of overall institutional adjustment was total number of disciplinary reports. The best predictor of disciplinary reports was custody classification. Being the member of specific Megargee groups was the single best predictor for days in disciplinary segregation, good time forfeited, and for positive work ratings.

Studies of Predictors of Institutional Aggression

Monahan (1984) indicated that studies of aggressive behavior in acute care psychiatric facilities offer valuable data in which to judge the short term predictive accuracy of psychological and psychiatric prediction. Studies of aggressive behavior in institutional settings have provided useful information on aggression within controlled environments. These studies have provided information on environmental variables, patient characteristics, and behavioral correlates of violent behavior.

Studies of institutional aggression have indicated that environmental variables such as the amount of structure and activity influence the frequency of aggressive behavior. Age, race, diagnosis, type of admission, and behavioral ratings of agitation and psychotic behavior were found to be correlates of institutional aggression.

A series of four studies which included 720 male inmates, 16 institutional subsettings, 63 types of infractions, and 30 types of institutional sanctions was conducted by Edinger and Auerbach (1978). A factor analysis of situations yielded a differentiation between situations which had a high amount of staff supervision, were structured, and in which staff-inmate interaction was controlled and situations which were characterized as free-time subsettings. A higher probability of assaults in free settings than supervised settings was reported.

Although Rogers, Ciula, and Cavanaugh (1980) found a low overall incidence of aggressive behavior in a 42 bed maximum security

psychiatric unit, they found that time of day and availability of professional staff were correlated with the frequency of aggressive incidents. Peak times for aggressive and socially disruptive incidents were shift changes, meals, and periods of concentrated treatment programming.

Mealtimes and the beginning of the day were also peak periods for incidents in a study of three psychiatric hospitals which did not admit "persistently violent individuals" (Fottrell, 1980). A few patients were reported to account for the majority of the incidents. Patients who acted violently towards themselves or others were younger and more often diagnosed schizophrenic. A study of battery incidents in a maximum security state hospital also found that most batteries occurred in the daytime on the way to meals (Deitz & Rada, 1982).

In the Deitz and Rada study (1982) batterers were reported to have a longer mean length of hospitalization, were more frequently prison transfers, and were more frequently nonwhite. Race was also found to be a significant variable in a study of 5000 incidents occurring over the course of a year at a large state hospital. Evenson, Sletten, Altman, and Brown (1974) found that non-whites had higher risk rates for assault and antisocial behavior. They found that young, unmarried males with deferred diagnoses had the highest probability of engaging in assaultive incidents.

Some studies have examined short term behavioral correlates of violent behavior within institutions. Few (7%) of the 5164

patients in two state hospitals studied by Tardiff and Sweillam (1982) assaulted anyone in a three month period. Behavioral ratings of these patients indicated assaultive patients were more severely impaired on ratings of such psychotic symptoms such as delusions, hallucinations, inappropriate affect, bizzare habits, rituals, and exhibited more antisocial behavior than nonassaultive patients. Assaultive patients were younger and more frequently diagnosed nonparanoid schizophrenic, organic brain syndrome, mentally retarded, or personality disordered.

Behavioral ratings and violent behavior was also examined by Yesavage, Werner, Becker, and Mills (1982) in a comparison of voluntary versus involuntary admissions to a 20 bed V.A. inpatient psychiatric unit during the first week after admission. Patients who were assaultive scored higher on behavioral ratings of anxiety, conceptual disorganization, tension, mannerisms, grandiosity, hostility, suspiciousness, motor retardation, unusual thought content, and excitement than did nonassaultive patients.

Hostile verbal behavior was used by Werner, Yesavage, Becker, Brunsting, and Isaacs (1983) in an effort to predict assaultive behavior by 110 schizophrenic V.A. inpatients. The authors found that 32% of patients who engaged in hostile verbal behavior commited an assault.

Type of admission has also been associated with assaultive risk. In the Yesavage et al. (1982) study involuntary admissions were

rated more hostile than voluntary admissions. Sixty-five percent of the involuntary admissions versus 47% of the voluntary admissions incurred a violent incident in the first week of admission. Rofman, Askinazi, and Fant (1980) compared the records of 59 involuntary admissions to a V.A. inpatient unit to 59 voluntary admissions during the first ten days of admission. Forty-one percent of the involuntary admissions versus 8% of the voluntary admissions were involved in assaultive incidents.

Prediction Issues

The ability to predict behavior or events is a fundamental test of knowledge. De Groot, quoted in Pedhauzer (1982), stated "If one knows something to be true, he is in a position to predict, where prediction is impossible, there is no knowledge" (p. 40). Although prediction is not identical with explanation, and may be far removed from causality, it is unlikely meteorologists would make the evening news solely explaining yesterdays weather.

The importance of predicting violent behavior cannot be underestimated since such predictions involve the civil liberties and freedom of individuals. Predicting which individuals would be violent under what circumstances has been called the paramount consideration in the interface between mental health and the law by the president of the American Psychiatric Association (Stone, 1975).

The accuracy of such predictions presents important ethical and legal issues. Factors affecting accuracy involve the determination of cutting scores and decision rules. While it may be acceptable to adopt a criterion of more likely than not (51%) for short-term civil commitment proceedings (Mental Health Law Project, 1977), the application of a criterion of "a greater than average probability" (greater than the overall base rate) would lead to the deprivation of liberty of a large number of people (Monahan, 1981).

The selection criterion employed to determine cut scores determines the rate of true positives to true negatives and the absolute number of successful predictions. Monahan (1981) urged that regardless of the selection procedure used, "by all means the rule shoud be made explicit" (p. 38).

Task forces of the American Psychiatric Association (1977) and the American Psychological Association (1978) have maintained that psychiatrists and psychologists do not possess adequate information or scientific knowledge to predict violent behavior. Monahan (1981) suggested the question is not whether or not predictions of violence could be made, nor whether or not they should be made, but the question should be how accurately can they be made and in what circumstances.

The method by which predictions are made is the subject of the debate between clinical and statistical prediction (Meehl, 1954). Meehl reviewed the research data in a variety of fields and found "overwhelming" evidence in favor of statistical prediction. He

found little need to retract "95%" of his position 30 years later (Meehl, 1986).

Kastermeir and Eglit (1973) suggested that the resistance to the idea of statistical prediction in the area of prediction of violent behavior stemmed from the view that legal issues are intrinsically individualized, the fact that actuarial methods explicitly acknowledge that errors will be made, uneasiness over stating the reasons decisions which are made which run counter to statistical predictions, and concern about loss of status and jobs to clerks armed with statistical formulae.

To this list Monahan (1981) added that concerns about stating certain reasons for decisions which are statistically made (i.e., race and sex) lead to resistance. Einhorn (1986) indicated that the unavailability of the required data to make a statistical prediction, or insufficient time (in the case of emergency commitment procedures), results in a necessity to rely on clinical experience and judgement. Increased overall accuracy, explicit, empirically testable rules, and increased consistency in decision making are cited as advantages of statistical prediction (Einhorn, 1986).

Monahan (1981) suggested the issue is not one of clinical versus statistical prediction, but a question of what can the clinician do to increase the accuracy of prediction. To accomplish this end Monahan suggested that determination of the base rate of violence in the population to which the predictions are to be applied needed to be made the primary consideration. Megargee (1976)

maintained a similar position and suggested that mental health professionals should limit themselves to predicting violent behavior to populations with high base rates of violent behavior such as those who have already exhibited violence.

Monahan (1981) added that obtaining information on a limited number of reliable valid predictive relationships was necessary to limit the reliance on illusory correlations. Monahan (1984) urged a shift away from clinical attempts at long term predictions of dangerousness in chronically institutionalized populations and a shift toward a multidimensional approach to examining short term predictions.

Statement of the Problem

The early research on attempts to predict violent behavior focused on long term prediction using chronically institutionalized samples (Monahan, 1984). Monahan (1984) suggested that this research has been overgeneralized and that empirical approaches using a multivariate model which attempt to make more short term predictions in less chronic populations may be more fruitful.

Many predictive efforts have failed due to low base rates (i.e., Michigan Department of Corrections cited in Monahan, 1981; Steadman & Cocozza, 1974; Wenk, Robison, & Smith, 1972). Predictive efforts are most likely to be successful when the target behavior has an approximate 50% base rate (Meehl, 1954). Previous studies indicate involuntary admissions (Yesevage

et al., 1982; Rofman et al., 1980) and those adjudicated incompetent to stand trial (Steadman & Cocozza, 1976) have relatively high base rates of aggressive behavior.

The present study attempts to use a multivariate model which includes demographic data, arrest history, diagnosis, institutional variables, and test data to develop multiple regression equations which identify groups of individuals with higher than base rate involvement in institutional incidents and aggression.

The need for efficient classification systems in forensic facilities to aid in management and treatment remains (Mrad, Kabacoff, & Duckro, 1983). Classification systems based on psychological test results have been as effective or more effective than clinical predictions at discriminating between potentially aggressive and nonaggressive groups (Shagoury, 1971; Spellacy, 1978; Haramis & Wagner, 1980; Jones et al., 1981).

Cluster analysis of MMPI profiles has been successfully employed in Megargee's MMPI based system for offender classification (Megargee & Bohn, 1979) and in developing an MMPI typology of murderers (Anderson & Holcomb, 1983). Megargee's method has been successfully used to identify naturally occurring groups of adult offenders (Nichols, 1979), and half-way house residents (Mrad et al., 1983). Implementation of Megargee's system was successful at reducing institutional violence in a medium security federal prison (Megargee & Bohn, 1979).

Cluster analysis of the MMPI profiles of forensic patients may identify new groups which are likely to be unique to forensic psychiatric facilities. The present study attempted to identify naturally occurring MMPI subgroups in this population and to validate the groups by demonstrating between group differences in demographics, institutional behavior, and independent psychological test data.

Individuals found incompetent to stand trial have been relatively ignored in forensic psychological research (Steadman, 1984). A secondary purpose of the present study was to provide more data on a population of forensic inpatients consisting predominantly of individuals adjudicated incompetent to stand trial. Multiple regression procedures were used in an exploratory investigation of the predictors of the length of time required to return to competency. It was hoped this would add to the sparse literature on the subject (e.g., Cuneo, Brelje, Randolph, & Taliana, 1982; Heller, Traylor, Ehrlich, & Lester, 1981).

The hypotheses tested in the current study were as follows.

1. Some weighted combination of psychological test indices and demographic data derived from multiple regression analysis could identify residents at higher than base rate risk for becoming involved in institutional incidents.

2. A similarly derived equation could identify residents at risk for a) aggressive incidents, b) fights, and c) incidents requiring use of force.

3. Some combination of psychological test indices and demographic data could predict length of treatment for those residents adjudicated incompetent to stand trial.

4. Naturally occurring groups of forensic inpatients could be identified by hierarchical cluster analysis of residents MMPI data.

5. The derived groups would be valid in that significant differences would be found between the groups on demographic data, institutional adjustment, and other psychological test data.

CHAPTER TWO

METHOD

The present research used demographic and psychological test variables to predict institutional incidents, aggression, and length of stay for residents in a state forensic psychiatric facility. The present study also tested the hypothesis that naturally occurring groups of forensic patients could be identified by cluster analysis and that the groups would be significantly different on demographic, test, and behavioral characteristics. The subjects, institution, and variables used are discussed below.

Subjects

Subjects were 451 male residents from a pool of 474 residents evaluated by the center's Psychology Service between March, 1981, and April, 1985. Incomplete medical records, conflicting identifying information, and lost psychological or medical records resulted in the exclusion of 23 of 474 (4.85%) residents from this study. Residents' ages ranged from 15 to 64, with a mean age of 30.52.

The Psychology Service was staffed by two full time licensed Ph.D. clinical psychologists and two assistants who conducted psychological evaluations as part of a contract with the

Department of Clinical Psychology at the University of Florida. The assistants were pre-doctoral graduate students with similar training in psychological test administration and scoring in that department.

The Institution

North Florida Evaluation and Treatment Center is a 200 bed maximum security treatment facility for mentally disordered offenders. Ten buildings house from 18 to 27 residents. The center is comprised of four units one of which houses residents participating in a sex offender treatment program. These sex offenders were not included in the present study. The 451 residents in the present study consisted of residents on the three units comprised mostly of residents who had been adjudicated incompetent to stand trial. A small percentage of those found not guilty by reason of insanity and transfers from the department of corrections were also residents on these three units.

Evaluations of residents were routinely completed by the Psychology Service within the first 30 days of admission. The Psychology Service files contained evaluations of 474 residents. The evaluation consisted of a clinical interview and testing. Some tests which were routinely administered included the MMPI, WAIS-R (Wechesler, 1981) or rarely the Peabody Picture Vocabulary Test (Dunn, 1965), projective drawings, and the Rorschach. Variability in the tests administered existed due to reading difficulties, limited cooperation, and time constraints.

Materials and Measures

Demographic Variables

The selection of variables used in the present study was based on previous research findings, and the availability of such data in existent records. The selection of demographic data to be used in prediction equations was determined by the previous prediction literature. An effort was made to use nonredundant summary variables to minimize the number of independent variables thereby increasing the stability of the solutions (Pedhazur, 1982).

Admission status was coded as incompetent to stand trial, not guilty by reason of insanity, prison transfer, and other. Individuals adjudicated incompetent to stand trial were court ordered to one of two Florida maximum security psychiatric facilities if they were also adjudicated to be a danger to themselves or others and in need of treatment in a secure facility. Type of admission has been associated with between group differences in institutional aggressive behavior (Deitz & Rada, 1982; Yesavage et al., 1982).

Age was coded as the subject's age at time of testing. Race was coded as white, black, Hispanic ethnic group, and other. Age and race have been consistently reported to correlate with aggressive behavior (i.e., Deitz & Rada, 1982; Sweillam, 1982).

Diagnosis was coded from resident's NFETC official discharge DSM-III diagnosis (American Psychiatric Association, 1980). Diagnosis has frequently emerged as associated with aggressive

behavior (Evenson et al., 1974; Fottrell, 1980; Tardiff & Sweillam, 1982) although methods of diagnosis and findings have not been entirely consistent.

After reviewing the frequencies of each type of diagnosis it was decided that diagnoses would be coded as no axis-I diagnoses, affective (for DSM-III major affective disorders, n = 19, or schizoaffective disorder, n = 8), paranoid schizophrenia, all other types of schizophrenia, and "other" (this consisted of schizophreniform disorder, n = 5, post-traumatic stress disorder n = 1, dysthymic disorder, n = 5, brief reactive psychosis, n = 14, and paranoid disorder n = 6). Organic brain syndrome (OBS) was coded if the discharge diagnosis included dementia, epilepsy, or organic personality syndrome.

The NFETC discharge diagnoses included few diagnoses of personality disorder and other diagnoses except mixed personality disorder (n = 39) and antisocial personality disorder (n = 51). It was decided personality disorder would be coded as presence of any Axis-II diagnosis exclusive of antisocial personality disorder (n = 79). Presence of antisocial personality disorder was coded separately.

The presence of substance abuse or dependence was also coded separately and was coded as positive if the individual had a diagnosis of substance abuse or dependence, a history of two or more alcohol or drug related arrests, or a previous history of treatment for alcohol or drug dependency.

Marital status and education were coded from medical records. It was judged that a reliable source of residents employment status was not readily available. Employment status was not coded.

Arrest Data

National Crime Information Center (FBI-NCIC) and Florida Department of Law Enforcement (FDLE) arrest records were routinely obtained upon an individual's admission to NFETC. These records were the source for determining total number of arrests and number of violent arrests. The age of first arrest was obtained from arrest records, medical records and reports. Total arrests, violent arrests, and first recorded arrest were coded by two assistants if they occurred in Megargee's list of violent offenses (Megargee, 1982).

As a test of the reliability of the assistant's coding the primary investigator recoded random samples of each assistants arrest codings. Inter-scorer reliability was assesed between the principal investigator and Assistant One with $r = .9742$ ($n = 22$) for total arrests, and $r = .98333$ ($n = 22$) for violent arrests. For records coded by Assistant Two and recoded by the principal investigator, $r = .9309$ ($n = 23$) for total arrests, and $r = .9827$ ($n = 23$) for violent arrests. These results indicated that the codings were highly reliable and certainly sufficient for purposes of the present study.

Test Data

Residents were routinely referred to Psychology Service for evaluation within four weeks of admission. Medical records were reviewed, and residents were interviewed and tested individually. Residents were informed that a report would be included in their NFETC records. Among tests routinely administered by psychology services were the MMPI, WAIS-R, and the Rorschach.

MMPI

Psychology services administered two forms of the MMPI to residents. One hundred eighty-three subjects were administered Form-R of the MMPI and 110 residents were administered the MMPI-168 (Overall, Higgins, & DeSchweinitz, 1976), a short form of the MMPI. Due to criticism concerning the equivalency of the two forms (Hoffman & Butcher, 1975; Ward, Ward, & Moore, 1983) and lack of data concerning the use of the MMPI-168 in institutionalized forensic populations (Stevens & Reilley, 1980), 40 randomly chosen Form-R MMPI's were recoded as MMPI-168s and the resultant K-corrected t-scores compared.

Correlations between Form-R scored and the MMPI-168 scored profiles yielded correlation coefficients between .37739 and .93273 (see Table 1). Significant differences were found between the differently scored profile for K-corrected scores on scales Hs, Hy, Pd, Mf, Pa, and Sc (see Table 1). On the basis of these results, MMPI-168s were excluded from the present study to reduce measurement error.

Table 1

Mean K-Corrected T-score Differences and Correlations between MMPI Form-R recoded as MMPI 168: Paired Observations

Scale	Mean Form R Score - 168 Score	S. D.	t	prob.	correlation *
L	-0.1000	5.7325	-0.1103	n.s.	.84286
F	1.8000	9.7407	1.1687	n.s.	.89980
K	-0.9750	6.9485	-0.8875	n.s.	.73784
HS	-3.5250	8.1743	-2.7273	<.01	.84561
D	-0.4250	6.4087	-0.4194	n.s.	.93273
HY	2.4250	5.7329	2.6753	<.01	.87688
PD	-2.8750	7.6768	-2.3686	<.05	.83472
MF	2.6750	9.6247	1.7578	<.05	.56196
PA	-3.0750	10.6130	-1.8325	<.05	.81655
PT	-0.6500	8.0369	-0.5115	n.s.	.90805
SC	-3.7750	13.8017	-1.7299	<.05	.79842
MA	-2.6000	13.9409	-1.1795	n.s.	.37739
SI	-2.1750	8.8517	-1.5540	n.s.	.69653

*critical value (one-tailed, p = .05) = .26406

An additional 16 MMPI profiles from residents admitted after April 1985 were included in the cluster analysis to increase the power of the analysis. Data from residents of the additional 16 profiles were not included in the multiple regression equations since the full set of data was not collected. These additional 16 profiles were included in calculation of the overall mean NFETC MMPI profile.

A subset of MMPI scales was used in the multiple regression analyses. Scales F, K, 4, 6, 8, and 9 were selected for inclusion since the literature reviewed suggested these scales were most consistently found to differ, or discriminate between, aggressive and nonaggressive groups. All MMPI scales were not used in order to minimize the variable to sample size ratio, thereby increasing the stability of the solutions (Pedhazur, 1982).

Intelligence Measures

Psychological Services administered the Wechesler Adult Intelligence Scale-Revised to residents unless time constraints precluded administration, the residents mental status at the time or spoken English would not yield a valid estimate, or if a valid recent intelligence estimate was available.

Intelligence quotient (IQ score) was coded as the best WAIS-R estimate available from testing or medical records. The WAIS-R yields a Full Scale I.Q. (FSIQ), a Verbal I.Q. (VIQ) and a Performance I.Q. (PIQ). The VIQ is calculated from the subscales of Information, Arithmetic, Vocabulary, Comprehension, and Similarities. The PIQ is

calculated from the subtests of Picture Completion, Picture Arrangement, Block Design, Object Assembly, and Coding.

The WAIS-R subtest correlations with each other range from .33 (Digit Span and Object Assembly) to .81 (Vocabulary and Information). Verbal and Performance IQ's correlate .74. VIQ correlates .95 with FSIQ, and PIQ correlates .91 with FSIQ.

Since the full WAIS-R was not administered in some cases prorating or estimation of scores was based on the subtests administered. Coded IQ was, in order of preference, WAIS-R FSIQ or prorated FSIQ, WAIS-R VIQ or pro-rated VIQ, WAIS-R PIQ or prorated PIQ, and previously reported WAIS-R IQ.

Conflicting evidence for the role of intelligence in predicting recidivism or aggressive behavior exists (Heilbrum, 1979; Hinton, 1983). Heller et al. (1981) found that intelligence test results were predictive of length of treatment required to restore competency to stand trial.

Rorschach

The Rorschach was administered and scored using Exner's Comprehensive Rorschach System (Exner, 1974). The following variables were selected for use in the multiple regression equations based upon the previously reviewed literature. Except where noted, the variables were coded according to Exner's (1974) scoring criterion.

Rorschach R was defined as the total number of responses to the cards. The Rorschach variable X+% is the percentage of

total responses (excluding pure Color responses) whose form conforms to the features of the blot and represents good form quality. The determination of whether or not a percept conforms to a particular region of the inkblot is primarily determined by the use of frequency tables (Exner, 1974).

The Rorschach variable M refers to the presence of human movement in a percept. The frequency and form quality of M were coded. Rorschach M+ indicates the human movement response conformed to the features of the blot, whereas M- indicates the human movement response did not conform to the features of the blot. To facilitate computation and summarize the quality of the human movement response, the ratio M- + 100 / (M- + M+) + 100 was used in the present study.

The ratio of responses which include the whole blot, to the total number of responses which include human movement, W/M is generally interpreted as an index of aspirations to current capacity (Exner, 1974). Rorschach W/M was coded as W + 100 / (M+ + M-) + 100. The percentage of responses which include human percepts as content was coded as h%.

The use of color as a response determinant is often examined as an index of affective control and related to expression of anger or aggression. Responses that include color as a determinant are coded as FC, CF, or C depending on the relative weight the individuals responses indicated that either the color of the blots or the form was primary in determining the percept. Pure C is coded when the percept is solely based on color as

determinant. The rare Color naming response (e.g., "red") was also coded as C in the present study.

Rorschach Sum C, which was coded as the sum (1/2FC + CF + 1.5C), represents the sum and quality of the subjects' color responses. An index of M to Sum C (EB) was computed as (M+ + M-) + 100 / Sum C + 100. The ratio EB is reflects the degree to which the person is more prone to use inner life versus interaction with the world for satisfaction of important needs (Exner, 1974).

For purposes of this study path% was defined as the ratio: b + sex + rel + fd + an / R. Percepts with a content of blood, sex, religion, food, and anatomy percepts are believed to be related to sexual, aggressive, and primitive needs and impulses (Exner, 1974; Phillips & Smith 1953; Rapaport, Gil, & Schaeffer, 1946). This index was created by the present author since it could be readily coded from Exner's content categories. Previously published methods of scoring pathological content were not used since this would require substantial recoding, often from illegible transcripts of subjects initial verbal responses.

The interscorer reliability of two of the examiners which administered and scored many of the Rorschach protocals in the present study has been reported in a previous study (Unger, 1985). Every fifth response of 30 randomly chosen protocals from a pool of 150 student protocals were scored by both examiners. Unger (1985) reported interscorer reliabilty agreement of 92% for overall responses, 98% for location, 94% for determinants, and 93% for form quality (X+%).

Dependent Measures

Dependent Variables

The primary dependent measures in the multiple regression equations were coded from NFETC Incident (IR) and use of force (UFR) reports (Appendix A). These reports were implemented by NFETC in September 1982. Staff at the center are required to complete an incident report form for each time a resident threatens or actually harms another person or property. These reports are reviewed and signed by supervisors and security for completeness and accuracy.

Time of incident, circumstances, and response to incidents are coded on the incident report by checking off appropriate categories. Incident reports are divided into five sections. The first section indicates the particular people involved in the incident.

Section two indicates the location of the incident. Section three contained the majority of the data of interest in the present study. The type of incident was coded on incident reports as A. Refusal to take medications; B. Violation of standing procedures; C. Refusal to comply with verbal orders; D. Verbal abuse toward staff or other residents; E. Resident threatened violence (toward self or other); and F. Resident performed violence (toward self or other). Residents response to security was also coded as to whether the resident complied, resisted verbally, or resisted physically. More than one problem could be coded during any incident.

Staff response to the incident was coded on incident reports as A. Verbal orders issued to resident; B. Physical force applied; C. Condition B watch; D. Placed in observation room (Condition A watch); E. Nurse called; F. Security called; G. Placed in seclusion room; and H. Restraints applied.

Building Incident Rates

A separate index file was maintained by NFETC security which listed incident report numbers by resident. This included any incident which listed the resident in section I of the report. This file was used in the present study to calculate building incident rates in the following manner.

Indexed incidents were totaled by building and month for each resident at NFETC (exclusive of sex offender buildings) between September 1982 and December 1985. For each resident in the study a total of all incidents occurring in his building during months he was present for more than 14 days was made. The number of indexed incidents which involved the particular resident was subtracted from this number and then divided by the number of months of the residents stay yielding a building monthly incident rate for each resident.

Individual Incident Rates

Each resident's total incident rate was calculated from raw incident report and use of force report data which were collected, stored, and supervised by NFETC security. In calculating each

resident's incident rate, reports which involved building searches, reports in which the resident was not directly involved, minor medical injuries, and reports in which the resident was clearly only the victim of a verbal or physical assault were not included. Thus, this total was below each resident's index card total. The total number of incidents was divided by each resident's length of stay yielding a monthly incident rate for each resident.

Violent incidents were coded as a subset of the total incident figure above. An incident was coded as aggressive if it involved violent physical contact with another resident, staff, or security. The number of such incidents was divided by each resident's length of stay to yield a monthly aggressive incident rate.

On occasion, physical aggression would occur following the initial incident intervention. These incidents were added to each resident's total violent incidents to yield a monthly rate of extended aggressive incidents. Thus, aggressive incidents formed a subset of extended aggressive incidents.

Fights constituted a subset of violent incidents and were coded from narrative reports. Reports of clearly identified victims of attacks were excluded, and a monthly fight rate was calculated for each resident.

Use of force reports were required whenever physical intervention was required by staff or security to control the resident and most likely constituted the most serious subset of

incidents. Use of force reports were tabulated by resident and were used to calculate monthly use of force rate for each resident.

Building Response

A measure of each building's response characteristics was derived from examining the rate of physical intervention, restraint, or seclusion in response to incidents which did not involve actual physical violence by the resident.

One hundred ninety-four reports were identified which included verbal aggression, but no physical aggression, or threats of violence to self or property. These were tabulated by building and the percentage of these reports which included physical intervention, restraint, or seclusion by staff was calculated and coded as building verbal aggression response.

Length of Stay

Resident's length of stay was coded as days between date of admission and date of discharge. Length of stay was tabulated by building to yield building average length of stay.

Analyses

The selection of predictor variables was determined by previous research findings and the availability of such information in existing files. K-corrected Minnesota Multiphasic Personality Inventory (MMPI) scales were used. The MMPIs were not included if the

psychological report indicated evidence of a random response style or if the profile had a scale K T-score above 70 - T. Eleven profiles were excluded from cluster analysis and multiple regression analyses due to K scores greater than 70 - T.

Prediction equations were generated by sequential application of stepwise multiple regression to blocks of predictor variables (Cohen & Cohen, 1975). In this method, the stepwise regression procedure selects variables from the subset of predictor variables constituting the "block." At each stage the variable which has the largest semipartial correlation is entered. When no predictor variable from the block would make a further significant contribution to the variance accounted for, the analysis is terminated. If the addition of a variable results in a previously entered variable no longer making a significant contribution, as sometimes happens with highly correlated variables, the previous variable is removed from the equation.

In a blockwise selection procedure surviving variables from the previous block which had made a significant contribution are added to the next block and the stepwise multiple regression procedure described above repeated until all variables and blocks are analyzed (Cohen & Cohen, 1975). Resultant equations are obtained in an a posteriori order based solely on the relative uniqueness of predictor variables in the sample at hand (Cohen & Cohen, 1975).

Stepwise multiple regression procedures have been criticized as being unsuitable for explanatory research. The use of a large number of predictor variables relative to the sample size results in capitalization on chance and make overall tests of multiple R-squared invalid (Cohen & Cohen, 1975). These criticisms are less of a problem when the research goal is entirely or at least primarily predictive when the sample size is relatively large relative to the number of predictor variables, and when the results are cross validated (Cohen & Cohen, 1975).

A more realistic estimate of the multiple R-squared can be calculated as a "shrunken R-squared," where shrunken R-squared = 1 - (1 - R-squared) X (n - 1) / (n - k - 1) (Cohen & Cohen, 1975), where n is the sample size and k is the number of predictor variables. Two estimates of Shrunken R Squared may be made. A liberal estimate involves calculating k as the number of variables actually entered into the equation. A conservative estimate is calculated defining k as the total number of variables examined prior to the stepwise selection procedure (Cohen & Cohen, 1975). An estimate of the magnitude of error in estimating values in other samples is calculated by the standard error of estimate which yields the estimated standard deviation of residual errors.

Stepwise multiple regression was applied in blocks to generate prediction equations for the criterion variables incident rate, aggressive incident rate, extended aggressive incident rate, fight

rate, and use of force rate. All multiple regression analyses were performed using Microstat software (Ecosoft, 1984).

The same procedure was used to generate a prediction equation for length of stay for residents adjudicated incompetent to stand trial. Prediction equations were then utilized to generate classification tables for different incident types using various cutting scores. The resultant classification rates were compared with classification rates based upon chance (50%) and the overall base rate.

The order of block entry was determined by availability of data, difficulty and costs of obtaining the data, and finally by the completeness of the data for all subjects. Since all subjects did not complete all of the psychological tests, test data were entered last.

Possible differences between groups of residents who were and were not administered a Form-R MMPI and between those residents who were and were not administered a Rorschach were examined using t-tests. Differences between the groups of residents would pose limits to the generalization of equations which included test variables.

Categorical variables such as race, diagnosis, building, and, admission type were coded as dummy variables (Cohen and Cohen, 1975) in the multiple regression analyses (See Table 2). All analyses used the same order of block entry (Table 3).

Block 1 consisted of the basic demographic variables of age, education, race, marital status, and admission type. Block 2

Table 2

Variable Coding for Multiple Regression Analyses

Race:	black, Hispanic (0,0) = white
Marital Status:	married, divorced, other (0,0,0) = never married
Admision Status:	not guilty by reason of insanity, other, (0,0) = incompetent to stand trial
Axis I:	affective disorder, nonparanoid schizophrenia, paranoid schizophrenia, other axisl, (0,0,0,0) = no axis I diagnosis
Unit:	Unit 2, Unit 3, (0,0) = Unit 1
Building:	blg. 6, blg. 7, blg. 8, blg. 9, blg. 10, blg 13, blg. 14, (0,0,0,0,0,0,0) = other

Table 3

Multiple Regression Blocks

B L O C K S							
ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT
age	Axis I:	blg. avg.	blg.	total arrests	Rorsch:	MMPI:	IQ
ed.	affect.	l.o.s.	6		R	F	
Race:	o. schiz.	blg. incid.	7	first arrest	X+ %	K	
black	par. scz.	rate	8	violent arrests	path %	4	
Hisp.	o. Ax I.	blg. verbal	9		W/M	6	
Marital:	personal. disorder	incid. resp.	10	current violent arrest	Sum C	8	
married			13		M-/M	9	
div.	antisoc.	Unit II.	14		M/Sum C		
other	organic drug/etoh	Unit III.			H %		
Admit Type:							
NGRI							
other							

consisted of discharge diagnoses. Although these diagnoses were not predictor variables in the chronological sense, it was assumed these diagnoses were descriptive of the residents and representative of the syndromes and symptoms for which they were admitted and treated.

Blocks 3 and 4 represented institutional variables. Block 3 consisted of each resident's building average length of stay, building incident rate, building response to verbal aggression, and the unit to which the resident was assigned. These data were entered before Block 4, which represented the building to which the resident was assigned, because Block 3 variables contained more specific and meaningful data.

Block 5 data consisted of the arrest variables of total arrests, violent arrests, age of first arrest, and presence of violent current offense. These data were entered after the previous blocks since it was likely that this type of data would be difficult to obtain in many instances.

Psychological test data were entered last since all residents did not complete all tests, the economic cost of collecting such data, and to assess whether or not psychological test data would contribute significant additional information beyond demographic, diagnostic, and institutional data.

The Rorschach variables R, X+%, path%, M- to M, W to M, Sum C, M to Sum C, and h percent were entered as block 6. Rorschach data were

entered prior to other test data since subjects who completed the Rorschach represented a larger subsample.

The MMPI scales F, K, 4, 6, 8, and 9 were entered as block 7. The MMPI data were included prior to the single variable block 8 (I.Q. score) due to the relative costs of administering an MMPI and an individually administered Wechsler Adult Intelligence Scale-Revised (WAIS-R).

Cluster Analysis

The hypothesis that naturally occurring groups of forensic inpatients could be identified by hierarchical cluster analysis of K-corrected MMPI T-scores was tested using 188 subjects administered the test. The MMPI data were cluster analyzed using hierarchical profile analysis using Ward's (1963) method and the CLUSTAN (Wishart, 1978) computer program at the Northeast Regional Data Center.

The procedure is an agglomerative hierarchical method which uses Euclidean distance as the similarity measure and minimizes within cluster variance (Blashfield & Morey, 1980). Since cases are not assigned to the nearest cluster after initial assignment by this procedure, procedure RELOCATE, which does assign cases to the nearest cluster, was performed.

If the resultant cluster groups are valid, significant between group differences are expected (Blashfield, Aldenderfer, & Morey, 1979). Following the RELOCATE procedure multivariate and univariate anlayses of variance were conducted to test for

between group differences on continuous variables. Chi-square analyses were conducted for categorical variables.

In a deviation from Megargee's cluster analytic procedure (Megargee & Bohn, 1979) records with an F scale score greater than 100-T were not eliminated from the present sample. Random selection of 32 profiles from the present sample found nine (35.5%) profiles with F scale scores greater than 100-T. These profiles were included since they constituted a large part of the sample to be studied. A large percentage (24%) of a halfway house sample was eliminated by this procedure in a previous study (Mrad et al., 1983).

CHAPTER THREE

RESULTS

Sample Characteristics

Demographic and Diagnostic Characteristics

The mean age of the 451 NFETC residents in the present sample was 30.5. The racial composition was mixed (Table 4), 44.1% of the residents were white, 38.4% black, 16.6% were of Hispanic ethnic origin, and 0.9% "other." The Hispanic group was comprised of 70.6% residents of Cuban origin, 11% residents of South American origin, 11% of Puerto Rican origin and 7% other Hispanic origins. Of the Cubans, 56.6% were refugees from Cuban prisons and asylums who arrived in the United States during the 1980 Mariel boat lift. These refugees comprised 40% of the entire Hispanic ethnic group.

Few residents were presently married (5.6%), and most had never been married (69.2%). The mean number of years of education (9.9) suggests that most of the sample had not graduated high school. Demographic and diagnostic data descriptive of the present sample are presented in Tables 4-8.

The majority of residents in the present sample had been adjudicated incompetent to stand trial (91.4%). The overall sample had a substantial criminal history (Table 5). Residents had been previously arrested a mean 7.9 times with a mean

Table 4

Demographic Data

Variable	Mean	Sample S. D.	Minimum	Maximum	N
Age	30.52	9.52	15	64	451
Education	9.869	3.193	1	18	443
Race:	Frequency	Percentage			
white	199	44.1			
black	173	38.4			
Hispanic	75	16.6			
other	4	0.9			
Marital Status:					
unmarried	312	69.2			
married	25	5.6			
divorced	108	24.0			
other	6	1.3			

Table 5

Admission Type and Arrest Data

Variable	Frequency	Percentage
Admission Type:		
Incompetent to stand trial	412	91.4
Not guilty by reason of insanity	16	3.6
Baker Act transfer from D. O. C.	14	3.1
Other	9	1.9
Type of Current Arrest:		
Violent	304	67.4
Nonviolent	147	32.6

Arrest History:	Mean	Sample S. D.	Minimum	Maximum	N
Total Arrests	7.95	8.03	1	54	439
Violent Arrests	1.87	1.85	0	16	439
Age at First Arrest	21.78	8.34	8	60	439

1.9 arrests for violent crimes. Although juvenile records were rarely available, the mean age of first known arrest based primarily on adult records was 21.8. The majority of residents were faced with a violent current charge (67.4%). Approximately 10% of the sample had present charges of some form of homicide, and 14% of the sample had a present or past arrest for homicide.

The majority of the residents in the present sample were suffering from severe forms of mental illness. The modal Axis-I of diagnosis was schizophrenia (Table 6). Sixty-four percent of the sample received discharge diagnoses of some type of schizophrenia. Paranoid schizophrenics made up 41.24% of the sample, and other forms of schizophrenia accounted for an additional 22.84%. A substantial minority of residents (23.06%) received no Axis-I discharge diagnosis.

Personality disorders other than antisocial personality disorder were not frequently diagnosed (17.5%, Table 7). Antisocial personality disorder was also not frequently diagnosed (11.3%). The NFETC residents had frequent histories of alcohol and substance abuse. Residents with either a discharge diagnosis which included some form of substance abuse or dependence, history of two or more substance related arrests, or history of treatment for substance dependency included 27.7% of the sample. Discharge diagnoses of organic brain syndromes, or organic personality syndromes were rare (5.5%).

Residents were fairly evenly assigned to Units (Table 8). Residents were assigned to Unit and building at admission.

Table 6

NFETC DSM-III Axis-I Discharge Diagnoses

DSM-III Diagnosis	Frequency	Percentage
0. No Axis-I Diagnosis (Below)	104	23.06
1. Major Affective Disorder	19	4.21
2. Schizoaffective Disorder	8	1.77
3. Paranoid Schizophrenia	186	41.24
4. Schizophrenia (Other)	103	22.84
5. Schizophreniform	5	1.11
6. Post Traumatic Stress Disorder	1	0.22
7. Dysthymic Disorder	5	1.11
8. Brief Reactive Psychosis	14	3.10
9. Paranoid Disorder	6	1.37

Note: For purposes of multiple regression analyses Major Affective Disorder and Schizoaffective Disorder were combined into "Affective Disorders", and diagnoses 5-9 above were combined into the category "other Axis-I."

Table 7

Other DSM-III Discharge Diagnoses

DSM-III Diagnosis	Frequency	Percentage
Personality Disorders (not including antisocial personality disorder)		
not diagnosed	372	82.48
diagnosed	79	17.52
Antisocial Personality Disorder		
not diagnosed	400	88.69
diagnosed	51	11.31
Organic Brain Syndromes		
not diagnosed	426	94.46
diagnosed	25	5.54
History of Substance or Alcohol Abuse or Dependence		
absent	326	72.28
present	125	27.72

Table 8

Unit and Building Assignments

Assignment	Frequency	Percentage
Unit		
I.	151	33.48
II.	125	27.72
III.	175	38.80
Building		
6.	51	11.31
7.	54	11.97
8.	54	11.97
9.	67	14.86
10.	90	19.96
12.	12	2.66
13.	63	13.97
14.	51	11.31
15.	9	2.00

Assignment was made on the basis of available bed space. Unit One, Unit Two, and Unit Three housed 33.5%, 27.7%, and 38.8% of the sample of residents respectively. Assignment to buildings was also fairly evenly distributed, with the following exceptions. Residents from Building 12 and 15 combined comprised only approximately 5% of the sample. This was due to changes in the use of these buildings during the time period of the present study. A somewhat higher proportion of residents (20%) were assigned to Building 10.

Test Data

Test data indicated that NFETC residents were poorly functioning cognitively and emotionally. The mean level of intellectual functioning was at the very low end of the low average range of measured intelligence (80.5). This was just slightly above the range of IQ scores which are indicative of borderline intelligence (70-79).

The MMPI data were characteristic of acutely hospitalized inpatient populations. The mean MMPI profile (see Table 9) is presented in Figure 1. This profile included data from an additional 16 residents which were used in the cluster analysis, and eliminated residents with a scale K score greater than 70 - T since these were considered invalid.

Rorschach data are presented in Table 10 along with means and standard deviations of a nonpatient and a schizophrenic sample (Exner, 1977). The low percentage of percepts conforming to the physical features of the blots (59%) is indicative of poor reality testing and is characteristic of psychotic individuals.

Table 9

NFETC MMPI Descriptive Statistics

MMPI Form R
K corrected
t-scores

Scale	Mean	Standard Deviation
L	54.97	9.86
F	81.14	23.54
K	51.72	9.37
HS	65.27	15.04
D	69.01	15.97
HY	62.27	11.90
PD	73.31	13.95
MF	62.82	9.53
PA	74.68	18.99
PT	71.28	17.29
SC	86.22	24.92
MA	70.82	13.77
SI	56.60	10.74

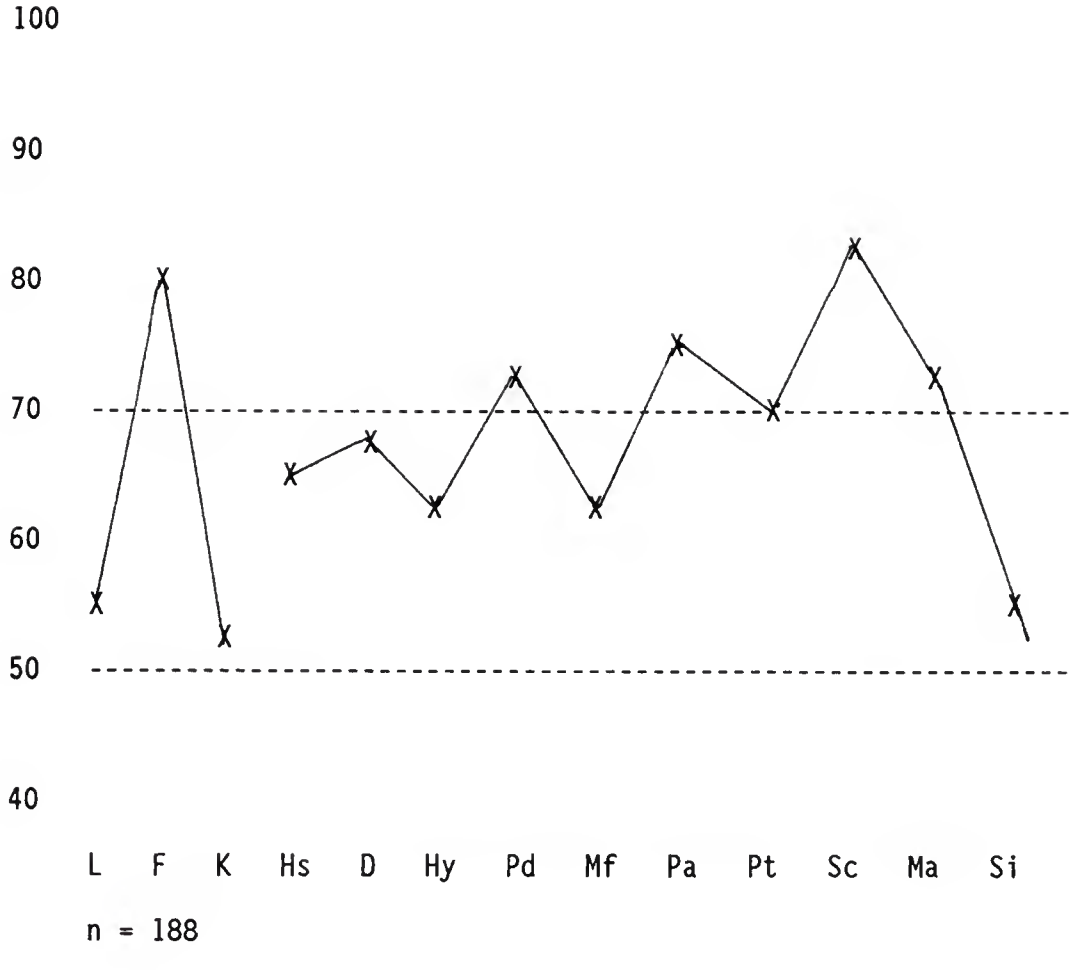

Figure 1. Mean Group NFETC MMFI Profile

Table 10

Rorschach NFETC Descriptive Statistics

	NFETC n = 237		Nonpatient* n = 325		Inpatient Schizophrenic* n = 210	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
R	15.96	6.624	21.75	5.1	24.20	7.2
X+ %	59.00	17.80	81.00	12.0	57.0	14.0
path %	12.18	13.32	n/a	n/a	n/a	n/a
weighted Sum C	1.784	2.136	3.73	1.8	6.58	3.7
h %	12.02	12.43	n/a	n/a	n/a	n/a
M -	.4231	.8212	n/a	n/a	n/a	n/a
M +	1.124	1.196	n/a	n/a	n/a	n/a
W	7.265	3.761	7.04	2.8	7.38	3.2

* Exner (1974)

Incident Data

Security maintained an index file which listed incident report numbers whenever a resident was mentioned in an incident report form. This sometimes included reports in which the resident was only a witness, only marginally involved, or part of a building wide search. Indexed incidents were used in the present study to estimate monthly incident rates on each building. Indexed incident data included all residents assigned to the three units which did not treat sex offenders.

A total of 4466 index file incidents were tallied for the period between September 1982 and December 1985. A single incident could be tallied more than once, depending on the number of residents involved, therefore the present results are an overestimate of actual building incident rates.

Residents in the present study were those residents who were tested by Psychological Services. Residents in the present sample accounted for 2329 (51.4%) of the index file incidents accounted for by residents exclusive of those residents in the sex offender unit. The mean number of incidents appearing on a residents index card was 6.30 (records = 369) for residents tested by Psychological Services, and 5.410 for residents not tested (records = 395). A single resident could have more than one record if he was readmitted, or transferred to another building.

An index of the number of incidents which occured on each residents building during each resident's length of stay was

calculated. Index file incidents were tabulated by building and month. Each resident's file index incidents were subtracted from the total number of indexed incidents on their building yielding a building incident rate which was unique to each resident.

A total of 1367 incident reports were coded from original Incident and Use of Force Report forms maintained security (Appendix A). These forms were coded only for the residents in the present study. Incidents involving building searches and those which did not directly involve a resident were not coded.

Rates and frequency of individuals involved in different types of incidents are presented in Table 11. These data indicated that the frequency of individuals involved in any type of incident (54.1%) was sufficient to expect a successful attempt at prediction. The frequency of individuals involved in specific types of incidents ranged from approximately 20% to 33%, somewhat less than optimum for predictive attempts but high enough to warrant an attempt.

An index of each building's response to incidents which were not physically violent was created. Of the 1367 incident reports coded, 193 were found to involve some form of verbal aggression but no actual physical aggression toward staff, security, other resident, self, or property. Of these verbally aggressive incidents, 70 (36.27%), resulted in physical intervention, restraint, or seclusion.

Table 11

NFETC Incident Data

Incident Type:	Frequency	Percentage
Incidents--Any type		
None	207	45.90
One or more	244	54.10
Aggressive Incidents		
None	325	72.06
One or more	126	27.94
Aggressive Incidents (Extended)		
None	300	66.52
One or more	151	33.48
Use of Force Incidents		
None	352	78.05
One or More	99	21.95
Fighting Incidents		
None	361	80.04
One or More	90	19.96

Type of Incident (Monthly Rate)	Mean	Sample S. D.	Minimum	Maximum
Total	0.3686	0.7377	0	7.088
Aggressive	0.0794	0.1758	0	1.359
Aggressive Extended	0.1173	0.2575	0	2.473
Use of Force	0.0879	0.3400	0	5.604
Fights	0.0495	0.1287	0	0.968

The rates of verbally aggressive incidents and this type of result was tabulated by building to yield a percentage coded as "building response" (Table 12).

Comparison of Residents Tested by MMPI and Rorschach

Since not all residents which were evaluated by Psychological Services were administered the same battery of tests, the possibility existed that tested residents would constitute a biased subsample of all the residents in the study and thereby pose limits to the generalizability of test findings.

To test the hypothesis that residents administered the Rorschach or the MMPI were different from those who were not administered the particular test, a series of t-tests and Chi-square analyses were conducted.

Those residents administered the MMPI (Form-R) were compared with the group of residents either not administered the test or who were administered the short form MMPI-168. Data of residents for whom the Rorschach was administered and available was compared with data of residents for whom the Rorschach was not administered or available. A small, undetermined number of the "no Rorschach group" may actually have been administered a Rorschach which was not coded in the present study because it was not scored by the examiner at the time of evaluation.

Table 12

Building Rates of Physical Intervention, Restraint, or Seclusion for Verbally Aggressive Incidents

Building	VAI Verbally Aggressive Incidents	PIRS Physical Intervention Restraint / Seclusion	PIRS / VAI Building Response %
none	8	2	25.0
2	3	0	0.0
6	34	21	61.7
7	16	8	50.0
8	29	9	31.0
9	34	16	47.1
10	21	3	14.3
11	1	0	0.0
12	4	1	25.0
13	13	6	46.2
14	29	9	31.0
15	1	0	0.0

Note: Building was coded as none if it occured on a building other than those listed, building was not listed on incident report, or if incident occured before resident was actually assigned to a building.]

Rorschach Group Differences

A comparison of those residents administered the Rorschach and those who were not yielded the following results. All t-tests and Chi-square analyses were performed using Microstat software (Ecosoft, 1984).

The analyses indicated no significant differences between groups for any of the variables examined (see Tables 13 and 14). Therefore, the null hypothesis that no between group differences exist could not be rejected.

MMPI

A comparison of residents administered Form-R of the MMPI and those not was conducted by t-tests and Chi-square analyses. The analyses yielded the following results.

Residents who had completed the MMPI were found to have significantly more education (Mean = 10.282) than those not administered the test (Mean 9.594) (Table 15).

Differences between residents administered the MMPI and those not were found for discharge diagnoses. Chi-square analysis of Axis-I diagnoses of "none," major affective disorder, schizoaffective disorder, paranoid schizophrenia, and other schizophrenia found a significant difference in the relative frequencies of these diagnoses for those administered the Rorschach and those not (Table 16). Proportionately more residents administered the MMPI were diagnosed as having a major affective disorder than those not administered the test (Table 17).

Table 13

Comparison Data for Residents Administered the Rorschach and Those Not

Variable	Mean No Rorschach	Mean Rorschach	F	prob.	d.f.
Demographic:					
age	30.701	30.000	.581	.4463	1,449
education	9.824	9.910	.080	.7773	1,441
Arrest history:					
total	8.068	7.811	.112	.7385	1,438
violent	1.797	1.931	.573	.4493	1,438
age of first	21.990	21.591	.251	.6169	1,437
Intelligence score:	80.055	80.806	.243	.6227	1,296
Length of Treatment:	220.14	213.69	.117	.7326	1,440
Monthly Incident Rates:					
total	0.434	0.309	3.233	.0729	1,449
aggresive	0.078	0.081	.037	.8484	1,449
aggressive extended	0.125	0.110	.356	.5509	1,449
use of force	0.106	0.071	1.220	.2700	1,449
fights	0.047	0.052	.171	.6798	1,449

Table 14

Results Chi-Square Comparisons of NFETC Residents Tested and Not Tested with Rorschach

Variable	Chi-square	d. f.	prob.	n
Admission Type	2.249	2	.325	442
Race	.310	2	.856	447
Marital Status	3.013	2	.222	445
Axis-I Discharge Diagnosis	7.133	4	.129	420
Personality Disorder	.243	1	.622	451
Antisocial Personality Disorder	.008	1	.929	451
Organic Brain Syndrome	1.181	1	.277	451
Substance Abuse or Dependence	.121	1	.941	451
Current Violent Arrest	.107	1	.948	451

Table 15

Comparison Data for Residents Administered the MMPI Form-R and Those Not

Variable	Mean No MMPI Group	Mean MMPI Group	F	Prob.	D.F.
Demographic:					
age	30.470	30.127	.134	.7144	1,449
education	9.594	10.282	4.986	< .05	1,441
Arrest history:					
total	8.283	7.400	1.276	.2593	1,438
violent	1.977	1.705	2.290	.1310	1,438
age of first	21.428	22.314	1.190	.2759	1,437
Intelligence Score:	77.152	84.969	28.733	<.001	1,296
Length of Treatment:	235.452	189.173	5.916	< .05	1,440
Monthly Incident Rates:					
total	0.379	0.353	.126	.7229	1,449
aggressive	0.084	0.073	.372	.5425	1,449
agressive extended	0.121	0.112	.142	.7064	1,449
use of force	0.093	0.081	.129	.7191	1,449
fights	0.049	0.051	.019	.8904	1,449

Table 16

Results of Chi-Square Comparisons of NFETC Residents Tested and Not Tested with MMPI Form-R

Variable	Chi-square	d. f.	prob.	n
Admission Type	3.881	2	.144	442
Race	3.740	2	.154	447
Marital Status	5.112	2	.078	445
Axis-I Discharge Diagnosis	23.398	4	< .001	420
Personality Disorder	8.886	1	< .01	451
Antisocial Personality Disorder	.380	1	.538	451
Organic Brain Syndrome	2.200	1	.1380	451
Substance Abuse or Dependence	.327	1	.567	451
Current Violent Arrest	.010	1	.919	451

Table 17

Chi-square Analysis of MMPI Tested Versus Not Tested Residents: DSM-III Axis-I Discharge Diagnoses

	No Diagnosis	Major Affective	Schizo-Affective	Paranoid Schiz.	Other Schiz.
No MMPI					
Frequency	57	5	6	107	79
Observed Pecentage	13.57	1.19	1.19	25.48	18.81
Expected Percentage	14.98	2.74	1.15	26.78	14.83
MMPI					
Frequency	47	14	2	79	24
Observed Percentage	11.19	3.33	.48	18.81	5.71
Expected Percentage	9.79	1.79	.75	17.50	9.69

Chi-square = 23.398, d.f. = 4, p = <.001, n = 420

Analyses also indicated that residents who were administered an MMPI were proportionately more likely to receive a DSM-III discharge diagnosis of some type of personality disorder other than antisocial personality disorder (Table 18).

Residents administered the MMPI were found to have a significantly higher measured WAIS-R I.Q. score (Mean = 84.969) than those not tested (Mean = 77.152).

Residents administered an MMPI were found to have a lower length of stay (Mean = 189.173 days than residents who were not administered the test (Mean = 235.452 days, F (1,440) 5.916, $p < .05$.

No significant differences were found between groups for total incident rate, aggressive incident rate, extended aggressive incident rate, use of force, or fights (Table 15). Further analyses (see Tables 15 and 16) failed to find significant differences.

In contrast with comparisons of resident administered and not administered the Rorschach, significant differences were found between residents which were or were not administered the MMPI. Residents administered the MMPI were more educated and achieved a higher WAIS-R IQ score upon testing.

Differences in rates of DSM-III Axis-I and personality disorder discharge diagnoses were also found. Residents administered the MMPI were also found to be discharged sooner than those not administered the test. These results suggest that the group of residents who completed the MMPI Form-R may have been functioning better cognitively and in other ways than those residents not administered the test.

Table 18

Chi-square Analysis of MMPI Tested Versus Not Tested Residents: DSM-III Personality Disorder Diagnosis (Excluding Antisocial Personality Disorder)

	No Diagnosis	Personality Disorder
No MMPI		
Frequency	235	35
Observed Percentage	52.11	7.76
Expected Percentage	49.38	10.49
MMPI		
Frequency	137	44
Observed Percentage	30.38	9.76
Percentage	33.10	7.03

Chi-square with continuity correction factor = .8.886, $p < .01$.

Chi-square without continuity correction factor = 9.655, $p < .01$.

d. f. = 1, n = 451

Prediction Equations

Incident data consisting of total incident rate, aggressive incident rate, extended aggressive incident rate, use of force rate, and fighting incident rate was analyzed by stepwise multiple regression applied to blocks. Variables were entered in the order of basic demographic data, diagnoses, unit assignment and building rates, building assignment, arrest data, Rorschach data, MMPI data, and I.Q. score (Table 3).

An F for each variable to be selected to enter the multiple regression equations of 3.00 was selected, since it was slightly more conservative than a F of 2.00 which was described as liberal by Cohen and Cohen (1975). Lower values of F make it easier for variables to enter the equation. Selection of this F value resulted in a significance level of .05 for most variables entering the equations.

After the multiple regression equation rates were derived, the ability of the equations to classify residents into incident and no-incident groups was examined. Classification rates of multiple regression equations based on demographic data alone and on demographic plus test data were examined by calculating the number of residents falling above and below various cutting scores and comparing the actual number of residents in these categories who were actually involved in incidents.

Cutting scores were selected as to minimize the false positive rate while maintaining a high overall classification rate. Two

separate prediction equations were computed for each type of incident. Separate equations were computed using data exclusive and inclusive of test data.

A summary of the resultant multiple regression equations which were results of analyses of the demographic variables only are presented in Table 19. These demographic results were based on the entire sample of 451 residents. A summary of the results of multiple regression analyses of demographic and test data are presented in Table 20. Since not all residents completed all tests these results were based on subsamples of residents completing the tests.

As can be seen from these summaries, conservative estimates of Shrunken R-squared, an estimate of the actual population variance accounted for, are quite small or null. This is due to the large number of predictor variables originally examined. The liberal calculations of Shrunken R-squared, based only on the actual variables entered after the stepwise selection procedure, offer a much higher estimate of the actual population variance accounted for.

Analyses were conducted for total incident rates which included any type of disruptive incident, aggressive incidents, extended aggressive incidents, incidents requiring the use of force, and fighting incidents. Separate equations were derived using only the demographic blocks of variables and those including the test blocks. Some post hoc analyses were done which varied

Table 19

Demographic Multiple Regression Summary: Regression Weights and Statistics

Variable	Overall Incident Rate	Aggressive Rate	Extended Aggressive Rate	Use of Force Rate	Fight Rate
hispanic	.3995	.0953	.1617	.1300	
age	-.0880	-.0018	-.0025	-.0043	
divorced		-.0408	-.0640		-.0455
antisoc.	.4775	.0619	.1078		
other Axis-I	-.2683				
Blg 6				.4094	
Blg 7				-.1388	
Blg 10				-.2035	
Blg 14	.2166	.1017	.1091	-.1925	.0624
Blg Avg L. O. T.				-.0054	
Unit II					.0296
Constant	.4896	.1085	.1584	1.3889	.0451
Multi- R	.3198	.3123	.3235	.3186	.2692
Multi- R Squared	.1023	.0975	.1046	.1015	.0725
S. Error	.7029	.1679	.2450	.3248	.1244
Liberal Shrunken R-Square	.0921	.0874	.0945	.0873	.0663
Conserv. Shrunken R-Square	.0411	.0284	.0148	.0327	.0015

Table 19 continued

Variable	Overall Incident Rate	Aggressive Rate	Extended Aggressive Rate	Use of Force Rate	Fight Rate
Single Variables Accounting for Largest Proportion of Variance					
Variable	antisoc	hisp	hisp	hisp	blg 14
R-Square	.0271	.0272	.0405	.0151	.0446

Table 20

Demographic and Test Multiple Regression Summary: Regression Weights and Statistics

Variable	Inc Rate	Post Hoc Inc Rate	Aggr Rate	Post Hoc Aggr Rate	Ext Aggr Rate	Fight Rate
Hispanic	.2516		.1096	.1072	.1336	
age	-.0070					
divorced				-.0649	-.0761	-.0563
antisoc.	.3883	.2003				
Blg 14	.2221		.0899	.0932	.1132	.0951
Sum C	-.0320	-.0305		-.0146		-.0111
path %			.0018	.0021		.0014
R				.0038		.0038
M:C (100)			1.0288		1.0888	
MMPI K		-.0067				
Constant	.4695	.6667	-.9792	.0096	.9909	-.0018
Multi- R	.3366	.3302	.3389	.3577	.2945	.3409
Multi- R Squared	.1133	.1090	.1148	.1280	.0867	.1162
S. Error	.5133	.3726	.1737	.1728	.2635	.1337
Liberal Shrunken R-Square	.0931	.0823	.0956	.1053	.0710	.0971
Conserv. Shrunken R-Square	.0000	.0000	.0000	.0000	.0000	.0000

Table 20 continued

Variable	Inc Rate	Post Hoc Inc Rate	Aggr Rate	Post Hoc Aggr Rate	Ext Aggr Rate	Fight Rate
Single Variables Accounting for Largest Proportion of Variance						
Variable	antisoc	antisoc	hisp	hisp	hisp	blg 14
R-Square	.0413	.0402	.0396	.0396	.0345	.0397

the ofder of entry of test blocks, and used additional Rorschach variables.

Total Incident Rates

Results of the multiple regression procedure conducted on overall incident rates are presented in Table 21. Results of the analysis prior to entry of test data indicated that each of the variables age, Hispanic ethnic group, antisocial personality disorder, other Axis-I diagnosis, and building 14 assignment contributed significantly when added to the equation.

The resultant multiple regression equation accounted for 10.23% of the incident rate variance, and was significant at the .001 level. Young Hispanic males with a diagnosis of antisocial personality disorder had the highest predicted incident rates. The diagnosis of antisocial personality disorder was the single variable which accounted for the largest proportion of incident rate variance (4.30%), and was the variable which contributed the highest proportion of independent variance in the prediction equation.

Classification rates based upon the resultant equation of predicted rate = -.00816 age + .39952 Hispanic ethnic group + .97753 anticosial personality disorder + -.26827 other Axis-I diagnosis + .21660 building 14 assignment + .48961 are presented in Table 22.

Table 21

Incident Rate Blockwise Multiple Regression Results

Block 1. Demographic Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,441	12.275	<.001	.0271	.1646
2.	divorced	1,440	5.575	< .05	.0393	.1981
3.	age	1,339	3.124	.0778	.0458	.2141

Regression Block One results

Variable	Regression Coefficient	Standard Error	F(1,439)	Prob.	Partial r^2
age	-.00652	.00375	3.021	.08291	.0068
Hispanic	.34527	.09357	13.615	<.001	.0301
divorce	-.14876	.0841	3.124	.07786	.0071
constant	.54735				
STD. ERROR OF ESTIMATE =		.7285			
R SQUARED =		.0458			
MULTIPLE R =		.2141			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	11.18729	3	3.72910	7.027	<.001
Residual	232.97605	439	.53070		
Total	244.16334	442			

Table 21 continued

Block 2. Discharge Diagnoses Added to Block 1 survivors.

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	antisocial	1,449	20.199	<.001	.0431	.2075
2.	Hispanic	1,448	15.726	<.001	.0755	.2748
3.	divorced	1,447	4.938	<.05	.0856	.2926
4.	other Axis-I	1,446	3.936	<.05	.0936	.3059
5.	age	1,445	3.039	.0819	.0998	.3158
6.	divorced removed	1,446	2.972	.0937	.3062	

Regression Block Two Results

Variable	Regression Coefficient	Standard Error	F(1,439)	Prob.	Partial r^2
age	-.00792	.00343	5.333	< .05	.0118
Hispanic	.37670	.08964	17.660	< .001	.0381
antisocial	.47717	.10576	20.358	< .001	.0437
Other Axis-I	-.27012	.13223	4.174	< .05	.0093
constant	.51063				

STD. ERROR OF ESTIMATE = .7054

R SQUARED = .0937

MULTIPLE R = .3062

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	22.9540	4	5.7385	11.533	<.001
Residual	221.9187	446	.4976		
Total	244.8727	450			

Table 21 continued

Block 3. Unit, and building rates, added to Block 2 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	antisocial	1,449	20.199	<.001	.0430	.2075
2.	Hispanic	1,448	15.726	<.001	.0755	.2748
3.	age	1,447	4.767	<.05	.0853	.2920
4.	other Axis-I	1,446	4.174	<.05	.0937	.3062
5.	blg avg LOT	1,445	3.078	.0801	.1000	.3162
6.	Unit III	1,444	4.097	<.05	.1082	.3289

Variable	Regression Coefficient	Standard Error	F(1,444)	Prob.	Partial r^2
age	-.00889	.00344	6.678	< .05	.0148
Hispanic	.41564	.09286	20.033	<.001	.0432
antisocial	.47493	.10520	20.382	<.001	.0439
Other Axis-I	-.24295	.13223	3.376	.0668	.0075
Blg avg LOT	-.00278	.00111	6.269	<.05	.0139
unit III	.15822	.07817	4.097	<.05	.0091
constant	1.07405				

STD. ERROR OF ESTIMATE = .7013

R SQUARED = .1082

MULTIPLE R = .3289

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	22.9540	4	5.7385	11.533	<.001
Residual	221.9187	446	.4976		
Total	244.8727	450			

Table 21 continued

Block 4. building assignments, added to Block 3 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	antisocial	1,449	20.199	<.001	.0430	.2075
2.	Hispanic	1,448	15.726	<.001	.0755	.2748
3.	age	1,447	4.767	<.05	.0853	.2920
4.	blg 14	1,446	4.255	<.05	.0939	.3064
5.	other Axis-I	1,445	4.145	<.05	.1023	.3198

Regression Block Four Results

Variable	Regression Coefficient	Standard Error	F(1,444)	Prob.	Partial r^2
age	-.00816	.00342	5.702	<.05	.0127
Hispanic	.39952	.09000	19.705	<.001	.0424
antisocial	.47753	.10537	20.537	<.001	.0441
other Axis-I	-.26827	.13176	4.145	<.05	.0092
blg 14.	.21660	.10536	4.226	<.05	.0094
constant	.48961				

STD. ERROR OF ESTIMATE = .7029

R SQUARED = .1023

MULTIPLE R = .3198

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	25.0419	5	5.0084	10.138	<.001
Residual	219.8309	445	.4940		
Total	244.8727	450			

Table 22

Classification Rates of Demographic Prediction Equations
Any Incidents

Base rate of residents involved in any incidents:54.1%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.3081	.2130	207
Residents 1+ Incidents	.4198	.2421	244

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positives	Overall Correct
.364	48 (31.2%)	138	.434	.768	106	58.8%
.521	30 (26.8%)	162	.377	.848	82	57.4%
.734	11 (31.4%)	220	.098	.947	24	48.7%

Sensitivity = percent of incident residents correctly classified by cutting score as likely to be involved in incident.

Specificity = percent of non incident residents correctly classified by cutting score as not likely to be involved in incidents.

Examination of Table 22 indicates that the cutting scores presented fail to result in an overall classification rate much better than that which could be expected by chance. The cutting scores did identify a group which had a 68% base rate of individuals involved in incidents, compared with the 54% base rate for all residents. Use of a cutting score of .521 yielded a base rate of 73.2% for a subgroup which comprised 24.8% of all residents.

Addition of Rorschach data to the above demographic data indicated that antisocial personality disorder, Hispanic ethnic group, Rorschach Sum C, building 14 assignment, and age contributed significantly to incident rate variance for the subset of residents completing the Rorschach (Table 23).

A total of 11.3% of incident rate variance was accounted for by the resultant equation, Predicted rate = -.00697 age + -.03202 Sum C + .46945.

Analyses adding MMPI and IQ data indicated those variables did not add significantly to the variance accounted for in the subsample of residents completing the Rorschach and MMPI or the Rorschach and WAIS-R. Antisocial personality continued to be the single variable which accounted for the largest portion of incident rate variance.

Classification rates based upon the Demographic and Rorschach equation above yielded results presented in Table 24. The

Table 23

Incident Rate Blockwise Multiple Regression Results

Block 6. Rorschach variables added to Demographic survivors.

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	antisocial	1,232	9.990	<.01	.0413	.2032
2.	Hispanic	1,231	6.134	<.05	.0661	.2571
3.	Sum C	1,230	4.223	<.05	.0830	.2880
4.	blg	141,229	3.912	<.05	.0984	.3136
5.	age	1,228	3.849	.0561	.1133	.3366

Regression Block Six Results:

Variable	Regression Coefficient	Standard Error	F(1,444)	Prob.	Partial R^2
age	-.00697	.00355	3.849	.051	.0166
antisocial	.38829	.10643	13.309	<.001	.0552
blg 14.	.22212	.11137	3.946	<.05	.0170
Hispanic	.25164	.09112	7.626	.01	.0324
Sum C	-.03202	.01568	4.168	<.05	.0180
constant	.46945				

STD. ERROR OF ESTIMATE = .5133

R SQUARED = .1133

MULTIPLE R = .3366

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	7.6778	5	1.5356	5.829	<.001
Residual	219.8309	228	.2635		
Total	67.7467	233			

Table 24

Classification Rates of Demographic and Test Prediction Equations
Any Incident

Base rate of residents involved in any incident: 52.1%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.2585	.1630	114
Residents 1+ Incidents	.3548	.1845	124

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positives	Overall Correct
.301	30 (32.6%)	62	.500	.737	62	61.3%
.331	26 (32.1%)	69	.444	.772	55	60.0%
.421	21 (33.9%)	83	.331	.816	41	56.3%
.500	12 (29.3%)	95	.234	.895	29	55.0%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of non incident residents correctly classified by cutting score as not likely to be involved in incidents

cutting scores employed yielded overall classification rates slightly better than chance. The cutting scores employed identified a subgroup of residents which had an approximately 66% base rate of incidents compared to the overall 52% base rate. A cutting score of .331 identified a group with a 68% rate of incidents. This group comprised 34% of the residents completing the Rorschach.

Aggressive Incident Rate

An identical procedure to that employed above was used to develop multiple regression equations to predict aggressive incident rate. The overall base rate of aggressive incidents was 27.9%. This was considerably below the rate of overall incidents (54.1%).

Results of the blockwise multiple regression procedure performed on the demographic blocks indicated that age, Hispanic ethnic group, divorced marital status, building 14 assignment and antisocial personality disorder each contributed significantly when added to the regression equation (Table 25). Hispanic ethnic group was the single variable which accounted for the largest portion of aggression rate variance (2.72%).

The resultant demographic prediction equation of Predicted Aggressive Incident Rate = -.00177 age + .09534 hispanic ethnic group + -.04081 divorced marital status + .06186 antisocial personality disorder + .10163 Building 14 assignment + .10848 accounted for 9.75 % of aggressive incident rate variance.

Table 25

Aggression Rate Blockwise Multiple Regression Results

Block 1: Demographic Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,441	9.224	<.01	.0205	.1431
2.	divorced	1,440	7.504	<.01	.0369	.1921
3.	age	1,339	3.318	.0692	.0441	.2101

Regression Block One Results:

Variable	Regression Coefficient	Standard Error	F(1,439)	Prob.	Partial r^2
age	-.00159	.00087	3.318	.069	.0075
Hispanic	.07066	.02179	10.508	<.01	.0234
divorced	-.04132	.01961	4.441	<.05	.0100
constant	.12507				

STD. ERROR OF ESTIMATE = .1697

R SQUARED = .0441

MULTIPLE R = .2101

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.5837	3	0.19457	6.757	<.001
Residual	12.6413	439	0.02879		
Total	13.2250	442			

Table 25 continued

Block 2: Discharge diagnoses added to surviving Block 1 Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	12.531	<.001	.0272	.1648
3.	divorce	1,448	7.664	<.01	.0435	.2086
4.	antisocial	1,447	6.263	<.05	.0567	.2382
5.	age	1,446	3.690	.055	.0645	.2539

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,446)	Prob.	Partial r^2
age	-.00166	.00086	3.690	.055	.0082
Hispanic	.08460	.02169	15.221	<.001	.0330
divorced	-.04042	.01964	4.234	<.05	.0094
antisocial	.06177	.02549	5.873	<.05	.0130
constant	.11829				

STD. ERROR OF ESTIMATE = .1708

R SQUARED = .0645

MULTIPLE R = .2539

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.89654	4	0.224135	7.684	<.001
Residual	13.00948	446	0.029169		
Total	13.90602450				

Table 25 continued

Block 3: Unit and Building rates added to surviving Block 2 Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	12.531	<.001	.0272	.1648
2.	Unit	21,448	11.469	<.001	.0514	.2268
3.	divorce	1,447	9.351	<.01	.0709	.2662
4.	antisocial	1,446	5.657	<.05	.0825	.2872
5.	age	1,445	3.836	.051	.0904	.3006

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,445)	Prob.	Partial r^2
age	-.00167	.00085	3.836	.051	.0085
divorced	-.04520	.01944	5.407	<.05	.0120
antisocial	.05786	.02519	5.278	<.05	.0117
Hispanic	.08934	.02145	17.351	<.001	.0375
Unit 2	.06346	.01784	12.660	<.001	.0277
constant	.10183				

STD. ERROR OF ESTIMATE = .1686

R SQUARED = .0904

MULTIPLE R = .3006

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.2564	5	0.25128	8.840	<.001
Residual	12.6496	445	0.02843		
Total	13.9060	450			

Table 25 continued

Block 4: Building assignments added to surviving Block 3 Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	12.531	<.001	.0272	.1648
2.	blg. 14	1,448	14.850	<.001	.0584	.2416
3.	age	1,447	8.359	<.01	.0757	.2750
4.	antisocial	1,446	6.275	<.05	.0885	.2974
5.	divorce	1,445	4.464	<.05	.0975	.3123

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,445)	Prob.	Partial r^2
age	-.00177	.00085	4.344	<.05	.0097
Hispanic	.09534	.02149	19.685	<.001	.0424
divorced	-.04081	.01931	4.464	<.05	.0099
antisocial	.06186	.02506	6.092	<.05	.0135
Blg. 14	.10163	.02517	16.300	<.001	.0353
constant	.10848				

STD. ERROR OF ESTIMATE = .1679

R SQUARED = .0975

MULTIPLE R = .3123

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.3562	5	0.271245	9.618	<.001
Residual	12.5498	445	0.02820		
Total	13.9060450				

Classifications made using the above equation yielded the results presented in Table 26. The overall percentage correctly classified using the cutting scores presented was between 68% and 72%, which was better than chance.

A cutting score of .120 identified a subgroup which included 24% of the residents. This subgroup had a base rate of aggressive incidents which was 49.2% which compared to a 27.9% overall base rate. While a substantial subgroup which had twice the base rate of aggressive incidents could be identified by use of demographic data, this resident group was not more likely than not to be involved in aggressive incidents.

Analyses performed on the subset of individuals for whom the Rorschach was available indicated that two Rorschach variables, M to Sum C, and path %, added significantly to the aggressive incident rate variance (Table 27). Hispanic race continued to be the single variable which accounted for the largest proportion of the aggressive incident rate variance.

The resultant multiple regression equation Predicted Aggressive Incident Rate = .1096 Hispanic ethnic group + -.0640 divorced marital status + .08994 building 14 assignment + .0018 path% + 1.0288 M to Sum C - .97919 accounted for 11.48% of aggressive incident rate variance.

Classification rates obtained by using cutting scores generated by the above equation yielded the classification rates in Table

Table 26

Classification Rates of Demographic Prediction Equations

Aggressive Incidents

Base rate of aggressive incidents: 27.9 %

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0697	.0504	325
Residents 1+ Incidents	.1051	.0560	126

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.087	85 (56.3%)	60	.524	.738	66	67.8%
.120	57 (51.8%)	73	.421	.825	53	71.0%
.170	9 (42.9%)	114	.095	.974	12	72.7%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of non incident residents correctly classified by cutiing score as not likely to be involved in incidents

Table 27

Aggression Rate Blockwise Multiple Regression Results

Block 6: Rorschach data added to surviving demographic variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,235	9.678	<.01	.0396	.1989
2.	blg. 14	1,234	5.541	<.05	.0618	.2485
3.	Sumc100	1,233	4.968	<.05	.0814	.2852
4.	divorced	1,232	4.302	<.05	.0981	.3132
5.	path %	1,231	4.374	<.05	.1148	.3389

Regression Block Six Results:

Variable	Regression Coefficient	Standard Error	F(1,231)	Prob.	Partial r^2
Hispanic	.10963	.03031	13.086	<.001	.0536
divorced	-.06397	.02665	5.763	<.05	.0243
Blg. 14	.08994	.03753	5.742	<.05	.0243
path %	.00181	.00086	4.374	<.05	.0186
Sumc 100	1.02881	.45195	5.182	<.05	.0219
constant	-.97919				

STD. ERROR OF ESTIMATE = .1737

R SQUARED = .1148

MULTIPLE R = .3389

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.9044	5	0.1809	5.994	<.001
Residual	6.9710	231	0.0302		
Total	7.8755	236			

28. Inspection of the table indicates that a cutting score of to the classification rate obtained if all residents were identified as not likely to be involved in aggressive incidents. Residents with scores above this cutting score had nearly twice the overall base rate of aggressive incidents. This group made up 18% of residents completing the Rorschach.

Extended Aggressive Incident Rate

An identical procedure to that employed above was used to develop multiple regression equations to predict extended aggressive incident rate. The overall base rate of extended aggressive incidents was 33.48%.

Results of the blockwise multiple regression procedure of demographic blocks indicated that age, Hispanic ethnic group, divorced marital status, building 14 assignment, and antisocial personality disorder each contributed significantly when added to the regression equation (Table 29). Hispanic race was the single variable which accounted for the largest portion of aggression rate variance (4.05%).

The resultant demographic prediction equation of Predicted Extended Aggressive Incident Rate = -.00251 age + .16168 Hispanic ethnic group + -.06820 divorced marital status + assignment + .15837 accounted for 10.46 % of aggressive incident rate variance.

Table 28

Classification Rates of Aggressive Incidents

Demographic and Test Predictors

Base rate of aggressive incidents: 27.9%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0704	.0588	171
Residents 1+ Incidents	.1090	.0624	66

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.089	48 (60.0%)	34	.485	.719	32	65.4%
.129	30 (54.5%)	41	.379	.825	25	70.0%
.140	22 (51.2%)	45	.318	.871	21	71.7%
.190	6 (40.0%)	57	.136	.965	9	73.4%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of no incident residents correctly classified by cutting score as unlikely to be involved in incidents

Table 29

Extended Aggression Rate Multiple Regression Results

Block 1: Demographic data

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,441	16.133	<.001	.0353	.1879
2.	divorced	1,440	9.671	<.01	.0560	.2367
3.	age	1,439	3.559	.059	.0637	.2524

Regression Block One Results:

Variable	Regression Coefficient	Standard Error	F(1,439)	Prob.	Partial r^2
age	-.00244	.00129	3.599	.059	.0081
Hispanic	.13621	.03204	18.072	<.001	.0395
divorced	-.07039	.02882	5.965	<.05	.0134
constant	.18555				

STD. ERROR OF ESTIMATE = .2494

R SQUARED = .0637

MULTIPLE R = .2524

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.8590	3	0.61967	9.958	<.001
Residual	27.3168	439	0.06223		
Total	29.1758	442			

Table 29 continued

Block 2: Discharge Diagnoses added to Block 1. survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	18.953	<.001	.0405	.2012
2.	divorced	1,448	9.692	<.01	.0608	.2466
3.	antisocial	1,447	9.013	<.01	.0794	.2817
4.	age	1,446	3.671	.056	.0869	.2948

Regression Block Two Results:

Variable	Regression Coefficient	Standard Error	F(1,446)	Prob.	Partial r^2
age	-.00239	.00125	3.671	.056	.0082
Hispanic	.15016	.03138	22.899	<.001	.0488
divorced	-.06778	.03688	5.687	<.05	.0126
antisocial	.10786	.03688	8.551	<.01	.0188
constant	.16889				

STD. ERROR OF ESTIMATE = .2471

R SQUARED = .0869

MULTIPLE R = .2948

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	2.5924	4	0.64811	10.611	<.001
Residual	27.2409	446	0.06108		
Total	29.8334	450			

Table 29 continued

Block 3: Unit Assignment and building rates added to Block 2 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	18.953	<.001	.0405	.2012
2.	divorced	1,448	9.692	<.01	.0608	.2466
3.	antisocial	1,447	9.013	<.01	.0794	.2817
4.	Unit 2	1,446	8.322	<.01	.0962	.3102
5.	age	1,445	8.414	<.01	.1038	.3222

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,445)	Prob.	Partial r^2
age	-.00241	.00124	3.772	.053	.0084
Hispanic	.15578	.03118	24.958	<.001	.0531
divorced	-.07345	.02826	6.757	<.01	.0150
antisocial	.10323	.03662	7.9848	<.01	.0175
Unit 2	.07522	.02593	8.414	<.01	.0186
constant	.14938				

STD. ERROR OF ESTIMATE	=	.2451
R SQUARED	=	.1038
MULTIPLE R	=	.3222

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	3.0979	5	0.61960	10.313	<.001
Residual	26.7354	445	0.06008		
Total	29.8334450				

Table 29 continued

Block 4: Building Assignment added to Block 3 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	18.953	<.001	.0405	.2012
2.	divorced	1,448	9.692	<.01	.0608	.2466
3.	antisocial	1,447	9.013	<.01	.0794	.2817
4.	Blg. 14	1,446	8.382	<.01	.0964	.3104
5.	age	1,445	4.114	<.05	.1046	.3235

Regression Block Four Results:

Variable	Regression Coefficient	Standard Error	F(1,445)	Prob.	Partial r^2
age	-.00251	.00124	4.114	<.05	.0092
Hispanic	.16168	.03135	26.599	<.001	.0564
divorced	-.06820	.02818	5.858	<.05	.0130
antisocial	.10796	.03656	8.717	<.01	.0192
Blg. 14	.10907	.03673	8.820	<.01	.0194
constant	.15837				

STD. ERROR OF ESTIMATE = .2450

R SQUARED = .1046

MULTIPLE R = .3235

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	3.1219	5	0.62437	10.402	<.001
Residual	26.7116	445	0.06003		
Total	29.8334450				

Classifications made using the above equation yielded the results presented in Table 30. The overall percentage correctly classified was between 67 and 70% which was better than chance. A cutting score of .210 identified a subgroup which included 16.6% of the residents. Sixty percent of this subgroup, approximately two of three residents, commited one or more extended aggressive incidents.

The results of these classifications indicated a substantial subgroup of residents with nearly twice the base rate of extended aggressive incidents and who were more likely than not to be involved in these incidents could be identified by the multiple regression procedures. A more stringent cutting score of .247 identified a small subgroup with a 71.8% base rate of extended aggressive incidents.

Analyses performed on the subset of individuals for whom the Rorschach was available indicated that the Rorschach variable M to Sum C added significantly to the aggressive incident rate variance (Table 31). Hispanic ethnic group continued to be the single variable which accounted for the largest proportion of the aggressive incident rate variance (3.45%).

The multiple regression equation Predicted Extended Aggressive Incident Rate = .13362 Hispanic ethnic group + -.07633 divorced marital status + .11318 Building 14 assignment + 1.08881 M to Sum C - .9909 accounted for 8.67% of aggressive incident rate variance.

Table 30

Classification Rates of Demographic Prediction Equation Extended Aggressive Incidents

Base rate of extended aggressive incidents: 33.5%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0977	.0745	300
Residents 1+ Incidents	.1562	.0863	151

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positives	Overall Correct
.127	71 (48.0%)	74	.510	.763	77	67.8%
.173	53 (43.5%)	82	.457	.823	69	70.1%
.210	30 (40.0%)	106	.298	.900	45	69.2%
.247	11 (28.2%)	123	.185	.963	28	70.2%
.321	1 (16.7%)	146	.033	.997	5	67.4%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

Table 31

Extended Aggression Rate Blockwise Multiple Regression Results

Block 6: Rorscach data added to demographic variable survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,235	8.409	<.01	.0345	.1859
2.	Blg 14.	1,234	4.936	<.05	.0545	.2334
3.	divorced	1,233	4.991	<.05	.0743	.2726
4.	Sum C 100	1,232	3.148	.073	.0867	.2945

Regression Block Six Results:

Variable	Regression Coefficient	Standard Error	F(1,232)	Prob.	Partial r^2
Hispanic	.13362	.04121	10.511	<.01	.0433
divorced	-.07633	.03580	4.546	<.05	.0192
Blg. 14	.11318	.05109	4.908	<.05	.0207
SumC 100	1.08881	.61362	3.148	.077	.0134
constant	-.9909				
STD. ERROR OF ESTIMATE =		.2365			
R SQUARED =		.0867			
MULTIPLE R =		.2945			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.2320	4	0.3080	5.507	<.001
Residual	12.9755	232	0.0559		
Total	14.2075	236			

Classification rates obtained by using cutting scores generated by the above equation yielded the classification rates in Table 32. Inspection of the table indicates that a cutting score of .200 correctly classified 70.5% of the residents. Residents falling above this cutting score had a 59.3% base rate of aggressive incidents. This group made up 15.6% of the residents completing the Rorschach.

Use of Force Incident Rate

An identical procedure to that employed above was used to develop multiple regression equations to predict Use of Force rate. The overall base rate of use of force was 21.95%.

Results of the blockwise multiple regression procedure exclusive of test data indicated that age, Hispanic ethnic group, building average length of treatment, and assignment to buildings 6, 7, 10, and 14 each contributed significantly when added to the regression equation (Table 33). Hispanic ethnic group was the single variable which accounted for the largest portion of aggression rate variance (1.51%).

The resultant demographic prediction equation of Predicted Use of Force Rate = -.00429 age + .12995 Hispanic ethnic group + -.00535 building average length of treatment + -.13881 blg 7 + -.20346 blg 10 + .40944 blg 6 + -.19253 blg 14 + 1.38891 accounted for 10.15% of use of force rate variance.

Table 32

Classification Rates of Test and Demographic Prediction Equation Extended Aggressive Incidents

Base rate of extended aggressive incidents: 31.65%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0958	.0747	162
Residents 1+ Incidents	.1363	.0715	75

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.116	46 (57.5%)	41	.453	.716	34	63.3%
.170	22 (49.9%)	52	.307	.864	23	68.8%
.200	16 (41.7%)	54	.280	.901	21	70.5%
.250	3 (33.7%)	69	.080	.981	6	69.6%

Sensitivity = Percent of incident residents correctly classifed by cutting score as likely to be involved incidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

Table 33

Use of Force Rate Blockwise Multiple Regression Results

Block 1: Demographic data

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	6.865	<.01	.0151	.1227
3.	age	1,448	3.979	<.05	.0237	.1540

Regression Block One Results:

Variable	Regression Coefficient	Standard Error	F(1,442)	Prob.	Partial r^2
age	-.00325	.00163	3.979	<.05	.0088
Hispanic	.11739	.04266	7.571	<.01	.0166
constant	.16705				

STD. ERROR OF ESTIMATE	=	.2494
R SQUARED	=	.0637
MULTIPLE R	=	.2524

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.29836	2	0.64918	5.642	<.01
Residual	50.63171	440	.11507		
Total	51.93007	442			

Table 33 continued

Block 3: Unit Asignment and Building Rates added to Block 1 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	6.865	<.01	.0151	.1227
2.	age	1,448	3.979	<.05	.0237	.1540
3.	blg avg. l. o. t.	1,447	3.785	.052	.0319	.1787
4.	Unit 3	1,446	4.983	<.05	.0426	.2065

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,446)	Prob.	Partial r^2
age	-.00378	.00164	5.366	<.05	.0119
Hispanic	.13858	.04411	9.872	<.01	.0217
blg alot	-.00147	.00529	7.677	<.01	.0169
Unit 3	.08261	.03701	4.983	<.05	
constant	.46544				
STD. ERROR OF ESTIMATE =		.3342			
R SQUARED =		.0426			
MULTIPLE R =		.2065			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	2.21724	4	0.55431	4.964	<.001
Residual	49.80048	446	.11166		
Total	52.01772	450			

Table 33 continued

Block 4: Building Assignment added to Block 3 survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,449	6.865	<.01	.0151	.1227
2.	age	1,448	3.979	<.05	.0237	.1540
3.	blg avg LOT	1,447	3.785	.052	.0319	.1787
4.	Blg 6.	1,446	13.191	<.001	.0597	.2444
5.	Blg 10.	1,445	6.953	<.01	.0742	.2724
6.	Blg 14.	1,444	6.049	<.05	.0866	.2944
7.	Blg. 7.	1,443	7.317	<.01	.1015	.3186

Variable	Regression Coefficient	Standard Error	F(1,443)	Prob.	Partial r^2
age	-.00429	.00159	7.263	<.01	.0161
Hispanic	.12995	.04329	9.010	<.01	.0199
blg avg LOT	-.00535	.00091	34. 738	<.001	.0727
Blg. 7	-.13881	.05131	7.317	<.01	.0162
Blg. 10	-.20346	.04898	17.252	<.001	.0375
Blg. 6	.40944	.08367	23.942	<.001	.0513
Blg. 14	-.19253	.06101	9.958	<.01	.0220
constant	1.38891				

STD. ERROR OF ESTIMATE	=	.3248
R SQUARED	=	.1015
MULTIPLE R	=	.3186

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	5.27912	7	0.75416	7.148	<.001
Residual	46.73861	443	0.10550		
Total	52.01772	450			

Classifications made using the above equation yielded the results presented in Table 34. The overall percentage correctly classified using the cutting scores presented was between 75% and 78%, which was better than chance.

A cutting score of .177 identified a subgroup which included 14.9% of the residents. This subgroup had a base rate of aggressive incidents which was 41.8% which was nearly twice the overall base rate for incidents requiring the use of force. Use of the multiple regression equation for classification could not identify a subgroup which had a greater than 50% probability of being involved in use of force incidents.

Analyses performed on data for subjects completing the MMPI, Rorschach, and WAIS-R indicated that no test variable when added to the demographic variables above resulted in a significant increase in the use of force rate variance accounted for.

Fighting Incident Rate

An identical procedure to that employed above was used to develop multiple regression equations to predict Fighting incident rate. The overall base rate of residents involved in fighting incidents was 19.29%.

Results of the blockwise multiple regression procedure of demographic data indicated that the three variables of divorced marital

Table 34

Classification Rates of Demographic Prediction Equation
Use of Force Incidents

Base rate of use of force incident type: 21.95%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0765	.1010	352
Residents 1+ Incidents	.1280	.1221	99

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.177	39 (58.2%)	71	.283	.889	28	75.6%
.278	10 (55.5%)	91	.081	.758	8	77.6%
.379	5 (55.5%)	95	.040	.769	4	77.8%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

status, building 14 assignment, and Unit II assignment each contributed significantly when added to the regression equation (Table 35). Blg 14 assignment was the single variable which accounted for the largest portion of fighting incident rate variance (4.46%).

The resultant demographic prediction equation of Predicted Fighting Incident Rate = -.04547 divorced + .02956 Unit II + variance.

Classifications made using the above equation yielded the results presented in Table 36. The overall percentage of residents correctly classified using the cutting scores was between 73% and 80%, which was better than chance. A cutting score of .092 identified a small subgroup which included 8.2% of the residents. This subgroup had a base rate of fighting incidents which was 48.6%. Thus, a small subgroup which had more than twice the base rate of fighting incidents was identified.

A less stringent cutting score of .075 still yielded a base rate twice that of the overall base rate and included 11.3% of the residents in the sample. Residents with a greater than a 50% chance of being involved in a fighting incident could not be identified based upon multiple regression analyses of demographic data.

Analyses performed on the subset of individuals for whom the Rorschach was available indicated that the Rorschach variables R, Sum C, and path % added significantly to the fighting rate variance (Table 37). Building 14 assignment was the single variable which accounted for

Table 35

Fight Rate Blockwise Multiple Regression Results

Block 1: Demographic data

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	divorce	1,449	9.196	<.01	.0201	-.1417

Regression Block One Results:

Variable	Regression Coefficient	Standard Error	F(1,449)	Prob.	Partial r^2
divorce	-.04269	.01408	9.196	<.01	
constant	.05971				
STD. ERROR OF ESTIMATE =		.1276			
R SQUARED =		.0201			
MULTIPLE R =		-.1417			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.14967	1	0.14967	9.196	<.01
Residual	7.30733	449	0.01627		
Total	7.45700	450			

Table 35 continued

Block 3: Unit assignment, building rates, and building assignment added to Block 1 survivor.

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Blg. 14	1,449	20.952	<.001	.0446	.2111
2.	divorce	1,448	9.997	<.01	.0654	.2558
3.	Unit II	1,447	3.385	.066	.0725	.2692

Regression Block Three Results:

Variable	Regression Coefficient	Standard Error	F(1,447)	Prob.	Partial r^2
divorce	-.04547	.01377	10.907	<.01	.0238
unit II	.02956	.01607	3.385	.066	.0075
Blg. 14	.06243	.02265	7.597	<.01	.0167
constant	.04513				

STD. ERROR OF ESTIMATE	=	.1244
R SQUARED	=	.0725
MULTIPLE R	=	.2692

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.54035	3	0.18012	11.640	<.001
Residual	6.91665	447	0.01547		
Total	7.45700	450			

Table 36

Classification Rates of Demographic Prediction Equation
Fighting Incidents

Base rate of fighting incident type: 19.29 %

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0459	.0323	364
Residents 1+ Incidents	.0648	.0391	87

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.056	67 (65.7%)	52	.402	.816	35	73.6%
.075	31 (60.8%)	67	.230	.915	20	78.3%
.092	19 (51.4%)	69	.207	.948	18	80.5%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved inincidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

Table 37

Fight Rate Blockwise Multiple Regression Results

Block 5: Rorschach data added to Demographic variable survivors.

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Blg. 14	1,235	9.727	<.01	.0397	.1994
2.	divorce	1,234	6.260	<.05	.0648	.2545
3.	R	1,233	3.990	<.05	.0805	.2837
4.	Sum C	1,232	4.868	<.05	.0994	.3153
5.	path %	1,231	4.395	<.05	.1162	.3409

Regression Block Five Results:

Variable	Regression Coefficient	Standard Error	F(1,231)	Prob.	Partial r^2
divorce	-.05634	.02053	7.535	<.01	.0316
Blg. 14	.09513	.02880	10.912	<.01	.0451
R	.00379	.00138	7.508	<.01	.0315
path %	.00141	.00067	4.395	<.05	.0187
Sum C	-.01105	.00435	6.463	<.05	.0272
constant	-.00176				

STD. ERROR OF ESTIMATE	=	.1337
R SQUARED	=	.1162
MULTIPLE R	=	.3409

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	.54283	5	0.10857	6.076	<.001
Residual	4.12767	231	0.01787		
Total	4.67049	236			

the largest proportion of the fighting rate variance (3.97%) in the sample of subjects completing the Rorschach.

The multiple regression equation Predicted Fighting Incident Rate = -.05634 divorce + -.09513 blg 14 + .00379 R + .00141 path % + -.01105 Sum C - .00176 accounted for 11.62% of fighting incident rate variance.

Classification rates obtained by using cutting scores generated by the above equation yielded the classification rates in Table 38. Overall classification rates ranged between 65% and 83%. Inspection of the table indicates that a cutting score of .088 correctly classified 76.8% of the residents. Use of this cutting score identified a subgroup with a 38.1% base rate of fighting incidents. This group, 18.2% of residents completing the Rorschach, had a base rate of fights not quite twice the overall base rate.

Length of Treatment

Stepwise multiple regression was performed in blocks as above to predict length of treatment for the 395 residents admitted as incompetent to stand trial. Results of the length of treatment analyses are summarized in Table 39.

Results of the blockwise multiple regression procedure applied to demographic blocks found that the variables Hispanic ethnic group, organic brain syndrome, other schizophrenia, paranoid schizophrenia, and building 13 assignment contributed significantly to the length of

Table 38

Classification Rates of Demographic and Test Prediction Equation Fighting Incidents

Base rate of fighting incidents: 19.48%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0460	.0427	186
Residents 1+ Incidents	.0765	.0604	45

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.061	61 (71.8%)	21	.490	.682	24	65.4%
.088	26 (61.9%)	29	.327	.865	16	76.8%
.131	4 (30.8%)	36	.184	.980	9	83.1%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

Table 39

Length of Treatment: Multiple Regression Summary

	Regression Weights and Statistics			
VARIABLE	DEMOGRAPHIC	DEMOGRAPHIC + RORSCHACH	DEMOGRAPHIC + RORSCHACH + MMPI	POST HOC
Hispanic	45.616	83.99	63.35	101.54
organic brain sy	87.310			
Paranoid Schiz.	86.50	67.98		
Other Schiz.	139.81	118.74		
Blg 13	48.37			
M-/M (100)		984.73	2609.01	
MMPI F			1.58	
MMPI Pa				2.52
IQ Score				- 1.88
Constant	119.46	-2061.6	-2552.31	126.23
Multi- R	.3351	.3548	.4982	.5037
Multi- R Squared	.1123	.1259	.2482	.2537
S. Error	166.07	162.21	110.88	124.59
Liberal Shrunken R-Square	.1011	.1019	.2217	.2335
Conserv. Shrunken R-Square	.0458	.0000	.0000	.0000
Single Variables Accounting for Largest Proportion of Variance				
Variable	o. schiz.	hispanic	MMPI F	MMPI Pa
R-Square	.0408	.0370	.1315	.1613

treatment variance accounted for when they were added to the equation (Table 40). The single variable which accounted for the largest proportion of length of treatment variance was diagnosis of "other schizophrenia" (4.08%).

The equation Length of Treatment = 45.62 Hispanic ethnic group + 87.31 organic brain syndrome + 139.81 other schizophrenia + 86.50 paranoid schizophrenia + 48.37 blg. 13 + 119.46 accounted for 11.23% of the length of treatment variance. The standard error of estimate, a measure of the accuracy of the regression equation was quite large (166.07).

Addition of Rorschach variables to the demographic variables above indicated that the variables Hispanic ethnic group, other schizophrenia, paranoid schizophrenia and M- to M total contributed significantly to length of treatment for the subsample of residents who completed the Rorschach (Table 41). Hispanic ethnic group was the single variable which accounted for the largest proportion of the variance (3.70%).

The resultant equation, Predicted Length of Treatment = 83.99 Hispanic ethnic group + 118.74 other schizophrenia + 67.98 paranoid schizophrenia + 2214.60 M- to M total - 2061.61, accounted for 12.59 percent of the length of treatment variance. The standard error of estimate (162.21) was similar in magnitude as that using demographic variables alone.

Addition of MMPI data to the demographic and Rorschach variables above indicated that the variables F, M- to M total, and hispanic race each contributed significantly to length of treatment variance when

Table 40

Length of Treatment Blockwise Multiple Regression Results

Block 1. Demographic Variables

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1, 394	5.312	<.05	.0133	.1153

Regression Block One results

Variable	Regression Coefficient	Standard Error	F(1,394)	Prob.	Partial r^2
Hispanic	52.9717	22.9825	5.312	<.05	.0133
constant	198.3282				

STD. ERROR OF ESTIMATE	=	174.4650
R SQUARED	=	.0458
MULTIPLE R	=	.2141

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	161699.83	1	161699.83	5.312	<.05
Residual	11992588.58	394	30438.04		
Total	12154288.41	395			

Table 40 continued

Block 2. Diagnoses added to Block One survivor

Step Variable	D. F.	F	Prob.	R Squared	Multi R
1. Other Shizophrenia	1, 401	17.045	<.001	.0408	.2019
2. Paranoid Schizophrenia	1, 400	15.869	<.001	.0774	.2782
3. Organic Brain Syndrome	1, 399	6.322	<.05	.0918	.3029
4. Hispanic	1, 398	4.942	<.05	.1029	.3208

Regression Block Two results

Variable	Regression Coefficient	Standard Error	F(1,398)	Prob.	Partial r^2
Hispanic	48.2991	21.7254	4.942	<.05	.0123
o. b. s.	93.1909	38.4218	5.883	<.05	.0146
other schiz.	135.6188	22.7025	35.686	<.001	.0823
par. schiz.	85.1388	19.4874	19.087	<.001	.0458
constant	127.2848				
STD. ERROR OF ESTIMATE =		166.7327			
R SQUARED =		.1029			
MULTIPLE R =		.3208			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1269225.11	4	317306.28	11.414	<.001
Residual	11064316.55	398	27799.79		
Total	12333541.66	402			

Table 40 continued

Block 4. Building assignment added to Block Two survivors

Step Variable	D. F.	F	Prob.	R Squared	Multi R
1. Other Scz.	1, 401	17.045	<.001	.0408	.2019
2. Paranoid Scz.	1, 400	15.869	<.001	.0774	.2782
3. Organic B.S.	1, 399	6.322	<.05	.0918	.3029
4. Hispanic	1, 398	4.942	<.05	.1029	.3208
5. Blg. 13	1, 397	4.185	<.05	.1123	.3351

Variable	Regression Coefficient	Standard Error	F(1,397)	Prob.	Partial r^2
Hispanic	45.6166	21.6786	4.428	<.05	.0110
o. b. s.	87.3099	38.3768	5.176	<.05	.0129
other schiz.	139.8058	22.7046	37.916	<.001	.0872
par. schiz.	86.4974	19.4213	19.836	<.001	.0476
Blg. 13	48.3670	23.6423	4.185	<.05	.0104
constant	119.4572				

STD. ERROR OF ESTIMATE	=	166.0695
R SQUARED	=	.1123
MULTIPLE R	=	.3351

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1384650.13	5	276930.01	10.041	<.001
Residual	10948891.62	397	27579.07		
Total	12333541.65	402			

Table 41

Length of Treatment Blockwise Multiple Regression Results

Block 6. Rorschach added to Demographic Variable survivors.

Step Variable	D. F.	F	Prob.	R Squared	Multi R
1. Hispanic	1, 212	8.138	<.01	.0370	.1923
2. Other Schizophrenia	1, 211	8.609	<.01	.0747	.2733
3. Paranoid Shizophrenia	1, 210	7.033	<.01	.1047	.3236
4. M- / M tot	1, 209	5.058	<.05	.1259	.3548

Regression Block Six results

Variable	Regression Coefficient	Standard Error	F(1,209)	Prob.	Partial r^2
Hispanic	83.9940	29.7153	7.990	<.01	.0368
other schiz.	118.7414	32.0111	13.759	<.001	.0618
par. schiz.	67.9753	25.3393	7.196	<.01	.0333
M- / M tot	2214.5957	984.7253	5.058	<.05	.0236
constant	-2061.6122				
STD. ERROR OF ESTIMATE =		162.2067			
R SQUARED =		.1259			
MULTIPLE R =		.3548			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	791735.61	4	197933.90	7.523	<.001
Residual	5499002.60	209	26311.02		
Total	6290738.21	213			

Table 41 continued

Block 7. MMPI Data added to Block 6 survivors

Step Variable	D. F.	F	Prob.	R Squared	Multi R
1. F	1, 87	13.177	<.001	.1315	.3627
2. M- / M tot	1, 86	7.716	<.01	.2030	.4506
3. Hispanic	1, 85	5.108	<.05	.2482	.4982

Regression Block Seven results

Variable	Regression Coefficient	Standard Error	F(1, 85)	Prob.	Partial r^2
Hispanic	63.3469	28.0281	5.108	<.05	.0567
M- / M tot	2609.0085	1014.0185	6.620	<.05	.0723
F	1.5762	.4944	10.162	<.01	.1068
constant	-2552.3114				

STD. ERROR OF ESTIMATE	=	110.8837
R SQUARED	=	.2482
MULTIPLE R	=	.4982

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	345068.39	3	115022.80	9.355	<.001
Residual	1045092.08	85	12295.20		
Total	1390160.47	88			

added to the regression equation. The MMPI scale F accounted for the largest proportion of length of treatment variance (13.15%) for the subgroup of residents which completed both the Rorschach and MMPI.

The multiple regression equation Predicted length of treatment = 63.35 Hispanic ethnic group + 2609.01 M- to M tot + 1.58 Fscale - 2552.31 accounted for 24.82 percent of length of treatment variance. The standard error of estimate obtained (110.88) was smaller than those obtained from demographic data alone or demographic and Rorschach data combined.

Post-Hoc Analyses

In post-hoc analyses the use of Rorschach variables, "simple Rorschach," were used in lieu of the complex Rorschach ratios used in the original analyses. This was done by adding the variables W, M+, and M- and deleting the ratios based on M-/M total, M/Sum C, and W/M. The results obtained by varying the order of entry of test data blocks was also examined.

In a post-hoc analysis, which used "simple Rorschach" data to predict aggressive incident rate, Hispanic ethnic group, building 14 assignment, divorced marital status, path %, Sum C, and R each contributed significantly to aggressive incident rate variance when added to the multiple regression equation (Table 42). Hispanic ethnic group was the single variable which accounted for the largest proportion of the variance (3.96%).

Table 42

Aggression Rate: Post-hoc with Simple Rorschach Variables
Blockwise Multiple Regression Results

Rorschach with "simple variables" added to demographic survivors

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	Hispanic	1,235	9.678	<.01	.0396	.1989
2.	blg 14	1,234	5.541	<.05	.0618	.2485
3.	divorced	1,233	4.800	<.05	.0807	.2841
4.	path %	1,232	3.661	.057	.0950	.3082
5.	sum C	1,231	4.116	<.05	.1108	.3329
6.	R	1,230	4.518	<.05	.1280	.3577

Variable	Regression Coefficient	Standard Error	F(1,230)	Prob.	Partial r^2
divorced	-.06491	.02654	5.983	<.05	.0254
Hispanic	.10719	.03009	12.688	<.001	.0523
blg 14	.09320	.03734	6.230	<.05	.0264
R	.00380	.00179	4.518	<.05	.0193
path %	.00207	.00870	5.650	<.05	.0240
Sum C	-.01459	.00562	6.740	<.05	.0285
constant	.00962				

STD. ERROR OF ESTIMATE = .1728

R SQUARED = .1280

MULTIPLE R = .3577

Table 42 continued

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.0078	6	0.1680	5.625	<.001
Residual	6.8677	230	0.0299		
Total	7.8755	236			

The equation Predicted Aggressive Incident Rate = -.0649 divorced marital status + 1072 Hispanic ethnic group + .0932 building. 14 assignment + .0038 Rorschach R + .0021 path % + -.0146 Sum C + .0096 accounted for 12.8% of aggressive incident rate variance.

Classification rates obtained by using this equation are presented in Table 43. A cutting score of .150 identified a subgroup of residents which comprised 15.19% of the residents completing the Rorschach. This group had a 58.3% base rate of aggressive incidents. The overall base rate of aggressive incidents for all residents was 27.9%. The cutting score of .150 correctly classified 72.6% of the residents completing the Rorschach.

Post-hoc analyses of overall incident rate data varied the order of test data block entry by entering the block of MMPI variables prior to the block of Rorschach variables. Antisocial personality disorder diagnosis, MMPI scale K, and Rorschach Sum C each contributed significantly to Incident rate variance when added to the multiple regression equation (Table 44). Diagnosis of antisocial personality disorder was the single variable accounting for the greatest proportion of incident rate variance.

The equation Predicted incident rate = .2003 antisocial personality disorder + -0705 Sum C + -.0066 MMPI scale K + .6667 accounted for 10.9% of incident rate variance.

Classification rates obtained using the above equation are presented in Table 45. A cutting score of .400 identified a subgroup

Table 43

Classification Rate of Post-Hoc Rorschach Prediction Equation
Aggressive Incidents

Base Rate of Aggressive Incidents: 27.8%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.0713	.0623	66
Residents 1+ Incidents	.1101	.0660	171

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.091	53 (59.6%)	30	.545	.690	36	65.8%
.134	23 (46.9%)	40	.394	.865	26	73.4%
.150	15 (41.7%)	45	.318	.883	21	72.6%
.196	7 (46.7%)	58	.121	.959	8	72.6%

Sensitivity = Percent of incident residents correctly identified by cutting score as likely to be involved in incidents

Specificity = Percent of no incident residents correctly classified by cutting score as not likely to be involved in incidents

Table 44

Incident Rate: Post-hoc Rorschach Variables Entered After MMPI Block

Step	Variable	D. F.	F	Prob.	R Squared	Multi R
1.	antisocial	1,102	4.271	<.05	.0402	.2005
2.	K	1,101	3.758	.055	.0746	.2732
3.	Sum C	1,100	3.858	.052	.1090	.3302

Post Hoc Block Results:

Variable	Regression Coefficient	Standard Error	F(1,100)	Prob.	Partial r^2
antisocial	.20028	.10748	3.472	.065	.0336
Sum C	-.03054	.00337	3.858	.052	.0371
K	-.00665	.01555	3.897	.051	.0375
constant	.66669				
STD. ERROR OF ESTIMATE- =		.3726			
R SQUARED =		.1090			
MULTIPLE R =		.3302			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	1.6980	3	0.5660	4.078	<.01
Residual	13.8801	100	0.1388		
Total	15.5781	103			

Table 45

Classification Rates of Post Hoc Test Order Prediction Equation: Any Incident

Base Rate of Incidents: 51.9%

	Mean Predicted Rate	Standard Deviation	N
Residents No Incidents	.2510	.1201	50
Residents 1+ Incidents	.3015	.1322	54

Cutting Score	False Positives	False Negatives	Sensitivity	Specificity	True Positive	Overall Correct
.371	7 (35.0%)	41	.240	.860	13	53.8%
.400	4 (25.0%)	42	.222	.920	12	55.8%
.431	2 (19.2%)	46	.164	.950	9	54.8%

Sensitivity = Percent of incident residents correctly classified by cutting score as likely to be involved in incident

Specificity = Percent of non incident residents correctly classified by cutting score as unlikely to be involved in incidents

comprising 15.4% of the residents completing the MMPI and Rorschach. This correctly classified 55.8% of this subsample of residents. Seventy-five percent of residents above this cutting score were involved in incidents.

The order of entry of test data blocks was also varied in analyses of length of treatment data. The MMPI scale Pa, I.Q. score, and Hispanic ethnic group each were found to contribute significantly to length of treatment variance (Table 46) when added to the multiple regression equation. The MMPI scale Pa was the single variable in this analysis which accounted for the largest proportion (16.13%) of length of treatment variance. The standard error of estimate (124.58) was in a range between those obtained in the previously performed analyses of length of treatment data.

Cluster Analyses

The hypothesis that naturally occurring subgroups of forensic inpatients could be identified by cluster analysis of resident MMPI profiles was examined. The MMPI Form-R profiles were available for one hundred eighty-eight NFETC residents. K-corrected T-scores were used in the analyses. Profiles which had a K score greater than 70-T were excluded since they were considered invalid. In addition to 172 profiles obtained from the sample described earlier, sixteen additional profiles from residents admitted to NFETC from September to December 1985 were included.

Table 46

Length of Treatment Post-Hoc Test Order Blockwise Multiple Regression Results

Post Hoc Results (MMPI plus I. Q.)

Step Variable	D. F.	F	Prob.	R Squared	Multi R
1. Pa	1, 113	21.738	<.001	.1613	.4017
2. Hispanic	1, 112	10.052	<.01	.2304	.4800
3. I. Q.	1, 111	3.462	.065	.2537	.5037

Regression Block Seven results

Variable	Regression Coefficient	Standard Error	F(1,111)	Prob.	Partial r^2
Hispanic	101.5350	30.8209	10.853	<.01	.0891
Pa	2.5228	.5927	18.120	<.001	.1403
I.Q.	-1.8792	1.0100	3.462	.065	.0302
constant	126.2315				
STD. ERROR OF ESTIMATE =		124.5885			
R SQUARED =		.2537			
MULTIPLE R =		.5037			

Analysis of Variance

SOURCE	SUM of SQUARES	D. F.	MEAN SQUARE	F RATIO	PROB.
Regression	585671.79	3	195223.93	12.577	<.001
Residual	1722973.74	111	15522.29		
Total	2308645.53	114			

The general demographic characteristics of the residents included in the cluster analyses were similar to that of the overall sample of NFETC residents presented earlier. Residents included in the cluster analysis included residents which were 46.02% white, 33.52% black, and 19.89% Hispanic ethnic group. Of the residents included in the cluster analyses 64.77% were never married, 5.68% were married at the time of admission, and 28.41% were divorced. Eighty-eight percent of the residents had been adjudicated incompetent to stand trial, 6.25% were incompetent to stand trial, 4% were transferred from the Department of Corrections and less than 2% were other types of admissions.

The mean education of residents included in the cluster analysis was 10.2 years (S.D. = 3.07), the mean IQ score was 84.9 (S.D. =12.97), and the mean age of the sample was 30.1 years (S.D. = 9.66). Residents in this sample had a mean of 7.1 total arrests (S.D. = 8.26), a mean of 1.7 violent arrests (S.D. = 1.59) and a mean age of first recorded arrest of 22.3 years (S.D. = 7.83). Sixty-seven percent of these residents had most recently been arrested for a violent crime.

One hundred eighty-eight K-corrected MMPI profiles were analyzed using the Clustan computer program. Examination of Realized Deviates indicated two large increases in the error variance, which suggested a possible six cluster solution and a possible three cluster solution. Since the hierarchical procedure utilized did not automatically assign

individual residents profiles to the cluster to which it was most similar, Clustan procedure Relocate was run to assign resident profiles to the cluster they were most similar to.

Six Cluster Solution

The means and standard deviations of the six cluster solution are presented in Table 47. To test the hypothesis that these groups were valid a series of multivariate analyses of variance and Chi-square analyses were conducted to test for significant differences between the groups. Statistics reported include F statistics computed using Wilks' Lambda.

The only significant result indicated that the proportion of residents with histories of substance abuse or dependence in the different cluster groups was significantly different than the proportion expected by chance. Chi-square = 14.936, d.f. = 5, $p < .05$ (see Tables 48-50).

The above analyses which tested for between group differences for the six cluster solution, with the exception of history of substance abuse, failed to reject the null hypothesis of no significant differences between groups. Since between group differences on independent data is required to validate cluster solutions the present results do not support the validity of the six cluster solution.

Table 47

Six Cluster Solution Profiles: K-corrected T Scores

MMPI SCALE	CLUSTER ONE	TWO	THREE	FOUR	FIVE	SIX
n	31	29	41	35	33	19
Mean L	48.48	55.76	56.12	53.63	62.24	51.74
(S.D.)	(7.65)	(10.43)	(10.92)	(6.09)	(9.96)	(7.88)
F	108.68	68.10	58.78	91.86	63.18	115.79
(S.D.)	(13.53)	(9.42)	(7.41)	(10.18)	(6.37)	(12.25)
Mean K	45.16	56.31	54.66	49.43	55.42	46.84
(S.D.)	(7.21)	(10.39)	(8.16)	(8.41)	(7.82)	(8.61)
Mean Hs	69.23	78.45	50.41	62.37	59.24	86.16
(S.D.)	(9.04)	(13.94)	(4.72)	(10.89)	(9.44)	(10.72)
Mean D	70.29	76.41	52.90	67.40	68.09	94.95
(S.D.)	(11.39)	(14.01)	(8.04)	(11.99)	(10.02)	(9.04)
Mean Hy	64.16	74.55	51.78	57.03	58.94	78.53
(S.D.)	(8.20)	(8.29)	(6.01)	(8.58)	(7.82)	(8.73)
Mean Pd	79.58	82.17	64.05	69.74	64.82	90.84
(S.D.)	(11.17)	(11.75)	(11.60)	(9.34)	(8.30)	(12.11)
Mean Mf	67.77	66.93	57.27	62.20	61.09	64.58
(S.D.)	(10.39)	(7.79)	(8.67)	(8.47)	(8.29)	(8.59)
Mean Pa	93.00	76.79	55.73	79.66	56.97	104.00
(S.D)	(9.74)	(10.29)	(7.69)	(9.55)	(7.62)	(9.80)
Mean Pt	86.39	72.69	53.80	73.57	60.15	97.32
(S.D.)	(8.44)	(14.15)	(9.20)	(10.12)	(6.28)	(11.95)
Mean Sc	112.45	85.07	58.56	92.37	67.36	126.21
(S.D.)	(10.10)	(13.52)	(10.15)	(11.17)	(7.76)	(8.37)
Mean Ma	83.61	66.17	67.44	73.54	58.61	80.58
(S.D.)	(9.73)	(13.68)	(12.66)	(9.25)	(10.15)	(10.27)
Mean Si	62.48	54.90	47.41	56.09	57.67	68.53
(S.D)	(9.53)	(10.21)	(7.78)	(7.43)	(9.23)	(9.95)

Table 48

Cluster Six by Test Data Analyses of Variance

VARIABLE	F	DF	PROB
I. Q.	1.32	5,54	.259
R	.18	5,99	.970
X plus %	.36	5,99	.870
Path %	.12	5,99	.989
W / M	.50	5,99	.776
Sum C	.59	5,99	.657
M- / M	2.17	5,99	.069
H percent	1.58	5,99	.172

Table 49

Cluster Six by Demographic Chi-Squares

VARIABLE	CHI-SQUARE	D.F.	Prob.
Race	10.877	10	.3672
Marital Status	10.572	10	.3918
O.B.S. Diagnosis	5.524	5	.3553
Axis-I	15.298	20	.7590
Personality	10.591	5	.0601
Antisocial	3.758	5	.5845
Admit type	14.182	10	.1652
Current Violent Arrest	9.151	10	.5178
Incident Rate	3.057	5	.6912
Agressive Rate	4.617	5	.4610
Use of force	2.489	5	.7782
Fighting Incident	3.516	5	.6260

Table 50

Six Cluster by Substance Abuse or Dependence Diagnosis

CLUSTER	NO DRUG DIAGNOSIS	DRUG DIAGNOSIS
1	26 (15.1 %)	11 (6.4 %)
2	17 (9.9 %)	5 (2.9 %)
3	31 (18.0 %)	8 (4.7 %)
4	15 (8.7 %)	8 (4.7 %)
5	30 (17.4 %)	3 (1.7 %)
6	8 (4.7 %)	10 (5.8 %)

Chi-Square = 14.936, p. = .0106, n = 172

Three Cluster Solution

A similar set of analyses were conducted to test the hypothesis of no significant differences between the three cluster solution groups. Means and standard deviations of the three cluster group solution are presented in Table 51. The three groups differed primarily in terms of profile elevation (Figure 2). Cluster One had the highest mean profile elevation with a mean F T-score of 111. Cluster Two was characterized by a moderate range of elevations, with a mean F T-score of 78. Cluster Three was characterized by a mean profile with no clinically significant elevations, and a mean F T-score of 61.

In contrast with the lack of findings of significant differences between the six cluster groups, results indicated that the most elevated profile group had a longer mean length of stay, more frequent history of substance abuse, and a higher proportion of residents involved in incidents which required the use of force (see Tables 52 and 53).

Significant differences were found in the proportion of residents in cluster groups with histories of substance abuse or dependence (Table 54). Cluster One had the highest proportion of residents with histories of alcohol or drug problems (42%). Cluster Three had the lowest proportion of residents with this history (14%).

Table 51

Three Cluster Solution Profiles: K-corrected T Scores

MMPI SCALE	CLUSTER ONE	TWO	THREE
n	54	61	73
Mean L (S.D.)	50.48 (7.50)	53.95 (8.59)	59.15 (10.77)
Mean F (S.D.)	111.04 (12.85)	78.44 (14.49)	61.27 (8.51)
Mean K (S.D.)	46.11 (7.71)	52.79 (9.50)	54.97 (8.61)
Mean Hs (S.D.)	76.33 (12.12)	68.82 (14.35)	54.01 (8.78)
Mean D (S.D.)	80.35 (15.62)	70.92 (13.91)	59.03 (11.01)
Mean Hy (S.D.)	69.81 (10.47)	64.89 (12.09)	54.51 (7.46)
Mean Pd (S.D.)	82.26 (13.29)	76.34 (12.05)	64.15 (10.07)
Mean Mf (S.D.)	66.57 (9.65)	64.25 (8.04)	58.85 (9.23)
Mean Pa (S.D)	96.26 (11.15)	77.20 (10.57)	56.60 (8.14)
Mean Pt (S.D.)	90.76 (10.92)	72.48 (10.16)	55.85 (8.72)
Mean Sc (S.D.)	117.31 (11.13)	87.89 (10.94)	61.81 (9.44)
Mean Ma (S.D.)	80.96 (10.58)	71.10 (12.33)	63.10 (12.07)
Mean Si (S.D)	64.13 (10.20)	55.85 (8.67)	51.66 (9.62)

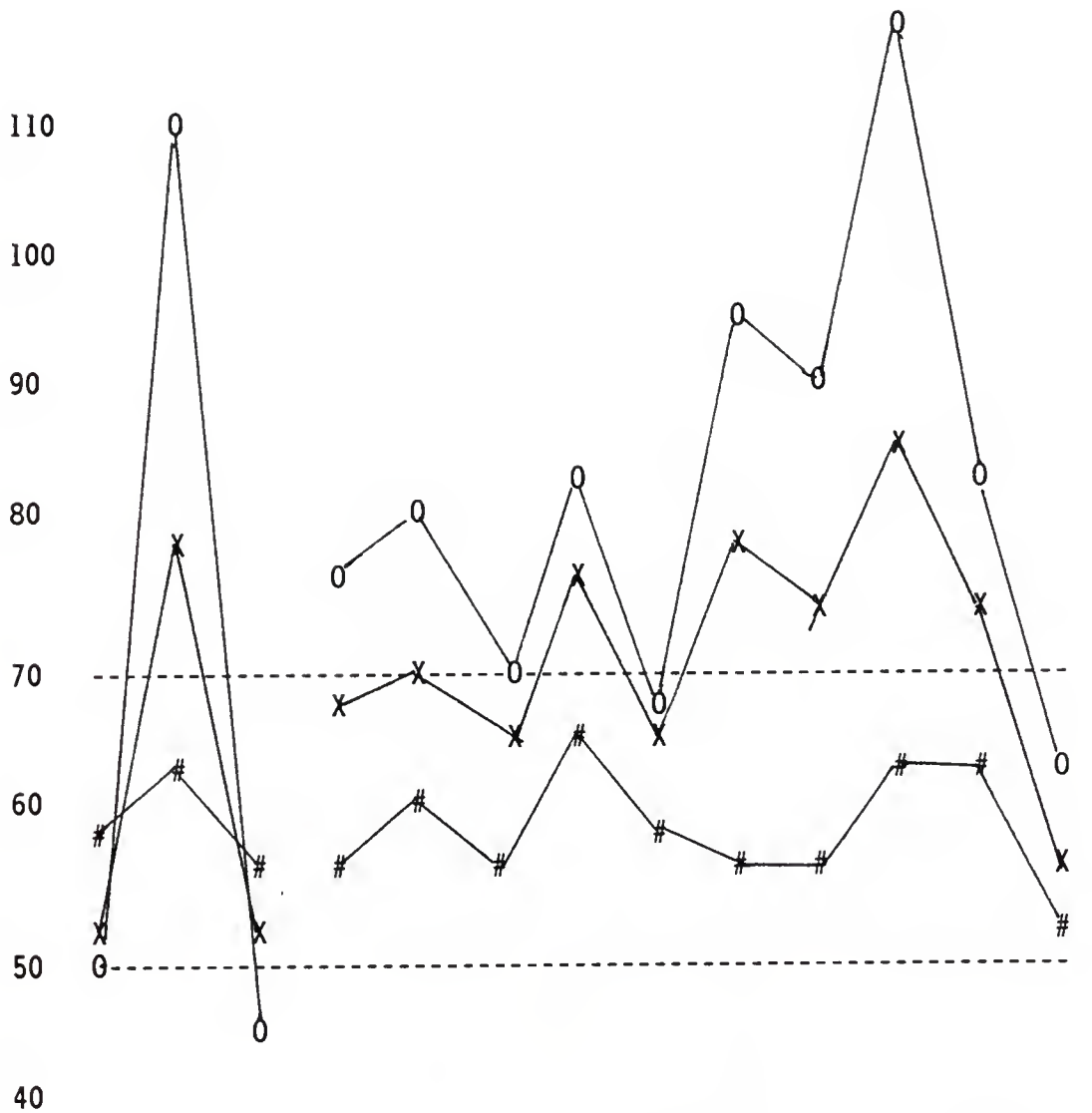

Figure 2. Three Cluster Solution Groups

Table 52

Three Cluster by Demographics Chi-Squares

VARIABLE	CHI-SQUARE	DF	PROB
Race	.365	4	.985
Marital Status	4.545	4	.337
OBS	1.630	2	.443
Axis-I	9.321	8	.316
Axis-II	.409	2	.815
Antisocial	.099	2	.952
Admission Type	6.071	4	.194
Incidents	3.317	2	.190
Aggression Rate	2.299	2	.317
Fight Incidents	1.285	2	.526

Table 53

Cluster Three by Test Data Analyses of Variance

VARIABLE	F	DF	PROB
I. Q.	1.12	2,118	.330
R	.23	2,99	.787
X plus %	.78	2,99	.464
Path %	.71	2,99	.496
W / M	.27	2,99	.764
Sum C	.66	2,99	.519
M- / M	2.96	2,99	.056
H percent	2.101	2,99	.128

Table 54

Cluster Three by Drug Abuse of Dependence Frequencies

	NO HISTORY	HISTORY
ONE	28 (16.3%)	20 (11.6%)
TWO	40 (23.2%)	16 (9.3%)
THREE	59 (34.3%)	9 (5.2%)

Chi-square = 12.023 df = 2, p <.01, n = 172

Analysis of variance of length of treatment data indicated there was a significant difference between the three cluster groups. Cluster group One, the most elevated profile, had the longest mean length of treatment, 221 days, compared to 202 days for group Two, and 148 days for group Three.

Chi-square analyses of the proportion of residents in each group commiting one or more incidents involving the use of force found that the proportion of residents in each cluster group involved in these incidents did differ significantly from chance (Table 55). Cluster One, the group with the highest mean profile elevation, had the highest frequency of residents involved in incidents requiring the use of force (25%). Cluster Two, the intermediate profile, had the lowest frequency of residents involved in incidents requiring the use of force (7%).

The above results indicate significant differences between the three cluster groups for length of treatment, substance abuse or dependence, and in the number of residents involved in incidents requiring the use of force. Cluster One, the group with the greatest elevations on the MMPI profile was found to have the highest proportion of residents involved in incidents requiring the use of force, the highest proportion of residents with histories or diagnoses of substance abuse, and the longest mean length of treatment.

Table 55

Use of Force by Three Cluster Solution

	Use of Force Incidents		
Cluster	None	One or more	Total
ONE	36 (20.93%)	12 (6.98%)	48 (27.91%)
TWO	52 (30.23%)	4 (2.33%)	56 (32.56%)
THREE	58 (33.72%)	10 (5.81%)	68 (39.53%)
Total	146 (84.88%)	26 (15.12%)	172 (100%)

Chi-Square = 6.438, d.f. = 2, p. < .05, n = 172

Comparisons of Residents Involved and Not Involved in Incidents

Comparisons between groups of residents who were involved in incidents and residents who were not involved in incidents were conducted for any incident type, aggressive incidents, extended aggressive incidents, use of force incidents, and fighting incidents. A summary of significant differences between the groups is presented in Table 56. Differences between residents involved and not involved in incidents were found for race, age, education, Axis-I diagnosis, antisocial personality disorder, and Unit assignment. Test differences were found on MMPI scales F and K, and Rorschach M + and Sum C. A marginal difference was found for I.Q. score. These findings are presented in more detail below.

Any Incident

A series of one-way analyses of variance were conducted which compared groups of residents involved in any type of incident to the group of residents not involved in any incident during their admission. Chi-square analyses were used to examine differences in the frequencies of categorical variables. Table 57 presents results of one-way analyses of variance which tested for differences between residents involved in incidents during their admission and those residents not involved in any incidents. Chi-square analyses of categorical variables are presented in Table 58.

Table 56

Summary of Significant Between Group Differences
Incident versus No Incident Groups

VARIABLE	ANY	EXTENDED USE OF AGGRESSIVE	AGGRESSIVE	FORCE	FIGHTING
Educ.	*	*	***	<.08	*
Race	** P	** P	** P	n.s. P	*
Age	n.s. P	* P	** P	<.08 P	*
Axis I	*	n.s.	n.s.	n.s.	n.s.
Antisoc.	*	n.s.	** P	**	n.s.
Unit	***	**	**	*	* P
MMPI F	*	<.08	<.08	*	<.08
MMPI K	n.s. P	n.s.	n.s.	*	n.s.
M +	<.08	n.s.	n.s.	n.s.	n.s.
Sum C	* P	n.s. P	n.s.	n.s.	n.s. P
I.Q.	<.08	n.s.	n.s.	n.s.	n.s.

* = prob. <.05 ** = prob. < .01 *** = prob < .001

P = variable was a predictor in the stepwise multiple regression analyses

Table 57

One Way Analysis of Variance Results Residents Involved in Incidents Versus Those not Involved

Variable	F	D.F.	Prob.
Education	6.335	1,442	< .05
Age	.398	1,450	.528
Total Arrests	.181	1,439	.670
Violent Arrests	.407	1,439	.524
Age at First Arrest	.095	1,438	.758
MMPI Scale F	3.911	1,180	< .05
MMPI Scale K	.792	1,182	.375
MMPI Scale Pd	.133	1,182	.716
MMPI Scale Pa	1.413	1,182	.236
MMPI Scale Pt	.134	1,182	.715
MMPI Scale Sc	1.389	1,182	.240
MMPI Scale Ma	.658	1,182	.418
I. Q.	3.257	1,297	.072
Rorschach R	.077	1,236	.781
Rorschach X+ %	.324	1,236	.570
Rorschach path %	.035	1,236	.852
Rorschach W/M	1.198	1,236	.275
Rorschach Sum C	5.929	1,236	< .05
Rorschach M+/M tot	.140	1,236	.431
Rorschach h %	2.087	1,236	.150

Table 57 continued

Variable	F	D.F.	Prob.
Rorschach M -	2.362	1,233	.126
Rorschach M +	3.138	1,233	.078
Rorschach W	1.041	1,233	.309
Length of Stay	21.361	1,441	< .001

Table 58

Chi-Square Analyses Residents Involved and not Involved in Incidents

Variable	Chi-Square	D.F.	Prob.
Admission Type	.754	2	.686
Unit	16.285	2	< .001
Race	10.689	2	< .01
Marital Status	1.697	2	.428
Organic Diagnosis	.700	1	.403
Drug Diagnosis	3.509	1	.061
Antisocial Personality Disorder	4.249	1	< .05
Axis-I Diagnosis	11.510	4	< .05
Axis-II Diagnosis	.004	1	.952
Current Violent Arrest	1.028	1	.311

Residents involved in incidents were less educated, more frequently of Hispanic ethnic origin, more frequently diagnosed antisocial personality disorder, more frequently had alcohol or drug abuse histories, and differed with respect to Axis-I diagnosis in comparison to residents not involved in any incident. Residents committing one or more incidents had higher scale F scores on the MMPI and lower Sum C scores on the Rorschach than did residents not involved in incidents. The incident group had a longer mean length of stay than did the no incident group.

Analysis of variance between groups indicated that residents involved in incidents had significantly less education (mean = 9.52 years) than residents not involved in any incidents (mean = 10.28 years).

The frequency of white, black, and Hispanic residents involved and not involved in incidents differed significantly from that expected by chance. Compared to an approximately equal number of residents involved and not involved in incidents for white and black residents, twice as many Hispanic residents were involved in incidents than were not involved in incidents (Table 59).

Chi-square analysis comparing the frequency of residents involved in incidents for those residents with histories of drug or alcohol abuse indicated the observed frequencies differed marginally from that expected by chance (Table 60). Inspection of the table indicates that twice as many residents receiving

Table 59

Chi-Square: Race by Incident

	No Incident Group			Incident Group		
	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
White	100	22.37	20.42	99	22.15	24.10
Black	84	18.79	17.75	89	19.91	20.95
Hispanic	27	6.04	9.13	62	13.87	10.78
Total	205	45.86	45.86	242	54.14	54.14

Chi-Square = 10.689, D.F. = 2, prob. = < .01

Table 60

Chi-Square Substance Abuse by Incident

History	No Incident Group Observed Frequency	No Incident Group Observed Percent	No Incident Group Expected Percent	Incident Group Observed Frequency	Incident Group Observed Percent	Incident Group Expected Percent
No Substance Abuse/ Dependence History	159	35.25	33.18	167	37.03	39.11
Substance Abuse/ Dependence History	48	10.64	12.72	77	17.07	15.00
Total	207	45.90	45.90	244	54.10	54.10

Chi-Square with continuity factor = 3.509, D.F. = 1, prob. = .0611

substance abuse or dependence diagnoses were involved in incidents than were not involved in incidents, while the frequency of residents not receiving these diagnoses had an approximately equal frequency of being involved and not being involved in incidents.

The number of residents involved in incidents among different Axis-I diagnoses differed significantly from the frequencies expected by chance (Table 61). Inspection of the table indicates that residents with schizoaffective, nonparanoid schizophrenic, and paranoid schizophrenic diagnoses had a greater than 50% rate of involvement in incidents than were not, while residents with no Axis-I diagnosis, or a diagnosis of major affective disorder had a less than 50% rate of involvement in incidents.

Chi-square analysis of the frequency of residents diagnosed as antisocial personality disorder and not so diagnosed involved in incidents indicated the number of residents involved in incidents differed by this diagnosis (Table 62). Examination of the table indicates that residents receiving a discharge diagnosis of antisocial personality disorder were twice as likely to be involved in incidents than were those not receiving that diagnosis.

Two significant differences were found between groups on psychological test data (see Table 57). Residents involved in incidents had a significantly higher T-score on scale F of the MMPI (mean = 85.16) than residents not involved in incidents (mean = 78.26). Residents involved in incidents were found to

Table 61

Chi-Square Axis-I Diagnosis by Incident

	No Incident Group			Incident Group		
Axis-I Discharge Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
None	58	13.81	10.85	46	10.95	13.91
Major Affective	11	2.62	1.98	8	1.90	2.54
Schizo-Affective	2	.48	.83	6	1.43	1.07
Non-Paranoid Schizophrenia	42	10.00	10.74	61	14.52	13.78
Paranoid Schizophrenia	71	16.90	19.40	115	27.38	24.88
Total	184	43.81	43.81	236	56.19	56.19

Chi-Square = 11.510, D.F. = 4, prob. < .05

Table 62

Chi-Square Antisocial Personality Disorder by Incident

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
No Anti-Social Personality Disorder	191	42.35	40.71	209	46.34	47.98
Anti-Social Personality Disorder	16	3.55	5.19	35	7.76	6.12
Total	207	45.90	45.90	244	54.10	54.10

Chi-Square with continuity factor = 4.249, D.F. = 1, prob. < .05

have a significantly lower Rorschach Weighted Sum C (mean = 1.464) than residents not involved in incidents (mean = 2.132). Residents involved in incidents also had a marginally lower number of M+ responses (mean = .992) than residents not involved in incidents (mean = 1.268).

Analysis of variance indicated the difference in I.Q. score between residents involved in incidents (mean = 79.16) and those not involved in incidents (mean = 81.88) was only marginally significant.

The frequency of residents involved in incidents also differed by Unit assignment (Table 63). Inspection of the table indicates that Unit I had fewer residents involved in incidents than expected, while Unit three had slightly more residents involved in incidents than expected.

Residents involved in incidents had a significantly longer mean length of treatment (mean = 256.2 days) than residents who were not involved in incidents (mean = 171.1 days).

Aggressive Incidents

Residents involved in aggressive incidents were younger, less educated, more often of Hispanic ethnic origin, more often from Unit II, and had marginally higher F scores on the MMPI than did residents who did not commit any aggressive incidents during their admission. Residents involved in incidents had a longer mean length of treatment than residents not involved in these incidents.

Table 63

Unit by Incident Chi-Square

	Unit I	Unit II	Unit III	Total
No Incident Group				
Observed	88 (19.5%)	56 (12.4%)	63 (14.0%)	207 (45.9%)
Expected Frequency	(15.4%)	(12.7%)	(17.8%)	(45.9%)
Incident Group				
Observed	63 (14.0%)	69 (15.3%)	112 (24.8%)	244 (54.1%)
Expected Frequency	(18.1%)	(15.0%)	(21.0%)	(54.1%)

Chi-Square = 16.285 D.F. = 2, Prob. < .001

Table 64 presents results of one-way analyses of variance which tested for differences between residents involved in aggressive incidents during their admission and those residents not involved in any aggressive incidents. Chi-square analyses of categorical variables are presented in Table 65.

Residents who were involved in aggressive incidents had significantly less education (mean = 9.325 years) than residents not involved in any aggressive incidents (mean = 10.078 years). Residents involved in aggressive incidents were significantly younger (Mean = 28.460 years) than residents not involved in aggressive incidents (mean = 31.058 years).

Results indicated that the frequency of residents involved in aggressive incidents differed with respect to race (Table 66). The frequency of white, black, and Hispanic ethnic group residents involved in aggressive incidents differed significantly from that expected by chance. Inspection of Table 61 indicates that residents of Hispanic ethnic origin had a higher than expected frequency of residents involved in aggressive incidents. The aggressive incident rate for residents of Hispanic ethnic origin was 42.7% which compared to rates of 23.6% for whites, and 26.0% for blacks.

Examination of test score differences failed to find significant between group differences on Rorschach data. Residents involved in aggressive incidents had a marginally higher T-score on scale

Table 64

One way Analysis of Variance Results Residents Involved in Aggressive Incidents versus Those not Involved

Variable	F	D.F.	Prob.
Education	4.985	1,442	< .05
Age	6.525	1,450	< .05
Total Arrests	.209	1,439	.648
Violent Arrests	.058	1,439	.810
Age at First Arrest	.582	1,438	.446
MMPI Scale F	3.488	1,180	.063
MMPI Scale K	.742	1,182	.390
MMPI Scale Pd	.159	1,182	.690
MMPI Scale Pa	.997	1,182	.319
MMPI Scale Pt	.817	1,182	.367
MMPI Scale Sc	2.044	1,182	.155
MMPI Scale Ma	.213	1,182	.645
I. Q.	.717	1,297	.398
Rorschach R	.001	1,236	.979
Rorschach X+ %	.846	1,236	.359
Rorschach path %	.759	1,236	.385
Rorschach W/M	.448	1.236	.504
Rorschach Sum C	1.922	1,236	.167
Rorschach M+/M tot	.598	1,236	.440
Rorschach h %	.046	1,236	.830

Table 64 continued

Variable	F	D.F.	Prob.
Rorschach M -	.027	1,233	.871
Rorschach M +	.395	1,233	.531
Rorschach W	1.047	1,233	.307
Length of Stay	26.566	1,441	< .001

Table 65

Chi-Square Analyses Residents Involved and not Involved in Aggressive Incidents

Variable	Chi-Square	D.F.	Prob.
Admission Type	.485	2	.785
Unit	12.542	2	< .01
Race	11.783	2	< .01
Marital Status	3.050	2	.218
Organic Diagnosis	.049	1	.824
Drug Diagnosis	.704	1	.402
Antisocial Personality Disorder	1.985	1	.159
Axis-I Diagnosis	8.475	4	.076
Axis-II Diagnosis	.025	1	.875
Current Violent Arrest	.123	1	.725

Table 66

Chi-Square Race by Aggressive Incident Count

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
White	152	34.00	32.07	47	10.51	12.45
Black	128	28.64	27.88	45	10.07	10.82
Hispanic	51	11.41	14.34	38	8.50	5.57
Total	322	72.04	72.04	125	27.96	27.96

Chi-Square = 11.783, D.F. = 2, prob. = < .01

F of the MMPI (mean = 87.419) than residents not involved in aggressive incidents (mean = 79.754).

The frequency of residents involved in aggressive incidents differed by Unit assignment. Inspection of Table 67 indicates that Unit I had the lowest rate of aggressive incidents (18.5%), Unit II had the highest rate (37.6%), while Unit III was in between (29.24%).

Analysis of variance of between group differences indicated the aggressive incident group had a longer mean length of treatment. Residents involved in one or more aggressive incidents had a mean length of treatment of 292.9 days while residents not involved in any incidents of this type had a mean length of treatment of 187.6 days.

Extended Aggressive Incidents

Residents involved in extended aggressive incidents were less educated, younger, more frequently of Hispanic ethnic origin, more frequently antisocial personality disorders, less frequently form Unit I, and had marginally higher F scores on the MMPI than residents not involved in any of these incidents. Residents involved in these incidents had longer mean length of stays than residents not commiting any aggressive incidents of this type.

Table 68 presents results of one way analyses of variance which tested for differences between residents involved in extended aggressive incidents during their admission and those residents not involved in any of these incidents. Chi-square analyses of categorical variables are presented in Table 69.

Table 67

Chi-Square Unit by Aggressive Count

	No Incident Group			Incident Group		
Unit	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
I	123	27.27	24.13	2	6.21	9.35
II	78	17.29	19.97	47	10.42	7.74
III	124	27.49	27.96	51	11.31	10.84
Total	325	72.06	72.06	126	27.94	27.94

Chi-Square = 12.542, D.F. = 2, prob. = < .01

Table 68

One Way Analysis of Variance Results Residents Involved in Extended Aggressive Incidents Versus Those not Involved

Variable	F	D.F.	Prob.
Education	14.179	1,442	< .001
Age	7.414	1,450	< .01
Total Arrests	.057	1,439	.811
Violent Arrests	1.234	1,439	.267
Age at First Arrest	1.433	1,438	.232
MMPI Scale F	3.384	1,180	.074
MMPI Scale K	.074	1,182	.787
MMPI Scale Pd	.195	1,182	.659
MMPI Scale Pa	.386	1,182	.535
MMPI Scale Pt	.444	1,182	.505
MMPI Scale Sc	1.117	1,182	.292
MMPI Scale Ma	.160	1,182	.689
I. Q.	1.461	1,297	.228
Rorschach R	.010	1,236	.919
Rorschach X+ %	.192	1,236	.661
Rorschach path %	.030	1,236	.864
Rorschach W/M	.194	1.236	.660
Rorschach Sum C	1.462	1,236	.228
Rorschach M+/M tot	.122	1,236	.728
Rorschach h %	.112	1,236	.738

Table 68 continued

Variable	F	D.F.	Prob.
Rorschach M -	.404	1,233	.526
Rorschach M +	.729	1,233	.394
Rorschach W	1.078	1,233	.300
Length of Stay	34.758	1,441	< .001

Table 69

Chi-Square Analyses Residents Involved and not Involved in Extended Aggressive Incidents

Variable	Chi-Square	D.F.	Prob.
Admission Type	.067	2	.967
Unit	10.846	2	< .01
Race	13.304	2	< .01
Marital Status	4.292	2	.117
Organic Diagnosis	.665	1	.415
Drug Diagnosis	.662	1	.416
Antisocial Personality Disorder	10.788	1	< .01
Axis-I Diagnosis	7.017	4	.135
Axis-II Diagnosis	.262	1	.609
Current Violent Arrest	.335	1	.563

Analysis of variance indicated that residents involved in these incidents had significantly less education (mean = 9.074 years) than residents not involved in any extended aggressive incidents (mean = 10.268 years). Residents involved in extended aggressive incidents were significantly younger (Mean = 28.583) than residents not involved in aggressive incidents (Mean = 31.213).

The frequency of white, black, and Hispanic residents involved and not involved in extended aggressive incidents differed significantly from that expected by chance. Inspection of Table 70 indicates that the Hispanic ethnic group had the highest proportion of residents involved in extended aggressive incidents. The proportion of Hispanic residents involved in this type of incident was 49.4%, which compared to 32.4% for black residents, and 27.6% for white residents.

Chi-square analysis of the frequency of residents diagnosed as antisocial personality disorder and not so diagnosed involved in incidents indicated the number of residents involved in extended aggressive incidents differed by this diagnosis. Examination of Table 71 indicates that residents receiving a discharge diagnosis of antisocial personality disorder had a greater than 50% rate of extended aggressive incidents while residents not receiving that diagnosis had a frequency of less than 30% for incidents of this type.

Examination of test results indicated residents involved in extended aggressive incidents had marginally higher t-scores on

Table 70

Chi-Square Race by Extended Aggressive Count

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
White	144	32.21	29.58	55	12.30	14.94
Black	117	26.17	25.72	56	12.53	12.99
Hispanic	45	10.07	13.23	44	9.84	6.68
Total	297	66.44	66.44	150	33.56	33.56

Chi-Square = 13.304, D.F. = 2, prob. = < .01

Table 71

Chi-Square Antisocial Personality Disorder by Extended Aggressive Incidents

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
No Anti-Social Personality Disorder	277	61.42	59.00	123	27.27	29.70
Anti-Social Personality Disorder	23	5.10	7.52	28	6.21	3.79
Total	300	66.52	66.52	151	33.48	33.48

Chi-Square with continuity factor = 10.788, D.F. = 1, prob. < .01

scale F of the MMPI (Mean = 86.706) than those not involved in these incidents (mean = 79.562). No other significant test differences between groups were found.

The frequency of residents involved in extended aggressive incidents differed by Unit assignment. Inspection of the Table 72 indicates that Unit I had fewer residents (23%) involved in extended aggressive incidents than did Units II (39.2%) and Unit III (39.0%).

Analysis of variance indicated residents involved in extended aggressive incident had significantly longer length of treatment. Residents with one ore more extended aggressive incidents had a mean length of treatment of 293.1 days compared to a mean of 179.4 days for residents not involved in extended aggressive incidents.

Use of Force Incidents

Residents who were involved in incidents requiring the use of force were marginally less educated, marginally younger, more frequently of Hispanic ethnic origin, more frequently diagnosed as antisocial personality disorders, and were less frequently assigned to Unit I than residents not requiring the use of force. On test data Use of Force residents obtained higher F scale scores and lower K scale scores on the MMPI. Residents requiring Use of Force had a longer mean length of treatment than residents not involved in this type of incident.

Table 72

Chi-Square Unit by Extended Aggressive Count

	No Incident Group			Incident Group		
Unit	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
I	116	25.72	22.27	35	7.76	11.21
II	76	16.85	18.44	49	10.86	9.28
III	108	23.95	26.99	69	15.30	13.59
Total	300	66.52	66.52	151	33.48	33.48

Chi-Square = 10.498, D.F. = 2, prob. = < .01

Table 73 presents results of one-way analyses of variance which tested for differences between residents involved in incidents requiring the use of force during their admission and those residents not involved in any incidents of this type. Chi-square analyses of categorical variables are presented in Table 74.

Residents involved in Use of Force incidents had marginally less education (mean = 9.337 years) than residents not involved in these incidents (mean = 10.020 years). Residents involved in Use of Force incidents were marginally younger (Mean age = 28.707) than those residents not involved in these incidents (Mean age = 30.790).

Chi-square analysis of the frequency of residents diagnosed as antisocial personality disorder and not so diagnosed involved in incidents requiring the Use of Force indicated the number of residents involved in incidents differed by this diagnosis. Examination of Table 75 indicates that 39.2% of residents receiving a discharge diagnosis of antisocial personality disorder had been involved in incidents where the use of force was required compared to 19.75% of those who did not receive that diagnosis upon discharge.

Examination of test differences failed to find significant between group differences on Rorschach data. Analysis of variance indicated that residents involved in incidents requiring the Use of Force had a significantly higher T-score on scale F of the MMPI (mean = 90.815) than residents not involved in these

Table 73

One way Analysis of Variance Results: Residents Involved in Use of Force Incidents versus Those not Involved

Variable	F	D.F.	Prob.
Education	3.518	1,442	.061
Age	3.545	1,450	.060
Total Arrests	.304	1,439	.582
Violent Arrests	.967	1,439	.326
Age at First Arrest	.775	1,438	.379
MMPI Scale F	4.946	1,180	< .05
MMPI Scale K	4.185	1,182	< .05
MMPI Scale Pd	.791	1,182	.375
MMPI Scale Pa	.796	1,182	.374
MMPI Scale Pt	.424	1,182	.516
MMPI Scale Sc	1.515	1,182	.220
MMPI Scale Ma	1.991	1,182	.160
I. Q.	2.123	1,297	.146
Rorschach R	1.940	1,236	.165
Rorschach X+ %	.296	1,236	.587
Rorschach path %	.342	1,236	.559
Rorschach W/M	.164	1.236	.686
Rorschach Sum C	.839	1,236	.361
Rorschach M+/M tot	.849	1,236	.357
Rorschach h %	.405	1,236	.525

Table 73 continued

Variable	F	D.F.	Prob.
Rorschach M -	.424	1,233	.516
Rorschach M +	.647	1,233	.422
Rorschach W	2.948	1,233	.087
Length of Stay	16.820	1,441	< .001

Table 74

Chi-Square Analyses Residents Involved and not Involved in Use of Force Incidents

Variable	Chi-Square	D.F.	Prob.
Admission Type	2.649	2	.266
Unit	7.220	2	< .05
Race	4.540	2	.103
Marital Status	2.143	2	.343
Organic Diagnosis	.977	1	.323
Drug Diagnosis	1.065	1	.302
Antisocial Personality Disorder	8.900	1	< .01
Axis-I Diagnosis	1.500	4	.827
Axis-II Diagnosis	.002	1	.962
Current Violent Arrest	.451	1	.502

Table 75

Chi-Square Antisocial Personality Disorder by Use of Force

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
No Anti-Social Personality Disorder	321	71.18	69.22	79	17.52	19.47
Anti-Social Personality Disorder	31	6.87	8.83	20	4.43	2.48
Total	352	78.05	78.05	99	21.95	21.95

Chi-Square with continuity factor = 8.900, D.F. = 1, prob. < .01

incidents (mean = 79.995). Residents involved in Use of Force incidents also obtained a lower T-score on scale K of the MMPI (mean = 48.926) than the residents not involved in these incidents (mean = 53.179).

The frequency of residents involved in incidents requiring the Use of Force differed by Unit assignment (Table 76). Inspection of the table indicates that Unit I had fewer residents involved in incidents than expected. Unit I had 14.6% of its residents involved in this incident type compared to 25.6% for Unit II and 25.7% for Unit III.

Analysis of variance of between group differences indicated the Use of Force group had a longer mean length of treatment than the group not involved in this type of incident. Residents involved in one or more Use of Force incidents had a mean length of treatment of 289.0 days compared to 196.9 days for residents not involved in Use of Force incidents.

Fighting Incidents

Residents involved in fighting incidents were less educated, younger, more frequently of Hispanic ethnic origin, more frequently assigned to Unit II, and had marginally higher scale F scores on the MMPI than residents not involved in these incidents. Residents involved in fights had a longer mean length of treatment than residents not involved in fights.

Table 76

Chi-Square Unit by Use of Force

	No Incident Group			Incident Group		
Unit	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
I	129	28.60	26.13	22	4.88	7.35
II	93	20.62	21.63	32	7.10	6.08
III	130	28.82	30.29	45	9.98	8.52
Total	352	78.05	78.05	99	21.95	21.95

Chi-Square = 7.220, D.F. = 2, prob. = < .05

Table 77 presents results of one-way analyses of variance which tested for differences between residents involved in fighting incidents during their admission and those residents not involved in any incidents. Chi-square analyses of categorical variables are presented in Table 78.

Results indicate that residents involved in fighting incidents had significantly less education (mean = 9.264 years) than residents not involved in any incidents (mean = 10.017 years). Residents involved in fights were younger (mean = 28.533) than those not involved in fighting incidents (mean = 30.781).

The frequency of white, black, and Hispanic residents involved and not involved in fighting incidents differed significantly from that expected by chance. Table 79 indicates Hispanic ethnic group residents had a 32.6% frequency rate of fighting incidents compared to 16.6% for whites and 18.0% for blacks.

Examination of test results indicated no significant differences between the group of residents involved in fights and the group which was not. Residents involved in fighting incidents did have a marginally higher T-score on scale F of the MMPI (mean = 88.333) than residents not involved in incidents (mean = 80.068).

The frequency of residents involved in fighting incidents differed by Unit assignment. Inspection of Table 80 indicates that Unit II had a higher relative frequency of of residents involved in fighting incidents (29.6%) than did Unit I (13.9 %) or III (18.28%).

Table 77

One-Way Analysis of Variance Results Residents Involved in Fighting Incidents Versus Those not Involved

Variable	F	D.F.	Prob.
Education	3.908	1,442	< .05
Age	3.852	1,450	.050
Total Arrests	1.483	1,439	.224
Violent Arrests	.979	1,439	.323
Age at First Arrest	.165	1,438	.685
MMPI Scale F	3.336	1,180	.069
MMPI Scale K	.354	1,182	.552
MMPI Scale Pd	.248	1,182	.619
MMPI Scale Pa	1.555	1,182	.214
MMPI Scale Pt	.244	1,182	.622
MMPI Scale Sc	1.890	1,182	.171
MMPI Scale Ma	.609	1,182	.436
I. Q.	.673	1,297	.413
Rorschach R	.074	1,236	.786
Rorschach X+ %	.280	1,236	.597
Rorschach path %	.818	1,236	.367
Rorschach W/M	.827	1.236	.364
Rorschach Sum C	1.524	1,236	.218
Rorschach M+/M tot	.293	1,236	.589
Rorschach h %	.213	1,236	.645
Rorschach M -	.044	1,233	.834

Table 77 continued

Variable	F	D.F.	Prob.
Rorschach M +	1.417	1,233	.235
Rorschach W	.017	1,233	.898
Length of Stay	18.458	1,441	< .001

Table 78

Chi-Square Analyses Residents Involved and not Involved in Fighting Incidents

Variable	Chi-Square	D.F.	Prob.
Admission Type	.653	2	.722
Unit	11.043	2	< .01
Race	10.777	2	< .01
Marital Status	3.242	2	.198
Organic Diagnosis	.069	1	.792
Drug Diagnosis	.876	1	.349
Antisocial Personality Disorder	.242	1	.623
Axis-I Diagnosis	7.626	4	.106
Axis-II Diagnosis	.052	1	.820
Current Violent Arrest	.929	1	.335

Table 79

Chi-Square Race by Fighting Incidents

	No Incident Group			Incident Group		
Diagnosis	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
White	166	37.14	35.66	33	7.38	8.86
Black	142	31.77	31.00	31	6.94	7.71
Hispanic	60	13.42	15.95	29	6.49	3.96
Total	358	80.09	80.09	89	19.91	19.91

Chi-Square = 10.777, D.F. = 2, prob. = < .01

Table 80

Chi-Square Unit by Fights

	No Incident Group			Incident Group		
Unit	Observed Frequency	Observed Percent	Expected Percent	Observed Frequency	Observed Percent	Expected Percent
I	130	28.82	26.80	21	4.66	6.68
II	88	19.51	22.19	37	8.20	5.53
III	143	31.71	31.06	32	7.10	7.74
Total	361	80.04	80.04	90	19.96	19.96

Chi-Square = 11.043, D.F. = 2, prob. = < .01

Residents involved in fights had a longer mean length of treatment than residents not involved in fighting incidents. Residents involved in fighting incidents had a mean length of treatment of 296.7 days compared to 197.1 days for residents not involved in fights.

Summary

Results of comparisons between residents involved and not involved in the different types of incidents were fairly consistent. Residents involved in various types of aggressive incidents were approximately two years younger than the group of residents not involved in aggressive types of incidents. Residents involved in all types of incidents tended to be slightly less educated than residents not involved in the different types of incidents.

Residents of the Hispanic ethnic group had a significantly higher probability of being involved in all types of incidents than did white or black residents except for incidents requiring the Use of Force. Nearly two out of three residents of Hispanic origin were involved in some type of incident compared to about one out of two black or white residents. Hispanic residents had nearly twice the base rate of white or black residents for aggressive, extended aggressive, and fighting incidents. Nearly one of two residents of Hispanic ethnic origin were involved in physically aggressive incidents.

Residents with a discharge diagnosis of antisocial personality disorder also had a high frequency of involvement in incidents. These residents had double the base rate of involvement in overall incidents and incidents requiring the Use of Force than residents not receiving an antisocial personality diagnosis. Slightly more than fifty percent of residents receiving this discharge diagnosis were involved in some type of aggressive incident.

Differences on test data were less consistent for the different types of incidents, though residents involved in all types of incidents tended to have more elevated MMPI scale F scores.

Post Hoc Analyses of the Hispanic Ethnic Group

Since residents of the Hispanic ethnic group appeared to have much higher rates of incidents than either the white or black resident groups a series of post-hoc Chi-squares were conducted to determine if a particular subgroup of the Hispanic residents accounted for the high incident rate of this group.

Chi-Square analyses between Cuban and other Hispanic residents failed to yield significant differences between the number of residents commiting and not commiting any incident, aggressive incidents, extended aggressive incidents, Use of Force Incidents, and fighting incidents. A similar set Chi-squares was conducted for those Hispanic residents arriving as refugees during the

Mariel boat lift (n = 30) and the remaining Hispanic residents but no significant differences were found.

Further post-hoc analyses were conducted to determine if the Hispanic ethnic group exhibited more pathology on the MMPI than did the general NFETC population, and if they had a history of more serious crimes as assessed by the proportion of residents with histories of homicide than did white or black residents.

Nearly half (35) of the Hispanic ethnic group residents in the sample completed MMPIs. The mean Hispanic MMPI profile did not differ from the mean NFETC profile by more than 5 T - score points on any scale. However, further investigation determined that nearly 50% (n = 14) of the Hispanic resident MMPI profiles had F scale scores equal or greater than 85 - T and nearly half (n = 17) had F scale scores below 61 - T.

Chi-square analyses of the two groups of Hispanic residents completing the MMPI found a significant differences in the proportion of residents involved in aggressive incidents and a marginal difference in the proportion of residents involved in fighting incidents.

Seventy-one percent of Hispanic residents with an F score greater than 85 - T were involved in physically aggressive incidents compared to 24% of the Hispanic residents with F scale scores below 61 - T, Chi-square with continuity correction factor = 5.310, d.f. = 1, $p < .05$. Fifty-seven percent of the Hispanic residents with high F scale scores were involved in fights compared to only 18% of the Hispanic residents with F scale scores below 60 - T,

Chi-square with continuity correction factor = 3.648, d.f. = 1, $p = .0561$.

A Chi-Square analysis of the frequency of residents with histories of homicide for the white, black, and Hispanic groups was conducted. This analysis indicated the proportion of residents with homicide arrest histories differed for white, black, and Hispanic groups, Chi-square = 11.688, d.f. = 2, $p < .01$. Twenty-two of 193 whites, 20 of 170 blacks and 20 of 75 residents of Hispanic ethnic origin had at least one arrest for homicide. This indicated that more than one of four residents in the Hispanic ethnic group had an arrest history of homicide compared to one of eight and one of seven for the white and black groups, respectively.

Chi-squares were conducted comparing the frequency of Hispanic residents with arrest histories of homicide and without homicide histories commiting incidents. No significant differences for the proportion of homicide and no homicide Hispanic residents involved in any incident, aggressive incidents, extended aggressive incidents, Use of Force incidents, or fighting incidents were found.

CHAPTER FOUR

DISCUSSION

The main purposes of the present study were to identify residents at risk for various types of incidents by use of blockwise multiple regression procedures applied to demographic and test data and to determine if cluster analysis of MMPI profiles could identify valid subgroups of forensic inpatients. This section will examine the implications of the results of the data analysis in terms of the research hypotheses. Suggestions for further future research are considered in the context of the results of the present study.

Methodological Considerations

Methodological issues such as the inclusion or exclusion of data obtained by the MMPI-168, the reliability of arrest coding, and possible between group differences between residents completing and not completing tests were examined prior to tests of the main hypotheses.

An important variable which was not collected was a measure of socioeconomic status. A previous study conducted at NFETC provided information with respect to violent incidents and socioeconomic status. Barnard, Robbins, Newman, and Carrera (1983)

reported that the occupations of 177 residents at the facility during a three month period were classified as 75.1% blue collar, 6.2% white collar, 10.7% unemployed, and 5.6% students. They reported that a Chi-square of the occupational classification by presence of one or more violent incidents was not significant.

A methodological decision was made to eliminate MMPI data of 110 subjects tested with the MMPI-168 short form (Overall et. al., 1976). This decision was based on criticism of the use of short forms of the MMPI (e.g., Hoffman & Butcher, 1975) and the presence of significant differences and low correlations between some scales when scored by the two different methods (see Table 1). This decision had the effect of reducing the number of residents included in the multiple regression analyses which included test data. A consequence of the lower number of residents in these analyses was reduction of the power of these analyses to detect significant relationships where they existed, and made the resultant solutions less statistically stable. This was evident in the zero order estimates of the population variance accounted for by the regression equations which included test data.

Since many of the actual mean differences between scale scores obtained by the different scoring methods were small in magnitude and the correlations between the scores obtained on most scales were quite high, a suggestion for further investigation would be the examination of results obtained by including the MMPI-168 profiles.

Prior to conducting the regression analyses the question of the reliability of the research assistants coding of arrest records in terms of the number of total and violent arrests was examined. The obtained interscorer relibilities were quite high, ranging from .931 to .983. Arrest codings made by the two assistants were pooled in the analyses.

Another issue, examined prior to the analyses central to this study, was that of a possible threat to the generalizability of data obtained from test results due to possible bias in terms of which residents were and were not tested with the MMPI or with the Rorschach.

A series of Chi-square analyses and univariate analyses of variance failed to find any significant differences between those residents administered and not administered the Rorschach. It was concluded that there was no evidence of significant bias between residents administered and not administered the Rorschach on the variety of measures examined.

Significant differences between groups of residents administered Form-R of the MMPI and those residents either administered the short form MMPI-168, or not completing an MMPI at all, indicated that residents completing Form-R of the MMPI were more educated, and had a higher mean I.Q. score. Differences were also found in the discharge diagnoses and length of treatment of residents administered and not administered Form-R of the test.

The differences found in education and intelligence scores were not unexpected since the use of the MMPI Form-R is limited to individuals who possess at least a fifth grade reading level. Therefore, it is likely that the differences obtained in terms of education and intelligence pose no further threat to the generalizability of the present findings than the use of the MMPI would allow. One possible interpretation of the differences in discharge diagnoses is that the differences may have been a consequence of the use of the MMPI in diagnostic assessment rather than a result of bias in test administration.

The difference in the length of treatment of residents administered the MMPI Form-R and those not is more perplexing. Two factors may account for this result. It is possible the test was not administered to those residents who were functioning too poorly to reliably complete the test, therefore raising the possibility that residents completing the test were better functioning and therefore were more quickly treated.

A second possibility, which is actually a more specific dimension of the above, is that since residents with poor reading ability were not administered the test, intellectual differences between the groups accounted for the difference in length of treatment. This possibility was supported by a post-hoc multiple regression analysis which found that in the context of other variables intelligence score did contribute significantly to length of treatment variance.

It was concluded that the group of residents administered Form-R of the MMPI did constitute a biased subgroup of residents who were likely to be somewhat more functional at least with respect to intelligence and education than the residents not administered Form-R of the test.

Demographic Data

A goal of the present research was to provide additional data concerning a sample of forensic inpatients the majority of which were adjudicated as incompetent to stand trial and in need of involuntary hospitalization, since this has been a neglected group in research. Characteristics of this group are discussed below.

The present sample of residents was much younger (30.5 years) than the mean age of residents in long-term institutions in the early studies of prediction of violence (47 years) by Kozol et al. (1972), and by Thornberry and Jacoby (1979). The mean age of the present sample was very close to the mean age of 31 years of the 257 patients adjudicated incompetent to stand trial in the study reported by Cocozza and Steadman (1976).

Hispanic ethnic group residents were the minority group in the institution, comprising 16.6% of the present sample. The Hispanic ethnic group consisted of residents which were 71% Cuban, 11% South American, 11% Puerto Rican and 7% other. The majority (56.6%) of the Hispanic ethnic group were refugees released form Cuban jails and mental institutions during the Mariel Boatlift.

Many of the Hispanic ethnic group residents were Cuban refugees and immigrants who had difficulty with the English language and were at a cultural disadvantage. The Hispanic ethnic group contained a large group (43%) of Cuban refugees arriving during the Mariel boatlift. The Mariel refugees were a controversial group within the institution and were the subject of political debate in the popular media.

Review of residents coded marital status indicated that a substantial majority were never married (70%). This percentage was consistent with the findings of Barnard et al. (1983), who surveyed 177 NFETC residents in the facility during a three month period.

Residents in the present sample did have a substantial history of prior arrests. The majority of residents had a history of violent arrests outside the treatment center. Sixty-seven percent had a most recent arrest which included violence. The NFETC residents had a mean of approximately two prior violent arrests. These results are consistent with the findings of Roesch and Golding (1980) who found that 77% of a sample of individuals found incompetent to stand trial in North Carolina had been charged with violent crimes. Steadman and Braff (1975) also found violent crimes were overrepresented in a population of New York individuals adjudicated incompetent to stand trial.

Approximately 14% of the NFETC residents in the present sample had a current or prior arrest for homicide. The rate of residents with a history of a homicide arrest among the

Hispanic ethnic group was significantly higher (27%) than the rate for white (11.3%) or black residents (11.7%). Further analyses found that residents who were Mariel refugees had a significantly higher proportion (36.6%) of residents with arrest histories of homicide than the remainder of the Hispanic ethnic group residents who had a rate (11.6%) similar to the rate for black and white residents.

The finding that the majority of NFETC residents (64%) were diagnosed as some form of schizophrenia is indicative of the presence of severe psychopathology in the present sample. Interestingly, personality disorders were relatively infrequently diagnosed. The number of residents (28%) with diagnoses or histories of alcohol or substance abuse or dependence indicated substance abuse was common in the present population. Diagnoses of organic brain syndromes were relatively rare (5%).

Test Characteristics

Consistent with the modal diagnosis of schizophrenia, analyses of test results indicated the present NFETC sample was impaired with respect to cognitive functioning, ego functioning, affective resources, and interpersonal developement. The NFETC residents were found to be deviant on most Rorschach and MMPI indices, most closely resembling groups of inpatient schizophrenics.

Intelligence test data indicated that the mean intellectual functioning of the present sample was between the borderline and

low average range of measured intelligence. The mean I.Q. score of 80.5 represents performance which is approximately at the tenth percentile for adults in the WAIS-R standardization sample (Wechsler, 1981). The low intelligence scores of the present sample may also have be a partial consequence of difficulties in thinking, reasoning, and concentrating due to psychosis. Heller et al. (1981) found a positive relationship between findings of psychosis along with subaverage intelligence and subsequent evaluation as incompetent to stand trial.

The mean NFETC MMPI results indicated clinically significant elevations on scale F, the Psychopathic Deviate scale, the Paranoia scale, and the Schizophrenia scale. The elevated MMPI 8/6-4 profile type obtained from those NFETC residents completing the test is generally associated with schizophrenia or paranoid schizophrenia, the modal diagnoses of this sample. People with similar profiles often display disordered thinking, poor judgment, anger, persecutory delusions, grandiose delusions, and may report hallucinations (Lachar, 1974). The elevation on scale 4 is often associated with rejection of societal norms, anger, difficulties with the law, and substance abuse. These interpretations are quite consistent with the diagnoses and symptoms displayed by the NFETC population.

The mean group Rorschach results previously presented in Table 9 indicated the present NFETC sample exhibits significant psychological disturbance on a variety of indices. The mean number of responses to the inkblots was less than the means

presented by Exner for nonpatient and inpatient schizophrenic groups. The relatively low number of responses on the Rorschach is often associated with intellectual limitations, defensiveness, organicity, depression, or attempts at malingering (Exner, 1974). In the present sample a lower than average number of responses would be expected on the basis of the low mean intelligence score.

The capacity of NFETC residents to cope with stress is poor judged by the Mean X+% of 59%. The low percentage on this index of the percentage of patient's responses which are of good correspondence to the physical features of the blots is associated with deficits in perceptual accuracy or reality testing operations (Exner, 1974). The mean X+% is similar to that obtained in an inpatient schizophrenic sample (Table 9) and is also consistent with the mean MMPI results which were also suggestive of psychoses.

The percentage of "pathological" responses as defined in the present study appears to be high (12%) since the index is comprised of rare or pathognomically significant contents (blood, sex, food, religion, anatomy, and fire). Since this index was created by the present author, no other normative information is available.

The mean Sum C, a weighted total of color responses, was lower than a nonpatient group, a group of inpatient schizophrenics and a group of inpatient depressives. Low Sum C is associated with

lack of adaptive responsiveness, anxiety and stress, and functional psychoses (Ogdon, 1977).

The percentage of human responses was low relative to the ratio of human responses (4.2) to total responses (21.6) of non psychiatric individuals and is similar to that of in-patient schizophrenics (Exner, 1974, Table F). Low h% is associated with impairment of empathy, social isolation, and immaturity (Ogdon, 1977).

The mean number of total M responses (1.5) for NFETC residents is below the mean for nonpatients, inpatient schizophrenics, and inpatient depressives (Exner, 1977). The NFETC residents had a mean number of M responses which was more characteristic of an inpatient sample of patients diagnosed as character problems (Mean M total = 1.85; Exner, 1977). Boehnert (1983) reported similar mean M scores for groups of individuals attempting or succeeding in the use of insanity defenses. Low M is associated with low intellectual ability, difficulty delaying the expression of impulses (Exner, 1977), low empathy, psychotic conditions, and poor prognosis in therapy (Ogdon 1977).

The mean of approximately .5 M- responses per record is high in comparison with rarity of M- responses (3%) in nonpsychiatric records. The presence of M- is generally associated with psychosis and schizophrenia (Exner, 1974).

The number of W responses is about average for both nonpatient and inpatient schizophrenic samples. However, the ratio of the mean number of W responses to the mean number of M responses

(W / M) is greater than 4 to 1 in the present sample. Ratios of greater than 3 to 1 are generally interpreted as indicating aspirations exceed functioning level.

Test results indicated the present sample of NFETC residents to be characterized by significant deficits in ego and intellectual functioning. Test results are generally consistent with the modal diagnoses of paranoid schizophrenia and other types of schizophrenia. Test results suggested that NFETC residents would be likely to exhibit deficits in reality testing, capacity to cope with stress, and poor interpersonal functioning.

Incidents

The NFETC residents displayed a high frequency of acting out behavior both in terms of general incidents and physically aggressive incidents. More than half (54%) of NFETC residents in the present sample were involved in some type of incident. Nearly one in three residents were involved in an incident involving actual physical aggression during their admission. This rate is slightly below the rate of hospital assaults (36-42%) of individuals adjudicated incompetent to stand trial in the Cocozza and Steadman study (1976).

Blockwise Multiple Regression Analyses

One major goal of the present investigation was to determine if groups of residents with high base rates of of violent institutional

behavior could be identified on the basis of equations derived from blockwise multiple regression analyses of demographic and test data.

The effect of the large number of demographic variables (32) examined in the multiple regression equation relative to the sample size (451) is evident in the rather small estimates of the actual population incident rate variance accounted for the resultant regression models (Shrunken R-squared; Cohen & Cohen, 1975). The amount of population variance accounted for by the demographic regression models varied between less than 1% for the prediction model of fighting incident rate and 4% for the prediction model of the overall incident rate.

The use of a blockwise selection procedure in which an a priori order of blocks was selected allowed examination of the hypothesis that test data would account for significant additional variance beyond that which was accounted for by the demographic blocks. These results must also be considered exploratory and not explanatory (Cohen & Cohen 1975).

Separate multiple regression analyses were conducted for incidents in general, aggressive incidents, extended aggressive incidents, Use of Force incidents, and fighting incidents.

Hypothesis 1. This hypothesis asserted that some weighted combination of psychological test indices and demographic data derived from stepwise multiple regression analysis could identify residents at higher than base rate risk for becoming involved in institutional incidents.

Analysis of these data included any incident in which the resident was involved. In the present sample of NFETC residents, 54.1%, were involved in one or more incidents indicating that slightly more than half of the residents admitted to NFETC could be expected to be involved in some type of incident.

Results of the stepwise regression procedures indicated that the demographic variables age, Hispanic ethnic group, discharge diagnosis of antisocial personality disorder, "other Axis-I diagnosis," and building 14 assignment could be combined to identify a group of residents which comprised nearly 25% of the present sample. Seventy-three percent of this identified group were involved in one or more incidents during their admission. Three of four residents in the identified group commited one or more incidents.

Further analyses indicated that the Rorschach variable Sum C along with the demographic variables antisocial personality disorder, Hispanic ethnic group, building 14 assignment, and age could be used to identify a subgroup which had a higher than base rate frequency of incidents (68%). For this group one false positive was identified for every two true positives. Although less successful than the model based on demographics alone, this model nevertheless represented an improvement over the overall base rate.

Post-Hoc analyses indicated that a three variable model based on the presence or absence of antisocial personality diagnosis, Scale K of the MMPI, and Sum C of the Rorschach

accounted for approximately the same percentage (10.9%) of incident rate variance as the above models. In this model presence of antisocial personality disorder, lower scale K scores, and lower sum C were associated with higher incident rates. This model performed as well as or better than the above models, yielding subgroups of residents with 65-80% frequency rates of individuals involved in incidents.

The present results are supportive of the hypothesis that groups with a higher than average base rates of incidents could be identified. Test results were found to account for significant additional variance beyond the variance accounted for by the demographic variables employed alone. The resultant classification models limited false positives to between one in three and one in five.

Hypothesis 2a. This hypothesis asserted that the blockwise multiple regression procedures could identify a group of individuals at a higher than average base rate risk with regard to aggressive incidents. In this analysis aggression rate was strictly defined as occurence of physical aggression prior to treatment staff intervention.

The overall base rate of aggressive incidents was 27.9%. A multiple regression model based on the demographic variables of age, Hispanic ethnic group, divorced marital status, antisocial personality disorder, and building 14 assignment identified a subgroup with a 48% base rate of aggressive incidents. This represented a group with nearly twice the overall rate of

aggressive incidents. One false positive was identified for each true positive.

Two Rorschach variables, the ratio of M to Sum C (M + 100 / Sum C + 100), and the experimental index path % accounted for significant additional aggressive incident rate variance when added to the demographic variables divorced marital status, Hispanic ethnic group, and building 14 assignment. In this model, higher M to Sum C and higher path % were associated with higher rates of aggressive incidents. The resultant model was able to identify subgroups of residents which had an approximately equal number of residents involved and not involved in aggressive incidents.

Post-Hoc analyses yielded a model based on Hispanic race, building 14 assignment, divorced marital status, path %, Sum C, and R. Higher path %, higher R, and lower sum C scores were associated with higher aggressive incident rates in these multiple regression results. This model identified subgroups with slightly greater than 50% rates of aggressive incidents.

These results supported the hypothesis that a subgroup of residents could be identified which had a higher than base rate risk of involvement in aggressive incidents. Test results were found to account for significant additional aggressive incident rate variance beyond that accounted for by the demographic variables employed. Residents identified by the regression equations had an approximately equal chance of being involved and not being involved in one or more aggressive incidents.

Hypothesis 2b. This hypothesis asserted that a blockwise multiple regression procedure could identify a subgroup of individuals with a higher than base rate with respect to extended aggressive incidents. Extended aggressive incidents were defined as incidents which involved physical aggression initially or upon staff's response.

The overall base rate of extended aggressive incidents was 33.5%, indicating approximately one in three residents were involved in one or more incidents which involved actual physical aggression. Since extended aggressive incidents were defined as any incident which involved physical aggression either initially, or after staff response this rate was slightly higher than the aggression rate defined above (2a). Results indicated that demographic variables which emerged as predictors for aggression rate also emerged as predictors for extended aggression rate. This was not unexpected since aggressive incidents were a substantial subset of extended aggressive incidents.

Results indicated that Hispanic ethnic origin, divorced marital status, diagnosis of antisocial personality disorder, age, and building assignment could be used to identify a group of individuals who had a greater than 50% rate of being involved in one or more extended aggressive incidents. Another model based on race, building assignment, marital status and the Rorschach ratio M (+100) to Sum C (+100) was also able to identify residents with base rates of extended aggressive incidents greater than 50%.

These results indicated that prediction equations based on the variables above could identify groups of individuals which had a higher than base rate frequency of involvement in aggressive behavior. Test data were found to account for additional extended aggressive incident rate variance beyond that of the variance accounted for by the demographic variables employed. Groups of individuals more than 50% of which were involved in violent behavior during their admission were identified.

Hypothesis 2c. This hypothesis asserted that blockwise multiple regression procedures could identify a group of individuals with a higher than average base rate with respect to incidents requiring the use of force. It was assumed that incidents which required use of force by staff represented incidents which were more severe in the level of violence encountered. Only one resident in five was involved in this type of incident.

A model based on Hispanic ethnic group, age, building average length of treatment, and assignment to buildings 6, 7, 10, and 14 accounted for 10% of the use of force variance. This model was able to identify a group of individual with nearly double the 22% overall base rate. Even the most stringent cutting score was unable to identify a group which was more likely than not to be involved in incidents requiring the use of force.

The addition of test data to the regression equation indicated that no test variable accounted for significant use of force

incident rate variance beyond that of the demographic variables above.

Hypothesis 2d. This hypothesis asserted that blockwise multiple regression procedure could identify a group of residents with a higher than average base rate of fighting incidents.

Fighting incidents, a subgroup of aggressive incidents, had a base rate of incidents (19.29%) similar to that of incidents requiring the use of force. Similar classification rates resulted. A demographic model based on building 14 assignment, divorced marital status, and unit II assignment was able to double the overall base rate but was unable to identify a group of individuals more likely than not to be involved in fighting incidents.

Rorschach variables R, Sum C, and path% when combined with Blg 14 assignment and divorced marital status also could identify a group of residents with twice the 19% overall base rate of fighting incidents.

Summary of Prediction Hypotheses

The results of the multiple regression procedures employed were able to identify groups of residents which had higher than average base rates of all incidents, aggressive incidents, incidents requiring the use of force, and fighting incidents. The rate of false positives in all these attempts was much lower than the two out of three rates obtained in first generation research attempts to predict violent behavior of discharged institutionalized populations.

The actual rate of false positives appeared to be strongly related to the overall base rate. The regression equations could not identify groups which were more likely than not to be involved in incidents requiring the use of force or in fighting incidents. In both instances, the overall base rate was 20%, and the resultant false positive rates were approximately three in five. However, the resultant equations were able to classify correctly 75% or more of residents into the categories of likely and unlikely to be involved in these two types of incidents.

Multiple regression analyses were able to identify individuals more than one out of two of which were involved in one or more physically aggressive incidents. The overall correct classification rates of these equations were approximately 70%. With respect to overall incidents false positive rates of less than one in four could be achieved.

In the present study, belonging to the Hispanic ethnic group was the single variable which accounted for the largest proportion of the incident rate variance for aggressive, extended aggressive, and use of force incidents. This finding prompted a set of post hoc analyses to determine if a particular subgroup of Hispanic residents accounted for the higher base rates of incidents. These results are discussed with respect to post-hoc analyses below.

The above results are consistent with previous studies which found higher incidence of violent behavior among younger, minority racial groups. Nonwhites were more frequently involved

in battery incidents in a maximum security state hospital (Dietz & Rada, 1982), and more frequently involved in assaults at a large state hospital (Evenson et al., 1974). Younger residents were more frequently in involved in assaults in psychiatric hospitals (Tardiff & Sweillam, 1982; Evenson et al., 1974; Fottrell, 1980).

Diagnosis, particularly that of antisocial personality disorder was also found to account for significant variance in the regression models. In fact, the diagnosis of antisocial personality disorder was the single variable which accounted for the largest portion of overall incident rate variance. Higher incident rates by residents diagnosed as antisocial personality disorders might be expected since the diagnostic criteria include failure to accept societal norms, irritability, and aggressiveness.

Age contributed significantly to incident rate, aggressive incident rate, extended aggressive incident rate and use of force incident rate variance. Marital status also contributed significantly to the variance accounted for in the regression models. Interestingly, divorced residents appeared to have lower than average rates of aggressive incidents, extended aggressive incidents, and of fighting incidents.

Unspecified environmental variables unique to each building also appeared to contribute significantly to incident rate variance. Building 14 assignment was associated with increased overall incident rates, aggressive and extended aggressive incident

rates, use of force incidents, and fighting incidents in the present multiple regression models. Building 14 assignment was the single variable which accounted for the largest proportion of fighting incident rate variance.

The experimenters experience at the institution and discussion with NFETC administrators and staff failed to reveal any variables such as staff racial or sexual composition, staff experience or turnover, staff policies, or patient composition which differentiated this building from others. Residents were assigned to buildings on a space available basis, so that no particular differences in the aggressive incident rate would be expected among the different buildings.

Building assignments and building average length of treatment dominated the regression results of use of force incident data. It may be speculated that factors specific to each building influenced residents frequency of involvement in use of force incidents. Building and unit assignment accounted for a larger proportion of fighting rate variance than did other demographic variables.

Results of the multiple regression procedures indicated that test variables did account for significant additional variance to that accounted for by demographic models for all types of incidents except those involving the use of force. The models which included test data were able to perform as well as or slightly better than the models based on demographic data alone at identifying groups of individuals which had greater probabilities of being involved in incidents.

The Rorschach variables which contributed significantly in these models were Sum C, alone or in the ratio M to Sum C, R, and path %. Sum C was inversely related to overall incident rates, aggressive incident rates, extended aggressive incident rates, and fights, in the resultant regression models. Since the mean Sum C was below that of nonpatient samples, one speculative interpretation of the present results is that individuals with more normative Sum Cs were less likely to be involved in the above types of incidents. Sum C functioned in a similar manner to discriminate between a group of homicide offenders and a group of property offenders in a study conducted by Shagoury (1971).

The experimental Rorschach variable path %, the ratio of the contents blood, anatomy, sex, food, religion, and fire to the total number of responses, accounted for significant additional aggressive and fighting incident rate variance. The direction of the association in the present models was as expected, with higher percentage of these responses associated with higher incident rates.

The number of Rorschach responses also accounted for significant additional variance for aggression rate and fighting incident rate in the resultant regression equations. In these equations, a greater number of Rorschach responses was associated with higher rates of incidents. Although R is generally associated with intelligence, the present results suggest that residents who gave more responses, especially if they were poor in quality, were less functional, or at least more aggressive.

A possible interpretation of this finding is that residents who gave many responses were more disinhibited. Given that the general quality of the responses given in this sample was poor, better functioning residents may have been more successful at adopting a strategy of reducing their responses. This would be consistent with decreased affective responsiveness as assessed by Sum C, with those residents displaying less affect acting out less. This would also consistent with less aggressive acting out on the part of those residents who produced fewer Rorschach responses.

Intelligence test and MMPI data did not account for additional variance beyond the demographic and Rorschach variables in the a priori regression equations. The number of residents completing both the MMPI and Rorschach was relatively small and most likely limited the ability of the present study to detect a relationship if it existed. The analyses of subjects completing Rorschach, MMPI, and intelligence test were even more severely compromised due to the small number of residents completing all three tests.

Nevertheless, a post hoc analysis, which varied the order of entry of test variables (e.g., entering MMPI data before Rorschach data) found that MMPI scale K contributed significantly to the overall incident rate variance accounted for. In the post hoc model, lower K scores were associated with higher incident rates. A possible interpretation of this relationship would be that individuals with low K scores had poorly functioning ego

defenses, resulting in more frequent impulsive or aggressive behavior.

Although the present study was exploratory in nature, test results suggested a hypothesis which may be suitable for further study. For poorly functioning psychotic groups such as the present NFETC sample, test signs of constricted affect and test signs of defensiveness may be indicative of some availability of ego defenses however primitive. For severely disturbed individuals the presence of these defenses may allow some control of impulsive behaviors. In the context of Megargee's (1966) discussion of overcontrolled and undercontrolled hostility, the present NFETC sample might be considered an undercontrolled group.

Hypothesis 3. This hypothesis asserted that a weighted combination of psychological test indices and demographic data could predict length of treatment for those residents adjudicated incompetent to stand trial. The mean length of stay for the 403 NFETC residents in the present sample who were adjudicated incompetent to stand trial was 208 days (S.D. = 175.2), or approximately seven months. This figure is higher than the mean length of treatment of 5.5 months reported by Barnard et. al. (1983) for a group of 177 NFETC residents.

The equations derived from blockwise multiple regression procedures were able to account for a much larger proportion of length of treatment variance than for incident rate variance. The standard errors of the prediction equations were quite large,

approximately four months, but less than the 5.8 month standard deviation of the overall mean length of stay.

The prediction equation based on demographic variables alone which was derived from the blockwise multiple regression analysis accounted for approximately 11% of the length of treatment variance. Diagnoses of "other schizophrenias," paranoid schizophrenia, and organic brain syndromes, Hispanic ethnic group, and building 13 assignment contributed significantly to length of treatment variance in the resultant equation. Diagnosis of other schizophrenia, which was defined as diagnosis of all types of schizophrenia other than paranoid schizophrenia, was the single demographic variable which accounted for the greatest proportion of length of treatment variance (4%).

One interpretation of these results suggest that the length of treatment required to be returned to the court may be strongly influenced by the time required to treat the psychotic or disturbing symptoms of individuals mental illness. Interestingly, the violent or nonviolent nature of the crime for which residents were found incompetent did not account for significant additional variance beyond the variables above, suggesting that psychiatric factors rather than criminal history or type of crime determined decisions about termination of treatment. These exploratory results contrast with a study of predictions of the dangerousness of individuals incompetent to stand trial made by psychiatrists which found that the only factor which statistically was related to predictions of violence was the type of crime the defendant

was faced with (Cocozza & Steadman, 1978). These results also contrast with the findings of Steadman, Pasewark, Hawkins, Kiser, and Bieber (1983) which found that severity and type of offense were significant predictors of the hospitalization length of insanity aquitees.

Test data accounted for significant additional length of treatment variance beyond that accounted for by demographic variables. Both the Rorschach ratio of the number of M responses of bad form quality to the total number of M responses and MMPI scale F contributed significant additional variance in the resultant equation which included Hispanic ethnic group as the only other variable. Scale F was the single variable which accounted for the gratest proportion of length of treatment variance (13%). Higher F scale scores and a higher percentage of M responses of poor form quality were associated with increased length of stay in the regression model. Both test indices positively correlated with psychopathology. The equation based on a weighted combination of Scale F, M minus to M total and Hispanic ethnic group accounted for nearly 25% of length of treatment variance.

Results of a post hoc multiple regression analysis which varied the order of entry of test blocks indicated that Hispanic ethnic group, intelligence test score, and scale Pa of the MMPI could be combined to account for slightly more than 25% of length of treatment variance for the group of residents completing both the WAIS-R and the MMPI. Within this regression model higher Pa scores were associated with longer length of stay, while

higher IQ scores were associated with shorter length of stay. The MMPI scale Pa was the single variable in this model which accounted for the greatest proportion of length of treatment variance (16%). Scale Pa correlated .402 with length of treatment.

One interpretation is suggested which might be further investigated. Individuals with high MMPI Pa scores are likely to exhibit persecutory and grandiose delusions. In the adversarial criminal justice system these individuals may be likely to manifest delusions that there are conspiracies against them, that the judge is the devil, or that they will be sentenced to death for a petty crime. Such beliefs would cause obvious problems with respect to restoration of competency to stand trial since one requirement is that individuals must have a realistic understanding of court procedures and the roles of the judge, jury, prosecutor, and defense attorney.

A further difficulty with respect to return to competency would be significant cognitive deficits which would limit residents cognitive appreciation of the procedures against them, their ability to challenge witnesses and provide for an appropriate defense.

Results of the above multiple regression analyses of aggression rates and length of treatment must be considered exploratory. It is suggested that the equations and classification rates based upon them be cross-validated on a new sample of NFETC residents. Future investigations, which might include measures of socioeconomic

status and environmental measures, could provide more specific information as to the predictors of institutional violence. Possible environmental variables which could be studied include ward ratings such as those obtainable from the Correctional Institutions Environment Scale (Moos, 1974) and measures of external support such as the number of visits received. Additional variables which might be investigated include more specific arrest information and number of previous hospitalizations.

Hypotheses 4 and 5. These hypotheses asserted that naturally occurring groups of forensic inpatients could be identified by cluster analysis of residents MMPI profiles and that the cluster groups could be validated by multivariate and univariate analyses of between group differences.

One hundred eighty-eight profiles were analyzed by a hierarchical cluster analysis. In a departure from the methodology of Megargee in his identification of offender types high MMPI F scale score elevations were not used to discard profiles. Two solutions obtained in the cluster analyses were suggested by examination of the realized deviates.

The six cluster solution failed to yield but marginal differences between groups on all variables examined with the exception of substance abuse or dependence. It was therefore concluded that the null hypothesis of no significant differences between groups could not be rejected and that no support for the validity of the six cluster solution was present in the data.

The three cluster solution yielded three groups which differed primarily in terms of profile elevation. In contrast with results of no between group differences of the six cluster solution, significant differences were found between the three cluster groups on important variables.

The group with the most elevated profile was quite deviant with respect to mean elevation which had both scale F and Scale 8 T-scores approximately 110 - T, and Scale 6 greater than 90 - T. The routine interpretation of the majority of the profiles as invalid due to the high F score would have discarded nearly one third of the present NFETC MMPI results. Important behavioral correlates of the elevated profile were found in the present study.

A significant difference between the three cluster groups was found for length of treatment. The most elevated profile groups had the longest mean length of treatment. This finding was consistent with multiple regression results which found that elevation on MMPI scale F accounted for 13% of the length of treatment variance for those residents admitted as incompetent to stand trial.

Differences between the cluster groups with respect to the frequency of residents with histories or diagnosis of substance abuse or dependence also were found. The most elevated profile group had the highest frequency of substance abusers, while the least elevated profile had the lowest frequency of substance abusers.

Finally, between group differences in the number of residents involved in use of force incidents differed across the three cluster groups. The most elevated profile group had the highest frequency of residents involved in this type of incident while the intermediate profile had the lowest frequency.

The present results provided some validational support for the three group cluster solution, with longer length of treatment, higher incidence rate of substance abuse, and higher proportion of serious incidents being characteristic of the group with the most elevated profile. A more parsimoniuos explanation of the obtained results could be that of a simple positive correlation between MMPI elevation, psychopathology, and acting out behaviors.

Post Hoc Analyses

A series of post hoc analyses were conducted to test for between group differences of residents involved and not involved in different types of incidents. These were conducted to provide additional data with respect to demographic and test differences of groups of individuals who were and were not involved an incidents in general and incidents involving violence in particular. A set of Chi-squares was conducted to explore if a particular subgroup of Hispanic ethnic group residents accounted for the higher incident rates of this group.

Residents involved in incidents exhibited significant differences with respect to basic demographic variables.

Hispanic ethnic group residents were nearly twice as likely as white or black residents to be involved in overall incidents, aggressive incidents, aggressive incidents, and fighting incidents. There were no significant differences in the frequencies of white, black and Hispanic residents involved in incidents requiring the use of force.

The findings that the Hispanic ethnic group had higher frequencies of residents involved in various types of aggressive incidents is consistent with previous studies of higher aggression rates among minority groups (e.g., Dietz & Rada, 1982; Evenson et al., 1974). In the NFETC population the Hispanic ethnic group was statistically the minority group. Consisting of a large number of Mariel refugees and immigrants this group was at a disadvantage both culturally and with respect to language. Although NFETC staff represented a fair mixture of white and black staff members (Barnard et al., 1983), Hispanic staff members were few despite NFETC efforts to hire new qualified bilingual staff.

A set of post hoc Chi-squares indicated that within the Hispanic ethnic group, there were no significant differences in the frequencies of residents involved in incident rates with respect to Cuban national origin and Mariel refugee status. Although the Hispanic ethnic group had a significantly higher percentage of residents with histories of one or more homicide arrests than did groups of white or black residents, the higher proportion was accounted for by the Mariel refugee groups.

Hispanic residents with histories of homicide arrests were not more frequently involved in incidents than other Hispanic residents.

Further examination of Hispanic ethnic group residents who completed the MMPI suggested a bimodal distribution of general MMPI elevation. Chi-square analyses of the frequencies of Hispanic residents with MMPI F scale T-scores greater than 74 and those with F T-scores less than 70 - T involved in incidents indicated that the high F scale Hispanic had more than double the proportion of residents involved in fights and aggressive incidents than the Low F Hispanic residents. Nearly three of four Hispanic residents with high F scale scores were involved in aggressive incidents. These findings suggest that the higher frequency of Hispanic residents involved in incidents may be attributable to a subgroup of Hispanic Residents which exhibited greater psychopathology at least with respect to the MMPI.

Results indicated that residents involved in all types of violent incidents were younger than residents not involved in these types of incidents. These results are generally consistent with higher rates of aggression and assaults by younger men in studies of institutional violence (e.g., Fottrell, 1980), and extra institutional violence (e.g., Thornberry & Jacoby, 1979).

Results of the post hoc analyses indicated that differences in the proportion of residents involved in incidents existed between the different Units which were comprised of three to four buildings under supervision of the Unit Director. Unit I was

found to have significantly lower frequencies of residents involved in most types of incidents. Unit II was found to have a greater proportion of residents involved in fights than the other units. These results suggest that environmental variables common to buildings within a Unit might be further explored in future investigations.

Results of the multiple regression analyses suggested that individual building variables other than the general rates of incidents on these buildings were correlated with the frequency of those incidents requiring the use of force. The results of the analyses suggested that the frequency of the most serious incidents, those which required physical intervention by staff, were more strongly influenced by differences between buildings than were other types of incidents.

Results also indicated that educational differences existed between groups of residents involved in incidents and those not. Results indicated that that this was true for all types of incidents. One possible interpretation of this finding is that since education is correlated with socioeconomic status these findings actually pertain to opportunity and cultural factors versus learned skills or intelligence. A previous finding that casts some doubt about this alternative interpretation was the findings of Barnard et al. (1983) who reported no differences in the frequencies of NFETC residents classified as unemployed, student, blue collar, or white collar who were involved in aggressive incidents.

A trend for residents involved in overall incidents to have lower intelligence test scores was found, but this finding was not statistically significant. The present results are inconclusive with respect to the association between intelligence and violence (e.g., Heilbrun, 1979). Results of the regression analyses, though limited by the small number of residents, did not provide supportive evidence for the predictive validity of intelligence with respect to violence.

Some differences with respect to diagnoses and substance abuse histories of residents involved and not involved in overall incidents were found. Results suggested that the most relevant difference with respect to diagnoses of residents involved in violent incidents was the diagnosis of antisocial personality disorder. Individuals with this diagnosis were twice as likely as other residents to be involved in some type of incident and were more frequently involved in extended aggressive incidents and incidents requiring the use of force.

Although arrest history has been strongly associated with recidivism and rearrest for violent crimes (e.g., Monahan, 1981) no significant differences in arrest rates, frequency of violent arrests or violent current arrest were found between residents involved in incidents and residents not involved in incidents. Since the present study did not code current arrests more specifically than violent or nonviolent, future research might be directed toward examining if residents charged with specific

types of crimes exhibit higher frequencies of assaultive behavior.

Significant differences with respect to test results between residents involved and not involved in incidents were found. Although results were only indicative of trends with respect to aggressive incidents and fights, Scale F of the MMPI was significantly higher for residents involved in overall incidents and incidents requiring the use of force. Residents involved in incidents requiring the use of force also had significantly lower MMPI K scales. Significant differences on MMPI scales F and K have been previously reported between assaultive inmates and non assaultive inmates (Spellacy, 1978), and between property offenders and violent offenders (Deiker, 1974).

While multiple regression analyses found that Rorschach variables accounted for significant additional incident rate variance in the context of the multiple regression equations, the only significant Rorschach difference which emerged in the post hoc analyses was that residents involved in overall incidents had significantly lower mean Sum C scores than residents not involved in incidents. Lower mean Sum C scores for a homicide group versus a property crime group was reported by Shagoury (1971).

Conclusions

The prediction of violence is an important area of research in the interface of psychiatry and the law. Despite the importance of this

area research with the respect to predictions of violence has been neglected in recent years. This may be partially attributable by the overgeneralization that the limit of predictive attempts was approximately one in three based upon early research which focused on global predictions in chronically institutionalized populations, or in populations with low base rates of violence. Monahan (1984) criticized this overgeneralization and suggested development of multivariate models applied to shorter term predictions in populations with high base rates of violent behavior, and cited a number of short term studies of involuntary commitments as examples of more successful attempts at prediction.

The present study represented an exploratory attempt at identifying groups of individuals with high base rates of institutional violent behavior and institutional incidents. Blockwise multiple regression was used to reduce the number of possible demographic and test predictor variables and to develop prediction equations.

Use of the equations with various cutting scores allowed correct classification of 70 to 75% of NFETC residents with respect to residents commiting one or more general incidents and physically violent incidents. For general incidents a group of residents three of four which were involved in incidents was identified. For physically violent incidents a group of residents in which slightly more than one out of two commited at least one such incident was identified, suggesting that the limits of prediction are much higher than the one in three figure commonly cited. The

achieved classification rates are overestimates of the actual classification rates likely to be obtained upon application of the derived equations to a new sample. Further investigation is necessary to validate the present findings.

The present results of the multiple regression analyses tend to support previous findings of higher rates of aggression for younger individuals and for minority group members. Test results suggested that it is the most psychologically disturbed of these groups that have the highest frequency of aggressive behaviors. Residents which displayed evidence of defensive resources tended to display less overtly aggressive behavior.

Exploratory multiple regression analyses of length of treatment data for residents adjudicated incompetent to stand trial indicated that twenty five percent of length of treatment variance could be accounted for by diagnosis, ethnic group, and test data. Results suggested that the degree of psychological disturbance, cognitive resources, and degree of suspiciousness influenced length of treatment to a significant degree.

Cluster analysis of NFETC resident MMPI profiles identified three groups of residents with similar profiles which varied primarily in terms of profile elevation. The most elevated profile group, which might have be ignored if the profiles were routinely discounted as malingering or invalid due to the high elevations on scales Sc and F, had important behavioral correlates. This group had a higher mean length of treatment, a higher frequency of residents with substance abuse histories, and a higher

frequency of residents involved in the most serious physically violent incidents.

The present investigation also sought to provide more information concerning characteristics of a group of forensic inpatients which was predominantly incompetent to stand trial. Consistent with previous investigations these individuals have high base rates of violent crimes and significant criminal histories. Psychological test results as well as the eventual discharge diagnoses of these residents indicate that these individuals are not merely criminals. These forensic inpatients displayed significant cognitive deficiencies, as well as difficulties in ego functioning, interpersonal functioning, and reality testing. With respect to psychological functioning these residents strongly resemble severely disturbed, acutely hospitalized, schizophrenics. Thus, these individuals are doubly stigmatized as criminal and as mentally ill.

APPENDIX

INCIDENT/USE OF FORCE REPORT

NORTH FLORIDA EVALUATION AND TREATMENT CENTER

Date of Incident_____ Service Report #_____

Time of Incident_____ Incident Report #_____

Location _____ Use of Force #_____

SECTION I. PERSONS INVOLVED

1. Resident Name:_____NFETC#_____Building:_____
2. Resident Name:_____NFETC#_____Building:_____
3. Resident Name:_____NFETC#_____Building:_____
4. Security Involved:_____
5. Persons Using Force:_____
6. Staff Involved (1):_____Dept._____(2)_____Dept._____
7. Professional Staff:_____8.Nurse:_____
9. Medication Given: Yes_____ No_____ 10.Medical Report Issued: Yes_____ No_____
11. Incident Report Issued To:_____

SECTION II. INTERVENTION_____

12. Security Responded:_____Security Returned:_____Total Time:_____
13. Level of Security Intervention Required:_____14. Resident's Response to Sec.:_____

a. none	a. complied without resistance
b. verbal request	b. verbally resisted
c. stand-by	c. physically threatened
d. escort resident	d. physically resisted w/o weapon
e. physical intervention without shield	e. physically resisted with weapon
f. physical intervention with shield	f. other (specify)_____
g. other intervention (specify)_____	

15. Search conducted:_____a. Pat b. Strip c. Room d. Pod e. Building f. Campus
16. Handcuffs used: Yes_____ No_____ Total Time:_____
17. Bed Restraints used: _____
18. Use of Force Report Issued to:_____ _____

SECTION III. TIME OF RESTRICTION_____

19. Restraints: Time in:_____ Time out:_____ Total Time:_____ Building:_____

SECTION IV. NARRATIVE

_____ _____

Report Writer's Signature Reviewing Supervisor's Signature

_____ _____

Name/Title Date Name/Title Date

HRS III-NFETC-208

G. Instrument Used:
1. His own body 2. Physical items:_____ 3. Fire 4. Drugs

SECTION IV. NATURE OF RESPONSE (Circle all that apply)

13. Treatment staff's response:
a. Issued verbal orders to resident
b. Physical force applied
c. Condition B watch
d. Placed in observation room I Condition A watch
e. Nurse called
f. Security called
g. Placed in seclusion room
h. Restraints applied

14. Resident's response to treatment(s)
a. Complied without resistance
b. Verbally resisted
c. Physically threatened
d. Physically resisted
e. Other specify:_____

15. Resident's response to Security:
a. Complied without resistance
b. Verbally resisted
c. Physically threatened
d. Physically resisted without weapon
e. Physically resisted with weapon
f. Other specify:_____

SECTION V. NARRATIVE OF INCIDENT

SECTION VI. NARRATIVE OF USE OF FORCE

Report Writer's Signature:

Name

Title

Date

Reviewer's Signature:

Name

Title

Date

NORTH FLORIDA EVALUATION
AND TREATMENT CENTER

INCIDENT REPORT #_____
DATE OF INCIDENT_____
TIME OF INCIDENT_____

INCIDENT/USE OF FORCE REPORT

SECTION I. PERSONS INVOLVED

1. Resident's Name (1):_____ Resident's Number (1):_____

2. Resident's Name (2):_____ Resident's Number (2):_____

3. Resident's Name (3):_____ Resident's Number (3):_____

4. Prof Staff/COD Involved:_____ Nurse Involved:_____

5. Staff Involved (1):_____ Dept._____ (2):_____ Dept._____

6. Security Involved:_____ Super.:_____

SECTION II. LOCATION OF INCIDENT (Circle all that apply.)

7. Building No._____ Pod._____

8. Room
A. Resident's Room
B. Other resident's room
C. Common Room
D. Pod Area
E. Observation room
F. Seclusion room
G. Other_____ (Specify)

9. Campus Area:
A. Street/Sidewalk
B. Pool area
C. Athletic Field
D. Academic area (Bldg. #4)
E. Clinic area (Bldg. #2)
F. Visiting area (Bldg. #2)
G. Acute Care (Bldg. #15)
H. Other_____ (Specify)

10. Other Area:
_____ (Specify)

SECTION III. PROBLEMS ENCOUNTERED (If resident not involved, go to narrative.)

11. Rate level of agitation of resident: (circle one) .... none 1 ..... minimal 2 3 ..... moderate 4 5 ..... extreme 6 7

12. Nautre of Problem: (circle all that apply)

Person Toward Whom Violence Directed

	Sex		Race			
A. Refusal to take meds	M	F	B	W	H	O
B. Violation of standing procedures	M	F	B	W	H	O
C. Refusal to comply with verbal orders	M	F	B	W	H	O
D. Verbally abusive toward:						
1. treatment staff	M	F	B	W	H	O
2. security staff	M	F	B	W	H	O
3. Other residents	M	F	B	W	H	O
E. Resident threatened violence:						
1. toward self			B	W	H	O
2. toward other resident			B	W	H	O
3. toward staff:						
a. treatment staff	M	F	B	W	H	O
b. security	M	F	B	W	H	O
4. toward property						
F. Resident performed violence:						
1. toward self			B	W	H	O
2. toward other resident			B	W	H	O
3. toward staff:						
a. treatment staff	M	F	B	W	H	O
b. security	M	F	B	W	H	O
4. toward property						

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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