

ASSESSING RISK OF VIOLENCE IN MENTALLY DISORDERED OFFENDERS

WITH THE HCR-20

by

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B.A., Simon Fraser University, 1994

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ABSTRACT

The present retrospective study assessed the predictive validity of a recently devised scheme for predicting violence in mentally-disordered and personality-disordered offenders and patients, the HCR-20. The HCR-20 includes, as a key historical variable, measures of psychopathy. Coding was undertaken for 80 males who had been remanded to the Forensic Psychiatric Institute for psychiatric assessment in 1986. The project took advantage of Psychopathy Checklist Scores (PCL) obtained during the 1986 evaluations. Predictive and outcome data were obtained from medical, legal, psychological, psychiatric, and social work reports from the Forensic Psychiatric Institute and Riverview Hospital, and from criminal records that were obtained through the R.C.M. Police. Information regarding violent behavior was gathered for the period from the patient's date of discharge from the Institute up to and including December 31, 1994. The mean follow-up period was 96.5 months (8 years). Seventy percent of the subjects were violent during the outcome period. Correlations between HCR-20 Total scores and various measures of outcome violence ranged from .12 to .26. For outcome measures of Criminal Recidivism, the HCR-20 Total score correlations were lower, ranging from .02 to .12, and for outcome measures of Psychiatric Readmissions, the correlations were highest, with $r = .35$ for whether or not the individual was readmitted, and $r =$

.45 for the Number of Psychiatric Readmissions. Regression analyses were conducted on the data. Results showed that the HCR-20 Total score and certain subscores are predictive of various indices of violence, criminal recidivism, and psychiatric readmissions. Stepwise Linear Regression showed that the HCR-20 Historical Total scores and Item C3 (Symptoms) predict the Number of Violent Acts committed in an institutional setting ($R = .44$, $p < .05$). When dichotomizing the Number of Violent Acts in an institutional setting into Violent in an Institution or Not Violent in an Institution, stepwise regression showed that the Historical Total scores and PCL-R Factor 2 scores are predictive of the presence of institutional violence, with the Historical Total having more predictive weight. PCL-R Total scores and some of the HCR-20 Items predict Total Violence ($R = .44$, $p < .05$). Historical Total scores are also predictive of whether or not Charges are received for Violence during the outcome period, and for Criminal Recidivism in general. Both Historical Total and PCL-R Factor 1 scores predict Psychiatric Readmissions.

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INTRODUCTION

The Problem

Highly publicized cases of violence in modern society have resulted in an increasing demand for accountability of mental health and legal professionals regarding the release of violent offenders into the community. But while victim advocacy groups are lobbying for changes in current sentencing and release legislation regarding violent offenders, the Canadian Charter of Rights and Freedoms states that the rights of both the victim and the offender need to be considered. Mental health professionals thus face both legal and ethical dilemmas in terms of predicting whether a released offender will be violent in the community. Conceding the legal right of an individual not to be detained for an offence he or she has not yet committed may violate the right of an innocent victim to be protected from foreseeable harm. Conversely, protecting an individual from possible harm may result in the incarceration of an individual for an offence he or she might never have committed.

A Critique of Earlier Research

Limiting the prediction of offenders who will not be violent in the future when they actually are violent (false-negatives) and the prediction of offenders who will be violent when they would not (false-positives) has been a major focus in research of the assessment of dangerousness.

Monahan & Steadman (1994) summarize this problem by providing a brief review of the literature from the 1970s through the early 1990s on predicting future violence by mentally disordered offenders. They note that research has been conducted in three main areas -- clinical decision-making, clinical prediction, and actuarial assessment. The present research follows Monahan & Steadman (1994) and focusses on actuarial assessment.

Monahan & Steadman (1994) point out four methodological difficulties inherent in past research. These are the use of inadequate predictor variables, weak criterion variables, problems with the applicability of the research designs used in the validation of risk factors (e.g., validating predictions only in an institutional setting with persons with a high base rate of violence), and a failure to coordinate research efforts.

Predictor Variables. Monahan & Steadman (1994) note that a substantial amount of past research has largely used a narrow range of variables and has neglected the role of theory relating how social, psychological and biological variables interact to affect violent behavior in mentally disordered persons. A comprehensive theory needs to be developed in which social, psychological and biological variables are not only used as individual predictors, but are seen to interact in a way that will lead to increased accuracy of prediction.

Criterion Variables. Monahan & Steadman (1994) point out that a large proportion of violent behavior goes undetected. As a result, studies that use criminal records to the exclusion of other potential sources of information when ascertaining an individual's level of violence during follow-up periods may have their predictive validity improved by inclusion of these other sources of information. Such collateral information may include reports of family and friends (Steadman, 1995), admissions to hospitals for violent behavior, and self-reports of the individuals themselves (Monahan & Steadman, 1994).

Farrington (1989; 1995), for example, followed 411 young males (aged 8-9 years) in a London community up to the age of 32. Sixty-five subjects (16%) were convicted of assault causing bodily harm, robbery, and/or use of a weapon over a 30-year period (common assault and impaired driving offences were not included in the formal charges). However, self-reports from 409 of the original subjects indicated that between the ages of 10 and 32, there was a violence rate of 70%. If these self-reports can be accepted as valid, this study offers empirical support not only for the view that official agency records per se are insufficient indices of violent behavior, but also for the view that base rates may be much higher than previously supposed.

Applicability of Research Designs. The results of studies that focus on violence solely within institutions or solely

within a community setting may underestimate actual rates of outcome violence. Base rates of violence within institutions may be lower than those in the community, largely due to the effects of being in a controlled environment where therapeutic intervention is available and immediate negative consequences are more likely to follow maladaptive behavior. A person who is not violent in an institutional setting may consequently be violent when released into the community (Monahan & Steadman, 1994). In other words, predictors of institutional behavior may not be predictive of community behavior. It could prove useful to assess outcome violence when patients are released on day or weekend passes, where some of the controlling aspects of institutionalization would be attenuated, and any tendency towards violence would more likely surface.

A related issue discussed by Monahan & Steadman (1994) is that persons are not usually released into the community if clinicians expect they will be violent. As such, studies that measure correlations between predictor and criterion variables in a community setting may be looking only at patients who evidence less violence to begin with, and thus these studies may not be representative of all patients who become violent. Lower correlations between predictors and violent outcome would be expected. Monahan & Steadman suggest designing research studies such that large, broad, representative samples of patients are included (e.g., both

men and women, with and without a history of violence).

Interdisciplinary Approach. In order to ensure a broader, more inclusive perspective on the correlates of violent behavior, Monahan & Steadman (1994) suggest an interdisciplinary approach when assessing the risk of future violence. With this approach, a broader range of information regarding criterion measures would be employed (e.g. social worker reports, probation reports), thus enhancing predictive accuracy.

Current Canadian Research: The HCR-20 Scheme

During the past 5 years, a number of researchers in Canada (Harris, Rice & Quinsey, 1993; Klassen & O'Connor, 1989; Webster, et. al, 1994; Webster, Eaves, Douglas & Wintrup, 1995) have embarked on a program of research that attempts to overcome the limitations identified by Monahan & Steadman (1994).

One particular attempt to devise a comprehensive predictive scheme for assessing the risk of violence in psychiatric and non-psychiatric offenders is the HCR-20 Scheme (Webster, Eaves, Douglas & Wintrup, 1995).

The HCR-20 Scheme incorporates a number of individual historical, clinical, and risk variables, which have proven to have reasonable predictive validity. Consistent with the recommendations of Monahan & Steadman (1994), these predictor variables span a broad range of areas, including past violence and criminality, social relationships, childhood and

adolescent behavior, employment stability, mental disorder, personality, and emotional stability. Also included in the scheme are various categories of risk, where an attempt is made to assess future situational factors the individual may encounter that could elicit violence.

In relation to Monahan & Steadman's (1994) critique of studies that utilize weak criterion variables, the outcome scoring for the HCR-20 includes information obtained from records of the police, psychiatric hospitals, the Department of Vital Statistics, and where available, records containing statements from family and friends (available from hospital files). As well, information from various disciplines, including Psychology, Psychiatry, Criminology, Nursing, and Social Work, was utilized when coding the outcome criteria.

Historical Predictors. Hare's Psychopathy Checklist, Revised is included in the Historical section of the HCR-20 scheme because many of the items contained in the PCL-R are based on behaviors in childhood and adolescence (see Appendix A). Research on historical variables provide evidence that Psychopathy Checklist-Revised (Hare, 1991) scores, early childhood maladjustment, mental disorder, marital status, a history of violence, substance abuse, and personality disorder are all significant predictors of later violence.

Harris, Rice & Quinsey (1993) designed a study to statistically identify variables that predict violent recidivism among mentally disordered and non-mentally

disordered offenders (see also Webster, Harris, Rice, Cormier, & Quinsey, 1994). They used two samples, the first consisting of a group of 371 men undergoing treatment at a maximum security psychiatric institute, and the second consisting of 324 men admitted for brief pre-trial assessments. These groups were matched on the basis of age, index offences, frequency and severity of past violent and non-violent criminal activity, and having had their index offences occur within 12 months of each other. Those subjects who had no opportunity to recidivate were dropped, leaving a total sample size of 618.

All predictor variables (except recidivism) were coded retrospectively from files, and outcome data were obtained from coroner, review board, RCMP, parole and correctional services. The subjects were classified as "violent failures" if they received a new charge for an offence against persons, or if their release was revoked for violence against persons. Violence against persons included all assaults, sexual assaults, armed robbery, forcible confinement, threatening, and pointing a firearm. Not included were possession of a weapon, robbery, or arson. Violent outcome was scored dichotomously, as either violent or not violent. Opportunity to recidivate included being released from the prison or psychiatric facility, or being placed on an open psychiatric unit.

A preliminary analysis showed that the relationship between

the predictor variables and violent outcome was the same for offenders deemed legally insane and those deemed sane. All subjects were therefore pooled for the final analyses. The mean time at risk for the subjects was 81.5 months (SD = 60.6). Harris et al, (1993) report that 86% of the sample had been charged with violent offences in the past. Thirty-one percent of the subjects were violent failures. The variables that were significantly predictive of violent outcome are shown in Table 1. Correlations of each variable are shown, along with the multiple correlations with the addition of each variable. All correlations are significant at $p < .05$, and all multiple correlations are significant at $p < .0001$.

All of the variables in Table 1, below, are included in the HCR-20 scheme, with the exception of female victim and victim injury at the time of the index offence. Degree of victim injury and female victim are shown to be negatively correlated with violence, and thus constitute a lower level of risk.

Table 1. Correlations and Multiple Correlations of Predictor Variables with Violent Outcome (Harris, Rice & Quinsey, 1993)

Variable	<i>r</i>	<i>R</i>
PCL-R	.34	---
Separation from Parents	.25	.406
Victim Injury	-.16	.429
DSM-III Schizophrenia	-.17	.439
Never Married	.18	.446
Elementary School Maladjustment	.31	.450
Female Victim	-.11	.454
Failure of Prior Release	.24	.456
Property offence History	.20	.457
Age at index offence	-.26	.458
Alcohol abuse history	.13	.459
DSM-III Personality disorder	.26	.459

Quinsey, Rice & Harris (1995) found past criminality (including violent offences), current or past marital relationships (yes or no), previous forensic psychiatric admissions and PCL-R scores related to recidivism in a group of 178 male sexual offenders (rapists and child molesters) who had been admitted to a forensic psychiatric facility. Forty percent of the offenders committed a violent offence against persons during the follow-up period. Regression analysis resulted in eight significant predictors of violent recidivism, which included sexual offences, for this group (correlation coefficients are in brackets): Never married (.21), PCL-R score (.33), Personality Disorder (.12), Convictions for violence (.18), other convictions (.26), property offence convictions (-.13), sexual offence convictions (.28) and phallometric deviance index (-.20).

Farrington (1989) conducted a longitudinal study of 411

boys in England, following them from the age of 8 to 32. The subjects and their families were interviewed at several intervals, and teacher ratings regarding aggressive behaviors, attention deficits, truancy, and school attainments were obtained. At age 32, interviews were obtained for the 378 men who were available. Aggression was measured at 3 points, adolescence (aged 12-14); teenage (aged 16-18); adult (age 32), and legal convictions for violence (age 10 to 32) were also obtained. Aggression was measured at age 12 and 14 by teacher ratings on the following characteristics: disobedient, difficult to discipline, rough during play, quarrelsome and aggressive, degree of competitiveness with other children, and resentful of criticism or punishment. At 16, 18, and 32, measures of aggressiveness were obtained from self-reports of fighting behavior and carrying and/or using weapons. Fifty of the original subjects received at least one conviction for violence between the ages of 10 and 32.

Farrington categorized the resultant childhood predictors of violence and aggression at age 8-10 into 6 main theoretical classes: (a) economic deprivation; (b) family criminality; (c) poor child rearing; (d) school failure; (e) hyperactivity; and (f) antisocial child behavior. Multiple regression analysis with Convictions for Violence as the dependent measure resulted in four significant predictors at the $p < .05$ level: Low interest in education at age 8 ($r =$

.20); High daring, ages 8-10 ($r = .18$, $R = .26$); Authoritarian parents at age 10 ($r = .19$, $R = .30$); and Convicted parent by age 10 ($r = .18$, $R = .33$).

Klassen & O'Connor (1994) note that several studies suggest historical predictors for acquiring violent behavior include modelling, either through observing violent role models within the family, through being subjected to violence (i.e., abuse) by adults, or through televised modelling of aggression. Of import also, according to Klassen & O'Connor (1994), is rehearsal, especially during adolescence, and reinforcement, especially intermittent, positive reinforcement of violent behavior.

Clinical Predictors. Research on the clinical correlates of violence have focused on DSM diagnoses such as affective disorders, substance use disorders, psychotic disorders, and personality disorders (Swanson, 1994; Dutton, 1996; Raine, 1993); and specific psychiatric symptoms such as hallucinations and delusions (Link & Stueve, 1994; Taylor et al., 1994).

Swanson (1994) reports on a secondary analysis of the Epidemiological Catchment Area (ECA) Project originally undertaken in the early 1980s in several sites in the United States. Swanson utilized data (structured diagnostic interviews) from approximately 10,000 of the original 17,803 respondents. Data on violence were based on self-reports of the respondents, such that the presence or absence of any

violent act was coded, including familial and extra-familial violence. Swanson found that those with a major mental disorder and a substance abuse disorder showed the highest percentage (63.89%) of self-reported violence using a five-item index of violence; 55.2% of persons with substance abuse disorder alone reported violence; 33.12% of the group with schizophrenia or major affective disorder reported violence, and the percentage of violence of persons with no diagnosis was 14.55.

Link & Stueve (1994) found that mentally disordered patients who displayed psychotic symptoms such that they perceived some form of external control of their minds or perceived others wishing to do them harm, reported significantly more hitting, fighting and weapons offences than did community controls and patients with lower levels of these psychotic symptoms. Correlations between such violence and other, non-controlling or non-threatening psychotic symptoms (e.g., feeling of not existing or of being dead, thought broadcasting, possession by devil, visual or auditory hallucinations, etc) were not significantly correlated. Taylor et al., (1994), have shown that, in addition to controlling/threatening psychotic symptoms, delusions in general have also been shown to correlate with violence.

According to Dutton (1996), men who are violent toward their partners tend to fall into one of three categories of personality disorder: avoidant, psychopathic, or borderline.

He has postulated a "Borderline Personality Organization" (BPO) in men who have assaulted their partners, that includes an attenuated constellation of those traits found in persons with full-blown Borderline Personality Disorder. That is, these men display symptoms of Borderline Personality Disorder, such as identity diffusion, impaired reality testing, impulsivity, primitive defences, anger, and emotional instability, but in less extreme form. Such individuals tend to have a history of insecure attachment, with rejecting fathers and mothers; having experienced shame globally in childhood with inconsistent, random punishment; and having observed or experienced familial abuse. Dutton reports that measures of BPO are correlated with anger, trauma symptoms, and emotional and physical abusiveness.

Similarly, Raine (1993) found that an increase in the severity of violence of adult male offenders increased linearly as scores of Borderline Personality Disorder increased. Borderline Personality scores were obtained with a rating scale from 1 (definitely not present) to 5 (definitely present) according to DSM-III criteria. Murderers in Raine's (1993) sample were considered severely violent, prisoners committing nonviolent offences were considered the least severe, and offenders who committed violent acts against persons, other than murder, were in the middle. The murderers had the highest Borderline scores, with significantly higher scores on the criteria of affective

instability and unstable, intense relationships.

Hare's Psychopathy Checklist-Revised. The PCL-R is a 20 item checklist for assessing psychopathy, as conceptualized by Cleckley (1982). It is comprised of two main factors, the first being reflective of interpersonal and affective characteristics and the second of an antisocial, deviant lifestyle. Appendix A provides a list of the PCL-R items and the items comprising the two factors.

Psychopathy Checklist-Revised scores have been shown to have good predictive validity in relation to violent outcome for mentally disordered offenders (Heilbrun et al., 1993; Harris, Rice, & Quinsey, 1993; Quinsey, Rice, & Harris, 1995) and non-mentally disordered offenders (see Serin, 1991; Serin & Amos, 1995, for example). Williamson, Hare and Wong (1987) report that persons who are diagnosed as psychopathic with the PCL-R will be convicted more often for violent crimes, and have higher incidences of violent behavior while incarcerated than will other criminals (see also Hare, 1981). Heilbrun et al. (1993) studied the relationship between psychopathy and violence in 232 mentally disordered American offenders, who were found either Not Guilty by Reason of Insanity or Not Fit to Stand Trial (these are analogous to the current Canadian categories of Not Criminally Responsible due to Mental Disorder, and Unfit to Stand Trial, respectively). Outcome measures included shouting, threatening, pushing and/or hitting behaviors, rearrests, and

re-hospitalizations. The results showed that PCL-R total scores correlated significantly with aggression during the first two months in hospital ($\underline{r} = .30, p < .001$) and post-discharge arrests for offences against persons ($\underline{r} = .16, p < .05$), but not with post-discharge offences against property. PCL-R Factor 1 scores also correlated with aggression during the first two months of hospitalization ($\underline{r} = .24, p < .001$), and Factor 2 scores correlated with crimes against persons ($\underline{r} = .18, p < .05$).

Webster's HCR-20

Description. The research cited above provides empirical support for the inclusion of many of the variables included in the HCR-20. The studies above, whether conducted longitudinally, prospectively or retrospectively, show some consistencies regarding the relation of certain variables with violence. Table 2 provides a summary of these studies in relation to HCR-20 items. The specific items of the HCR-20 are:

Historical Variables:

- H1. Past Violence
- H2. Age at first known Violent Act
- H3. Employment Stability
- H4. Relationship Stability
- H5. Alcohol or Drug Abuse
- H6. Mental Disorder
- H7. Psychopathy

- H8. Early Maladjustment
- H9. Personality Disorder
- H10. Prior Release or Detention Failure

Clinical Variables:

- C1. Insight
- C2. Attitude
- C3. Symptoms
- C4. Emotional Stability
- C5. Treatability

Risk Variables:

- R1. Plan Feasibility
- R2. Access to Victims, Weapons, Drugs or Alcohol
- R3. Support
- R4. Compliance with Treatment
- R5. Stress

Appendix B provides a complete description of each HCR-20 item.

Table 2. Empirical Support for the HCR-20 Items: Summary of Research Findings

HCR-20 Item	Supporting Studies
H1 Past Violence	Harris et al (1993) Quinsey et al. (1995)
H3 Relationship Stability	Harris et al. (1993) Quinsey et al. (1995) Raine (1993)
H5 Alcohol/Drugs	Harris et al. (1993) Swanson (1994)
H6 Mental Disorder & C3 Symptoms	Harris et al. (1993) Link & Stueve 1994) Swanson (1994)
H7 Psychopathy	Harris et al. (1993) Quinsey et al. (1995) Heilbrun et al. (1993) Serin (1991) Williamson et al. (1987)
H8 Early Maladjustment	Harris et al. (1993) Farrington (1989) Klassen & O'Connor (1994) Dutton (1996)
H9 Personality Disorder	Harris et al. (1993) Swanson (1995) Raine (1993)
C4 Stability	Raine (1993)

Predictive Validity of the HCR-20. Some preliminary work on the HCR-20 scheme was done by Wintrup, Coles, Hart, and Webster (1994), and focussed on the first 15 variables of the model. Fourteen variables (historical and clinical) were coded retrospectively from agency files for a sample of males

who had been remanded for fitness-to-stand trial assessments in 1986. Psychopathy Checklist-Revised (PCL-R) scores were obtained in 1986 for these subjects. Of the original 80 subjects, 72 were included in the final analysis since arrest records were unavailable for seven of the subjects, and one subject had died in 1986. The severity of violent outcome was coded in the same manner as Item 1 of the HCR-20, previous violence.

The 14 HCR variables in total (coded for 60 subjects) correlated with the number of psychiatric readmissions ($r = .27$, $p = .04$), and was predictive of rates of recidivism (arrests and readmissions). The PCL-R total score was predictive of criminal recidivism (number of arrests) and an outcome measure of violence (number of charges for violent offences). Interrater reliabilities of the original HCR-20 items H2 through C5 ranged from 0.24 (Maladjustment at School) to 1.00 (Age) as measured by Kendall's Tau. The Tau statistic for item H1 (Past Violence) was 0.00. This result was due to no variation in one of the rater's scores for this item. Items other than Past Violence, Maladjustment at School, and Age showed Tau statistics in the range of 0.54 to 0.86 (Douglas, Webster & Wintrup, 1996).

Some problems with the preliminary study included using fewer people from the sample for scoring the HCR-20 variables ($n = 60$) than for the PCL-R variables ($n = 72$), thereby reducing power for the analysis of the HCR-20. In addition,

the five risk variables of the HCR-20 were not included in the original study, and Item H7 (Psychopathy) was not included in the statistical analyses. The exclusion of these six items limited this study in terms of testing the predictive validity of the HCR-20.

The scoring of the individual items was also difficult due to lack of clarity in scoring criteria. Overall, the criteria for coding the variables were made more explicit in the revised version by including concrete examples and definitions of the qualities in question. Age at First Known Violent Offence was decreased in the revised version, such that the individual would obtain a higher score with the revised version if the first known violent offence occurred at a younger age. In the original version, an individual received the highest score of 2 if the first known violent offence occurred prior to the age of 30. In the revised version, the cutoff was decreased to the age of 20. Item H3 of the original HCR-20, Lifestyle Stability, was divided into two separate items for the revised version: H3, Relationship Stability and H4, Employment Stability. Items H7, Maladjustment in Elementary School and H10, Separated from Parents under Age 16 of the original HCR-20 were combined into one item, H8, Early Maladjustment, in the revised version. Item C3, Symptoms, was changed from both positive and negative schizophrenic symptoms in the original version, to positive symptoms in the revised version. Criteria for

the five Risk variables had not been developed at the time of the original study

The present study was undertaken in an attempt to provide a more accurate estimate of the predictive validity of the HCR-20 by utilizing all predictor variables in the HCR-20, using revised scoring criteria, and obtaining outcome measures from a broader range of sources.

THE PRESENT STUDY

Hypothesis

Continuing the line of research defined by Webster et al. (Harris, Rice, & Quinsey, 1993; Quinsey, Rice, & Harris, 1995; Quinsey, 1995; Webster, Eaves, Douglas, & Wintrup, 1995; Webster, Harris, Rice, Cormier, & Quinsey, 1994; Wintrup, Coles, Webster, & Hart, 1994), the present study evaluated the predictive validity of the revised HCR-20 scheme with males remanded for forensic assessments (the same sample as was used for the pilot study). It is hypothesized that the revised HCR-20 scheme will be more predictive of violence during the follow-up period than will the Psychopathy Checklist-Revised.

Method

Subjects

Eighty subjects who had been remanded to the Forensic Psychiatric Institute for fitness-to-stand trial assessments were given the PCL-R between May 1 and October 31 of 1986.

One of the 80 patients had died prior to his release from the psychiatric institute in 1986, and four died during the follow-up period. These five subjects were thus excluded from the present study.

Age. The mean age of the subjects at the time of their discharge from the Forensic Institute was 40.17 (SD = 10.26, range = 26-72, N = 79).

Race. Ninety percent of the patients were Caucasian, 5% were Native North American, and 5% were of other descent.

Materials. The preliminary study of the HCR-20 had identified some difficulties with the coding criteria for the variables, and these were revised for the present study. Appendix B contains the complete coding criteria of the Revised HCR-20.

Procedure. **Predictor Variables.** Demographic data and HCR-20 scores were coded from information contained in criminal records, which were obtained from the R.C.M.P., as well as medical files from the Forensic Psychiatric Institute and Riverview Hospital. The medical files contain information from psychological and psychiatric assessments, nursing notes, legal records, medical data, social worker reports (including interviews with the patient's family, when possible), and vocational rehabilitation reports.

For the HCR-20 coding, a rating of 0 was given if the patient evidenced none or little of the qualities measured by that particular variable (none or mild), a rating of 1 was

given if there was evidence to suggest the patient had some of the qualities measured by that variable (moderate), and a rating of 2 was given if the available evidence indicated the subject had most or all of the qualities measured by that variable (severe). A score of 0-2 was possible for each variable, with a total possible score of 40. Since measures of Past Violence and Outcome Violence include "property offences," this study might be more correctly be viewed in terms of predicting aggression rather than violence. The literature to date has used the term violence, and so this practice will be continued in the present study.

Outcome Criteria. Ratings of violent behavior were obtained from the R.C.M.P. criminal records, clinical and legal files from the Forensic Psychiatric Institute, clinical records from Riverview Hospital, and records from the Department of Vital Statistics for the period between the date of discharge from the 1986 psychiatric admission and December 1994 (mean follow-up duration = 8.04 years, range = 0 months to 102 months).

Outcome measures consisted of coding thirteen variables relating to criminal charges, violence, psychiatric readmissions, and the follow-up period:

A. Charges

- (1) whether the individual had criminal charges laid,
- (2) the number of charges laid,

B. Violence

- (3) whether the person was violent or not,
- (4) the number of charges for violence,
- (5) the number of violent offences committed where no charges were laid,
- (6) the severity of violence

C. Psychiatric Readmissions

- (7) readmissions to a psychiatric facility,
- (8) the number of readmissions,

D. Follow-up Period

- (9) whether the person was incarcerated during the follow-up period,
- (10) the number of months where the person was at risk,
- (11) the number of months to their first readmission,
- (12) the number of months to their first offence, and
- (13) the number of months to their first violent act.

Definition of Terms. Months at Risk refers to the number of months where the person was not incarcerated, and includes time spent in a psychiatric facility. The number of months to the first readmission, first re-offence and first violent act was coded as 108 (nine years) for those individuals who were not readmitted, who did not re-offend, and/or who were not violent during the follow-up period.

The total number of charges for violence was added to the total number of violent offences where charges were not laid

to give an Index of Total Violence.

Rate of Violence (the number of violent acts per month at risk) was obtained by dividing total violence by the number of months in which the individual was at risk.

Severity of Violence was coded on a scale from 0-2, with 0 = mild violence or no violence, 1 = moderate violence, and 2 = severe violence. These were coded according to the same criteria as variable H1 of the HCR-20: a score of 0 was given if there were no or extremely minimal threats or acts of violence; a score of 1 was given when there were threats or violent acts of moderate seriousness directed purposively against property or people, without the use of a weapon; and a score of 2 was given if there were extremely violent acts carried out possible though not necessarily with intent to harm others, with or without a weapon. A given behavior was coded as violent if it involved any one of nine offences (whether reported to police or not): murder, attempted murder, physical assault, sexual assault, arson, robbery, any behavior involving the use of a weapon, threatening behaviors, and property damage. Final outcome coding sheets are in Appendix C.

Statistical Analysis. Prior to analysis, all variables were examined for accuracy of data entry, missing values, and violation of normality assumptions.

Missing Data. Missing values were found for those individuals who did not have criminal records available, and

these cases were retained for analyses that did not involve criminal recidivism. Arrest records were available for all but 4 of the 75 subjects. The Risk variables of the HCR-20 could not be scored for one individual due to inadequate information in the files, and this person was excluded from the analyses, leaving 74 subjects in total, and 70 persons whose arrest records were available.

Outliers. Cases were included in the analysis unless their z-scores were in excess of 4 in either direction. One individual had received 63 post-discharge criminal charges, with a z-score of 6.513. Most of the charges incurred were for fraud, and so the score of 63 for this individual was substituted with the next highest score obtained from the sample, which was 23. Six individuals had z-scores between 3 and 4 for either Past Violence, Age, Number of Violent Acts in the follow-up period, Number of Violent Acts with no charges laid in the follow-up period, Number of Psychiatric Readmissions, or Number of Charges received for Violence. The high score for the person with Number of Charges for Violence resulted in high scores for this individual on Rate of Violence and Total Violence. These individuals were retained for the analyses since omitting them could give an underestimate of actual outcome violence for this sample.

Perusal of the bivariate normality distributions showed that each outcome variable differed significantly from normality. Violation of normality assumptions affect the

weights assigned to the variables when constructing models and when assessing how well the models fit the actual data (Gardner, et al., 1995). Since the purpose of the present study is to identify significant predictors of violence for this sample rather than to construct a regression model, the data were not transformed for the regression analyses.

Correlations and Reliabilities. Pearson's correlation coefficients (r) were computed for all variables measured for this study. Historical and Clinical item scores for 14 of the 74 patients were coded by another graduate student to determine interrater reliabilities. Interrater reliabilities were calculated with Kendall's Tau.

Regression Analyses. Stepwise regression analyses using Multiple Linear Regression were conducted for the HCR-20 and PCL-R all for continuous outcome measures. Cox's regression method was used for the HCR-20 and for the PCL-R for the dichotomous outcome variables using SPSS. Cox's method is similar to Logistic Regression and has the advantage of including time as a factor in the regression. This method provides a probability estimate of how well the HCR-20 and PCL-R predict the various outcome measures over time. Stepwise regression using Cox's method was conducted to compare the predictive validity of the HCR-20 with the PCL-R. Three major classes of dependent variables were used, Measures of Violence, Measures of Criminal Recidivism, and Measures of Psychiatric Readmissions, as described above.

Results

Interrater Reliabilities.

Interrater reliabilities for 14 of the cases were computed with Kendall's Tau statistic. Scoring of the Risk variables was very difficult as the file information pertaining to discharge planning was scant, and therefore the reliabilities pertain to the Historical and Clinical variables only. The correlations are in the moderate to very good range, with the exception of item H3, Relationship Stability. While this reliability is very low (.02), it may be premature to drop the item from the HCR-20 as reliabilities for only 14 cases were computed. The perfect interrater reliability for Item H7, Psychopathy score, is due to the nature of the coding, For this item, the subject received an HCR-20 score of 0 for a PCL-R rating of <24, an HCR-20 score of 1 for a PCL-R rating of 25-30, and an HCR-20 score of 2 for a PCL-R rating of >30, leaving little room for rater error. The reliabilities are depicted in Table 3. It should be noted that the reliabilities for items such as Mental Disorder and Personality Disorder are not reliabilities of diagnosis. Rather, the Tau coefficients pertain to the degree to which the raters were able to retrieve the same information from the files regarding the HCR-20 items.

The relatively low levels of interrater reliability are to be expected given the lack of clinical expertise of the raters (both first-year graduate students) and the

retrospective coding of the data. Regarding the latter, the task of each rater was to extract pertinent information from reports written in 1986 regarding the subject's mental health status and plans for release at that time. There was much variation in the amount of detail included in patient files, and there was often insufficient information to obtain a clear rating for some of the variables (e.g., Relationship patterns). Since low interrater reliabilities may be an inherent aspect of retrospective coding from files, the measures of the HCR-20 were not refined for this study.

Descriptive Analysis. The mean HCR-20 score for the 74 patients was 26.58 with a standard deviation of 4.5, and a range of 14-35. The number of months in which these patients were at risk following discharge from the Institute ranged from 0 to 102 months, with a mean of 86.62 (SD = 23.01). The mean number of charges incurred subsequent to discharge from the Institute was 5.1 (SD = 8.8), with a range from 0 to 63, and the average number of readmissions was 1.18 (SD = 1.99, range = 0-8). Table 4 provides a summary of the percentage of subjects falling within various Historical item categories, and the percentage of those with each outcome measure. A rather unexpected finding was the very high amount of past and outcome violence evident in this study. Ninety-eight percent of the subjects had a history of violence, and % were violent during the follow-up period (cf Klassen & O'Connor, 1988; Harris et al., 1993; Lidz, et

al., 1993; Quinsey, Rice & Harris, 1995). This provides support for the view that actual outcome violence may be higher than is usually reported (Farrington, 1989).

Table 3. Interrater Reliabilities of the HCR-20

	Kendall's <u>Tau</u>
H1. Past Violence	.64**
H2. Age at First Violent Act	.69***
H3. Relationship Stability	.02
H4. Employment Stability	.42
H5. Mental Disorder	.65**
H6. Alcohol or Drug Abuse	.53**
H7. Psychopathy	1.00***
H8. Early Maladjustment	.88***
H9. Personality Disorder	.86***
H10. Prior Release Failure	.31
C1. Insight	.69***
C2. Attitude	.71***
C3. Symptoms	.76***
C4. Stability	.47*
C5. Treatability	.62**
HCR-20 Total Score	.67***

Note. *p < .10; **p < .05; ***p < .01

Table 4. Descriptive Characteristics of the Sample

	Percentage of Subjects
<hr/>	
Characteristics (<u>N</u> = 74)	
<hr/>	
History of Severe Violence	76%
History of Moderate Violence	23%
No Previous Violence	1.4%
Violent <20 Years	51.4%
Severe Relationship Instability	54.1%
Extremely Poor Work History	63.5%
Severe Maladjustment at Home or School	58.1%
Severe Personality Disorder*	27%
Severe Alcohol/Drug Abuse	51.4%
Severe Mental Disorder**	70.3%
Psychotic Symptoms at Discharge	45.9%
PCL-R Score >30	10.8%
<hr/>	
Outcome Measures (<u>N</u> = 70)	
<hr/>	
Charged with Offence	71.4%
Violent	70%
Moderately Violent	20%
Severely Violent	51.4%
Violent, but not Charged	29.7%
Psychiatric Readmission(s)	41.9%
Incarceration	56.2%
Violent in Institution	20.3%

*Histrionic, Antisocial, or Borderline Personality Disorder.

**Schizophrenia, Drug-induced psychoses, Organic based psychoses, Bipolar disorder, or Delusional disorder.

Correlational Analysis. Correlations between the HCR-20 items are presented in Appendix D. Correlations between HCR-20 Items and outcome variables are shown in Appendix E. Table 5 provides a summary of the correlations between the major independent variables and Outcome variables. Of the three main categories in the HCR-20 (Historical, Clinical,

and Risk), the Historical variables show the highest correlations with outcome measures of violence, criminal recidivism, and psychiatric readmissions. The only significant correlation in terms of Clinical Total and Risk Total scores are between Clinical Total and the Number of Violent Acts with no Charges, and between Clinical Total and whether or not the individual was readmitted to a psychiatric facility. HCR-20 Total scores show higher correlations with Number of Violent Acts with no Charges, Severity of Violence, Institutional Violence, and Psychiatric Readmissions than do PCL-R Total scores, whereas PCL-R Total scores are more highly correlated with subsequent criminal recidivism than are HCR-20 Total scores. Of interest is that the HCR-20 Total scores and PCL-R Total scores show an identical correlation with Violent, Yes or No. Factor 2 scores of the PCL-R are more highly correlated with outcome measures than are Factor 1 scores, with the exception of Number of Charges received where Factor 1 score correlations are slightly higher than are the Factor 2 correlations. Age at the time of discharge from the Forensic Psychiatric Institute shows a negative correlation with outcome measures. Negative correlations between age and violence are often reported by other studies (Webster, et al., 1994; Swanson, 1994).

Table 5. Correlations between Predictors and Outcome

Variable	Violent? Y/N	Number of Viol Acts, No Chgs.	Severity of Violence	Violent in an Institution
H Total	.25**	.23**	.31***	.35***
C Total	-.02	.22*	.11	.18
R Total	.08	-.08	.00	-.16
HCR Total	.20*	.23**	.26**	.26**
PCL-R	.20*	.16	.22*	.22*
Factor 1	.06	.04	.04	.14
Factor 2	.24**	.27**	.30**	.26**
Age	-.16	-.12	-.23**	-.14

Variable	Criminal Charges? Y/N	Number of Charges	Psych. Re-Adm? Y/N	Number of Re-Admissions
H Total	.19*	.14	.37***	.43***
C Total	-.07	-.13	.22*	.18
R Total	.05	-.02	-.03	.16
HCR Total	.12	.02	.35**	.45***
PCL-R	.23**	.26**	.05	.23**
Factor 1	.12	.16	-.08	.10
Factor 2	.24**	.19	.22*	.32***
Age	-.11	-.01	-.21*	-.19

*p <.10; p <.05; p<.01. Two-tailed.

Multiple Regression Analyses

Stepwise Regression. Stepwise regression analyses were conducted for each continuous measures of outcome violence with the HCR-20 and PCL-R entered into the model. The

minimum F to enter was set at 4.00

For the outcome measure, Number of Charges received for Violence, Item H6 (Mental Disorder) entered first, with $R = .28$, $R^2 = .07$, and Item R4 (Compliance) entered second, $R = .38$, $R^2 = .15$. Mental Disorder is negatively related to the number of charges for violence. For Number of Violent Acts with No Charges Laid, Factor 2 of the PCL-R entered the equation on the first step, with $R = .27$, $R^2 = .07$. Item H7 (Psychopathy) entered next, with $R = .38$, $R^2 = .14$. H7 is negatively related to outcome violence. For Institutional Violence, Historical Total entered first, $R = .34$, $R^2 = .12$, and C3 (Symptoms) entered second, $R = .44$, $R^2 = .19$. For the outcome measure, Severity of Violence, Item H10 (Prior Release Failure) entered first, $R = .32$, $R^2 = .10$; Item H4 (Employment Stability) entered next, $R = .41$, $R^2 = .16$; and Item C3 (Symptoms) entered last, $R = .47$, $R^2 = .22$. For Total Violence, PCL-R entered first, $R = .31$, $R^2 = .09$; Item R4 (Compliance) entered next, $R = .38$, $R^2 = .14$; and C2 (Attitude) entered last, $R = .44$, $R^2 = .20$. Attitude is negatively related. See Table 6 for the Multiple correlations, Squared Multiple correlations, and Adjusted Multiple Correlations, squared.

Table 6. Stepwise Multiple Linear Regression: Predictors of Violent Outcome

		<u>R</u>	<u>R²</u>	Adj. <u>R²</u>
Number of Charges for Violence				
Step 1.	H6 (neg)	.28	.07	.06
Step 2.	R4	.38	.15	.12
Violent Acts, No Charges				
Step 1.	Factor 2	.27	.07	.06
Step 2.	H7 (neg)	.38	.14	.12
Institutional Violence				
Step 1.	HTotal	.34	.12	.10
Step 2.	C3	.44	.19	.17
Severity of Violence				
Step 1.	H10	.32	.10	.09
Step 2.	H4	.41	.16	.14
Step 3.	C3	.47	.22	.18
Total Violence				
Step 1.	PCL-R	.31	.09	.08
Step 2.	R4	.38	.14	.12
Step 3.	C2 (neg)	.44	.20	.16

*p < .05 for all variables.

H4. Employment Stability	C2. Attitude
H6. Mental Disorder	C3. Symptoms
H7. Psychopathy	R4. Compliance
H10. Prior Release Failure	

Survival Analyses

Violent Outcome, Yes or No. Survival analysis was conducted using the HCR-20 and the PCL-R as predictors, and violent outcome as the dependent measure. Cox Regression

analysis was used with HCR-20 Total scores entered into the equation initially to ascertain whether they, as a model, provide a good fit to the observed data. Results show that the HCR-20 Total scores fit the observed data well in terms of whether or not an individual is violent during the outcome period, Chi-Square = 5.08, $p = .024$. The Chi-Square analysis provides a test of how well the model fits the data overall.

The three subsets of Total Scores (Total Historical scores, Total Clinical scores, and Total Risk scores) were entered next. Results show that Total Historical scores predict outcome violence over time ($p = .009$), where Total Clinical and Total Risk scores failed to reach significance ($p = .92$ and $p = .44$, respectively). These p -levels pertain to the Wald statistic, which provides a test of whether the regression coefficients for each variable are significantly different from zero.

Each Historical item was then entered. Of the Historical subset, Items H10 (Prior Release Failure), H8 (Early Maladjustment), H6 (Mental Disorder), and H3 (Relationship Instability) are predictive of outcome violence over time, with item H6, Mental Disorder, being negatively associated with outcome violence. Table 7 provides a summary of the significance of these predictors with outcome measures using the Wald statistic.

PCL-R Total scores were entered next. PCL-R scores approach significance, Chi-Square = 3.03, $p = .08$, with

Factor 2 regression coefficients having the predictive accuracy ($p = .013$).

Table 7. Predictive Significance of the PCL-R and HCR-20 Variables, using Wald statistic.

	Violent	Charged with Violence	General Charges	Psych. Admissions	Institution Violence
	Significance Level (p)				
HCR-20 Total	.03	NS	NS	.00	.01
Historical Total	.01	.05	.03	.01	.01
H10	.00	.00	.00	NS	NS
H8	.02	NS	NS	NS	NS
H6	.05	.02	.00	NS	.04
H3	.05	NS	NS	NS	NS
H1	NS	NS	.04	NS	NS
H4	NS	NS	NS	.03	NS
PCL-R Total	NS	NS	NS	NS	.04
Factor 1	NS	NS	NS	.05	NS
Factor 2	.01	NS	NS	.02	.02

Note 1, N.S. means Not Significant at the .05 level

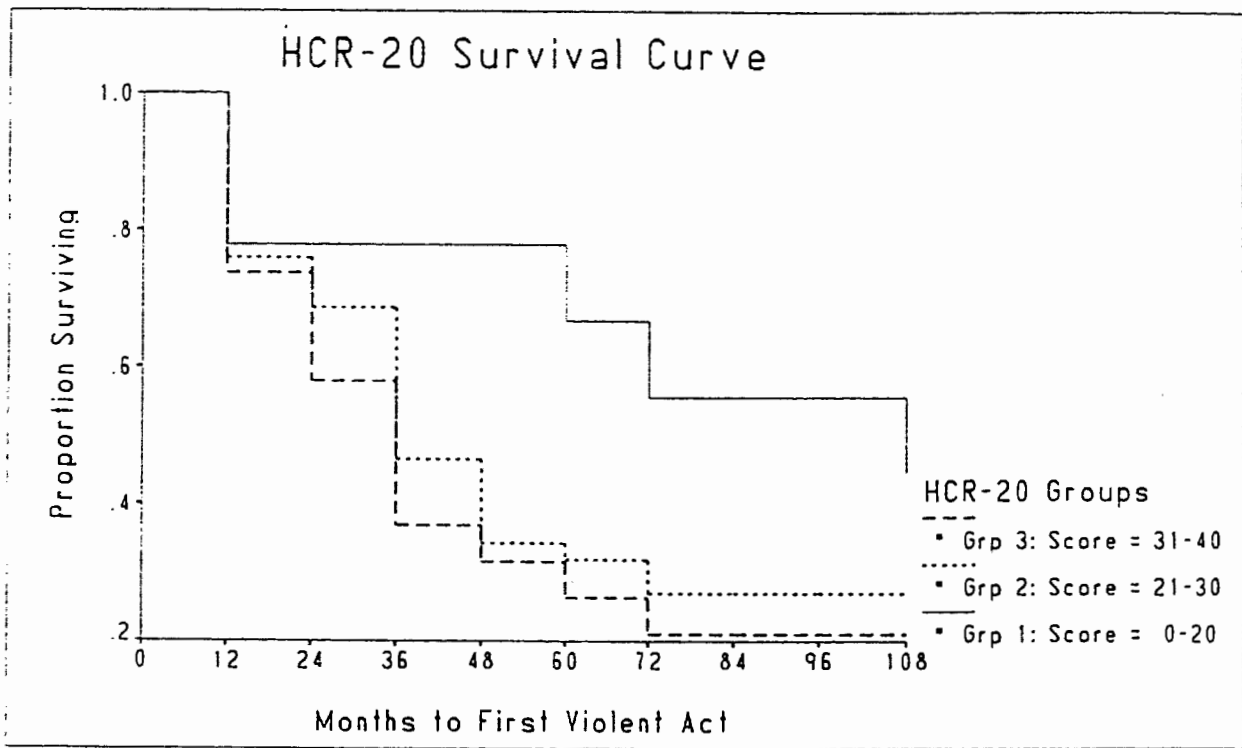
Note 2. All Outcome Variables are scored as either Yes or No.

- H1. Previous Violence
- H3. Relationship Stability
- H4. Employment Stability
- H6. Mental Disorder
- H8. Early Maladjustment
- H10. Prior Release Failure

HCR-20 Survival Curve. A Survival Curve was plotted for the HCR-20 and is depicted in Figure 1. This curve depicts the probability that a given group of individuals will reach

the end of a specific time interval without becoming violent. Three groups were formed, Low Risk, Medium Risk and High Risk. Subjects who received Total HCR-20 scores between 0 and 20 were assigned to the Low Risk group, those with scores between 21 and 30 were assigned to the Medium Risk group, and those with scores of 31 to 40 were assigned to the High Risk group. The follow-up period was divided into nine 12-month intervals. As can be seen from Figure 1, just over 20% of those in each group committed at least one violent act within the first 24 months. Differences between the groups become more apparent between 24 and 36 months, with 37% of the High Risk group committing at least one violent act, and the Low Risk group remaining stable at 22%. At the end of six years, approximately 79% of the High Risk group had been violent, whereas 44% of the Low Risk group are violent. The Medium Risk group shows a pattern similar to the High Risk Group over the course of the follow-up period, with slightly fewer individuals becoming violent.

Figure 1. The HCR-20 Survival Curve



Charges for Violence. Using Cox's Method, HCR-20 Total scores approach significance in terms of whether or not the individual received charges for violence in the outcome period (Chi-Square = 3.171, $p = .0749$). Total Historical scores are predictive of receiving charges for violence, and the Historical items H6 (Mental Disorder) and H10 (Prior Release Failure) hold the predictive weight (see Table 7). Again, Mental Disorder is negatively related to charges for violence. Neither PCL-R Total scores nor Factor 1 scores are predictive of charges for violence, however Factor 2 approaches significance at $p = .0677$.

Institutional Violence. In terms of whether or not the individual was violent within an institutional setting, HCR-20 Total Scores fit the model, Chi-Square = 6.44, $p = .01$. Of the Historical Total, Clinical Total, and Risk Total, only the Historical Total is significant (Chi-Square = 10.45, $p = .005$). Of the Historical items, Item H6 (Mental Disorder) is predictive of institutional violence, using Wald statistic, $p = .04$. Mental Disorder is positively related to this outcome measure of violence. PCL-R Total scores are significant, Chi-Square = 3.89, $p = .04$, as is Factor 2 (Wald statistic, $p = .02$).

Criminal Recidivism. HCR-20 Total scores do not predict whether or not criminal charges are received over the follow-up period (Chi-Square = .583, $p = .44$). The regression coefficient for Total Historical score is significantly

different from zero ($p = .03$). The individual item predictors are H6 (Mental Disorder), H10 (Prior Release Failure), and H1 (Past Violence). See Table 7. Both Mental Disorder and Past Violence are negatively associated with criminal recidivism. PCL-R Total scores approach significance (Chi-Square = 2.913, $p = .0885$), as does Factor 2 ($p = .0832$).

Psychiatric Readmissions. HCR-20 Total scores, Total Historical Scores, and Item H4 (Employment Stability) are significantly predictive of whether or not an individual is readmitted to a Psychiatric facility during the follow-up period. See Table 7. PCL-R Factor 1 and 2 scores are both significant.

HCR-20 and PCL-R Comparisons

Stepwise analysis was carried out to test whether the Total Historical scores add to the predictive ability of Factor 2, and whether Factor 2 scores add to the predictive ability of Total Historical scores in terms of Outcome Violence, Yes or No. Factor 2 scores fit the data with a Chi-Square of 5.34, $p = .02$. When adding Total Historical scores, the model continues to fit the data, Chi-Square = 7.23, $p = .02$, with no significant change in the model overall (See Table 8). The test of whether the regression coefficients are significantly different from zero show that with both Factor 2 and Historical Total score in the model, neither Factor 2 nor Historical Total per se are

significantly different, $p = .61$ and $p = .16$, respectively, from zero. When reversing the entry of Historical Total and Factor 2 into the model, there was no significant change. Historical Scores alone fit the data with a Chi-Square of 7.04, $p = .008$. When adding Factor 2 scores, the overall fit to the data is Chi-Square = 7.23, $p = .02$. Therefore, Factor 2 scores do not improve on Historical Total scores, nor do Historical Total scores improve on Factor 2 in terms of how well the models fit the observed data.

When comparing PCL-R Factor 2 scores with Historical Total in terms of Institutional Violence, there was a significant improvement when adding the Historical Total to Factor 2 (Chi-Square = 4.83, $p = .02$). When the order of entry was reversed, Factor 2 scores did not result in a significant change in the model (Chi-Square = .053, $p = .81$). The Wald statistic shows that the Historical Total scores are significant, $p = .03$, whereas the Factor 2 scores are not, $p = .81$. Therefore, in terms of violence within an institution, Historical Total scores are significantly more predictive than Factor 2 scores.

In terms of Psychiatric Readmissions, when comparing the two PCL-R Factor scores with Total Historical scores using Stepwise regression, the addition of HCR-20 Historical scores to PCL-R Factors 1 and 2 resulted in a significant change in the model (Chi-Square = 12.61, $p = .0004$). Factor 1 scores are significantly different from zero, $p = .0056$, as are

Total Historical scores, $p = .0007$, with Factor 1 scores being negatively related. Factor 2 is not related significantly ($p = .51$). When Factor scores are added to Total Historical scores, there is a significant change in the model (Chi-Square = 8.87, $p = .0118$) from Total Historical scores alone. The Total Historical scores and Factor 1 scores improve upon each other. See Table 8.

Table 8. Stepwise Regression Analysis: HCR-20 v PCL-R

	Overall Fit of Model	Change in the Fit of the Model
	Chi-Square	
<u>Violent, Yes or No</u>		
Step		
1. Factor 2	5.34 ($p = .02$)	
2. Historical	7.23 ($p = .02$)	1.97 ($p = .16$)
Step		
1. Historical	7.04 ($p = .008$)	
2. Factor 2	7.23 ($p = .02$)	.25 ($p = .61$)
<u>Institutional Violence</u>		
Step		
1. Factor 2	6.01 ($p = .01$)	
2. Historical	10.05 ($p = .006$)	4.83 ($p = .02$)
Step		
1. Historical	10.05 ($p = .001$)	
2. Factor 2	10.05 ($p = .006$)	.053 ($p = .81$)
<u>Psychiatric Readmissions</u>		
Step		
1. Factor 1	5.92 ($p = .05$)	
2. Historical	16.42 ($p = .00$)	12.61 ($p = .00$)
Step		
1. Historical	9.38 ($p = .00$)	
2. Factor 1	16.42 ($p = .00$)	8.87 ($p = .01$)

DISCUSSION

Results

Before proceeding with a discussion of the results of this study, it's important to note that while there may be a natural tendency to infer causation when independent variables temporally precede the occurrence of criterion measures, the nature of this study is correlational only. Moreover, due to the non-representative nature of the sample utilized for this study, such as the age and offence histories of the subjects and the political decisions that often underly admission to an institution such as the Forensic Psychiatric Institute, the results are to be regarded as sample specific.

The results of the above analyses suggest that the HCR-20 is predictive of outcome violence, criminal recidivism and psychiatric readmissions within a nine-year period. HCR-20 Total Scores and PCL-R Factor 2 scores are predictive of the presence of outcome violence, institutional violence, and psychiatric readmissions, and PCL-R Factor 1 scores are predictive of presence of psychiatric readmissions. PCL-R Total scores are significantly predictive of presence of institutional violence, and total violence. In terms of presence of violent outcome, PCL-R Factor 2 scores did not add to the predictive validity of the HCR-20 Historical Total, nor did the HCR-20 Historical Total add to Factor 2. However, in terms of violence within an institution,

Historical Total scores add to the predictive validity of PCL-R Factor 2 scores, whereas Factor 2 scores do not add to the predictive validity of Historical Total scores. The hypothesis that the HCR-20 will have higher validity in predicting outcome violence than the PCL-R is therefore supported in part, namely, in terms of institutional violence. The Total Historical Scores predict more of the outcome measures for violence than do the PCL-R Factor scores. In relation to criminal recidivism, Total Historical Scores were significant, whereas PCL-R Total and Factor scores were not. Total PCL-R scores and Factor 2 approached significance at the .08 level, however, and an increase in sample size could increase the significance level.

The finding that History of Violence (Item H1) is negatively correlated with outcome violence (-.23), such that violent outcome (scored as "yes: violent," or "no: not violent") is more likely as severity of past violence decreases, is an interesting finding. Not only is it commonly accepted that the best prediction of future violence is past behavior, but many studies have shown a positive correlation with past violence and future violence (Menzies, et al., 1993; Farrington, 1989; Klassen & O'Connor, 1988, 1989). Since violence within an institutional setting is included in the scoring for severity of violence in this study, the possibility that the negative correlation is due to the individual having less opportunities to be violent on

account of his being detained in an institution can be ruled out. Perusal of the percentages of individuals falling into each category of Past Violence and Severity of outcome Violence shows that 56 individuals were considered severely violent in the past, whereas only 31 of the individuals were classified as severely violent during follow-up. This could be attributable to the subjects of this study (mean age = 40.17 years, SD = 10.26 years) having advanced past their most violent period of life. However, it could also be attributed to the inadequacy of relying on criminal records per se for coding outcome measures of criminal recidivism, and serves to reinforce Monahan & Steadman's (1994) suggestion regarding the use multiple sources of information when measuring outcome. The use of Probation reports and records from Correctional facilities could provide important information regarding violent outcome.

Swanson's (1994) finding that outcome violence is more highly associated with a recent history of past violence, rather than a remote history, may provide an additional explanation for the negative correlation between past violence and outcome violence. The HCR-20 looks at both remote and recent violent behavior when scoring item H1 (Past Violence). If the HCR-20 were to look at a recent history of violence only, the correlation between past violence severity and outcome violence severity may cease to be negative.

The correlations between the HCR-20 Clinical Variables

and outcome measures are relatively small, as are the Risk variables. The low correlations between these two classes of predictors may be due to the retrospective nature of this study. Many of the patient files had scant information regarding future plans and situations the individuals might encounter, and scoring of the risk variables was often difficult. In regard to the Clinical variables, it is perhaps more difficult to get an accurate assessment of an individual's mental state from written records than from actual personal contact with the individual over time. In terms of coding the Clinical and Risk variables, it may be preferable to obtain ratings of current behaviors rather than relying upon historical information from the subject's file.

The finding that Item H4 (Employment Stability) is predictive of psychiatric readmissions is not surprising. If individuals are detained in Psychiatric facilities during various periods in their adult lives, they would not likely have the ability to maintain steady employment.

Methodological Issues

In addition to assessing an individual's mental status directly in order to improve the scoring of Clinical variables, obtaining self-reports from the individuals and those close to them could provide corroborating evidence for scoring certain of the variables. As noted by Monahan and Steadman (1994) and Webster, et al. (1995), impoverished predictors and criterion variables can lead to inaccurate

assessments of future violence. While self-reports may be prone to subjective bias in terms of honestly reporting actual violent behavior, they may prove useful for identifying situations that a given individual finds stressful and/or provocative. This information would better allow for coding of Risk variables. With knowledge of the situations that irritate or provoke a given individual, the assessor can attempt to ascertain the likelihood of the individual encountering such situations in the future. Such information would also be valuable in the formulation of treatment plans. Collateral reports, such as those from family and friends, could provide further information on the subject's degree of violence

Monahan and Steadman's suggestion that large, broad, representative samples of patients be included in violence prediction studies was made with the goal of increasing the accuracy of predictions of violence through circumventing the effects of detaining offenders thought to be at high risk. If high-risk patients are not released, estimates of actual outcome violence will be attenuated. Studying violence within institutions would also produce inaccurate estimates, since therapeutic effects of being in a controlled environment will also reduce incidences of violence. In other words, to the extent that this form of risk management is effective, violence prediction studies will produce inaccurate results. In this sense, it may be impossible to

design a perfect violence prediction study. The closest approximation may be a prospective longitudinal study that includes at least two large, broad, representative samples of individuals. The first sample might consist of patients in an institutional setting, with and without a history of violence. The second group might include individuals in the community who have never been in contact with legal or mental health professionals, with and without a history of violence. A broad selection of outcome measures, including objective indices of behavior (such as legal records), self-reports of the individuals, collateral reports from family and friends, and interviews with researchers would be ideal. Outcome measures taken at regular intervals would be desirable. With such a design, many of the limitations noted by Monahan & Steadman could be effectively overcome. Such a study would prove time-consuming and expensive, however.

Theoretical Issues

One of the criticisms made by Monahan and Steadman (1994) on predicting violence pertains to a lack of theory explaining how various facets of an individual and his/her environment, as measured by predictor variables, interact to result in violent behavior. One particular issue that can be addressed is the heterogeneity of individuals. Following Dutton's (1996) research on spousal assault, it is reasonable to assume that, just as there are differences in personality among spousal assaulters (e.g., Psychopathic, Borderline or

Borderline Organization, and Avoidant), there are differences among persons who are violent in general

Presuming that the distinctions noted by Dutton (1996) are generalizable to all violent offenders, it may be worthwhile to give the role of personality a more central role in predictions of violence. Revision of the Clinical items of the HCR-20, relying on research findings from the areas of personality, social psychology, and biological psychology, may assist in the formulation of a theory of violent behavior, including distinctions such as those noted by Dutton. One could conduct a study with the HCR-20 with individuals grouped according to predominant personality traits or styles. Constructs such as anger, and its role in the Borderline Personality, may add weight tantamount to that of Psychopathy to the HCR-20 Scheme.

A theoretical starting point might be the adoption of a Diathesis-Stress Model, where an individual has some psychological or biological predisposition to a disorder which is "activated" when the individual encounters a certain degree or type of stress. For example, a given individual may be predisposed by genetics or environmental factors toward Psychopathy, or Borderline Personality, or Schizophrenia. The presence of environmental stressors, such as a maladaptive family milieu or other environmental agents, may result in the individual's attempt at self-medication using drugs and/or alcohol. both exacerbating the original

diathesis and releasing any inhibitions toward violence. With such a model, various substances would have the dual role of stressor and disinhibitor. As Swanson's (1994) study shows, the abuse of substances is an important factor in acts of violence.

Summary

The HCR-20 Scheme shows good predictive accuracy in terms of whether or not individuals will be violent, will re-offend, or be readmitted to Psychiatric facilities for this sample. The Clinical and Risk variables of the scheme exhibit lower correlations with outcome measures than do the Historical variables, and suggestions have been made for improving the scoring of the Clinical and Risk variables.

The seemingly anomalous finding that severity of past violence is negatively correlated with severity of outcome violence was discussed in terms of the possibility that severity of violence may be related to a recent history of violence rather than a remote history, and also to the role that inadequate criterion variables play in prediction studies.

One of the limitations of the present study was that a small, non-representative sample of patients was used. The role of effective risk management of patients in relation to prediction accuracy was discussed. While the perfect prediction study is beyond our reach, an attainable suggestion for further study includes a longitudinal

prospective study using both institutionalized patients and a sample of individuals from the community, followed over several years with regular intervals of data collection.

The lack of theory in the area of violence prediction was addressed, which included a discussion on the possible role of the interaction between personality, stress, and substance abuse as precipitating factors in violence.

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APPENDIX A

PSYCHOPATHY CHECKLIST-REVISED ITEMS

1. Glibness/Superficial Charm
2. Grandiose Sense of Self Worth
3. Need for Stimulation/Proneness to Boredom
4. Pathological Lying
5. Conning/Manipulative
6. Lack of Remorse or Guilt
7. Shallow Affect
8. Callous/Lack of Empathy
9. Parasitic Lifestyle
10. Poor Behavioral Controls
11. Promiscuous Sexual Behavior
12. Early Behavior Problems
13. Lack of Realistic, Long-term Goals
14. Impulsivity
15. Irresponsibility
16. Failure of Accept Responsibility
17. Many Short-term Marital Relationships
18. Revocation of Conditional Release
19. Criminal Versatility
20. Juvenile Delinquency

PCL-R FACTOR 1 ITEMS

1. Glibness/Superficial Charm
2. Grandiose Sense of Self-Worth
4. Pathological Lying
5. Conning/Manipulative
7. Shallow Affect
8. Callous/Lack of Empathy
16. Failure to Accept Responsibility

PCL-R FACTOR 2 ITEMS

3. Need for Stimulation/Proneness to Boredom
9. Parasitic Lifestyle
10. Poor Behavioral Controls
12. Early Behavioral Problems
13. Lack of Realistic Long-term Goals
14. Impulsivity
18. Revocation of Conditional Release
19. Criminal Versatility

APPENDIX B

SCORING CRITERIA FOR THE HCR-20 SCHEME

Historical Variables

HI. Previous Violence

0	No, or extremely minimal, threats or acts of previous violence.
1	Previous threats or violent acts of moderate seriousness directed purposively against property or people, without the use of a weapon.
2	Previous extremely violent acts carried out possibly though not necessarily with intent to harm others, with or without a weapon.

Note 1. Previous violence includes index offence.

Note 2. *Moderate violent acts* include destruction of property (e.g., kicking a wall), moderate physical assault (e.g., mild pushing, light slapping), robbery, negligence (i.e., any action or failure to act which results or could result in harm to another person, such as impaired driving) and/or threats of violence against others.

Note 3. *Extremely violent acts* include murder, attempted murder, sexual assault, severe physical assault e.g., punching, throwing down stairs, breaking arms, etc.).

H2. Age at First Violent Offence

0	Over 40 years
1	Between 20 and 40 years
2	Under 20 years

Note 1. Age was defined as age at earliest known or suspected offence or incident. In cases where there had been no involvement with criminal justice or psychiatric authorities prior to the current

assessment, age was coded as at the index offence that resulted in the 1986 remand admission.

H3. Relationship Stability

0	Stable, nonconflicted relationship pattern. The individual shows evidence of having the ability to form and maintain longterm relationships (i.e., of at least one year in duration).
1	The individual shows evidence of a somewhat unstable relationship pattern, such as longterm relationships with a fair amount of conflict, or several short term relationships (i.e., within a period of months).
2	The individual is older than 30 and has never had a longterm partnership or the individual evidences relationship patterns that are highly conflicted and/or has had several short-term relationships within a short time period (i.e. months).

H4. Employment Stability

0	The individual has a history of actively seeking and/or maintaining employment, or is unable to work due to disability.
1	The individual has a history of having several jobs within a long time period (i.e., years), or seeks employment sporadically (i.e., alternates between long periods of work and long periods of unemployment).
2	The individual refuses to seek employment or has a history of having several jobs within a short time period (i.e., within a year). Or the person has experienced longterm institutionalization and has failed to meet work expectations of that institution.

H5. Alcohol or Drug Abuse

0	No evidence of frequent or heavy use or impairment of functioning.
1	Evidence of frequent use with moderate impairment in functioning.
2	Evidence of heavy use with severe impairment in functioning.

Note 1. *Moderate impairment* of functioning includes brief periods of time (i.e., hours) in which the person fails to meet responsibilities to self or others, or does not function up to his or her usual capacity. For example, being late for work, irate with others, severely hungover, unable to concentrate when driving or at work

Note 2. *Severe impairment* includes lengthy periods of time (i.e., days or longer) in which persons fail to meet responsibilities to self or others. For example, failure to maintain employment due to ingestion; sporadic employment as a result of ingestion; repeated charges for impaired driving; continuous difficulties with interpersonal relationships due to ingestion; denial of having a problem with substances despite strong evidence to the contrary. Severe impairment is also indicated where there is a diagnosis of neurological damage as a result of substance ingestion (this includes delirium tremens, alcohol or drug psychoses, severe memory impairment, etc.)

6. Mental Disorder

0	No recognized disorder diagnosed.
1	Diagnosis of a Group 1 disorder, but not Group 2.
2	Diagnosis of a Group 2 disorder.

Note 1. Personality Disorders were not included. The following groups accord with DSM-IV classifications:

Group 1 Disorder:

Anxiety disorders, somatoform disorders, dissociative disorders, sexual dysfunctions,

sleep disorders, factitious disorders, mood disorders, mild mental retardation.

Group 2 Disorders:

Organic mental disorders and syndromes, schizophrenia, delusional disorders, other psychotic disorders; bipolar disorders; manic disorders; paraphilias, impulse control disorders, adjustment disorders, severe mental retardation.

Note 2. Level of impairment was taken into account during this coding. The two groups provided rough guidance only. For example, a person evidencing a mild psychosis could receive a score of 1 instead of 2, whereas an individual with a severe depressive disorder could receive a score of 2 instead of 1, depending on symptomatology, etc.

H7. Psychopathy

0	Score of under 24 on the PCL-R.
1	Score of between 24 and 30 of the PCL-R.
2	Score of over 30 on the PCL-R.

H8. Early Maladjustment (at Home and School)

0	No maladjustment. Normal progress through school and evidence of a stable family atmosphere.
1	Moderate discipline or attendance problems and/or failure of one or two grades at school and/or moderate conflict, abuse or neglect in family while growing up. Separation from parents under the age of 16.
2	Serious discipline or attendance problems and/or failed 3 or more grades and/or dropped out of school and/or severe conflict, abuse or neglect in family.

Note 1. If the individual was separated from his family due to death of one or both parents, a score of 0 was given if no other maladjustment was evident.

H9. Personality Disorder

0	No personality disorder diagnosed.
1	A Group 1 personality disorder diagnosed.
2	A Group 2 personality disorder diagnosed.

Note 1. The following were grouped according to DSM-III classification:

Group 1 Personality Disorders:

Schizoid, compulsive, passive-aggressive, narcissistic, obsessive-compulsive (of a non-violent nature), dependent, avoidant, paranoid, schizotypal, masochistic, mixed.

Group 2 Personality Disorders:

Histrionic, antisocial, borderline, sadistic, obsessive-compulsive (where the nature of the obsessions or compulsions is violent).

Note 2. This variable was coded according to the level of impairment, as in Note 2, Item H6 above.

H10. Failure on Prior Conditional Release

0	The individual has never violated the terms of conditional release or community supervision, and has never escaped or attempted escape.
1	The individual has violated the terms of a conditional release or community supervision, or has escaped or attempted escape. No arrest made..
2	The individual has been arrested for violating the terms of a conditional release or community supervision, or has been arrested for an escape.

Note 1. *Prior conditional release* refers to parole or mandatory supervision, or release from hospital under conditions.

CLINICAL VARIABLES

C1. Insight

0	Acknowledges the mental disorder; full knowledge of effects of medication; understands effect of illness on other persons; realistic awareness of level of dangerousness and anger.
1	Partial acknowledgement of mental disorder; some knowledge of the effects of medication; some understanding of the effects of the illness on others; some awareness of level of dangerousness and anger.
2	No acknowledgment of the mental disorder; no knowledge of effects of medication; no understanding of the effects of the illness on other people; little or no awareness of the level of dangerousness and anger.

Note 1. By *insight* is meant, (1) extent to which the patient believes she or he has a mental disorder; (2) awareness of how medication affects his or her condition; (3) appreciation of social consequences of his or her mental disorder; (4) extent to which patient sees self to be dangerous, angry, or out of control.

C2. Attitude

0	Attitudes are largely pro-social. The individual is realistically optimistic regarding the future.
1	Available information suggests the presence of occasionally antisocial attitudes. The individual is somewhat pessimistic or unnecessarily doubtful about the future.
2	Attitudes are strongly antisocial. Individual is very pessimistic about the future.

Note 1. The extent to which the patient expressed pro- or - antisocial sentiments was considered, as well as the individual's aspirations for and expectations about the future.

C3. Severity of Symptoms

0	Available information contraindicates the presence of symptoms.
1	Available information suggests the presence of some symptoms.
2	Available information clearly indicates the presence of symptoms.

Note 1. By *symptoms* is meant current hallucinations, delusions, and paranoid or suicidal thoughts.

C4. Stability

0	Individual remains relatively calm in the face of real and imagined slights, insults and disappointments. Responses are in line with usual expectations given the circumstances.
1	Individual reacts to real and imagined slights, insults and disappointments with moderate violence. Reactions, of both negative and positive types appear somewhat exaggerated and overdone. There is somewhat unusual inconsistency in action over time.
2	Individual reacts to real and imagined slights, insults and disappointments with extreme violence. Actions, including ones which seem at least superficially to be responsible ones, appear markedly inconsistent and are often hard to predict.

Note 1. *Stability* means hour-to-hour, day-to-day, or week-to-week consistency in mood or general demeanour. It refers to the ability to remain composed and directed even when under pressure to act.

C5. Treatability

0	Individual responds well to treatment attempts, shows interest in and motivation toward progress, places much effort in therapy, and shows good potential for coming close to his/her stated goals.
1	Individual responds to treatment attempts in an unenthusiastic manner. Complies with treatment regimen, but only minimally and perhaps under protest or with complaints. But places some effort in making progress.
2	Individual responds poorly to treatment attempts. No motivation or effort is extended. The individual is non-compliant with medication, gives little indication that he or she will continue with medication or other aspects of treatment or remediation when released into the community. Individual tends to not reach stated goals.

Note 1. "'Treatability' refers to the clinical determination of which patients under what treatment modalities and environmental conditions will respond most favorably. Clinicians must articulate for each offender group under consideration: treatment goals, clinical methods, treatment compliance, and treatment response... predictors of treatment response involve cross-situational estimates of adaptive (e.g., attending treatment) and unadaptive (e.g., recidivistic) behavior, confounded by unknown external influences and future availability of treatment resources" (Rogers & Webster, 1989, p. 20).

RISK VARIABLES

R1. Plan Feasibility

0	Community agencies show an interest in assisting individual, and have the required resources. The individual understands the plan and, ideally, has a role in developing it. Family and peers are supportive.
1	Community agencies can provide short-term or partial assistance. Family is ambivalent over providing support, but shows some willingness to assist. Peers are able to provide some support.
2	Community agencies are unwilling (due to patient's behavior) or unable (due to lack of resources) to provide assistance. The patient is apt to have little role in evolving the plan and has little or no involvement with peers and family. Family is unwilling or unable to help the individual maintain a sense of direction, .

Note 1. Assess risk entailed evaluating how suitable, safe and realistic discharge plans were for the individual.

Note 2. Determining plan feasibility entailed assessing how the individual might respond given the existence of a sound remedial plan, and suitable social, vocational, and physical support.

R2. Access

0	The individual is discharged into a controlled environment, where access is monitored carefully. OR the index offence did not involve alcohol, drugs, weapons or victims and these factors are not likely to be important in new surroundings.
1	The individual is placed into a moderately controlled environment (e.g., regular visits to outpatient clinics; closely monitored by probation services); the individual resides in an area where access is relatively difficult AND the index offence involved alcohol, drugs, weapons and/or victims.
2	The individual is placed into an environment where access is made relatively easy and is not monitored (e.g., a downtown rooming house or subsidized hotel) AND the individual stands a good chance of being involved with alcohol, drugs, weapons, and/or victims.

Note 1. The aim was to determine the individual's propensities (based on expressed wishes and anticipated future circumstances), especially in relation to the presence of possible victims, weapons, alcohol and/or street drugs.

R3. Support and Supervision

0	Family, friends and other professionals are available and willing to offer acceptance and emotional support, as well as financial and physical assistance. Non-criminal activities are modelled and encouraged.
1	Some emotional, financial and physical support is available.
2	Little or no availability of emotional, financial or physical support. OR the individual is unwilling to accept support.

Note 1. By this is meant that support and supervision is available from patient, tolerant and encouraging relatives, friends and professionals.

R4. Compliance

0	The individual is motivated to succeed, willing to comply with medication and therapy, and is able to follow rules.
1	The individual shows some motivation to succeed and willingness to comply with medication and therapy. The individual is able to follow rules, but holds some antisocial attitudes.
2	The individual lacks motivation to succeed and willingness to comply with medication and therapy. Or the individual refuses to follow rules.

R5. Stress

0	The individual has healthy, well-adjusted relatives and friends; Employment, where feasible, involves little stress. Financial difficulties are at a minimum; The individual lacks major physical illness and is well-established socially. Integration into the community is carried out in slow, well-planned steps.
1	Conflict in relationships is moderate. Employment is difficult to attain. Financial difficulties. Some illness in self or loved one. Individual can be expected to suffer some stress-induced setbacks in his or her attempts to re-integrate.
2	The individual's personal relationships involve intense conflict. Employment involves high degrees of stress and/or there is little money. The individual or a close friend or relative is, or is likely to become, seriously ill. The individual responds to changing circumstances by embarking on many changes in a short period of time.

Note 1. The amount of stress the individual was likely to undergo in areas relating to family, friends and employment was assessed.

APPENDIX C

FINAL OUTCOME

Subject #: _____

ID #: _____

VIOLENCE

1. Criminal Recidivism (yes=1; no=0): 1. _____
2. Number of Charges Overall: 2. _____
3. Violent (yes=1; no=0): 3. _____
4. Number of Charges for Violence: 4. _____
5. Number of Violent Offenses where charges not laid: 5. _____
6. Severity of Violence (mild=0; mod=1; severe=2) 6. _____
7. Total Violence (# charges for violence plus # of offences for violence with no charges). 7. _____

PSYCHIATRIC

8. Psychiatric Readmissions (yes=1; no=0): 8. _____
9. Number of Admissions: 9. _____
10. Number of months in hospital: 10. _____
11. Total number of months since 1986 admission:
(Code date of release from FPI; If individual is found Guilty and is sentenced directly upon release from the FPI, code the date of release from jail. If actual release date from jail is unknown, estimate the time served (sentence x 2/3). 11. _____

INCARCERATION

12. Number of months sentenced: 12. _____
13. Estimated time served (months sentenced X 2/3): 13. _____

OR (if known): Actual time served: _____

RISK

14. Number of months at risk: 14. _____
(Total months minus months in
jail)

15. Number of months to first psychiatric
readmission*: 15. _____

16. Number of months to first offence*: 16. _____

17. Number of months to first violent act*: 17. _____

*If the individual was released directly from the Forensic Institute, calculate the number of months since the release date to the first readmission or offence.

If the individual was sentenced to serve time immediately upon release from the FPI, calculate the number of months from the actual or estimated release date from jail.

If the individual was found guilty but spent time in the community between his release from the FPI and his jail term, calculate the number of months from the date of the FPI release.

APPENDIX D

HCR-20 Inter-item Correlations

	H1	H2	H3	H4	H5
H1	1.000				
H2	0.053	1.000			
H3	0.183	-0.145	1.000		
H4	-0.103	0.468	0.072	1.000	
H5	0.011	0.415	-0.106	0.312	1.000
H6	-0.052	-0.241	0.069	-0.145	-0.146
H7	0.272	0.358	0.155	0.222	0.145
H8	0.036	0.511	-0.216	0.306	0.280
H9	0.095	0.351	0.075	0.337	0.155
H10	-0.213	0.293	-0.098	0.224	0.155
HTOT	0.190	0.681	0.181	0.601	0.535
C1	0.056	-0.001	0.189	-0.035	-0.002
C2	0.046	0.244	0.049	0.158	0.184
C3	-0.054	-0.211	0.077	-0.088	0.017
C4	0.061	0.171	0.173	0.041	0.241
C5	0.174	0.096	0.224	0.055	-0.009
CTOT	0.079	0.081	0.215	0.036	0.134
R1	-0.146	0.059	0.073	-0.059	-0.008
R2	0.253	-0.036	0.150	-0.003	-0.137
R3	-0.105	0.104	-0.049	0.021	-0.079
R4	-0.014	-0.004	-0.052	-0.127	-0.048
R5	0.099	-0.050	0.105	-0.005	-0.220
RTOT	-0.045	0.060	0.092	-0.060	-0.209
TOT	0.181	0.521	0.256	0.403	0.351

TOT = HCR-20 Total score.

HCR-20 Inter-item Correlations, con't.

	H6	H7	H8	H9	H10
H6	1.000				
H7	-0.410	1.000			
H8	-0.311	0.342	1.000		
H9	-0.357	0.525	0.382	1.000	
H10	-0.057	0.215	0.175	0.341	1.000
HTOT	-0.107	0.593	0.554	0.640	0.546
C1	0.266	0.121	-0.046	-0.105	0.118
C2	-0.160	0.352	0.257	0.279	0.076
C3	0.372	-0.267	-0.280	-0.405	-0.051
C4	-0.011	0.014	0.066	-0.031	-0.035
C5	0.180	0.257	0.141	-0.011	-0.045
CTOT	0.216	0.130	0.028	-0.100	0.018
R1	-0.004	-0.041	0.171	-0.131	0.170
R2	-0.170	0.208	0.051	-0.073	-0.083
R3	-0.073	0.072	0.218	0.033	0.234
R4	0.049	0.060	0.212	-0.090	-0.022
R5	0.201	-0.188	0.017	-0.006	-0.057
RTOT	-0.019	0.061	0.244	-0.104	0.085
TOT	0.022	0.486	0.475	0.362	0.419

	HTOT	C1	C2	C3	C4
HTOT	1.000				
C1	0.137	1.000			
C2	0.323	0.328	1.000		
C3	-0.176	0.205	0.119	1.000	
C4	0.156	0.195	0.452	0.218	1.000
C5	0.216	0.349	0.379	0.170	0.273
CTOT	0.189	0.637	0.703	0.569	0.659
R1	0.021	0.035	-0.057	-0.031	-0.041
R2	0.009	0.103	0.031	0.025	0.076
R3	0.102	-0.069	0.028	-0.177	-0.099
R4	-0.005	0.128	0.148	-0.133	-0.095
R5	-0.035	0.066	-0.042	0.134	0.143
RTOT	0.035	0.101	0.039	-0.066	0.063
TOT	0.785	0.436	0.580	0.139	0.443

HCR-20 Inter-item Correlations, Con't.

	C5	CTOT	R1	R2	R3
C5	1.000				
CTOT	0.650	1.000			
R1	0.096	-0.004	1.000		
R2	0.124	0.108	0.003	1.000	
R3	0.081	-0.082	0.354	-0.086	1.000
R4	0.320	0.157	0.499	0.004	0.213
R5	-0.133	0.060	0.129	-0.020	-0.010
RTOT	0.189	0.091	0.727	0.403	0.518
TOT	0.528	0.648	0.267	0.199	0.207

	R4	R5	RTOT	TOT
R4	1.000			
R5	0.123	1.000		
RTOT	0.660	0.404	1.000	
TOT	0.305	0.157	0.420	1.000

TOT = HCR Total Score

APPENDIX E. HCR-20 Correlations with Violent Outcome Variables

Items	Presence or Absence of Outcome of Violence	Number of Chgs for Violence	Number of Violent Acts, No Charges
Pearson's r			
H1.	-.22*	.13	-.05
H2.	.12	.02	.22*
H3.	.01	.08	-.01
H4.	.24**	-.01	.27**
H5.	.14	.19	.13
H6.	-.17	-.28**	.13
H7.	.13	.22*	-.03
H8.	.16	.06	.14
H9.	.09	.05	.06
H10.	.45***	.15	.13
HTOT	.25**	.14	.23**
C1	-.02	-.05	.15
C2	-.04	-.06	.06
C3	.13	-.09	.17
C4	.07	.05	.15
C5	-.23**	.00	.18
CTOT	-.02	-.05	.22**
R1	.19*	.15	-.13
R2	.06	.19	.06
R3	.02	-.10	-.20*
R4	.02	.24**	-.16
R5	.04	-.14	.09
RTOT	.08	.14	-.08
HCRTOT	.20*	.12	.23**
PCL-R	.20*	.27**	.16
F1	.06	.14	.04
F2	.24**	.20*	.27***
AGE	-.16	.08	-.12

Note. F1 and F2 refer to PCL-R Factor scores; Age refers to age of subject at time of discharge from the FPI. Correlations are for transformed individual HCR-20 items.

H1. Previous Violence	H6. Early Maladjustment	C5. Treatability
H2. Age 1st Offence	H9. Personality Disorder	R1. Plan Feasibility
H3. Relationship Stability	H10. Prior Release Failure	R2. Access
H4. Employment Stability	C1. Insight	R3. Support
H5. Alcohol or Drug Abuse	C2. Attitude	R4. Compliance
H6. Mental Disorder	C3. Symptoms	R5. Stress
H7. Psychopathy	C4. Stability	

HCR-20 Correlations with Violent Outcome Variables

Items	Total Violence	Severity of Violence	Violence in Institution
	Pearson's r		
H1.	.10	-.14	-.09
H2.	.06	.20*	.23**
H3.	.05	-.02	.02
H4.	.04	.32***	.25**
H5.	.18	.28**	.27**
H6.	-.27**	-.08	.19
H7.	.25**	.12	.05
H8.	.10	.21*	.20*
H9.	.07	.06	.14
H10.	.24**	.32***	.19
HTOT	.20	.31***	.35***
C1	-.02	.05	.19
C2	-.06	-.02	.03
C3	-.05	.19	.23**
C4	.04	.22*	.03
C5	-.00	-.12	.07
CTOT	-.03	.11	.18
R1	.12	.03	-.13
R2	.18	.13	-.11
R3	-.06	-.15	-.16
R4	.23**	-.07	-.22**
R5	-.09	-.03	.08
RTOT	.15	-.00	-.16
HCRTOT	.17	.26**	.26**
PCL-R	.31***	.22*	.22**
F1	.20*	.04	.14
F2	.24**	.30***	.26**
AGE	.03	-.23**	-.14

Note. F1 and F2 refer to PCL-R Factor scores; Age refers to age of subject at time of discharge from the FPI. Correlations are for transformed individual HCR-20 items.

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|----------------------------|----------------------------|----------------------|
| H1. Previous Violence | H8. Early Maladjustment | C5. Treatability |
| H2. Age 1st Offence | H9. Personality Disorder | R1. Plan Feasibility |
| H3. Relationship Stability | H10. Prior Release Failure | R2. Access |
| H4. Employment Stability | C1. Insight | R3. Support |
| H5. Alcohol or Drug Abuse | C2. Attitude | R4. Compliance |
| H6. Mental Disorder | C3. Symptoms | R5. Stress |
| H7. Psychopathy | C4. Stability | |

HCR-20 Correlations with Criminal Recidivism

Items	Charges? Y/N	Number of Charges	Incarcerated? Y/N
Pearson's r			
H1.	-.21*	-.08	-.01
H2.	.10	.09	.12
H3.	.03	-.19	-.26**
H4.	.32***	.05	-.10
H5.	.10	.15	.13
H6.	-.19	-.38***	-.22*
H7.	.06	.26**	.17
H8.	.14	.15	.29**
H9.	.09	.19	.22**
H10.	.32***	.31***	.17
HTOT.	.19*	.14	.13
C1.	-.14	-.02	.01
C2.	-.05	.06	.01
C3.	.06	-.15	-.32***
C4.	.02	-.16	-.10
C5.	-.16	-.17	-.15
CTOT	-.07	-.13	-.18
R1.	.22*	.17	.04
R2.	-.06	.05	-.06
R3.	.06	.03	.04
R4.	.04	.25**	.09
R5.	.01	-.20*	-.08
RTOT	.05	-.02	-.03
HCRTOT	.12	.02	-.00
PCL-R	.23**	.26**	.07
F1	.12	.16	.01
F2	.24**	.19	.11
AGE	-.11	-.01	-.21*

Note. F1 and F2 refer to PCL-R Factor scores; Age refers to age of subject at time of discharge from the FPI. Correlations are for transformed individual HCR-20 items.

H1. Previous Violence	H8. Early Maladjustment	C5. Treatability
H2. Age 1st Offence	H9. Personality Disorder	R1. Plan Feasibility
H3. Relationship Stability	H10. Prior Release Failure	R2. Access
H4. Employment Stability	C1. Insight	R3. Support
H5. Alcohol or Drug Abuse	C2. Attitude	R4. Compliance
H6. Mental Disorder	C3. Symptoms	R5. Stress
H7. Psychopathy	C4. Stability	

HCR-20 Correlations with Psychiatric Readmissions

Items	Psychiatric Readmissions? Y/N	Number of Readmissions
Pearson's r		
H1.	-.15	.10
H2.	.22**	.28***
H3.	.02	-.05
H4.	.42***	.30***
H5.	.32***	.15
H6.	.16	.16
H7.	-.06	.17
H8.	.23**	.27**
H9.	.15	.25**
H10.	.23**	.27**
HTOT.	.37***	.43***
C1.	.16	.08
C2.	.10	.08
C3.	.27***	.19*
C4.	.06	.06
C5.	.07	.14
CTOT	.22*	.18
R1.	.01	.06
R2.	-.01	.16
R3.	-.13	-.04
R4.	-.00	.02
R5.	.20*	.28***
RTOT	-.03	.16
HCRTOT	.35***	.45***
PCL-R	.05	.23**
F1	-.08	.10
F2	.22*	.32***
AGE	-.21*	-.19

Note. F1 and F2 refer to PCL-R factor scores; Age refers to age of subject at time of discharge from the FPI. Correlations are for transformed individual HCR-20 items.

H1. Previous Violence	H8. Early Maladjustment	C5. Treatability
H2. Age 1st Offence	H9. Personality Disorder	F1. Plan Feasibility
H3. Relationship Stability	H10. Prior Release Failure	R2. Access
H4. Employment Stability	C1. Insight	R3. Support
H5. Alcohol or Drug Abuse	C2. Attitude	R4. Compliance
H6. Mental Disorder	C3. Symptoms	R5. Stress
H7. Psychopathy	C4. Stability	