

COMPARING RISK ASSESSMENTS
WITH FEMALE AND MALE CIVIL PSYCHIATRIC PATIENTS:
THE UTILITY OF THE HCR-20 AND PCL:SV

by

Tonia Lee Nicholls

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APPROVAL

NAME: Tonia Lee Nicholls
DEGREE: Master of Arts (Psychology)
TITLE OF THESIS: Comparing Risk Assessments with Female and Male Civil
Psychiatric Patients: The Utility of the HCR-20 and PCL:SV.

EXAMINING COMMITTEE:

Chair: Dennis Krebs, Ph.D.

James R. P. Ogloff, J.D., Ph.D.
Professor
Senior Supervisor

Christopher D. Webster, Ph.D., FRSC
Professor

Margaret A. Jackson, Ph.D.
External Examiner
Professor, School of Criminology
Simon Fraser University

Date Approved: _____

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Abstract

The base rate of violence among male and female psychiatric patients is comparable and ranges between 8 - 45%. Civil commitment legislation in most of North America includes a requirement that the individual poses a degree of risk to others. However, there is a dearth of research evaluating the validity of risk assessment measures with civil psychiatric populations and particularly with women. The current study evaluated the predictive utility of three risk assessment schemes in a sample of 279 male and female civil psychiatric patients involuntarily committed to a large provincial psychiatric hospital. The HCR-20, Psychopathy Checklist: Screening Version (PCL:SV), and McNeil and Binder's Screening Tool were evaluated using Receiver Operating Characteristic (ROC) analyses and survival analyses. Consistent with previous research, the base rate of inpatient violence by men and women was nearly identical; however, men were significantly more likely to be violent following community discharge. Unexpectedly, the measures evidenced moderate to strong associations with many forms of violence by women, particularly in the inpatient setting. However, none of the measures demonstrated a strong relationship with physical violence by women during hospitalization or following discharge. The results of this study provide preliminary evidence for the use of the HCR-20 and PCL:SV to assess risk of inpatient and outpatient violence in civil psychiatric populations of men and women; however, it is concluded that there is a need to examine the possibility of developing measures composed of variables that are relevant specifically to the potential for violent behaviour in women.

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Introduction

Risk assessment is "one of the most complex and controversial issues in behavioral science and the law" (Borum, 1996, p. 945). It is a field that has exhibited tremendous growth and development since its inception in the 1960's. The accuracy of the assessment of risk of violence among males has been investigated extensively over the last 30 years. However, several other populations have been relatively ignored in the literature, in particular, male civil psychiatric patients, and civil and forensic samples of women (Monahan, 1995). The glaring omission of female psychiatric patients from risk assessment research prompted this study.

The literature review will begin by considering the ethics and prevalence of risk assessments. The next section will review briefly the well-documented research from the first and second generations of risk assessment research, closing with a commentary on the current state of the science. This is followed by a discussion of the association between mental disorder and violence. Despite the dearth of risk assessment research with women there are a few notable studies that are reviewed in some detail. Finally, a discussion of actuarial and risk assessment schemes and the risk assessment measures used in the current study: the HCR-20 (Webster, Eaves, Douglas, & Wintrup, 1995), PCL:SV (Hart, Cox, & Hare, 1995) and McNeil and Binder's Screening Tool (1994a) will be reviewed. The literature review precedes a statement of the purpose and methods of the current study. The results section will contrast the base rate of violence by male and female patients and review the ability of the noted risk assessment measures to accurately assess risk in men versus women. The thesis will conclude with a discussion of the implications of the research and future directions for risk assessment research with women.

Why Do Risk Assessments?

Through the years the literature has been replete with criticism and conjecture regarding the ethics and utility of conducting risk assessments. There has been, and continues to be, a tremendous amount of controversy surrounding risk assessment research, in particular, the practical and ethical implications of their use. Risk assessments weigh the rights of the individual against the rights of the community. Essentially it is a balancing act, an attempt to maintain an acceptable equilibrium between infringing unjustly on the rights of the individual to be protected from unfair detainment and punishment, and to simultaneously protect society from the potential threat of violent offenders (Webster, Harris, Rice, Cormier, & Quinsey, 1994). Risk assessments are currently used in the courts, and in forensic, psychiatric, and penal settings. The criminal justice system and mental health laws rely extensively on risk assessments (e.g., parole release decisions, probation/incarceration determinations, transfer to adult court hearings, civil commitment, criminal and civil release reviews, and dangerous offender hearings) (see Douglas & Webster, in press). The dependence on these assessments exists in spite of pronounced public concern regarding the ability of psychiatrists and psychologists to accurately assess risk of future violence.

Gottredson (1987) noted that despite the pessimism surrounding our ability to accurately assess violence risk, “a variety of justice system and mental health system functionaries are *required* to make them” (p. 71, original emphasis). Accordingly, a search for ways to make these judgments more effectively and efficiently remains necessary. Based on the modest improvements in the second generation of research (to be discussed below), and a recognition that it is unlikely that the demand for risk assessments will be reduced substantially in the near future, the focus of

research should be to determine what variables contribute to the most accurate assessments, particularly with those populations that have been overlooked to date. Our goal should be to provide the criminal justice system with as much information as possible about an individual's risk for violence (Webster et al., 1994) and with guidance as to how the information should be used.

The First and Second Generations of Research

The first generation. The initial research investigating the predictability of dangerousness produced disappointing results (see Kozol, Boucher, & Garofalo, 1972; Monahan, 1981). Early studies in the area indicated that large numbers of individuals were being assessed as high risk when, in fact, they did not go on to engage in violence (i.e., high false positive rates) (Steadman & Cocozza, 1974; Thornberry & Jacoby, 1979).

The historic review by Monahan (1981) painted a discouraging picture of the ability of clinicians to "predict," with any accuracy above chance, the likelihood of an individual's future violent behaviour. In the early 1970's, a small group of approximately five studies seemingly demonstrated that the ability to predict dangerousness was dismally low, such that clinicians were twice as likely to be wrong as they were to be right in their positive assessment (i.e., the individual was assessed to be at risk of future violence) of a psychiatric patient's violence risk (Lidz, Mulvey, & Gardner, 1993; Monahan, 1984). As Monahan eloquently stated, "Dark clouds began to form in our crystal balls" (p.10).

Monahan's review as of 1981 (see also, 1984, 1988) described the current state of the science. At the time, positive assessments of risk were estimated to be approximately 30% accurate (i.e., for every three individuals assessed as violent one will subsequently be involved in a violent act and two will not). Secondly, the same variables that were considered to be the best

predictors of violence among non-disordered offenders were similarly noted to be predictive of violent behaviour among mentally disordered offenders (e.g., age, gender, social class, and history of prior violence). Thirdly, Monahan concluded that diagnosis and severity of mental disorder or personality characteristics are the weakest predictors of violence among the mentally disordered population. In 1982, Monahan proposed that research on dangerousness was at a turning point; the time had come for the “first generation” to give way to the “second generation.”

The second generation. The next 15 years saw a more positive climate emerge in risk assessment research (Monahan, 1984). The research that followed Monahan’s review has been described as improved methodologically and noted to have resulted in a “small but notable” increase in the accuracy of assessments of risk (Webster, et al., 1997a, p. 3). Otto’s (1992) review concluded that at least one--in--two short-term predictions are accurate, a substantial improvement from the one--in--three long-term predictions noted by Monahan (1981) in the first generation. Otto cautioned, however, that inaccuracies were still common, and that false positives still constituted the most common error “even under the best circumstances” (i.e., “well-informed, short-term predictions of broadly defined dangerous behavior in settings similar to those in which the predictee is likely to operate” (p. 128). Although there was still little known about the accuracy of violence predictions, Monahan (1984) proposed that it was possible that they may be accurate enough to offer something of value. However, he criticized the scope of the research to date, suggesting that researchers extend their studies to include populations other than males with a history of violence. To summarize, the second generation of research seemed to suggest that there was reason to have a “guarded optimism” (Monahan, 1984, p. 11) regarding the utility of risk assessments, but the field continued to face several challenges.

Spanning the generations. More recently, Mossman (1994a) reviewed 58 data sets (from 44 separate studies) spanning the last two decades and the first and second generations of research. He concluded that: (1) Clinicians have a “modest, better-than-chance” (p. 790) ability to accurately predict violence risk, noting that 81% of predictions were significantly better than chance. (2) The second generation evidenced an improvement in predictive accuracy with 95% of studies since 1986 demonstrating predictions significantly better than chance compared to just 72% of the studies conducted prior to 1986. (3) Short-term and long-term predictions were found not to differ significantly in accuracy; and (4) Past behaviour was noted to be a robust predictor of future violence risk.

To summarize, there appears to be a growing consensus in the literature that risk assessments can be done with increasing reliability (see Lidz, et al., 1993; Monahan & Steadman, 1994; Mossman, 1994a; Menzies & Webster, 1995; Otto, 1992). “Most (researchers) suggest that mental health professionals have at least a modest ability to predict violence and that their predictions are significantly more accurate than chance” (Borum, 1996, p. 946). In general, the literature seems to support Monahan’s (1984) guarded optimism (p. 11; see Webster et al., 1995). The next section provides a discussion of the relationship between mental disorder and violence.

The Association Between Mental Disorder and Violence

The results of research documenting the relationship between mental disorder and violent behaviour have been mixed. Historically, mental illness was associated with unpredictability, dangerousness, and violence (Lidz, Mulvey, & Gardner, 1993; Russo, 1994; Steadman, 1983). Monahan (1988) noted that the notion that mental disorder increases an individual’s potential for violence has been a convention in mental health, law, and policy since Roman law. Specifically,

the mentally ill were thought to have a predisposition toward crimes that were violent and/or sexual in nature (Russo, 1994).

Mulvey (1994) noted that during the 1980's and early 1990's it was generally accepted, based on the research findings then available, that mentally ill individuals were no more likely to engage in violent behaviour than individuals from the general population. At that time, social scientists had generally concluded that once variables such as "drug abuse, poverty, gender, age, and victimization were taken into account" (Borum, 1996, p. 946), mental illness did not have a significant relationship with violent behaviour. As evidence of the lack of a relationship between mental disorder and aggressive tendencies, Monahan and Steadman (1983) conducted a thorough review of the link between crime and mental disorder and concluded that controlling for demographic factors resulted in a lack of evidence for any relationship between crime and mental illness.

Despite inconsistencies over the years, epidemiological studies (see Link, Andrews, & Cullen, 1992; Swanson, 1994; Swanson, Holzer, & Ganju, 1990) in the early 1990's began to cast doubt on the assumption that mental disorder was not associated with violent behaviour. These studies fostered a renewed interest in the relationship between mental disorder and violence (Mulvey, 1994). In addition, reviews by prominent members of the academic community (see Monahan, 1992; Mulvey, 1994; Otto, 1992) have come to convergent opinions regarding the likely relationship between mental disorder and violence. The research to date supports the following conclusions:

There is a significant relationship even after controlling for demographics. Mulvey (1994) stated that there is likely a significant relationship between psychiatric illnesses and

violence even after controlling for demographic variables. Monahan (1996a) also noted that although demographic factors such as age and gender are good predictors of violence in the general population, the identification of symptoms such as hostility and delusions are more likely to reliably predict violence in a mentally ill population.

The link is likely the result of current psychotic symptoms. Monahan (1996a) elaborated on the relationship between mental illness and violence, noting that it is “not based on a diagnosis of mental illness but on current psychotic symptoms” (p. 1). Mulvey (1994) similarly reported that the association between mental illness and violence is probably best characterized as a dynamic one. Specifically, Mulvey (1994) stated that active symptoms, as opposed to the presence of a mental disorder, are likely associated with an elevated risk of aggressive behaviour. Webster and colleagues (1995) further clarified the relationship between mental illness and violence, stating that “There is little in the literature to indicate that any DSM-IV condition is strongly and almost invariably associated with violent conduct” (p. 6). Webster and colleagues also pointed out that although it is not a DSM-IV diagnosis, psychopathy has been found to be reliably associated with future violence (see Harris, Rice, & Cormier, 1991; Hart, Kropp, & Hare, 1988; Serin et al., 1990; Serin & Amos, 1993).

Most mentally ill individuals are not violent. Importantly, Monahan (1992) and Mulvey (1994) acknowledged that the relationship between mental illness and violence is likely a small one. Although research indicates that there is a statistically significant relationship between mental disorder and violence (Monahan, 1992, 1996a), it is important to keep in mind that the relationship is likely a modest one (Monahan, 1996a). Monahan (1992) emphasized that the implications for mental health law and policy, and the treatment of mentally ill individuals should

not, and need not, be adversely affected by a recognition that there is a relationship between mental illness and violence. However, in terms of improving the accuracy of risk assessments, it is important to note that although the association may be weak (Monahan, 1992), and most psychiatric patients are not violent (Binder & McNiel, 1990), it currently is believed that the relationship between actively disturbed psychiatric patients and violence is consistent (Monahan, 1991; Swanson, 1996).

To summarize, there appears to be a consensus that there is a small but reliable relationship between mental illness and violence. Currently, researchers tend to agree that mental illness is a modest but stable risk factor for violence. However, this relationship is noted to be a reflection of current psychotic symptoms and most research seems to indicate that a psychiatric diagnosis, in and of itself, is not predictive of violent behaviour. In conclusion, the research suggests that it would be irresponsible to ignore this relationship when assessing an individual's risk of violence. As Monahan (1992) noted, "Denying that mental disorder and violence may be in any way associated is disingenuous and ultimately counterproductive" (p. 511).

Risk Assessment Research with Women and Female Psychiatric Populations

The renewed interest in the relationship between mental illness and violence has prompted researchers to evaluate the accuracy of assessments of risk with mentally disordered men and women. This section reviews the sparse risk assessment research conducted with women and specifically with female psychiatric patients. The base rate of violent behaviour committed by female versus male civil psychiatric patients, the current level of accuracy in risk assessments with males versus females, and the hypothesized moderating effect of setting (hospital vs. community) on the relationship between gender and violence will be discussed.

Female psychiatric patients have been virtually ignored in the risk assessment literature. Not surprisingly, much of the research to date has been conducted with samples of males with a history of violence (e.g., correctional inmates or forensic psychiatric patients). Therefore, the development and validation of measures commonly used to assess risk of violence, such as the Risk Assessment Guide (Harris, Rice, & Cormier, 1993)/Violence Risk Appraisal Guide (Rice & Harris, 1995), the PCL (Hare, 1980)/PCL-R (Hare, 1991)/PCL:SV (Hart, et al., 1995), and the HCR-20 (version 1) (Webster, et al., 1995)/HCR-20 (version 2) (Webster, Douglas, Eaves, & Hart, 1997) has been based on research conducted with samples of males, and primarily males with a history of violence. This oversight is particularly disconcerting given that approximately 40% of hospitalized psychiatric patients in British Columbia are women (Riverview Hospital clinical records, personal communication, January 7, 1996; see also Statistics Canada, 1995), and 15-49% of psychiatric patients are violent (Binder & McNeil, 1990; Lidz et al., 1993; Swanson, 1996). Mulvey (1994) noted that the "level of violence in samples of disordered individuals in the community varies widely, from 8% to about 45%, depending on the definitions of disorder and violence used" (p. 664). In addition, the limited research that has addressed the accuracy of predicting violence in women has demonstrated that our ability to assess risk in this population is not better than chance (Coontz, Lidz, & Mulvey, 1994; Lidz et al., 1993). This deficit in knowledge exists despite the fact that current research suggests that there is not a significant difference in the base rate of violence committed by male and female psychiatric inpatients (Binder & McNeil, 1990; Klassen, 1996; Lidz et al., 1993, McNeil, Binder, & Greenfield, 1988).

Underestimated risk. It is widely accepted that the base rate of violence in the general population is much higher for men than for women (Archer, 1994; Browne, 1994; Correctional

Service of Canada, 1993; Statistics Canada, 1995). However, the limited research that has addressed the accuracy of predicting violence in mentally disordered women has demonstrated that female psychiatric patients present a risk of violence equivalent to male psychiatric patients (Lidz et al., 1993; Steadman, et al., 1994). For example, two early studies conducted outside of North America investigating inpatient violence by psychiatric patients reported that female schizophrenic patients committed a disproportionate amount of violence (Cooper, Browne, McLean, & King, 1983; Fottrell, 1980). More recent research conducted in the United States and Canada has consistently reported comparable rates of inpatient violence by men and women and there is conflicting evidence regarding the base rate of outpatient violence by the sexes. These studies have also noted that clinicians typically underestimate the risk of violence presented by women.

Lidz et al. (1993) sampled 357 civil psychiatric patients from a large university based hospital. Patients predicted to be violent were matched by sex, age, race, and admission status (i.e., committed/not committed) with patients predicted to be nonviolent. The purpose of this study was to assess the ability of clinicians to predict the likelihood that a patient would engage in violence over a six month period. This study attempted to rectify some of the methodological problems the authors noted in previous risk assessment research with psychiatric patients. For example, to provide optimal accuracy in the measurement of clinical judgment and patient violence, Lidz and colleagues interviewed clinicians regarding their predictions, and patients and collaterals regarding patient violence, in addition to accessing official records.

The results of the Lidz et al. (1993) study indicated that despite the fact that there was not a significant difference in the rate of violence among male and female patients, clinicians predicted

that only 22% of females would be violent, compared to 45% of the males they assessed (Lidz et al., 1993). In fact, contrary to the predictions of the clinicians, the results indicated that women (49%) were actually involved in more violent incidents than men (42%). As noted, the risk assessments by clinicians vastly underestimated the risk of violence among female patients, and slightly overestimated the risk of violence among male patients. Violence assessments of male patients had *sensitivity* (the probability that the test will give a positive result when the patient has the condition, or the number of true positives) and *specificity* (the probability that the test will give a negative result when the patient does not have the condition, or the number of true negatives) rates of 63% and 60%, respectively, values that differ significantly from chance (50%) (see Mossman & Somoza, 1991b for a discussion of sensitivity and specificity). In contrast, sensitivity and specificity were 54% and 53% respectively, for predictions with the female patients, values that do not differ significantly from chance. The discrepancies in clinicians' predictions and the actual rate of violence among women, in addition to the low specificity and sensitivity rates, led Lidz and his colleagues to conclude that although clinicians are above chance in predicting violence with male patients, overall accuracy was "modest," and not better than chance with female patients.

The hypothesized moderating effect of setting. In another study comparing the validity of risk assessments between male and female civil psychiatric patients, McNiel and colleagues (1988) evaluated the relationship between community and hospital violence. Of 238 involuntarily hospitalized patients, they found that 22.3% had engaged in attacks on persons in the two weeks prior to hospitalization, and 18.1% engaged in attacks on persons in the first 72 hours after admission. The results demonstrated a significant positive relationship between violence in the

community and violence in the hospital. A direct discriminant function analysis found that the variable that contributed the most to distinguishing between patients who did and did not engage in violence in hospital, was whether the patient had been violent during the two week pre-admission period. This study suggests that individuals who are violent in the community are also more likely to be violent in the hospital. However, a follow-up study by the same researchers (Binder & McNiel, 1990), to be discussed below, demonstrated that setting may moderate the relationship between sex and violence.

In light of the results of their 1988 study, Binder and McNiel (1990) conducted the first study to examine if the relationship between an individual's sex and their base rate of violence is moderated by setting. Based on file reviews of a sample of 253 patients in a locked psychiatric unit (this study used almost the identical sample as the 1988 study), Binder and McNiel evaluated two groups of patients prior to and during hospitalization. A patient's sex was found to be significantly associated with violent behaviour both in the community and in the hospital; however, the direction of the relationship between gender and violence reversed as a function of the setting. Two weeks prior to hospitalization, 39.6% of female psychiatric patients and 60.4% of male psychiatric patients were physically violent. In contrast, during the first three days after admission, 59.1% of the female patients were physically violent in comparison to 40.9% of the male patients. Controlling for demographic variables and diagnosis, the results remained consistent. Thus, Binder and McNiel concluded that the setting in which violence occurs may be an important factor for predicting risk, possibly moderating the relationship between gender and violence.

Binder and McNiel (1990) proposed that inconsistent results in prior research examining the relationship between gender and violence could be attributed, at least in part, to the moderating effect of setting. In addressing the higher rate of violence among male patients prior to hospitalization, Binder and McNiel suggested that genetic and cultural factors might influence violent behaviour. They also noted that males in the general population are more likely to be assaultive and commit violent crimes. Therefore, they argued that it is not surprising that male patients are more violent in the community than female patients. The fact that female patients engaged in more physical violence while in hospital is more difficult to address theoretically. Less strict adherence by female psychiatric patients to gender roles while in hospital and staff expectations were offered as possible explanations for higher rates of physical violence by female patients than male patients in hospital. The following section will examine the effect of gender biases on the reliability of risk assessments.

Systematic gender biases. Research has consistently demonstrated that gender affects clinical assessments (Coontz et al., 1994). Inaccuracies in predicting violence risk among patients appear to be, at least in part, attributable to systematic biases in hospital staffs' gender expectations related to violence, with predictions underestimating risk in mentally disordered women by over 50%, and slightly overestimating risk in men (Binder & McNiel, 1990; Coontz et al., 1994; Lidz et al., 1993).

In a study assessing the influence of gender on assessments of risk of violence by psychiatric professionals, Coontz et al. (1994) investigated a subsample (72.6% male, 27.4% female) of individuals who were involved in a violent incident in the 72 hours prior to presenting at the emergency room of a university psychiatric hospital. Of the 62 cases, 56.5% of the

individuals were committed, generally for short periods. Prior to evaluating the relationship between gender and violence assessment in the subsample of patients with a recent history of violence, Coontz and colleagues calculated the proportion of all initial assessment interviews (N = 417) that contained no reference to violence. In general, the results of this study indicated that it is rare for clinicians *not* to bring up the subject of violence; however, a complete lack of discussion of violence is significantly more common when the clinician is interviewing a female (22.4%), than a male patient (14.8%). There was no significant difference between male and female patients in terms of who initiated a discussion of violence in the interview (i.e., the clinician or the patient). Similarly, there was not a significant difference in terms of when the subject of violence came up in the interview. The results clearly suggest that violence is raised significantly more frequently (approximately twice as often) with male than female patients, even in a subsample of individuals who had very recently been involved in violence. The authors summarized their results by stating that although gender does not appear to influence disposition (i.e., commitment, admission, or release), “gender norms guide the assessment process” and influence “how commitment decisions are made” (p. 375). Coontz and colleagues proposed that the difference in risk assessments for males and females is evidenced in the discrepancies between predictions and outcome (i.e., overestimations of risk for males, and underestimations of risk for females).

To summarize, there is a lack of research evaluating the reliability and validity of risk assessments in populations of women. A review of the sparse research to date indicates that despite comparable base rates of violence by men and women in psychiatric inpatient facilities, clinical-based assessments of risk of violence (i.e., assessments that are not guided by actuarial or

risk assessment schemes) with women are no more reliable than chance. The risk of violence posed by female psychiatric patients is comparable to that of male psychiatric patients, but preliminary research suggests that the relationship between sex and violence within mentally disordered populations may be moderated by setting. That is to say that women may be less likely to engage in violence in the community than males, but may engage in comparable or slightly greater rates of violence as inpatients. Interestingly, there is a high rate of false negative errors (underestimation) in risk assessments with women, in direct contrast to the high rate of false positive errors (overestimations) found in risk assessments with males. This finding suggests that systematic gender biases may affect the reliability of risk assessments. As noted, the above conclusions are based on the literature investigating clinical-based assessments of risk. The following section will discuss the advantages and disadvantages of *actuarial* risk assessment measures and risk assessment *schemes* that are structured to guide clinical assessments while taking into account historical and clinical variables found to be appreciably related to future violence.

“Actuarial Risk Assessment Measures” and “Risk Assessment Schemes”

Progress in risk assessment research can be attributed in large part to the development of actuarial prediction schemes (e.g., Hall, 1987; Kropp, Hart, Webster, & Eaves, 1994; Webster et al., 1994, 1995). Actuarial risk assessment schemes make use of “static” (i.e., unchanging) risk factors that are empirically related to violent behaviour (i.e., variables that have been proven through research to increase validity in risk assessments are weighted according to their capacity to add predictive information) (Serin, 1996). Actuarial measures have been found to appreciably increase the accuracy of assessments (see Dawes, Faust, & Meehl, 1989; Gardner, Lidz, Mulvey,

& Shaw, 1996; Monahan & Steadman, 1994; Otto, 1992, Webster et al., 1994, 1995). Actuarial measures make use of statistical probabilities that increase the accuracy of risk assessments. They also have pragmatic benefits. For example, they allow assessments to be framed in terms of probabilities for a select group rather than dichotomous distinctions for an individual (Serin, 1996). Because they are standardized, risk assessment schemes reportedly ensure that important points of consideration are not neglected (Borum, 1996; Webster et al., 1995). In addition to increasing the reliability and validity of assessments, standardized judgments increase the ease and precision of communications regarding risk assessments (Borum, 1996).

As noted, actuarial tools have been identified as having a number of strengths; however, researchers have also expressed some concerns regarding the use of these measures. For example, Serin (1996) criticized actuarial tools, arguing that they rely too heavily on static information, to the detriment of taking into account potential changes (e.g., in the individual, or the individual's life circumstances). In a similar vein, researchers have suggested that assessments should be comprised of actuarial *and* clinical measures, but that the standardized actuarial component should not be overshadowed by the clinical opinion (Webster et al., 1995; see also, Borum, 1996; Monahan, 1981; Mulvey & Lidz, 1984; Webster, Harris, Rice, Cormier, & Quinsey, 1994). In practice though, clinical prediction alone is still used more frequently than actuarial assessments or measures that combine actuarial and clinical techniques (Gardner et al., 1996). The two measures that are the primary focus of the current research are the PCL:SV and the HCR-20, both of these schemes, unlike strictly defined actuarial risk scales, have the advantage of implementing historical and clinical items in their assessment of risk. The third measure is McNiel and Binder's Screening Tool (1994a) which is perhaps most accurately

described as an actuarial instrument. The next section describes the measures used in the present study. The goal is to provide the reader with a brief description of the development of the tools, a concise explanation of the items and scoring, and a succinct review of the research conducted to date using the measures.

The Psychopathy Checklist-Screening Version (PCL:SV)

The assessment and diagnosis of psychopathy is a fairly recent trend (Hare, 1996), originating with the ground-breaking work of Cleckley (1941) and Hare (1980). Hare first operationalized the construct of psychopathy in the Psychopathy Checklist (PCL; Hare, 1980). The original PCL was a 22-item scale; revisions resulted in the 20-item PCL-R (Psychopathy Checklist-Revised; Hare, 1991). The PCL-R is a scale designed to rate psychopathy in forensic samples of males (Hare, 1991). The goal of the PCL-R was to operationalize the measures used in assessing psychopathy, and to provide a psychometrically sound measure for use across researchers and studies (Hare, 1991). The PCL-R considers a combination of personality characteristics and behaviours that reflect psychopathic traits (Forth, Brown, Hart, & Hare, 1996). Based on a dimensional score (range = 0 - 40; cutoff score of ≥ 30 classified as psychopathic), the checklist determines the degree to which an individual matches the "typical psychopath" (Hare, 1991).

Despite the fact that they were designed to measure psychopathy, and not as risk measures per se, the PCL (Hare, 1980) and the PCL-R (Hare, 1991) have proven to be the most reliable predictors of violent risk. Studies (to be discussed below) in samples of male prisoners and forensic populations have provided evidence of this measure's high interrater reliability (Hare, 1991).

The PCL-R is recognized as leading the field of risk assessment (Fulero, 1995; Serin & Amos, 1995); however, it requires several hours to complete—often unrealistic for research and clinical use (Hare, 1996). Acknowledging a need, Hare and his colleagues produced a brief screening version of the PCL-R. The PCL:SV (Psychopathy Checklist Screening Version; Hart, Cox, & Hare, 1995) was designed for use in civil and forensic populations. The authors described the purpose of the PCL:SV as twofold: “to screen for psychopathy in forensic settings and to assess and diagnose psychopathy outside forensic settings” (Hart et al., 1995, p. 1). Forth et al. (1996), described the PCL:SV as useful for assessments in non-criminal samples because it relies on less detailed information, requires less time to administer, and does not include any items that are specific to individuals with a criminal history.

Factor analyses of the PCL and PCL-R have demonstrated consistently that psychopathy includes two highly correlated factors composed of interpersonal/affective characteristics and antisocial/behavioural characteristics (Forth, et al., 1996). Accordingly, the PCL:SV is also composed of two factors that account for the two facets of psychopathy (Hart et al., 1995). The PCL:SV is a 12-item tool that uses the same scoring protocol as the two previous PCL measures. The first six items comprise Factor 1 which is composed of affective/interpersonal items (superficiality, grandiosity, manipulativeness, lack of remorse, empathy, and responsibility). Factor 2 measures social deviance and antisocial behaviour (impulsivity, poor behaviour controls, lack of goals, irresponsibility, and adolescent and adult antisocial behaviour). The items are scored on a three-point scale: 0 (*does not apply*), 1 (*item applies in some respects*), or 2 (*item definitely applies*). Items are omitted only in the absence of adequate information when absolutely necessary (Hare, 1991), and subtotals and the total score are subsequently prorated.

Possible scores range from 0 to 24, with scores ≥ 18 considered diagnostic of psychopathy. The PCL:SV has good validity as a screening test (Hart et al., 1995). As a screening tool, it makes virtually no false negative errors (Hart et al., 1995) and is typically used to identify individuals who should subsequently be re-evaluated using the PCL-R.

Psychopathy as a risk marker for violence

Psychopathy as measured by the PCL (PCL-R and PCL:SV) has been noted to be reliably associated with violence in correctional samples (Hart, Kropp, & Hare, 1988; Serin, 1996; Serin & Amos, 1995; Serin, Peters, & Barbaree, 1990). Research suggests that psychopathy is also reliably associated with violence in forensic psychiatric samples (Harris, Rice, Cormier, 1991; Harris, Rice, & Quinsey, 1993; Quinsey, Rice, & Harris, 1994).

Harris and colleagues (1991) assessed the relationship between psychopathy as measured by the PCL and violent recidivism in a sample of 169 male mentally disordered offenders. The subjects were patients released from a maximum security mental hospital over an average of ten years. Patients had been involved in a therapeutic program for at least two years. Many of the individuals had been found not guilty by reason of insanity (57%) and most were serious, dangerous offenders (“85% had a violent previous offence, a violent index offence, or both”) (Harris, et al., 1991, p. 627). The base rate of violence was 40% ($n = 67$). Using a liberal criterion of 25 on the PCL for identification as a psychopath Harris and colleagues found that 31% of the sample was classified as psychopathic. Psychopaths were noted to demonstrate elevated rates of violent recidivism (77%, i.e., 40 of 52 individuals with scores ≥ 25) compared to the nonpsychopaths (21%, i.e., 24 of 114 individuals with scores < 25).

In a similar study, Serin and Amos (1995) assessed the relationship between psychopathy (as measured by the PCL-R) and violent recidivism in a prospective study of 300 male federal offenders. Community follow-up was conducted over an average period of 5.5 years. PCL-R total scores were noted to have a linear relationship with violent recidivism (i.e., individuals with higher scores had higher rates of violent recidivism). Defining groups as nonpsychopaths (PCL-R total score <17), mixed (PCL-R total score between 18 and 28), and psychopaths (PCL-R total score >29), it was reported that psychopaths failed (i.e., violently recidivated) at five times the rate of nonpsychopaths. Although the base rate of violent recidivism in the population was low (17%), the rate of violent recidivism among non-psychopaths was 5% and among psychopaths was 25%. Serin and Amos found that the PCL-R correctly classified 80% of offenders.

In another correctional sample Serin (1996) compared the predictive validity of the PCL-R with three other actuarial risk scales in 81 male offenders released from minimum and medium security institutions. Follow-up was conducted for an average of 30 months in the community. Psychopaths (PCL-R total ≥ 29) were noted to fail sooner, and at higher rates than nonpsychopaths (PCL-R total $= \leq 16$) and the mixed group (PCL-R = 17-28). Results supported previous research, indicating that the PCL-R had high predictive efficiency with recidivism and violent recidivism. The PCL-R was noted to produce the most correct decisions (60.5%), to have a very high false negative rate (35.8%), and a very low false positive rate (3.7%). The PCL-R yielded significant correlations with both recidivism ($r = .31, p < .01$) and violent recidivism ($r = .28, p < .01$). Relative Improvement Over Chance (RIOCI) scores also indicated that the PCL-R was superior to the other three measures in terms of predictive efficiency for general recidivism (RIOCI = 65%, $\phi = .33, p < .01$) and for violent recidivism (RIOCI = 50%, $\phi = .29, p < .01$). Serin

conducted a hierarchical regression entering the PCL-R then the number of prior violent convictions. The number of prior violent convictions did not significantly improve the relationship with violent recidivism. Hierarchical regression analyses yielded interesting results regarding the factor structure of the PCL-R. Controlling for Factor 2, Factor 1 was noted to be significantly, and only, related to violent recidivism ($F(1, 74) = 3.97, p < .05$) and Factor 2 was significantly, and only, related to general recidivism ($F(1, 74) = 8.25, p < .005$).

As can be seen from the above concise review of the literature documenting the relationship between the psychopathy and violence, a great deal of our understanding of psychopathy is the result of research with incarcerated individuals (Forth et al., 1996). In addition, most of the research documenting the utility of the PCL and PCL-R resulted from studies with Caucasian males (Hare, 1991). The PCL-R has been used with few samples of female offenders (Hare, 1991) and apparently even fewer samples of non-criminal females (Forth et al., 1996). Hare (1991) stated that "Thus far, it appears that the distribution of scores and reliability (with females) are comparable with those in male samples" (p. 31). The following section will review the research that has been conducted using the PCL-R and PCL:SV with women.

Psychopathy and violence among women. Forth, Brown, Hart, & Hare (1996) noted that "Virtually all the published information on the PCL-R has been on prisoners" (p. 533) and it is only with the recent development of the PCL:SV that research in non-criminal populations has become a real option. However, Forth and her colleagues noted that even with the advent of the screening version of the PCL-R, a large scale evaluation of the reliability and validity of the measure using 10 samples ($N = 520$) from a combination of forensic/nonpsychiatric;

forensic/psychiatric; civil/psychiatric; and civil/nonpsychiatric samples made limited use of non-criminal populations (see Hart, Hare, & Forth, 1994). In addition, Forth and colleagues noted that despite a total sample of 373 males and 177 females, separate analyses for men and women were not conducted.

Given the deficit of research, Forth and her colleagues (1996) conducted the first study to evaluate the construct of psychopathy in female noncriminals. The sample was composed of 75 male and 75 female university students from three separate studies. The goals of the study were to: (1) Assess the validity of the PCL:SV in a large civil nonpsychiatric sample; and (2) Examine the reliability and validity of the construct of psychopathy in non-criminal females. The authors predicted that the base rate of psychopathy would likely be very low in community samples of noncriminals. They also hypothesized that females would obtain lower scores on items of the PCL:SV that are designed to measure behavioural characteristics, but that there would be no significant difference between men's and women's scores on items measuring affective/interpersonal characteristics.

Consistent with prior reported findings (Hart et al., 1994) the base rate of psychopathy (i.e., the proportion of individuals with PCL:SV total scores of 18 or greater) in this nonforensic sample was very low (1.03%; $n = 2$). Results also suggested that, in general, males receive significantly higher scores than females on Factor 1, Factor 2, and the PCL:SV total score. The only two participants meeting the diagnostic cutoff score for psychopathy were both male. Forth and colleagues also reported significant correlations between gender and each of the PCL:SV total, Factor 1, and Factor 2 scores. Results indicated that the PCL:SV is a valid measure of psychopathy for males and females in non-criminal populations.

Salekin, Rogers, and Sewell (1997) noted that “few studies have examined the applicability of psychopathy to women” (p. 7). One of the goals of their study was to evaluate the relationship between psychopathy (PCL-R) and violence. Salekin and colleagues found that the prevalence of psychopathy, even in a sample of female inmates, was low compared to research with male samples (see Hare, 1991). The results indicated that 15.5% (n = 16) of the female inmates met the standard cutoff of 29 as compared to the typical 25% to 30% prevalence reported for male correctional samples. The rates and severity of symptoms were noted to be lower than is typically found with male populations. Surprisingly, the factor scores and the total score of the PCL-R were not significantly correlated with criterion measures (i.e., correctional staff ratings of violence, verbal aggression, non-compliance, manipulativeness, and lack of remorse). Another interesting finding in this study was that although the factor structure of the PCL-R remained consistent, with Factor 1 remaining personality-based and Factor 2 remaining behaviour-based, the items that loaded on these two dimensions were unique compared with what has been found with male samples. Salekin and colleagues (1997) concluded that further research should examine the appropriate criteria and factor structure for female psychopathy. They also recommended that future studies examine the relationship between female psychopathy and risk of violence. It should be noted that the criterion measures used in this study were measures of institutional violence, which makes it difficult to draw direct comparisons with PCL (PCL-R, PCL:SV) data from male samples which has traditionally looked at post-release violence. The authors suggested that future studies in samples of female inmates should evaluate the relationship between PCL-R scores and violence following release into the community.

A small scale study by Klassen (1996) evaluated the "H" scale of the HCR-20 and specifically one of its items, the PCL:SV, in a sample of 50 men (n = 34, 68%) and women (n = 16, 32%) consecutively admitted to the ICU of a large provincial psychiatric hospital. Inpatient violence was measured by the Overt Aggression Scale (Yudofsky, Silver, Jackson, Endicott, & Williams, 1986). Similar to the results of the Forth et al. (1996) study, women were found to have significantly lower scores than men on the PCL:SV and the "H" scale, despite the fact that the base rate of violence was comparable for men and women. Sex was found to be a significant covariate in almost every analysis. Not surprisingly, this civil psychiatric population was found to be generally non-psychopathic according to their PCL:SV scores. Cronbach's alpha, used to measure the internal consistency of the PCL:SV, ranged from .77 for Factor 2, to .82 for Factor 1, and .86 for the PCL:SV total. In general, the PCL:SV was noted to have moderate predictive power in this sample ($r = .26$).

The HCR-20

Webster and his colleagues (1995) noted a lag between clinical acceptance/use and experimental advancement in risk assessment research. In an attempt to bridge the gap between research on violence risk assessment and clinical practice, Webster and his colleagues (1995) developed the HCR-20. The HCR-20 is a relatively new, but promising, risk assessment scheme designed specifically for use with individuals who present with evidence of a mental illness, or severe personality disorder, and who have a history of violence. The scheme was intended for use across psychiatric and forensic, inpatient and outpatient settings. The multiple goals of the scheme have been to provide accessibility, scientific integrity, testability, administrative feasibility, and efficiency, to risk assessment research and the clinical practice of assessing risk of future

violence (Webster et al., 1995). The guide provides historical variables with greater weight than clinical items based on empirical research, as noted above, which suggests that actuarial statistical assessments are generally superior to clinical judgment. The authors also noted that demographic characteristics have been found to be statistically valid predictors of violent outcome.

The "HCR-20" was named for the measure's 10 historical, five clinical, and five risk variables. The historical variables include: previous violence, age at first offence, relationship and employment stability, substance abuse, mental and personality disorder(s), psychopathy, early maladjustment, and prior release or detention failure. The clinical items include: insight, attitude, symptoms, stability, and treatability. Plan feasibility, access, support and supervision, compliance, and stress compose the risk factors. The 20 items are scored on a three-point scale designed with the Psychopathy Checklist in mind (PCL; Hare, 1991). Items are scored as 0 (available information *contraindicates* the presence of the quality or condition), 1 (available information *suggests* the presence of the quality or condition), or 2 (available information *clearly indicates* the presence of the quality or condition). A N/K ("not known") category is included for use when the category is irrelevant, or there is not sufficient information available to make an informed assessment. The authors suggest that this category be used sparingly. Each item has a maximum score of 2, and the measure has a total maximum score of 40. Again, similar to the PCL (Hare, 1991), an individual with a total score of ≥ 30 is considered to present a substantial risk of violence (Webster et al., 1995).

The HCR-20 recently was published in its second version (Webster et al., 1997). Although substantial changes to the items were not made, this version was an attempt by the authors to clarify some of the item descriptions and make the measure more "user friendly." To

aid in the ease of administration, Webster and colleagues set out to clarify the administration and coding of the measure. In addition, this newer version includes descriptions of the research conducted to date using the HCR-20 in correctional, forensic psychiatric, and civil psychiatric samples. The scheme is still composed of past (H), present (C), and future (R) temporal variables.

As noted previously, historical or static items are afforded the greatest weight in the HCR-20 (Webster et al., 1995). However, a virtue of the HCR-20 is the fact that it takes into account static *and* dynamic variables, thereby acknowledging the importance of individual growth, changing life circumstances, and improvement related to treatment. Webster and his colleagues cautioned that the HCR-20 is in the initial stages of development and its reliability and validity are still unknown; therefore, the scheme currently is regarded as “an *aide memoire* and as a research tool” (Webster, et al., 1997, p. 5). The next section will review briefly the research that has been conducted to date with the HCR-20.

A retrospective study by Wintrup (1996) assessed the relationship between the PCL-R, the HCR-20 (version 1) and outpatient violence in a sample of 80 forensic psychiatric patients released from a secure forensic hospital. Community violence was found to be moderately correlated (slightly less than .30) with the patients' HCR-20 and PCL-R scores. The measures were also found to be moderately to highly correlated with future hospitalization in the forensic facility (HCR-20 = .30; PCL-R = .25) and psychiatric hospitals (HCR-20 = .45; PCL-R = .36). The H scale was noted to be more reliably related to community functioning than either the C or R scales.

Using a subsample of involuntary civil psychiatric patients ($N = 200$) from the current study, Douglas (1996) evaluated the relationship between the HCR-20 total scores (version 1), scale scores, and outpatient violence. The mean follow-up was 690 days. Interrater reliability was calculated using 10% of the files ($n = 20$). Using a Pearson product moment correlation, the HCR-20 was noted to have an interrater reliabilities of .89 for the H scale, .72 for the C scale and .81 for the R scale. Results calculated using Receiver Operating Characteristic (ROC) analyses the Area Under the Curve (AUC) indicated moderate to large effect sizes depending on the outcome measure of violence. The HCR-20 was reliably associated with each index of post-release violence (any violence, $AUC = 0.73$; physical violence, $AUC = 0.73$), but was noted to be most highly predictive of violent crime ($AUC = 0.78$) ($n = 156$).

As discussed previously, Klassen's (1996) study of ICU patients from a provincial civil psychiatric hospital assessed the predictive validity of the PCL:SV and the H-scale of the HCR-20 as a function of inpatient violence. Internal consistency of the H scale was adequate (Cronbach's $\alpha = .73$). Controlling for sex, the H scale (with item H9 Personality Disorder removed because it was found to have a negative relationship with violence $r = -.34$) was found to correlate at a significant and moderate ($r = .27$ to $.30$) level with inpatient aggression measured by the OAS (Yudofsky et al., 1986). The H total score was also noted to be moderately and significantly associated with inpatient violence over the 28 day follow-up when subjects were categorized into low ($0 = 1-8$) and high ($1 \leq 9$) scorers ($r = .29-.31$). Klassen also found a significant difference between the dichotomized groups using a Kaplan Meier survival analysis (Log Rank statistic = 4.62, $p < .05$). Results of the survival analysis indicated that within four weeks on the ICU unit almost all of the individuals in the high risk group had engaged in violence, in comparison, just

over half of the low risk group had engaged in violence in the same period of time. Given her finding of comparable rates of inpatient violence by males and females (as discussed above), despite the low scores of the women on the "H" scale, Klassen (1996) proposed that there may be a need to reduce cutoff scores on the HCR-20 to increase the measure's usefulness in psychiatric samples of women.

McNiel and Binder's Screening Tool

The impracticality of lengthy actuarial tools prompted McNiel and Binder (1994a) to develop a succinct screening checklist intended to assist clinicians in screening inpatients' potential for violence. The checklist is composed of five items: (1) physical attacks and/or fear inducing behaviour within two weeks prior to admission; (2) *absence* of suicidal behaviour, (attempts, threats, gestures, ideation), within two weeks prior to admission; (3) diagnosis of schizophrenia or mania; (4) male gender and; (5) currently married or living together. The items are simply coded 0=No, 1=Yes. A total score of three or more is considered high risk, a score of two or less is considered low risk. McNiel and Binder (1994b) found that this screening tool performs better than clinical judgment.

The calibration sample for McNiel and Binder's screening tool consisted of 238 civil psychiatric inpatients described above (McNiel, et al., 1988). Inpatient violence was measured using the OAS (Yudofsky et al., 1986). The authors determined the optimum cutoff score for identifying high and low risk individuals using ROC curves to compare the true positive and true negative rates at different cutoffs. Patients with a score of two or less were categorized as low risk and patients with scores of three or more were categorized as high risk. These cutoffs resulted in a significantly lower proportion of low scoring patients who subsequently engaged in

fear inducing behaviour ($n = 40, 42\%$) or physical attacks ($n = 15, 34.9\%$) than patients categorized as high risk (fear inducing behaviour = 55, 58%; physical attacks $n = 28, 65\%$) ($X^2 (2, N = 238) = 15.48, p < .001$).

McNiel and Binder subsequently conducted a validation study with a sample of 338 civil psychiatric patients, most of whom were involuntarily committed (92%). Patients classified as low risk were significantly less likely to engage in fear-inducing behaviour or physical attacks than individuals classified as high risk ($X^2 (2, N = 338) = 27.43, p < .0001$). When the outcome behaviour was physical violence, the screening checklist resulted in a sensitivity of 55%, specificity of 64%, false positive rate of 68%, false negative rate of 18%, positive predictive value of 41%, negative predictive value of 82% and a total predictive value of 62%. The RIOC for physical violence was 25%. The likelihood ratio indicated that a patient with a high score on the checklist was 1.52 times more likely to become physically assaultive. When the outcome measure was any aggressive behaviour, the RIOC increased to 28% and the likelihood ratio increased to 1.97. McNiel and Binder concluded that given the base rate of violence (41%), the checklist increases the accuracy of classification of violent patients appreciably (65%). The authors also noted that the brief screening checklist performs comparably or better than past published studies of the reliability of violence assessments and better than most studies evaluating clinical accuracy of risk assessments.

Research Goals and Hypotheses

The purpose of this study was to aid the development of a clearer understanding of the relationship between gender and risk of future violence among civil psychiatric patients. The study had three specific goals: (1) To assess the base rate of violence in female and male civil

psychiatric patients; (2) To evaluate the utility of three standardized measures that have been noted to have an appreciable relationship with violence in males in forensic psychiatric and correctional populations in a civil psychiatric population of men and women; (3) To determine whether any gender differences that emerge in violent behaviour are moderated by setting (i.e., community or hospital).

Given the results of risk assessment research with civil psychiatric inpatients, and the limited research that has evaluated our ability to predict risk of harm to others among female psychiatric patients, the following hypotheses were put forward:

1. It was hypothesized that male psychiatric patients would present a risk of harm to others greater than, but not significantly different, than female psychiatric patients.

Acknowledging that there is a statistically significant but modest relationship between mental disorder and violence, and that there is a strong relationship between gender and violence, it was anticipated that male patients would be characteristically more violent than female patients.

However, as reviewed above, research suggests that female psychiatric patients present a risk of violence not significantly less than that of their male counterparts (Borum, 1996; Lidz et al., 1993; Steadman et al., 1994) and that current psychiatric symptoms are more predictive of violence than demographic factors such as gender (Monahan, 1996a). Therefore, it was hypothesized that the difference between males and females would not be significant.

2. All three risk measures were hypothesized to assess risk of violence more accurately with male patients than with female patients.

Due to the lack of risk assessment research with women in the investigation of the variables that compose the instruments used in the current study, these measures were hypothesized to be more

accurate in assessing risk of violence in male psychiatric patients than in female psychiatric patients.

3. The HCR-20 was hypothesized to be superior to the PCL:SV in assessing risk of violence in male and female civil psychiatric patients.

Given that psychopathy is not generally comorbid with major mental disorders, and recognizing that the PCL-SV is an item on the HCR-20 it was hypothesized that the HCR-20 would be superior to the PCL:SV in assessing risk of future violence by both males and females.

4. It was hypothesized that setting would not moderate the relationship between sex and violence.

Binder and McNiel (1990) concluded that the setting in which violence occurs may moderate the relationship between sex and violence. However, acknowledging the fact that a history of violence is one of the most reliable predictors of future violence, it was anticipated that individuals who were violent prior to admission would be more likely to be violent during their hospitalization, and following discharge.

Method

Participants

Files of all involuntary patients in a large psychiatric hospital who applied for a Review Panel hearing in the 1994 calendar year (N=279) were coded retrospectively for demographic, psychiatric, and criminal history information (see Appendix 1). The institutional files included information from various sources including: psychiatrists' and social workers' notes, psychological reports and tests, nurses' notes, intake, transfer, and discharge summaries, as well as a variety of information from other institutions (e.g., hospitals and prisons). In addition, three

risk measures were coded during file review to determine whether they accurately assess risk in male and female civil psychiatric patients during hospitalization and following discharge. A single file review generally required two to eight hours to complete depending on the length of the patient's index hospitalization and the length of their psychiatric history. The file review consisted of a review of all of the patients' files from previous stays at Riverview Hospital and a very thorough review of the patients' file from the index hospitalization. The review of the current file included reading all of the patient's nursing notes in order to ensure that all aggressive incidents were coded. Nurses at Riverview Hospital write notes every 15 minutes for patients who are exhibiting aggressive tendencies towards themselves or others. Clearly, confidentiality was of the utmost importance. Patients were identified by subject numbers, and just one list of identifying information was maintained. This research was approved by Simon Fraser University's Ethics committee, Riverview Hospital, and the cooperating general hospitals.

Procedure

HCR-20, PCL:SV, McNeil & Binder's Screening Tool. Research assistants trained in the use of the risk assessment instruments coded the measures based on descriptive file information. These measures can be coded relatively quickly and based entirely on file information.

Outcome data. Due to pragmatic considerations (e.g., time and cost), patients were not interviewed. Patients were followed-up for an average of almost two years¹ following discharge by examining multiple sources of outcome data available via record databases. Specifically, records were obtained from Riverview Hospital, Review Panel Office records, Coroner records,

¹ "The follow-up period ranged from a minimum of 312 days to a maximum of 1053 days ($M = 690.26$; $SD = 184.31$), depending on when in 1994 each participant was released from hospital" (Douglas, 1996, p.17).

additional psychiatric hospital and unit records (16 local general hospitals participated), B.C. Forensic Psychiatric Services records, and corrections records. Making use of multiple sources for outcome data increases the likelihood that we obtained comprehensive and reliable information.

Individuals who were arrested for a violent offence (e.g., assaults, sexual assaults, robbery, arson) following community discharge, or who were seen at psychiatric emergency rooms, or were rehospitalized following violent behaviour that in the opinion of the raters could have resulted in criminal charges for a violent offence against a person were considered violent at follow-up. A patient was considered to have had an opportunity for community violence if he or she was released from the hospital, to the streets, their own home, the home of friends or family, or to a group home. Patients on temporary absences and extended absences were not included in the follow-up until they were completely discharged from hospital.

Analyses

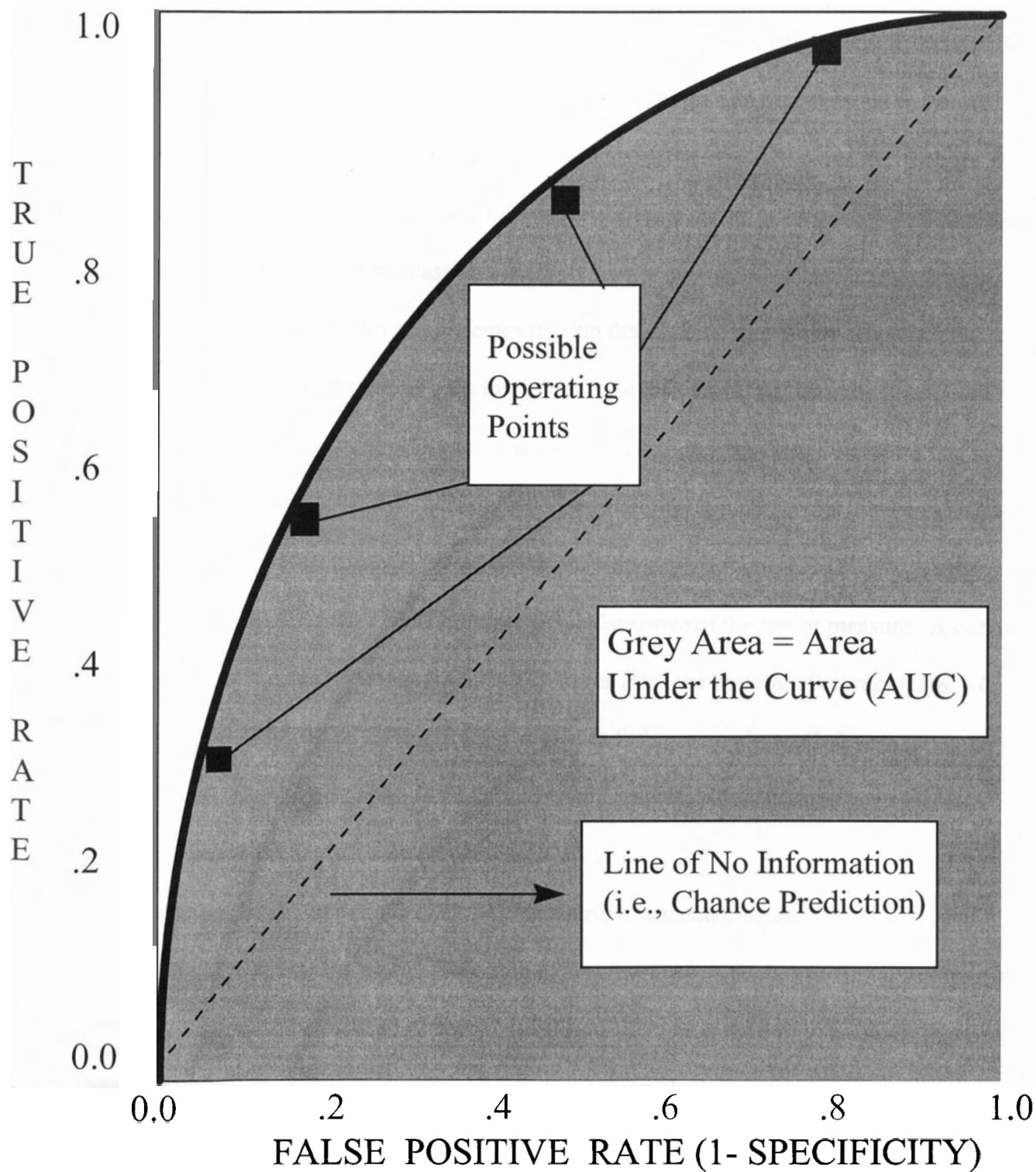
Interrater Reliability. To determine inter-rater reliability for the three risk measures, a random sample of 20 files were coded independently by two coders. Reliability was assessed for only the risk measures since the rest of the coding required generally dichotomous, objective determinations. "The Pearson correlation co-efficient for the HCR-20 full scale score between raters was 0.82, for the PCL:SV, 0.85, and McNeil and Binder's tool, 0.81" (Douglas, 1996, p. 24).

Receiver Operator Characteristic Analyses. Several authors have expressed concern regarding the use of binary terms to describe risk assessment reliability. In particular, the field's reliance on 2x2 contingency tables as a means of communicating violence risk has been heavily

criticized (Hart et al., 1993; Mossman, 1994a, 1994b). Hart et al. describe contingency tables as “artificial,” and incapable of communicating the true “multidimensional” nature of violence (p. 696). Statistically speaking, dichotomizing dimensional variables can result in an unacceptable loss of information (Hart et al., 1993). In light of these drawbacks, Mossman (1994b) proposed the use of receiver operating characteristic (ROC) analyses to be the preferred method of evaluating the “discriminating power of diagnostic tests” (Mossman & Somoza, 1991b, p. 331). For an example of a ROC curve see Figure 1.

Mossman (1994a) strongly recommends the use of receiver operating characteristic (ROC) analyses in violence risk assessment research. The benefits of ROC methods include their relative impermeability to base rates and clinical biases (i.e., a proclivity to make either Type I or Type II prediction errors). Essentially, ROC analyses protect the researcher from attributing greater predictive accuracy to higher base rates, or comparably, being led to believe that accuracy is lower than it actually is due to low base rates (Mossman, 1994a). Mossman argued that “accuracy should be described in a way that reflects the trade-offs between sensitivity and specificity and that is independent of a clinician’s actual cutoff or decision threshold” (p. 784). Receiver operator curves satisfy this proposed trade-off by plotting the true positive rate (TPR, sensitivity) by the false positive rate (FPR, 1-specificity) (Mossman, 1994a). The area under the ROC curve (AUC) is an approach frequently used to summarize the overall discriminating power of a test or measure (Mossman, 1994a). The AUC represents the probability that a randomly selected truly violent patient would be categorized as more likely to be violent than a randomly selected truly non-violent patient (Mossman, 1994a). Using ROC curves allows the decision-maker to monitor their threshold level based on a visual representation of the fluctuating

Figure 1
Sample Receiver Operator Curve (ROC)



relationship between true positive rates (the number of correctly identified violent individuals) and false positive rates (the number of misidentified non-violent individuals) (Mossman, 1994b).

As discussed above, an ROC graph depicts the true positive rate (equal to the test's sensitivity) as a function of the false positive rate (equal to $1 -$ the test's specificity) (Mossman & Somoza, 1991a). In these analyses, the curve represents the diagnostic performance of the risk measure across the range of possible cutoffs. One of the benefits of ROC curves is that they provide a succinct depiction of the cost and benefits of different cutoff points as a function of the sensitivity or specificity (i.e., an increase in sensitivity results in a decrease in specificity). The graph of an ROC curve provides a visual demonstration that as the true positive rate increases so does the false positive rate. As can be seen in Figure 1, the line extending from the bottom left corner to the top right corner of an ROC curve is the "line of no information...corresponding to a test with no discriminating capacity" (Mossman & Somoza, 1991b, p. 332). The closer the curve reaches from the bottom left corner (FPR = 0, TPR = 0) to the top left corner (FPR = 0, TPR = 1) and bends to the right the more nearly perfect the performance of the test or measure. A curve that lies close to the "line of no information," and reaches from the bottom left corner (FPR = 0, TPR = 0) to the top right corner (FPR = 1, TPR = 1) with little area underneath the curve would provide little predictive information. In the current study the points on the curve correspond to possible cutoff points on the risk assessment measures.

Survival analyses. One of the goals of psychiatric treatment, outpatient follow-up, and release planning is to attempt to extend the length of time between patients' rehospitalizations. In the current study, one of the main goals was to determine what proportion of individuals released into the community engaged in violent behaviour. In addition, the length of time that patients

“survived” in the community without engaging in violence was of considerable interest. The logical analyses to answer those questions is called “survival analyses.”

Survival analyses were named for the original use of the statistics in medical intervention studies that evaluated the increased life expectancy of patients (Streiner, 1995). Streiner (1995) noted that the strength of survival analyses is that they make use of data from all subjects, unlike Mean Survival or Survival Rate analyses. If one were to calculate the mean survival (i.e., how long subjects lasted without a relapse) the information for subjects without complete data would be lost. In addition, the patients who are most successful (i.e., did not relapse) are not included in the calculation and as Streiner (1995) stated, we are thereby “loading the dice against ourselves” (p. 440). Calculating the survival rate (i.e., the proportion of subjects who have not relapsed as of a certain time following discharge) is also problematic because again subjects without complete data are not used in the analyses. In addition, the length of follow-up is arbitrary. In contrast, survival analyses make use of information from all subjects, regardless of whether they are lost during follow-up or do not experience the event before the end of the study.

Streiner (1995) noted that survival analyses assume that all subjects have a common starting point and a common end point. In this study, the start point for inpatient violence was defined by the patients’ admission dates and the end point was the first date that they engaged in violence during their hospitalization. For outpatient violence, the start date was defined by the patients’ discharge dates and the end point was the first date they engaged in violence in the community. The concern with using this type of analysis for the outpatient data is that in this study patient discharge dates cannot be considered equivalent, given the fact that some patients were discharged to the community (i.e., to the streets, their own home, or to live with friends or

family) and other patients were discharged to boarding homes where there is obviously more supervision. Patients on leave of absences were not included in follow-up until the hospital discharged them completely. Therefore, the start point for outpatient violence was not as consistent across patients as would be ideal for these analyses.

Results

Demographic Characteristics of the Sample

The sample consisted of 167 (60%) men and 112 (40%) women (see Table 1). The average patient was an unemployed, single, Caucasian in their mid-thirties who had completed slightly less than a high school education. The median age of the average female patient and the average male patient was 39 years and 33 years respectively. The vast majority of both men (95%, $n = 158$) and women (97%, $n = 109$) were unemployed at the time of hospitalization. As displayed in Table 1, there were few significant demographic differences between the men and women in the current sample. Male patients (89%, $n = 148$) were significantly more likely to currently be single than female patients (72%, $n = 81$) ($X^2 = 12.11$, $p < .001$) and to have never been married or to have lived in a common law relationship ($X^2 = 9.86$, $p < .002$). Men (73%, $n = 121$) were also more likely to be on social assistance than women (64.3%, $n = 72$), although this difference did not reach significance.

Table 1

Demographic, Psychiatric, and Criminal Characteristics of the Sample

CHARACTERISTICS	N (%) or Mean (SD)		<u>X² or t-test</u>
	MALES (n = 167, 60%)	FEMALES (n = 112, 40%)	
Demographic			
Caucasian	134 (80%)	87 (78%)	<i>ns</i>
Single	148 (89%)	81 (72%)	12.11 ***
Never married or common law	87 (78%)	37 (33%)	9.86 **
Last Grade Completed	Mdn = 10 (2.3)	Mdn = 11 (2.0)	<i>ns</i>
Unemployed at Admission	158 (95%)	109 (97%)	<i>ns</i>
Receiving Social Assistance	121 (73%)	72 (64%)	<i>ns</i>
Psychiatric			
Family History of MD	93 (55.7%)	74 (66.1%)	<i>ns</i>
Had Prior Hospitalization(s)	153 (91.6%)	105 (93.8%)	<i>ns</i>
<19 yrs at 1 st Hospitalization	47 (28.1%)	31 (27.7%)	<i>ns</i>
No. of Prior Hospitalizations	<u>M</u> = 2.64	<u>M</u> = 2.99	<i>ns</i>
Age at Admission	<u>M</u> = 36 (13)	<u>M</u> = 42 (16)	<i>ns</i>
Length of Stay (days)	Mdn = 114 (961)	Mdn = 115 (875)	<i>ns</i>
Range	3-4744	8-6366	
Suicide Attempt(s)	64 (38.3%)	67 (59.8%)	12.44 ***
Any Substance Abuse	142 (85.0%)	62 (55.4%)	30.03 ***
Admit Dx			
Schizophrenic Disorder	78 (46.7%)	57 (50.9%)	<i>ns</i>
Criminal			
Any Arrests	114 (68.3%)	55 (49.1%)	10.30 ***
Violent Arrests	73 (43.7%)	22 (19.6%)	26.16 *

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Psychiatric Characteristics of the Sample

Similar to the demographic characteristics, there were few notable differences in psychiatric characteristics between the average male and female patient (see Table 1). The vast majority of men (91.6%, $n = 153$) and women (93.8%, $n = 105$) had at least one prior hospitalization and the average patient had been hospitalized between two and three times prior to the index admission. Almost 30% of patients of both sexes were hospitalized for the first time before their 19th birthday. Half of the sample, regardless of sex, was diagnosed with a schizophrenic disorder at admission. The length of stay during the index hospitalization was almost identical for men (114 days) and women (115 days). There were two notable sex differences in the psychiatric characteristics of the sample. The first was that women (59.8 %, $n = 67$) were significantly more likely than men (38.3% $n = 64$) to have a history of suicide attempts ($X^2 = 12.44$ $p < .001$). The second was that men (85.0% $n = 142$) were significantly more likely to have been, or currently be, substance abusers (55.4% $n = 62$) ($X^2 = 30.03$ $p < .001$).

Criminal History of the Sample

Not surprisingly, males were significantly more likely than females to have a criminal history (see Table 1). Men were significantly more likely to have an arrest record than women ($X^2 = 10.30$, $p < .001$). They were also significantly more likely to have a history of arrests for violent offences (e.g., robbery, assault, sexual assault) ($X^2 = 26.16$, $p < .04$).

Base Rate of Inpatient Violence

Consistent with previous research, there were no significant differences in the prevalence of inpatient violence by males versus females (see Table 2). The likelihood of inpatient violence by men and women was almost identical, independent of the outcome measure. Specifically, the

Table 2
Base rate of Inpatient Violence as a Function of Sex

<i>Outcome measure</i>	<u>MALES</u> (n = 167)		<u>FEMALES</u> (n = 112)	
	N	%	N	%
Any Aggression	120	71.9	80	71.4
Aggressive to Others	118	70.7	80	71.4
Verbal Aggression (only)	49	29.0	23	21.0
Physical Aggression	72	43.1	56	50.0

Note. Any Aggression includes individuals who displayed violence that was not necessarily directed at another person (e.g., patients who punched a wall when no one was around). Aggressive to Others refers only to patients who directed their aggression at another person. The rate of Verbal Aggression refers strictly to patients who were verbally aggressive without exhibiting any physical violence during their entire hospitalization. Physical Aggression includes patients who were only physically aggressive and those who were both physically and verbally aggressive.

Table 3
Base rate of Outpatient Violence as a Function of Sex

<i>Outcome measure</i>	<u>MALES</u> (n = 153)		<u>FEMALES</u> (N = 95)		χ^2
	N	%	N	%	
Any Violence	58	37.9	25	26.3	4.94 *
Verbal Aggression	51	33.3	23	24.2	3.44
Physical Violence	34	22.2	7	7.4	10.65 ***
Any Arrest	26	17.0	6	6.3	6.88 **
Violent Arrest(s)	17	11.1	5	5.3	3.01

Note. * p < .05, ** p < .01, *** p < .001

rate of “Any Aggression” (i.e., verbal threats, physical aggression against objects, staff, and other patients) was very nearly identical for men (71.9%, n = 120) and women (71.4%, n = 80).

Similarly, the rate of “Aggression to Others” (i.e., does not include violence that is not directed specifically at another person) was 70.7% (n = 118) for males and 71.4% (n = 80) for females.

Interestingly, male patients were slightly more “Verbally Aggressive” than female patients.

However, female inpatients (50%, n = 56) were slightly more likely to exhibit “Physical Aggression” than male inpatients (43.1%, n = 72).

Base Rate of Outpatient Violence

In contrast to inpatient violence, violent behaviour by psychiatric patients following discharge into the community was more likely to differ by sex (see Table 3). Males (37.9%, n = 58) were significantly more likely to engage in “Any Violence” than females (26.3% n = 25) after discharge into the community ($X^2 = 4.94$ p = .026). Male outpatients (22.2%, n = 34) were also more likely to be “Physically Aggressive” than female outpatients (7.4%, n = 7) ($X^2 = 10.65$ p < .001). Women (6.3%, n = 6) were also less likely to be arrested following discharge than men (17%, n = 26) ($X^2 = 6.88$ p < .009). There were no significant differences in the rates of “Verbal Aggression” by men (33.3%, n = 51) and women (24.2%, n = 23). Similarly, no significant differences were found between the rates of “Violent Arrest(s)” by men (11.1%, n = 17) and women (5.3%, n = 5), this is perhaps due to the very low baserates of these behaviours in this sample.

Base Rate of Violence in the Context of Rehospitalization

During the average two year follow-up period, 64 males and 40 females were

rehospitalized in Riverview Hospital or one of the 16 community general hospitals cooperating with the research project. As can be seen in Table 4, violent behaviour ("Any Violence") was associated with rehospitalization in 40.3% (n = 48) of the cases with male patients and 19.6% (n = 22) of the cases with female patients. Male rehospitalizations (12.6%, n = 21) were significantly more likely to be related to an incident involving "Physical Violence" than female rehospitalizations (4.5%, n = 5). The rates of rehospitalization involving "Verbal Aggression" were not significantly different for male (28.1%, n = 47) and female (17.9%, n = 20) patients.

HCR-20 Total and Scale Scores

Complete HCR-20 (discharge) scores were available for 117 males and 77 females. As can be seen in Table 5 the mean HCR-20 total discharge score (calculated using C-discharge) was 20.39 (SD = 5.55) for males and 16.57 (SD = 5.45) for females ($t = 4.72, p < .001$). Table 5 also displays the means and standard deviations for males and females on the subscales of the HCR-20. The mean H-scale scores for males (10.52, SD = 3.36) and females (8.36, SD = 3.23) were significantly different ($t = 5.27, p < .001$). Similarly, there were significant differences between men's (5.37, SD = 2.41) and women's (4.66, SD = 2.15) R-scale scores ($t = 2.12, p < .036$). The C-discharge scale scores also differed significantly by sex ($t = 2.76, p < .006$). However, the mean C-admit scale scores for male patients (7.37, SD = 1.54) and female patients (6.82, SD = 1.70) were comparable for the men and women. It is not surprising that patients clinical scores at admission did not differ significantly by sex given that Riverview Hospital takes only the most seriously mentally ill patients in British Columbia (patients must be transferred from a psychiatric ward at a general hospital and can not be admitted directly).

Table 4

Base rate of Violence in the Context of Rehospitalization

<i>Outcome measure</i>	MALES (n = 64)		FEMALES (n = 40)		X ²
	N	%	N	%	
Any Violence	48	40.3	22	19.6	2.95
Verbal Aggression	47	28.1	20	17.9	0.01
Physical Violence	21	12.6	5	4.5	5.22*

Note. *p < .05

Table 5

Means and Standard Deviations for HCR-20 Total and Scale Scores

Sex	HCR-20 Scores									
	H-total	n	C-admit	n	C-dis	n	R-total	n	HCR-total	n
Males	10.52 (3.36)	164	7.37 (1.54)	163	4.19 (1.93)	135	5.37 (2.41)	120	20.39 (5.55)	117
Females	8.36 (3.23)	108	6.82 (1.70)	108	3.80 (1.94)	89	4.66 (2.15)	79	16.57 (5.45)	77
t =	5.27***		1.42		2.76*		2.12*		4.72***	

Note. *p < .05, ***p < .001 HCR-20 total scores are calculated with the clinical discharge scale.

PCL:SV Total and Scale Scores

Table 6 displays the means and standard deviations of the PCL:SV total scores and subscale scores (i.e., Factor 1 and Factor 2 scores) for male and female patients. As can be seen in the table, males and females had significantly different PCL:SV total and factor scores. Males ($M = 4.36$) had significantly higher PCL:SV total scores than females ($M = 3.73$) ($t = 4.08$, $p < .001$). Similarly, the Factor 1 ($t = 3.62$, $p < .009$) and the Factor 2 ($t = 4.33$, $p < .001$) scores differed significantly between the sexes.

McNiel and Binder Total and Item Scores

Men and women were significantly different on all but one item (i.e., item 3 “diagnosis of mania or schizophrenia) of McNiel and Binder’s screening tool (see Table 7). Women’s mean scores were significantly lower than men’s for item 1 (violence in two weeks prior to hospitalization) ($t = 4.59$ $p < .001$), item 2 (absence of self-injurious behaviours in two weeks prior to admission) ($t = 2.76$ $p < .01$), item 4 (male gender) ($t = 58$ $p < .001$), item 5 (currently married or common law) ($t = -3.41$ $p < .001$), and the McNiel and Binder total score ($t = 11.35$ $p < .001$).

Table 6Means and Standard Deviations for PCL:SV Total and Factor Scores

		PCL:SV Scores		
Sample	<i>n</i>	Factor 1	Factor 2	PCL-total
Males	163	3.33 (2.47)	5.44 (2.47)	8.85 (4.36)
Females	105	2.61 (1.97)	4.14 (2.27)	6.75 (3.73)
t =		2.62 **	4.33 ***	4.08 ***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7Means and Standard Deviations for McNeil and Binder's Screening Tool

		McNeil and Binder Scores					
Sample	<i>n</i>	Item 1	Item 2	Item 3	Item 4	Item 5	Total
Males	164	.61 (.49)	.83 (.38)	.76 (.43)	.99 (.11)	.00 (.23)	3.24 (.87)
Females	110	.34 (.47)	.68 (.47)	.73 (.45)	.00 (.16)	.18 (.39)	1.96 (.97)
t =		4.59***	2.76**	.46	.58***	-3.41***	11.35***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Item 4 is male gender.

Correlations Between the Risk Measures and Violence

Inpatient Violence. Unexpectedly, the HCR-20 was noted to have moderate to large (range = .28 - .35) correlations with any aggression and verbal aggression by women during hospitalization (see Table 8). In contrast to the correlations between male HCR-20 scores and inpatient violence (range = .07 - .16) the HCR-20 performed notably better with female patients. However, physical violence was noted to have small to moderate correlations with male (range = .06 to .10) and female (range = .13 to .22) HCR-20 scores. Although the measure is not performing as well with physical violence as the other inpatient outcome measures, it is interesting to note that it is still performing better with women than with men. Table 8 demonstrates that, similar to the HCR-20, the PCL:SV was more highly correlated with inpatient violence by women than by men. Again, the correlations between inpatient violence (any aggression and verbal aggression) by women and their PCL:SV scores ranged from .26 to .38 in contrast to those of the men which ranged from .08 to .20. McNeil and Binder's tool was found to have a small to moderate correlation to inpatient violence by men (range = .06 - .15) and demonstrated a weak to moderate relationship with inpatient violence by women (range = .09 - .21). Similar to the findings with the HCR-20 and PCL:SV, this measure performed poorly with inpatient physical violence by men ($r = .06$) and women ($r = .09$).

Outpatient Violence. The PCL:SV demonstrated moderate to large relationships with outpatient violence by men (range = .14 - .27) (see Table 9). This measure had a larger association for males with the outcome measures "Physical Violence" ($r = .27$) and "Violent Arrest(s)" ($r = .22$) than "Any Violence" (i.e., verbal aggression, aggression against objects, etc.) which bodes well for the measure since these are clearly more serious types of violence. The

PCL:SV evidenced a moderate to large relationship with outpatient violence by women with the notable exception of “Physical Violence” ($r = .01$). The HCR-20 demonstrated a strong relationship with outpatient violence by men and women (range = .30 - .42), again, with the exception of “Physical Violence” by women ($r = .18$).

In order to control for length of time at risk (i.e., the number of days in hospital, or the number of days since discharge), correlational analyses were also done using the rate of each outcome measure of violence as the dependent measure. The rate was calculated by dividing the number of aggressive incidents by the number of days since discharge and multiplying this by 31 to produce the rate of violence per month.

Rate of Inpatient Violence. All three risk measures were poor predictors of the rate of inpatient violence (see Table 10). This is not surprising given the fact that in an inpatient setting the better the staff (e.g., nurses and psychiatrists) are at assessing risk of violence the lower this association would become as a result of staff de-escalating potentially violent patients (e.g., time outs, medication). This relationship would likely be particularly low given the likelihood that staff would prevent patients from being repetitively violent.

Rate of Outpatient Violence. The HCR-20 total score had a moderate to large significant relationship with the rates of “Any Violence”, “Physical Violence”, and “Violent Arrest” for both sexes, with the exception of physical outpatient violence by women (see Table 11). Most notable, the H-scale alone produced correlations of almost the same size as the HCR-20 total score for both men ($H = .33$; HCR-20 total = .37) and women ($H = .37$; HCR-20 total = .39) demonstrating the strong relationship between past behaviour/static risk factors and violence. Also interesting to

note is the fact that the HCR-20 generally performed better with female patients with the glaring exception of physical violence.

The PCL:SV did not do as well overall as the HCR:20. Similar to the HCR-20, with the exception of physical violence, the PCL:SV had correlations of larger sizes with females than with males. In general, the PCL:SV total scores were moderately related to outpatient violence in this sample.

To summarize, the correlations between the risk measures and the rate of violence by civil psychiatric patients in this sample indicates that these schemes are significantly related to inpatient and outpatient violence by men and women. Unexpectedly, in general, the measures have a stronger relationship with violence by women than by men, this is particularly true for inpatient violence. However, outpatient physical violence, conceivably one of the variables of greatest interest is not significantly related to women's scores on these measures.

Table 8

Correlation Matrix of HCR-20, PCL:SV and McNeil & Binder's Screening Tool Total and Scale Scores as Predictors of Inpatient Violence

Type of Violence

Scale	<u>Any</u>		<u>Verbal</u>		<u>Physical</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Factor 1	.09	.26**	.08	.33***	.11	.15
Factor 2	.16*	.29**	.20*	.35***	.15	.22*
PCL:SV total	.13	.30**	.15	.38***	.15	.21*
"H" total	.11	.28**	.07	.29**	.06	.13
"C" admit total	.16*	.30**	.15	.29**	.10	.22*
HC-20 total	.15	.34***	.12	.35***	.09	.20*
McNeil & Binder	.11	.21*	.15*	.20*	.06	.09

Note. * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed significance)

Verbal aggression refers to patients who were verbally aggressive during hospitalization but did not engage in any physical aggression. Physical aggression includes patients who engaged in physical aggression alone and patients who engaged in both types aggression.

Table 9

Correlation Matrix of HCR-20 and PCL:SV Total and Scale Scores as Predictors of Outpatient Violence

Type of Violence

Scale	<u>Any</u>		<u>Physical</u>		<u>Violent Arrest(s)</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Factor 1	.14	.13	.27***	-.03	.21**	.23*
Factor 2	.15	.19*	.18*	.03	.17*	.26**
PCL:SV total	.17*	.19*	.27**	.01	.22**	.28**
"H" total	.25***	.26**	.19*	.18	.18*	.30***
"C" dis-total	.20*	.25*	.16	-.07	.20	.05
"R" total	.41***	.34**	.43***	.09	.25**	.21
HCR-20 total	.39 ***	.42***	.34***	.18	.30***	.33**

Note. * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed significance)

Table 10

Correlation Matrix of HCR-20, PCL:SV and McNeil & Binder's Screening Tool Total and Scale Scores as Predictors of the Rate of Inpatient Violence

Scale	<u>Type of Violence</u>					
	<u>Any</u>		<u>Verbal</u>		<u>Physical</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Factor 1	.11	.14	.14	.16	.11	.03
Factor 2	.06	.07	.09	.06	.15	-.02
PCL:SV total	.08	.11	.12	.11	.15	.00
"H" total	.00	.03	.01	-.03	.06	-.03
"C" admit total	.11	.19	.11	.09	.10	.15
HC-20 total	.04	.10	.05	.02	.09	.04
McNeil & Binder	-.01	-.12	.00	-.15	-.02	-.13

Note. * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed significance)

Verbal aggression refers to patients who were verbally aggressive during hospitalization but did not engage in any physical aggression. Physical aggression includes patients who engaged in physical aggression alone and patients who engaged in both types aggression.

Table 11

Correlation Matrix of HCR-20 and PCL:SV Total and Scale Scores as Predictors of the Rate of Outpatient Violence

Scale	<u>Type of Violence</u>					
	<u>Any</u>		<u>Physical</u>		<u>Violent Arrest(s)</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
Factor 1	.25**	.19	.20*	.11	.15	.18
Factor 2	.21**	.23*	.18*	.13	.18*	.22*
PCL:SV total	.27***	.25*	.23**	.14	.19*	.24*
"H" total	.33***	.37***	.22**	.23*	.19*	.29**
"C" dis-total	.18*	.20	.16	.01	.10	.10
"R" total	.31***	.32**	.20*	.10	.12	.20*
HCR-20 total	.37***	.39***	.25**	.19	.20*	.30**

Note. * $p < .05$; ** $p < .01$; *** $p < .001$ (two tailed significance)

Receiver Operator Characteristic Analyses: Inpatient Violence

Predictive utility of the combined H & C scales for males versus females

ROC analyses were conducted using the ROCFIT program (Metz, Shen, Wang, & Kronman, 1989). This section reviews the HCR-20's relationship with inpatient violence, therefore, results were calculated using the combined H & C scale total scores. It should be recalled that the "R" scale of the HCR-20 refers to "release planning," and, therefore, is not relevant to risk assessments pertaining to inpatient violence. It should also be noted that analyses were completed using the clinical admission total (i.e., as opposed to the clinical discharge total) for the "C" scale. As will be discussed, the results of this study suggest that the HCR-20 is better at assessing risk of inpatient violence in women than in men.

As can be seen in Table 12, the AUC's associated with inpatient violence by males were in the range of .5535 to .6139. Areas Under the Curve in that range indicate that the combined "H" and "C" scale scores had a low to moderate relationship with inpatient violence by men. In contrast, the AUC's for females ranged between .6147 and .7484 depending on the outcome measure of inpatient violence used in the analyses. AUC's of this magnitude (i.e., .6 - .75) indicate a moderate relationship between the combined H and C scale score and inpatient violence by female patients. In comparison to the results of Mossman's meta-analysis which revealed a mean ROC of 0.78 (range = .60 - .80), the HCR-20 is performing relatively well at assessing inpatient violence by women. The AUC's for "Any Aggression" by men (.5944) versus women (.7226), and "Aggression to Others" by men (.6139) versus women (.7484) are noticeably different. The AUC's for "Verbal/Physical Aggression" are also quite divergent for the male (.5771) and female (.7192) patients. The AUC's for "Physical Aggression" indicate that the H&C

total score of the HCR-20 has a low to moderate predictive value when assessing inpatient physical aggression by men (.5535) and women (.6147).

Predictive utility of the PCL:SV for males versus females

Similar to the results with the HCR-20, the PCL:SV total scores were more predictive of inpatient violence by women than by men. As can be seen in Table 13, the likelihood that a truly violent male patient would receive a higher PCL:SV total score than a truly non-violent male was moderate (i.e., AUC's ranged from .5860 to .6149). In contrast, the size of the PCL:SV AUC's for the various outcome measures of female inpatient violence were moderate to high (i.e., AUC's ranged from .6424 to .7528). The PCL:SV AUC's for "Any Aggression" while in hospital were .5972 versus .7115 for males and females respectively. "Aggression to Others" produced AUC's of .6149 for male patients and .7356 for female patients. The PCL:SV produced AUC's of .7528 for women and .6136 for men when the outcome measure was "Verbal/Physical Aggression."

Predictive utility of McNiel and Binder's Screening Tool for males versus females

As can be seen in Table 14, the results from this study did not provide support for the predictive utility of McNiel and Binder's Screening Tool for inpatient violence. The AUC's for this tool were in the low (i.e., chance) range (.5113 - .5731) for males and the low/moderate range for females (.5538 - .6242). "Any aggression" produced AUC's of .5167 and .6242 for the male and female patients respectively. The AUC's were only slightly better for "Aggression to Others" with AUC's of .6117 for the women and .5731 for the men. "Physical Aggression" was also only moderately associated with total scores on the McNiel and

Table 12Predictive Utility of the HCR-20 for Inpatient Violence Measured by AUCsCombined H and C scale AUCs

<i>Outcome Measure</i>	MALES (n = 163)	FEMALES (n = 108)
Aggression	.5944	.7226
Aggression to others	.6139	.7484
Physical Aggression	.5535	.6147
Verbal/Physical aggression	.5771	.7192

Table 13Predictive Utility of the PCL:SV for Inpatient Violence Measured by AUCsPCL:SV AUCs

<i>Outcome Measure</i>	MALES (n = 163)	FEMALES (n = 105)
Any Aggression	.5972	.7115
Aggression to others	.6149	.7356
Physical Aggression	.5860	.6424
Verbal/Physical aggression	.6136	.7528

Table 14Predictive Utility of McNiel & Binder's Screening Tool for Inpatient Violence Measured by AUCsMcNiel & Binder AUCs

<i>Outcome Measure</i>	MALES (n = 164)	FEMALES (n = 110)
Any Aggression	.5167	.6242
Aggression to others	.5731	.6117
Physical Aggression	.5113	.5538
Verbal/Physical aggression	.5547	.6198

Binder Screening Tool for men (AUC = .5113) and women (AUC = .5538). Results also indicated a moderate relationship between men's (AUC = .5547) and women's (AUC = .6198) scores on this measure, and the likelihood of them being involved in "Verbal Aggression" while in hospital.

Outpatient Violence

Predictive utility of the HCR-20 for males versus females

Results of the ROC analyses provide encouraging support for the ability of the HCR-20 to assess risk of outpatient violence in both sexes (see Table 15). "Any Violence" was found to be moderately to highly associated with both male (.7418) and female (.7694) patients' HCR-20 total scores. This measure produced a moderate to high AUC for "Physical Violence" by males (.7358) but only a moderate sized AUC for "Physical Violence" by females (.6342). HCR-20 total scores produced comparable AUC's for men (.7446) and women (.7489) when the outcome measure was "Verbal Aggression." It should be noted that this measure was designed to predict "violence" and as would be expected, it has only a moderate relationship with "Any Arrests" for males (AUC = .6768), but a moderately high association with violent arrests in males (AUC = .7826). The AUC's for both types of arrests were moderate to high for women when utilizing the HCR-20 total scores in the Rocfit analyses.

Table 15Predictive Utility of the HCR-20 for Outpatient Violence Measured by AUCsHCR-20 AUCs

<i>Outcome Measure</i>	MALES (n = 117)	FEMALES (n = 77)
Any	.7418	.7694
Verbal	.7446	.7489
Physical	.7358	.6342
Any Arrest(s)	.6768	.7712
Violent Arrest(s)	.7826	.7481

Table 16Predictive Utility of the PCL:SV for Outpatient Violence Measured by AUC'sPCL:SV AUC's

<i>Outcome Measure</i>	MALES (n = 163)	FEMALES (n = 105)
Any	.6270	.6746
Verbal	.6430	.6876
Physical	.6769	.4768
Any Arrest(s)	.6614	degenerative
Violent Arrest(s)	.6603	degenerative

Predictive utility of the PCL:SV for males versus females

As can be seen in Table 16, the PCL:SV total scores were only moderately predictive of outpatient violence in both sexes. The rate of “Any Violence” was moderately associated with PCL:SV total scores for males (.6270) and females (.6746). PCL:SV total scores were also moderately associated with “Physical Violence” by male patients (.6769), but were actually negatively associated with “Physical Violence” by female patients (.4768). The AUC’s for “Verbal Aggression” were comparable for men (.6430) and women (.6876). PCL:SV total scores produced AUC’s of .6614 for the outcome measure “Any Arrest” and .6603 for “Violent Arrest.” The PCL:SV total scores for both of these outcome measures produced degenerative AUC’s for the female patients.

Violence in the Context of Rehospitalization

Predictive utility of the HCR-20 for males versus females

The HCR-20 was better at assessing violence in the context of rehospitalization with men than with women (see Table 17). This measure produced an AUC of .7310 for men, and an AUC of .6841 for women for “Any Violence.” These results indicate a moderate sized relationship between HCR-20 total scores and “Any Violence” in the context of rehospitalization. “Physical Violence” was also more highly associated with HCR-20 total scores for the male patients (AUC = .6995) than for the female patients (AUC = .5022). HCR-20 total scores had a moderate sized relationship with both male (AUC = .7370) and female (AUC = .6842) “Verbal Aggression” that was associated with the patient being rehospitalized.

Predictive utility of the PCL:SV for males versus females

As can be seen in Table 18 psychopathy as measured by the PCL:SV is moderately associated with violence in the context of rehospitalization in both men and women in this population. Total scores on the PCL:SV produced low/moderate AUC's of .6346 for males and .5992 for females for "Any Violence." "Physical Violence" similarly produced an AUC of .6539, but the AUC for females was .2716, demonstrating a negative predictive relationship between PCL:SV total scores and physical violence committed by women in the context of rehospitalization. The PCL:SV total score was moderately associated with "Verbal Aggression" by both men (.6326) women (.6764). Tables 19 and 20 provide a summary of the minimum and maximum AUC's for males and females by type of outcome violence.

Table 17Predictive Utility of the HCR-20 for Violence in the Context of Rehospitalization Measured by AUC'sHCR-20 AUC's

<i>Outcome Measure</i>	MALES (n = 64)	FEMALES (n = 40)
Any Violence	.7310	.6841
Verbal Aggression	.7370	.6842
Physical Violence	.6995	.5022

Table 18Predictive Utility of the PCL:SV for Violence in the Context of Rehospitalization Measured by AUC'sPCL:SV AUC's

<i>Outcome Measure</i>	MALES (n = 64)	FEMALES (n = 40)
Any Violence	.6346	.5992
Verbal Aggression	.6326	.6764
Physical Violence	.6539	.2716

Table 19Summary of HCR-20 AUC's for Males and Females by Type of Outcome Violence

<u>Violence</u>	<u>Males</u>		<u>Females</u>	
	<u>Min</u>	<u>Max</u>	<u>Min</u>	<u>Max</u>
Inpatient	0.5535	0.6139	0.6147	0.7484
Outpatient	0.6768	0.7826	0.6342	0.7712
Rehospitalization	0.7370	0.6995	0.5022	0.6842

Table 20Summary of PCL:SV AUC's for Males and Females by Type of Outcome Violence

<u>Violence</u>	<u>Males</u>		<u>Females</u>	
	<u>Min</u>	<u>Max</u>	<u>Min</u>	<u>Max</u>
Inpatient	0.5860	0.6149	0.6424	0.7528
Outpatient	0.6270	0.6769	0.4768	0.6876
Rehospitalization	0.6346	0.6539	0.2716	0.6746

Survival Analyses

Survival analyses examine the probability of dichotomous events and were done to compare the length of time (in days) that a patient scoring above the median split or below the median split would remain violence free (i.e., during hospitalization or following discharge into the community). Survival analyses were conducted for inpatient and outpatient violence with each of the three risk assessment schemes. These analyses demonstrate whether median cutoffs on the measures distinguish violent from non-violent individuals. The median cutoffs were used in part because the mean scores for the sample fell at around the median and given that this is a civil psychiatric population (i.e., relatively low base rate of violence compared to a correctional or forensic psychiatric population) it was thought that this would optimize the predictive capabilities of the measures without sacrificing the goals of the study (i.e., to assess the utility of the measures within a civil psychiatric population and with men versus women).

Inpatient violence

The survival curves for inpatient violence were plotted using a cutoff of 500 days, although the maximum length of stay (or time at risk for inpatient violence) was 6366 days, in order to reduce the effect of the skewed distribution on the survival curves. The cumulative survival rate is not accurately represented for inpatient violence using the entire range of the number of days until a violent incident because the distribution is extremely skewed. The vast majority of patients who engaged in violence did so before the 500th day after admission making this a good cutoff point. Between the 500th and 6000th day of hospitalization just 9 of the total 279 patients engaged in inpatient violence for the first time. The survival curve is an estimate of the proportion of patients surviving (i.e., not violent). For all of the patients entering a block of

time the patients who were violent as well as the patients who died or were released from hospital would be removed from the analysis at that time so that the graph would not accurately represent the proportion of patients surviving (i.e., not engaging in violence). The outpatient data was not skewed and, therefore, for those analyses the total follow up time period was used.

Any aggression against others. Using the recommended cutoff of <3 for Low scorers and ≥ 3 for High scorers (McNiel & Binder, 1994a) McNiel and Binder's tool did very poorly at distinguishing between patients who were and were not violent in the hospital (see Figures 2 & 3). Of the 30 men receiving low scores on McNiel and Binder's measure more than half ($n = 17$) went on to be aggressive against others (56.7%). Thirty-four of the total one-hundred-thirty four men with high scores were not violent (25.4% survival rate). Similarly, more than two-thirds ($n = 23$) of the women receiving low scores ($n = 75$) on McNiel and Binder's measure were aggressive against others during their hospitalization (30.7%). Of the 35 women with high scores the majority ($n = 26$) did engage in violence while hospitalized (74.2%).

Survival analyses were also conducted by doing a median split for the HCR-20 and PCL:SV. Patients receiving total H&C total scores of 0 - 7 were categorized as Low scorers and patients receiving scores between 8-15 were categorized as High scorers. Patients with PCL:SV total scores of 0-11 were categorized as Low scorers and patients with total scores in the 12-24 range were categorized as High scorers. Similar to McNiel and Binder's tool, the PCL:SV (see Figures 4 & 5) and the HCR-20 (see Figures 6 & 7) were not able to reliably distinguish between which patients would survive (i.e., would remain violence free) and those who would not survive (i.e., would engage in violence). Of the 118 males with low scores on the PCL:SV 80 were violent against others (67.8%). The rate of violence among women with low PCL:SV scores was

also high, with 64 of the 94 (68.1%) low scoring women engaging in aggression in hospital. The measure did a better of job identifying patients who would be violent. For males, 36 of the 45 (80%) patients with high scores were violent. For females, 11 of the 12 (91.6%) patients with high scores were violent.

Of the 43 males categorized as low scorers on the H & C scales of the HCR-20 26 were violent during their stay in hospital (60.5%). The measure also did poorly at identifying women who would not be violent, with 32 of the 58 (55.2%) women with low H & C scale scores being aggressive. In comparison, 90 of the 120 (75%) men with high scores were violent and 44 of the 50 (88%) women with high scores were violent. To summarize the raw data for inpatient violence, at the study end date 49 of the 167 men (29.3%) had “survived” (i.e., were not violent against others). Comparably, 32 of the 112 women (28.6%) had remained violence free.

Figure 2

M&B total: Time to Any Inpatient Violence

Males

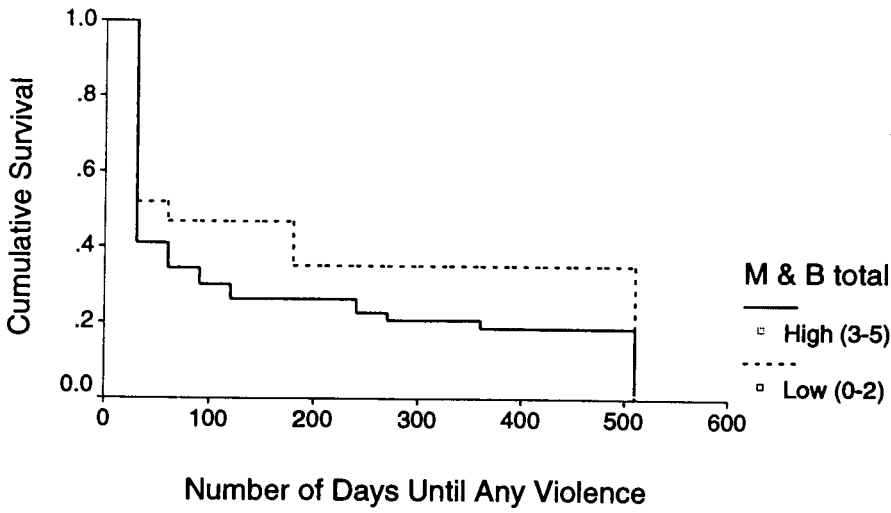


Figure 3

M&B total: Time to Any Inpatient Violence

Females

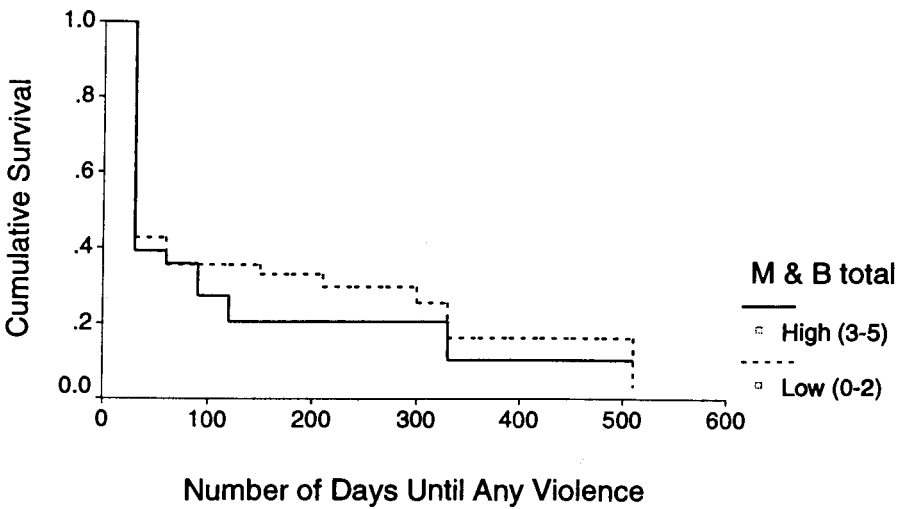


Figure 4

PCL:SV total: Time to Any Inpt Violence

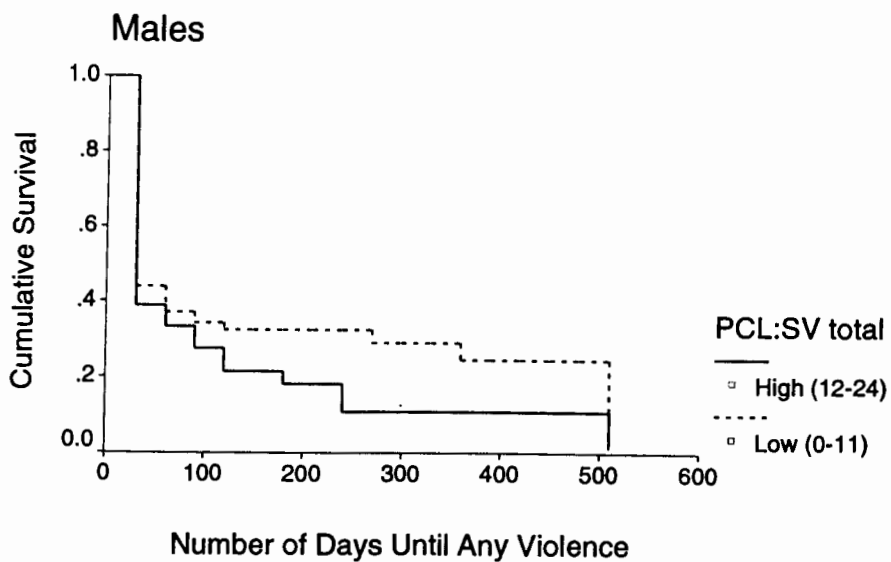


Figure 5

PCL:SV total: Time to Any Inpt Violence

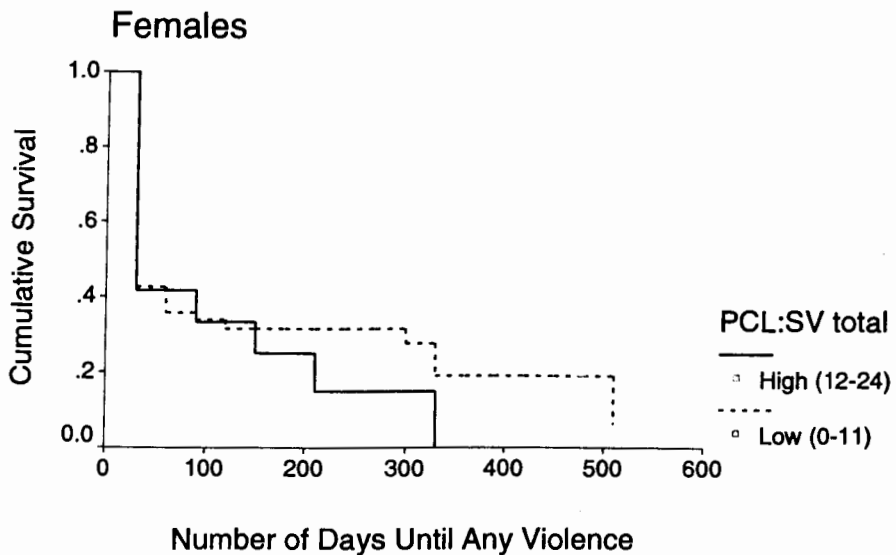


Figure 6

HCR-20 total: Time to Any Inpt Violence

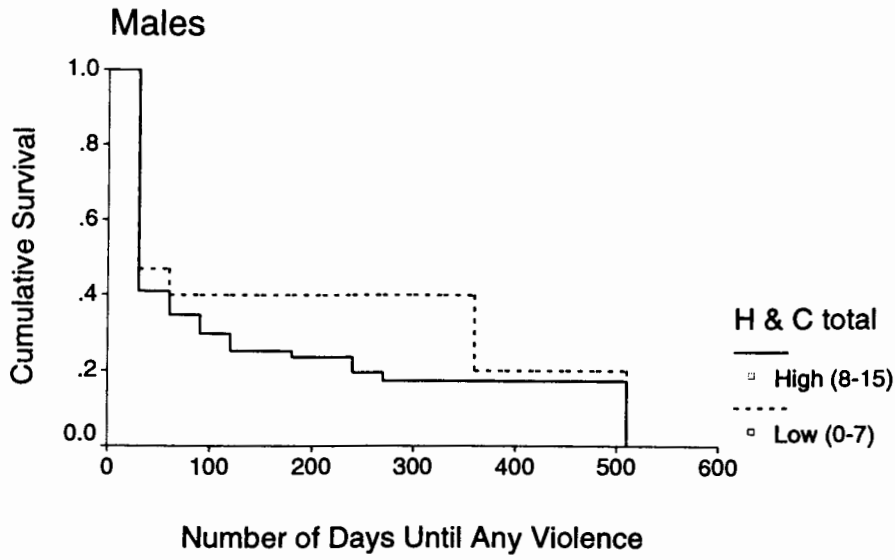
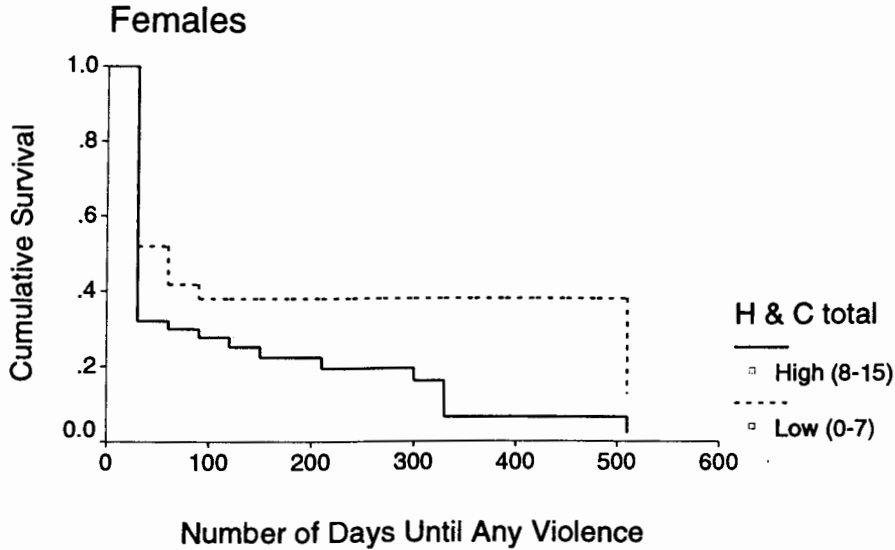


Figure 7

HCR-20 total: Time to Any Inpt Violence



Physical aggression. Conducting the survival analyses for patients who were physically aggressive (includes patients who were strictly physically aggressive and patients who were physically and verbally aggressive) did not increase the relationship between the measures' categorizations of patients as high or low scorers and the likelihood that a patient went on to be violent (see Figures 8 - 13). McNiel and Binder's tool classified 72 non-physically violent male patients as high scorers and 10 of the truly violent male patients as low scorers. The measure also performed very poorly with females. A woman with a high score on McNiel and Binder's tool was no more likely to be physically violent than she was to be non-physically violent, the same was true of patients with low scores (i.e, they were no more likely to be non-violent than they were to be violent). Of the 75 women receiving low scores 39 were not violent and 36 were physically violent in hospital. Of the 35 women receiving high scores 17 were not violent and 18 were physically violent at some time during their commitment. Note in Figure 9 how the two lines for the high and low scorers overlap between the 400th and 500th days of the study indicating that by that point in time there was no difference in the occurrence of physical violence by women with high and low scores.

High and low scores on the PCL:SV also did a poor job of distinguishing between physically violent and non-physically violent patients (see Figures 10 & 11). Regardless of sex, patients with high scores were almost as likely to be non-physically violent as they were to be physically violent. Of the 45 males with high PCL:SV scores 24 were physically aggressive and 21 were not physically aggressive. Of the 12 women with high PCL:SV scores seven were physically aggressive and five were not physically aggressive (see the overlap between the lines

representing high and low scorers in Figure 11). In comparison, 118 men and 94 women received low scores, 48 and 44 of whom were physically violent during their hospitalization, respectively.

Of the 163 men with complete HC - total scores (because this is for inpatient violence the R-scale was not used and the clinical admission scale total was used) 71 were physically violent in hospital. Of the 120 men with high scores on this measure just 56 were violent. In comparison, 15 of the men with low scores ($n = 43$) were also violent. Of the 50 women receiving high HC - total scores only 31 were actually physically violent and 21 of the women with low scores were also physically violent.

As mentioned previously, median cutoffs were used for the survival analyses in part because the mean scores for the sample fell at around the median and given that this is a civil psychiatric population (i.e., relatively low base rate of violence compared to a correctional or forensic psychiatric population) it was thought that this would optimize the predictive capabilities of the measures without sacrificing the goals of the study (i.e., to assess the utility of the measures within a civil psychiatric population and with men versus women). In fact, it may be that using median splits rather than the proposed cutoffs sacrificed the measures' abilities to assess violence. However, this is not the case for McNeil and Binder's screening tool because the recommended cutoffs were used.

Figure 8

M&B total: Time to Inpt Physical Violence

Males

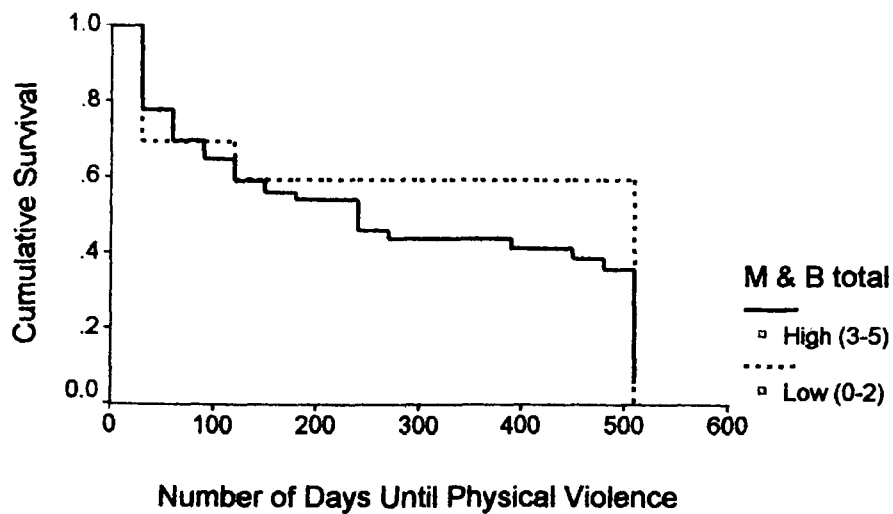


Figure 9

M&B total: Time to Inpt Physical Violence

Females

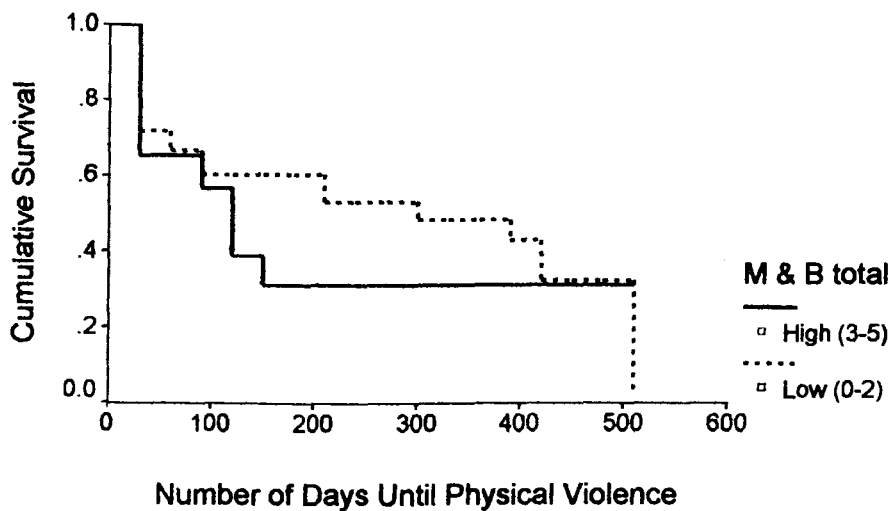


Figure 10

PCL:SV: Time to Inpt Physical Violence

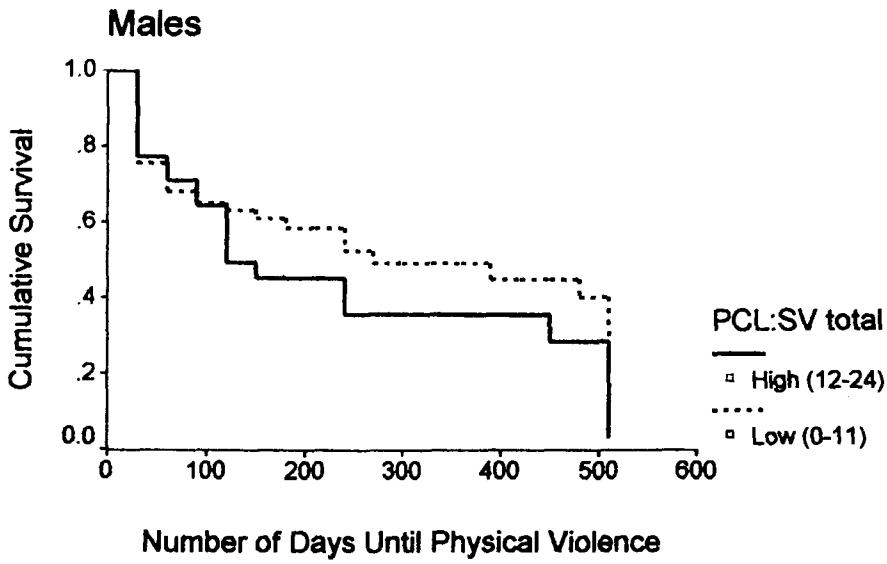


Figure 11

PCL:SV: Time to Inpt Physical Violence

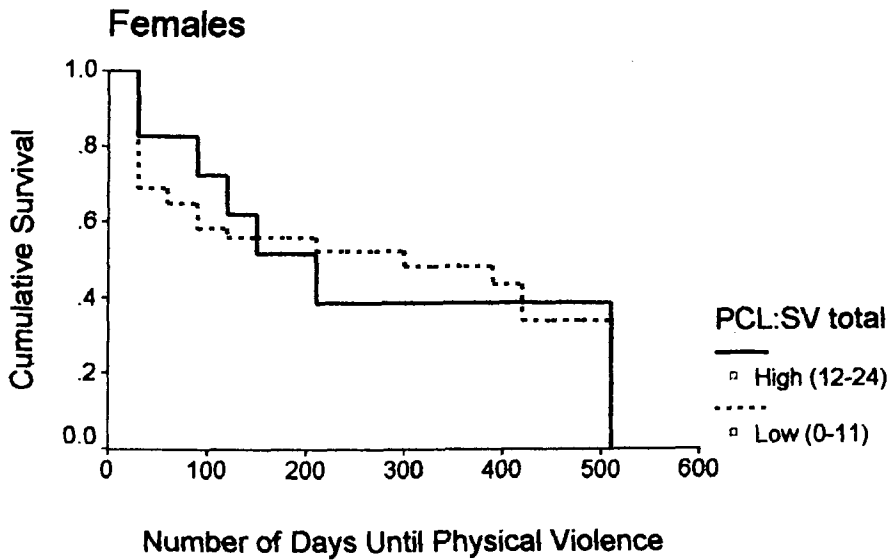


Figure 12

HCR-20: Time to Inpt Physical Violence

Males

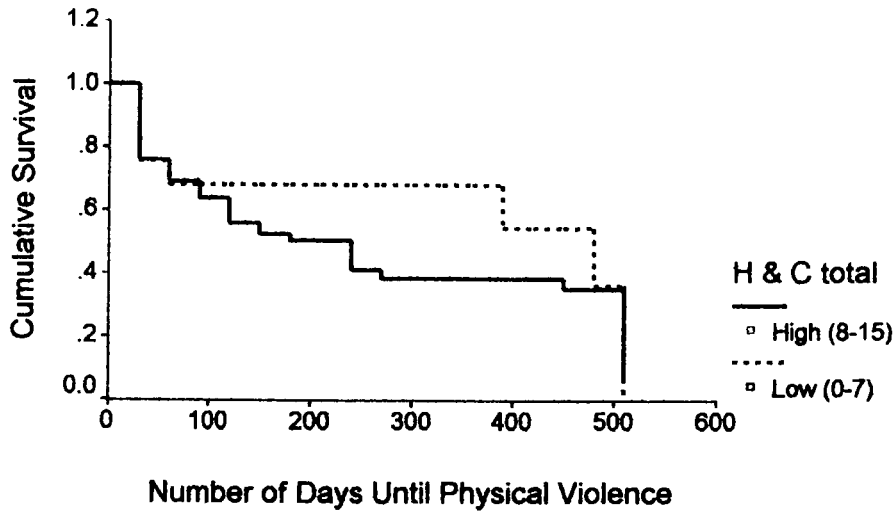
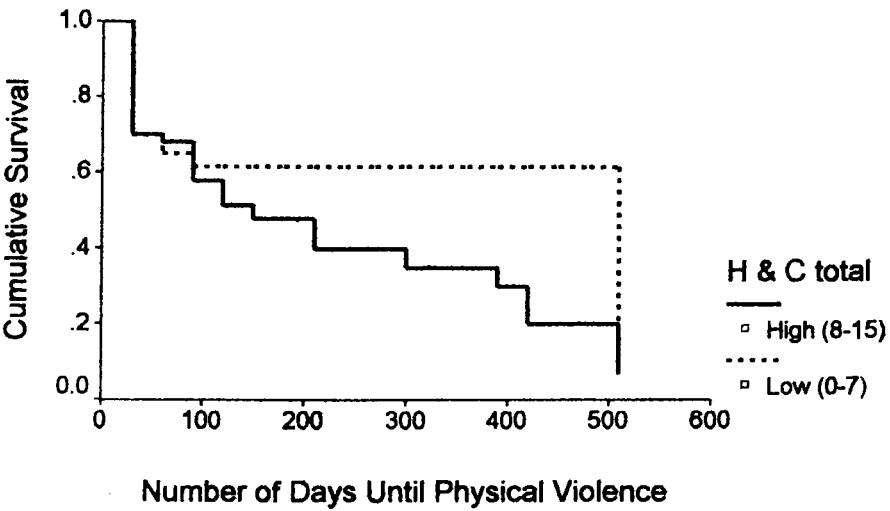


Figure 13

HCR-20: Time to Inpt Physical Violence

Females



Outpatient violence

With sex as a covariate, results indicate that the HCR-20 does a good job of distinguishing between patients who engage in “Any Violence” (see Figures 14 & 15). High and low scores on the HCR-20 were also reliable indicators of who was arrested for a violent offence following discharge. As can be seen in Figures 14 and 15, very few of the males and females receiving low scores on the HCR-20 were subsequently arrested for a violent offence. It will be recalled that a flat line indicates no incidents. In contrast, males and females receiving high scores on this measure were clearly distinguished as being more likely to be arrested for a violent offence. By the 900th day of follow-up, approximately 25% of patients with high HCR-20 scores (both male and female), had been arrested for a violent offence. As was seen with the ROC analysis, this measure did a good job of distinguishing between male patients who engaged in “Physical Violence,” but was a fairly poor predictor of outpatient physical violence by females (see Figure 10).

The PCL:SV did a poor to moderate job of distinguishing between patients who would go on to be aggressive in the community following discharge (see Figures 12 and 13). Of the 34 males who were physically violent following discharge just 13 had received a PCL:SV score of 12 or greater (see Figure 14). Similarly, only two of seven women who were physically aggressive during the average two year follow-up received PCL:SV total scores above the median split (see Figure 15). The measure also performed poorly for violent arrest outcomes (see Figures 16 & 17) for males although it did relatively well with this outcome measure with women.

Figure 14

HCR-20 total: Time to Any Outpt Violence

Males

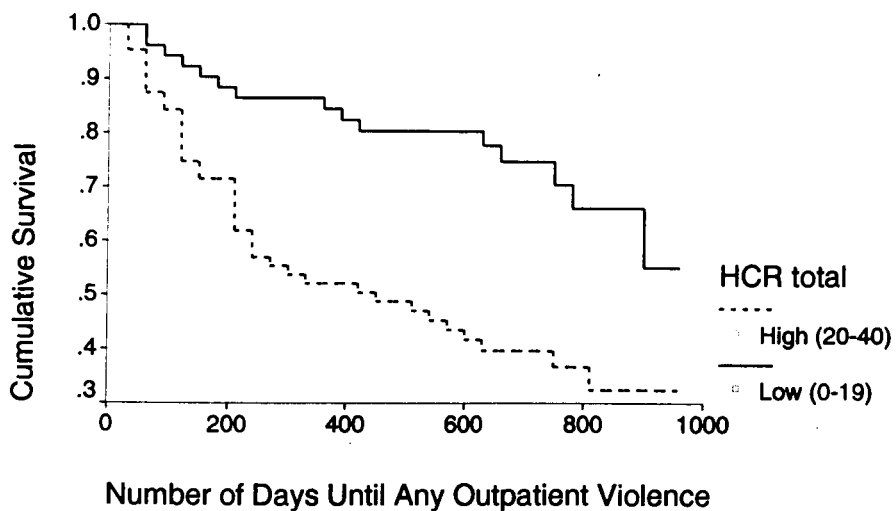


Figure 15

HCR-20 total: Time to Any Outpt Violence

Females

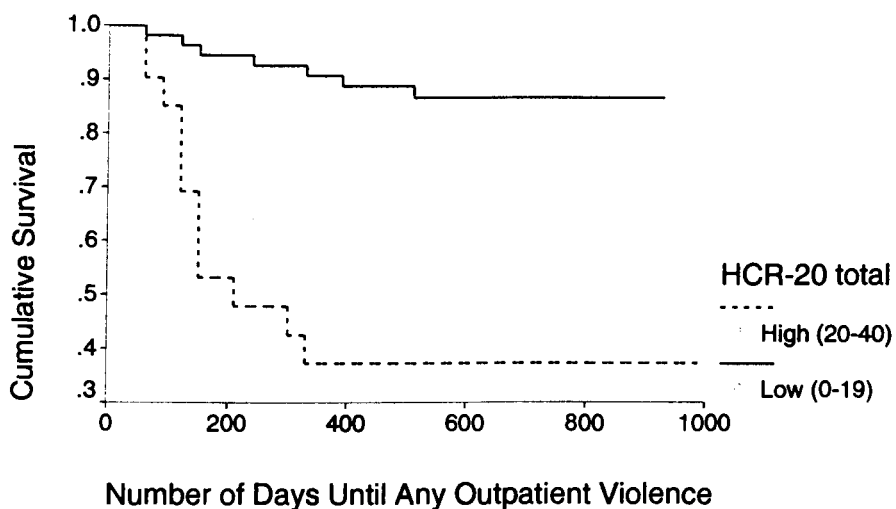


Figure 16

HCR-20 total:Outpt Physical Violence

Males

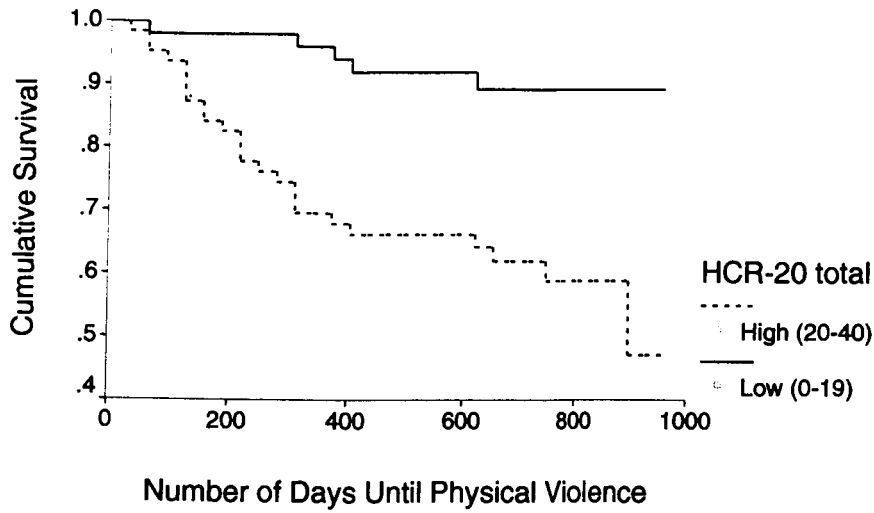


Figure 17

HCR-20 total:Outpt Physical Violence

Females

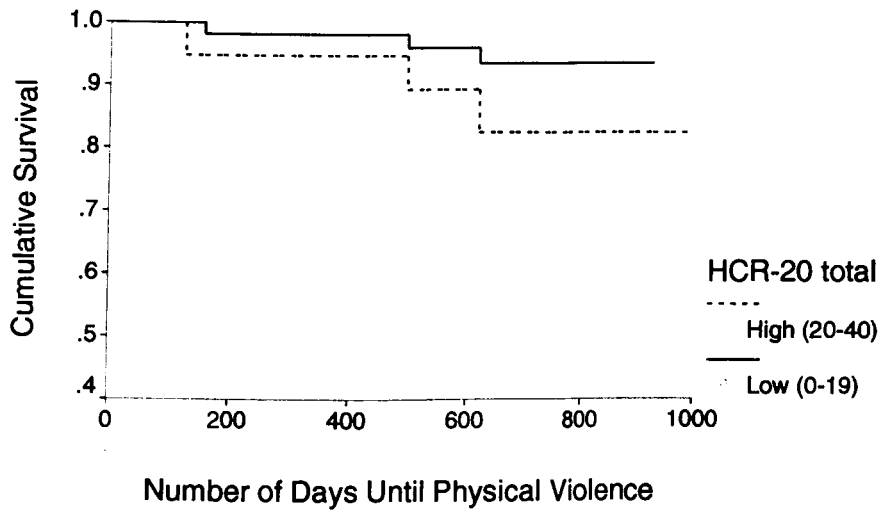


Figure 18

HCR-20 total: Time to Violent Arrest

Males

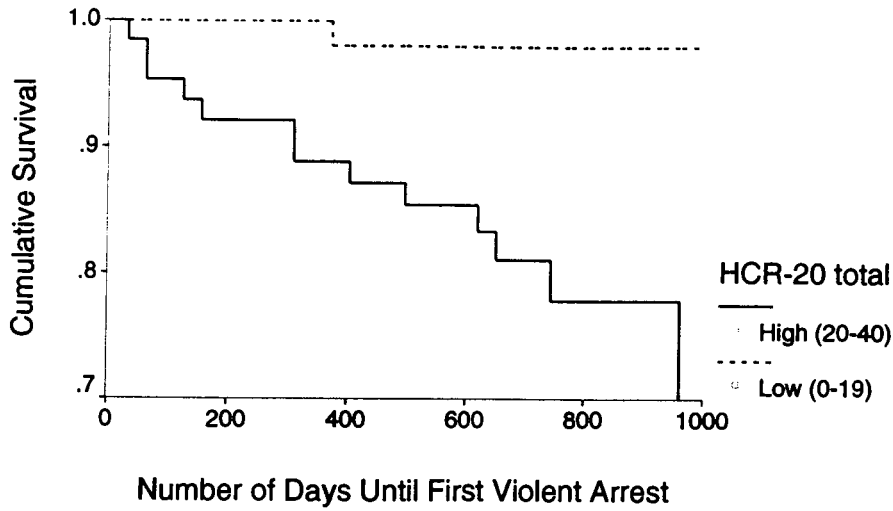


Figure 19

HCR-20 total: Time to Violent Arrest

Females

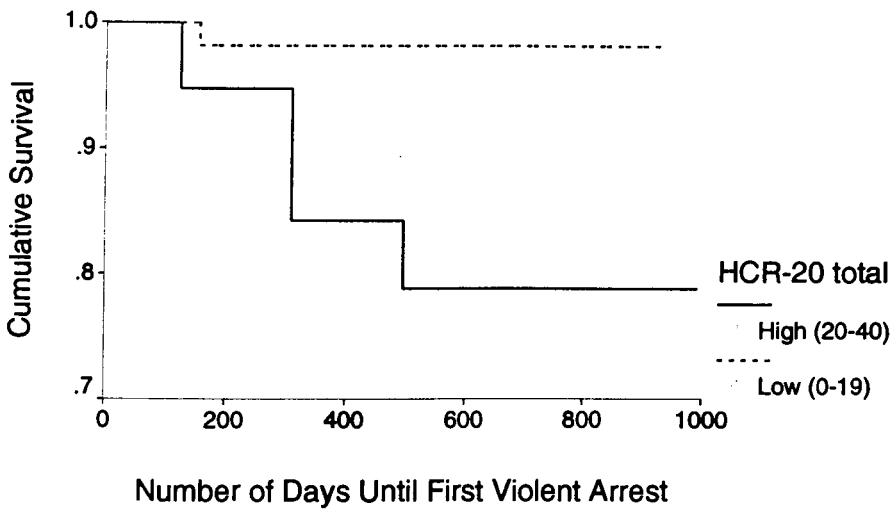


Figure 20

PCL:SV total:Any Outpt Violence

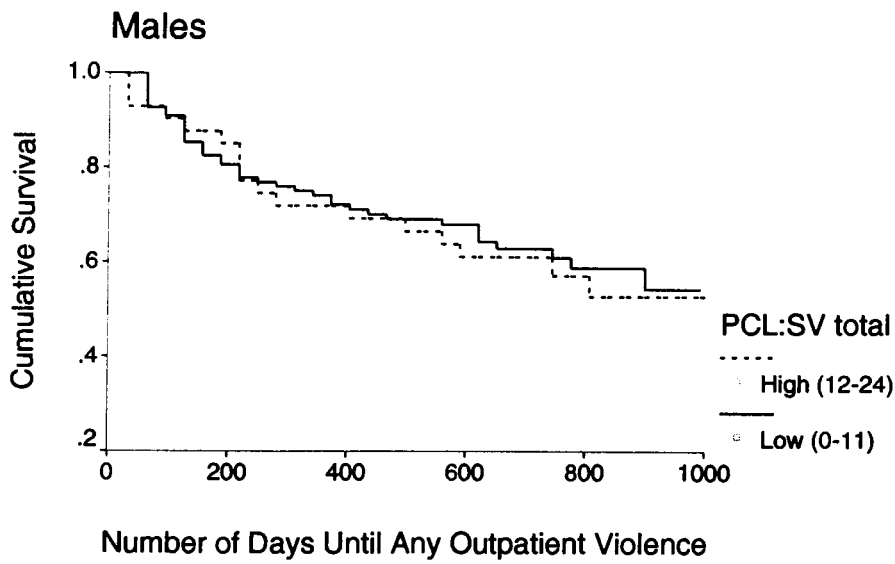


Figure 21

PCL:SV total: Any Outpt Violence

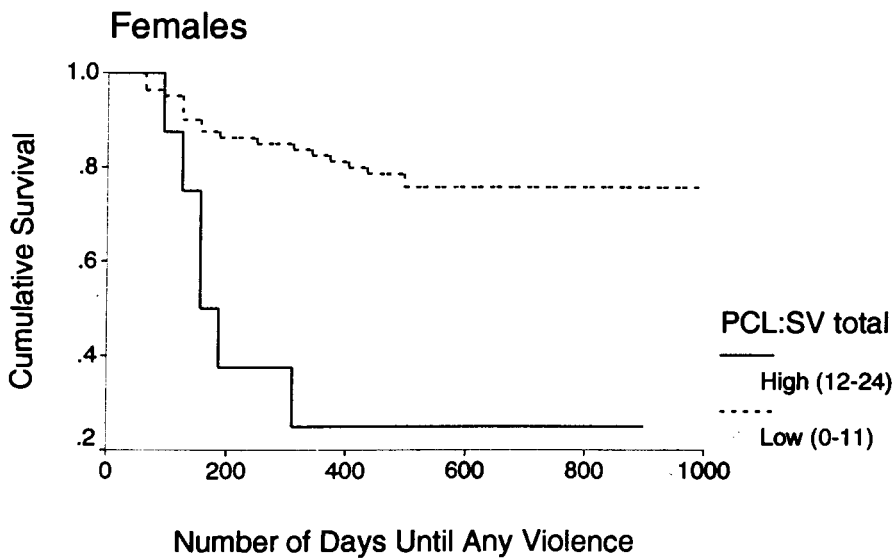


Figure 22

PCL total:Time to Outpt Physical Violence

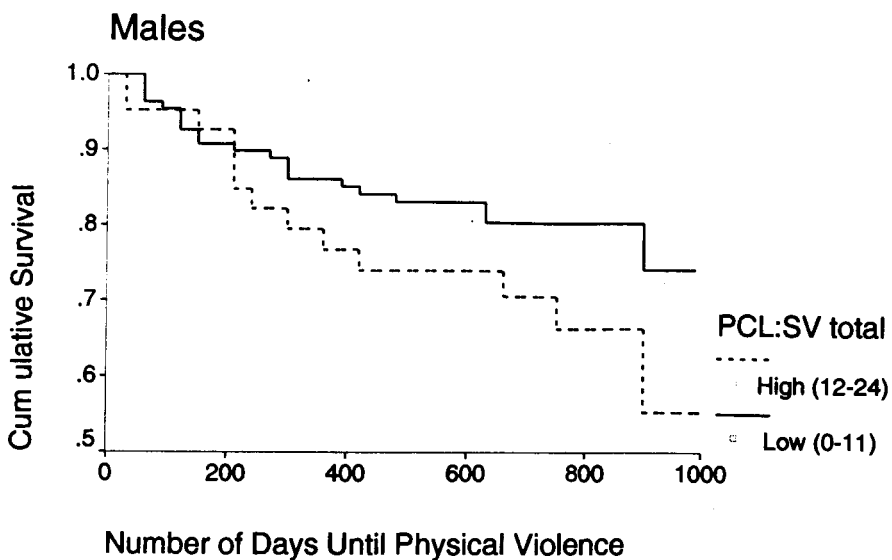


Figure 23

PCL total:Time to Outpt Physical Violence

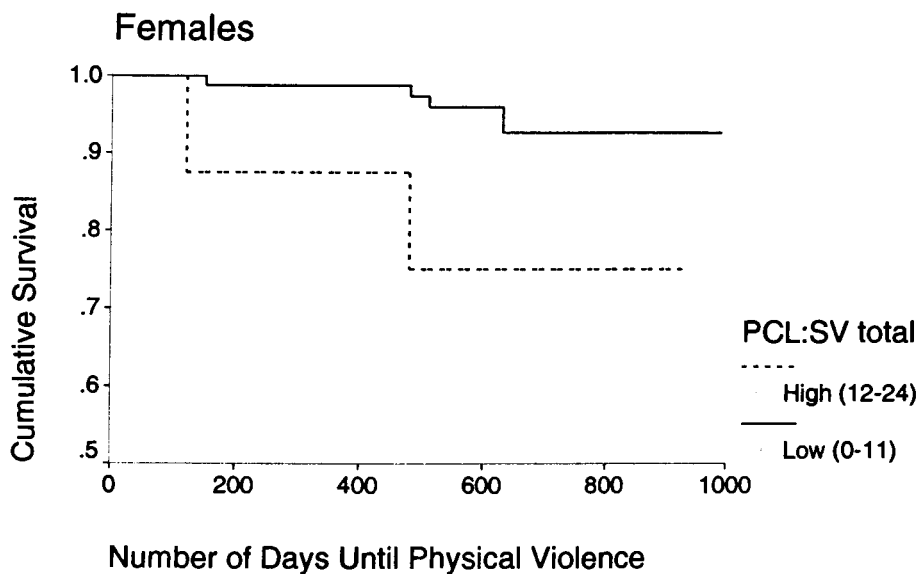


Figure 24

PCL:SV total: Time to Violent Arrest

Males

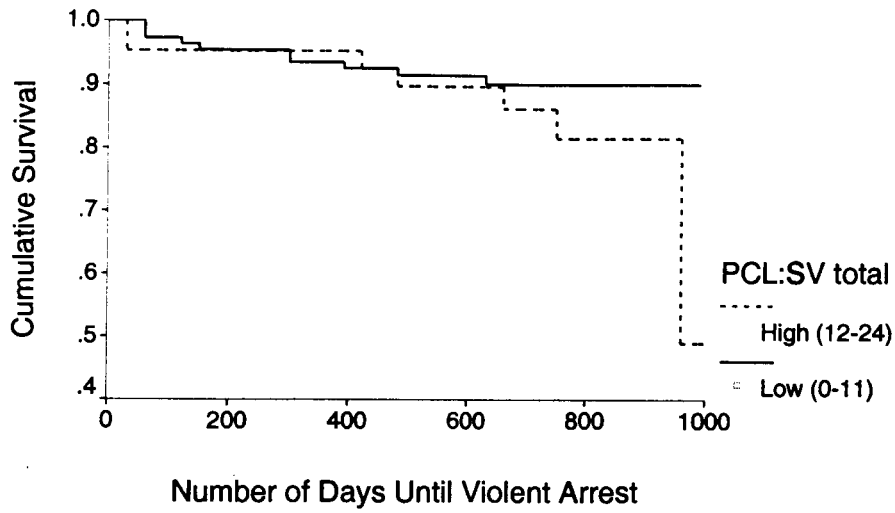
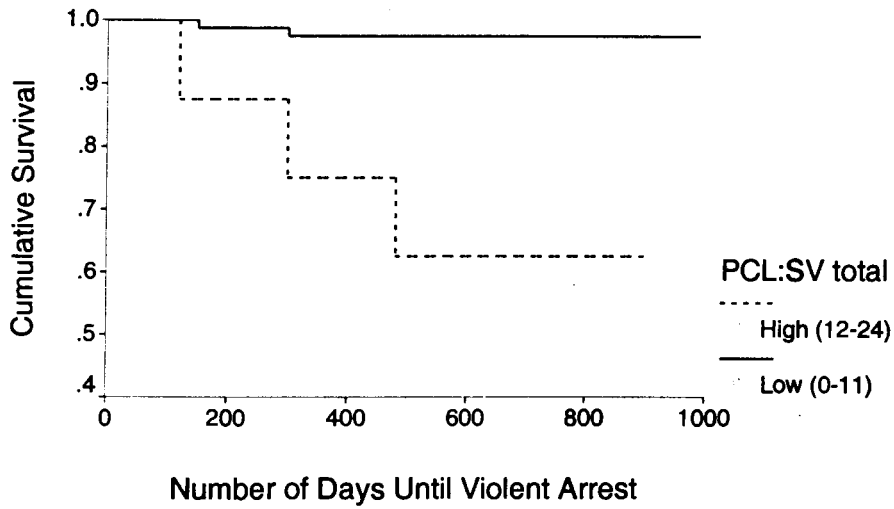


Figure 25

PCL:SV total: Time to Violent Arrest

Females



Discussion

The purpose of this study was: (1) To determine the base rate of violence among male and female civil psychiatric patients; (2) To evaluate the reliability of three measures recognized to have a significant relationship with future violence in men with a history of violence in a sample of male and female civil psychiatric patients; (3) To compare the predictive utility of the HCR-20, PCL:SV, and McNeil and Binder's screening tool; (4) To examine if the relationship between sex and violence in this population is moderated by setting.

Research Question 1: Contrasting the Base rate of Violence by Male versus Female Patients

Consistent with previous research, the men and women in this sample of civil psychiatric patients exhibited almost identical rates of inpatient violence. Also consistent with previous findings, men were more likely than women to be violent following release into the community. Taken together, research has demonstrated quite conclusively that female psychiatric inpatients present a risk of violence equivalent to their male counterparts. However, there is conflicting evidence to suggest that the risk of violence presented by men and women may be moderated by setting (this will be discussed with reference to research question 3).

It was hypothesized that female patients would present a risk of harm to others not significantly different, but never greater than, that of male patients. The results of this study, taken in combination with previous research on the topic, suggest that perceptions regarding the rate of violence by men versus women in psychiatric settings are erroneous. Consistent with previous research (Lidz, et al., 1993), this study suggests that the rate of violence by female psychiatric patients has generally been underestimated, particularly in inpatient populations. This research lends further support to the growing literature indicating that female civil psychiatric

inpatients present a risk of violence to others equivalent to their male counterparts. The base rate of inpatient violence by men versus women in this sample was comparable to the rates found in previous studies with comparable samples (Klassen 1996; Lidz et al., 1993; McNiel et al., 1988; Monahan, 1997). Almost half of the patients in this sample were physically violent during hospitalization and somewhat unexpectedly, the women were more likely than the men to exhibit physical aggression at some time during their stay in hospital, although this difference was not significant. The results of the current study should be tempered with a recognition that the severity of violence was not assessed and it may be that although women commit a similar number of violent acts during hospitalization the degree of harm caused to victims is significantly less than that caused by their male counterparts. Other studies have also found female patients to have slightly higher rates of aggression than male patients (Binder & McNiel, 1990; Convey, 1986; Lidz et al., 1993; Way & Banks, 1990).

Noting that a number of studies have concluded that female psychiatric patients present a risk of violence equivalent to, and in some cases greater than, male patients, Davis (1991) proposed that given the fact that inpatients are "a select group of disturbed, agitated individuals," sex roles may be blurred in the inpatient setting. Tardiff (1983) similarly proposed that when women experience this blurring of the sex roles they may adopt more masculine traits, such as aggressive or violent behaviours. Other authors have hypothesized that there is an accepted level of violence on inpatient units (Durivage, 1989; Felthous, 1986) and one might anticipate that this norm of aggression might contribute to an increased level of violence, particularly on the part of female patients who are used to strict norms regarding the unacceptability of expressions of aggression or violence in community settings.

Perhaps a more probable explanation to account for the comparable base rate of inpatient violence by men and women and the significant difference between the rate of outpatient violence by men versus women is the influence of gender expectations of hospital staff on their interactions with patients. For example, nurses may be less likely to anticipate that a verbally abusive woman will become physically aggressive. Or it could be that because men on average are larger, and stronger and therefore more intimidating, that hospital staff intervenes to de-escalate potentially violent male patients before they have a chance to exhibit violence, whereas a woman exhibiting the same cues may be overlooked. It is proposed that further research evaluating the base rate of inpatient violence by men versus women should examine, and take into account, factors such as hospital staff response to verbal aggression by male versus female patients. Perhaps the base rate of violence by men and women is not moderated by setting, but rather by the controlled atmosphere of an inpatient hospital ward. That is to say that it may be that the rate of violence by women psychiatric patients could be consistent across inpatient and outpatient settings and in fact the rate of violence by male patients is stifled in the hospital due to staff reacting to escalating demonstrations of aggression (e.g., verbal outbursts, or property damage).

To summarize, there is a growing body of literature to support the hypothesis that sex is not a useful factor for discriminating between violent and non-violent psychiatric patients. A large number of studies have concluded that female psychiatric inpatients present a risk of violence comparable to male patients. The challenge that lies ahead is to determine if the rate of aggression by female outpatients is also comparable to that of male outpatients. The results of the current study suggested that female patients were significantly less likely than male patients to engage in violent behaviour upon release to the community, supporting the hypothesis that setting

moderates the relationship between sex and violence in psychiatric patients. However, there is conflicting evidence from two methodologically strong studies, namely the Lidz et al., (1993) study and the MacArthur Violence Risk Assessment Study (see Monahan, 1997; Monahan & Steadman, 1994), both of which have found that female psychiatric outpatients present a risk of violence comparable to male outpatients. As noted previously, these studies differ from the current one in that they had access to follow-up interviews with patients and collaterals, suggesting that they are likely to have more accurate data on the rate of outpatient violence.

Research Question 2: Comparing the Predictive Utility of the Risk Assessment Measures with Men versus Women

Unexpectedly, the results of the current study indicate that the risk measures are significantly more reliable at predicting risk of inpatient violence in females than in males. The measures demonstrated comparable utility with both sexes for outpatient violence. Based on the rationale that the HCR-20 and PCL:SV were developed and have been evaluated primarily in research with males, and the fact that there has been a lack of research investigating variables that reliably predict violence risk in women, and in female civil psychiatric patients specifically, it was hypothesized that the risk measures would be more reliable at assessing risk of violence in male than in female patients. Results did not support this hypothesis. In fact, all three measures were better at assessing inpatient violence by women than by men, despite the fact that the base rates of inpatient violence were nearly identical for men and women. With the exception of physical violence, the HCR-20 and PCL:SV also proved to be more reliable assessors of the risk of violence upon release into the community in female patients than in male patients.

Inpatient violence. McNiel and Binder's tool was poorly predictive of inpatient violence by men. As was found with the other two measures, this tool was more reliably associated with inpatient violence by women than by men, although the relationship was still only moderate. This finding is particularly unexpected given that one of the risk items on the measure is being male. As noted previously, Monahan (1996) stated that gender is likely to be less predictive of violence in psychiatric populations than in the general population. It should also be noted that this measure was designed to assess risk of inpatient violence. It will be recalled that previous research has found that the rate of violence by male and female patients is almost equivalent, and in some cases female patients are more assaultive than their male counterparts (Klassen, 1996; Lidz et al., 1993; McNiel et al., 1988).

The HCR-20 appears to be better at assessing risk of inpatient violence in women than in men. The "H total" and "Clinical admission total" scores were moderately to moderately/highly predictive of inpatient violence by women, but only moderately predictive of inpatient violence by men. Similar to the HCR-20, the PCL:SV was more predictive of inpatient violence by women than by men. The relationship between patients' PCL:SV total scores and inpatient violence were in the low to low/moderate range for men and the moderate to moderate/high range for women.

Outpatient violence. The performance of the HCR-20 with outpatient violence was very encouraging in both sexes. It should be noted that the measure was designed to predict "violence," and as would be expected, it has just a moderate relationship with "Any Arrests" (for males), but a moderately large association with violent arrests in males and females. The PCL:SV total scores were only moderately associated with outpatient violence in both sexes.

To summarize, the risk measures performed surprisingly well with women. In general, the HCR-20 appears to predict inpatient violence better with women than with men. It performs well with both sexes for outpatient violence. This measure has a moderate to high relationship with rehospitalization violence by men, but a moderate to low relationship with rehospitalization violence by women. Overall, psychopathy as measured by the PCL:SV was found to be more reliably associated with inpatient violence than outpatient violence. In terms of inpatient violence it performs better for women than for men. The PCL:SV produced similar AUCs for outpatient violence and violence in the context of rehospitalization for both men and women.

Research Question 3: Comparing the Predictive Utility of the HCR-20 and PCL:SV

As hypothesized, the HCR-20 was generally superior to the PCL:SV although the difference between the two measures was marginal. The HCR-20 and PCL:SV are both better at predicting inpatient violence by women than by men. The two measures produced fairly equivalent AUC's for both sexes. The HCR-20 and PCL:SV were both better at predicting male outpatient violence. The HCR-20 was superior to the PCL:SV for both sexes. Both measures produced higher AUC's associated with male violence in the context of re-hospitalization. The results suggest that the HCR-20 and PCL:SV are only moderately associated with this type of aggressive behaviour. The fact that the HCR-20 slightly outperformed the PCL:SV is not surprising given that the PCL:SV is an item on the HCR-20. As noted the difference between the two measures was often marginal.

Research Question 4: Moderating Effect of Setting

The results of this study provide further evidence that setting may moderate the relationship between sex and violence. Similar to the results of Lidz et al., (1993) and McNiel, et al., 1988 (see also McNiel & Binder, 1990), the current findings indicate that women engage in comparable rates of violence during hospitalization (see Table 2) and significantly less violence following community discharge (see Table 3).

The Relationship Between Mental Disorder and Violence

The results of the current study, taken in combination with previous research on the subject, suggest that there is a disproportionate rate of violence among involuntarily hospitalized mentally ill individuals. Almost half of the men and one-fifth of the women in this sample of civil psychiatric patients had a history of arrests for violent offences prior to their index hospitalization. Following discharge into the community, 11% of the men and 5% of the women were arrested for violent offences during the two year follow-up period. In 1989/90, one in 100 women compared to seven in 100 men in Canada were charged with a violent crime (Juristat, 1990). Harry and Steadman (1988) noted that during the year following admission to a community mental health centre, patients were .76 to 1.96 times more likely to be arrested than an individual from the general population. It is important to note that these patients had no previous admission history. Clearly, in comparison to the general population, the rate of violence committed by this sample of involuntarily hospitalized mentally disordered men and women is considerably higher and indicates that the existence of a mental disorder (specifically current psychiatric symptoms) warrants recognition when conducting risk assessments with both men and women. It is important to recall, however, that only a small proportion of mentally ill individuals are ever involuntarily

hospitalized, so these results should not be generalized to suggest that all mentally ill individuals engage in a disproportionate rate of violence.

Given the prejudice and ignorance that mentally ill individuals face in the community, it is unfortunate that the research has come to this conclusion. However, it is a reminder of the importance of presenting research results accurately and completely. Given the social ramifications of concluding that a mental disorder is significantly associated with violence, it is important to reiterate what we know about the relationship between mental illness and violence.

Monahan (1992; 1996a; 1996b) described the relationship between mental disorder and violence as modest, but significant. It has been noted repeatedly that most mentally ill individuals are not violent (Binder & McNiel, 1990; Mulvey, 1994; Torrey, 1994) and it is believed that the common factor between mental illness and violence is current psychotic symptoms, not simply a diagnosis of mental illness (Link et al., 1992; Monahan, 1992; 1996b). In addition, research suggests that mentally ill individuals are more likely to be the victims of violence than they are to be the perpetrators (Campbell, Stefan, Loder, 1994; Jenkins, et al., 1989).

To summarize, it would be irresponsible to overlook the documented association between an Axis I DSM-IV diagnosis and violence when conducting risk assessments. In addition, it is improbable that the risk of violence posed by mentally ill individuals will not be factored into determinations such as commitment and review panel release decisions in the vast majority of civil psychiatric settings. Slovik and Monahan (1995; see also Miller, 1992) noted that most American states have a “dangerousness standard” and that civil commitment decisions are based on a decision of whether an individual is (a) sufficiently mentally ill and, (b) presents a sufficient risk of harm to others. However, responsible science precludes policy decisions regarding the rights and

freedoms of mentally ill individuals from being drastically altered based on recent research indicating that there is in fact a significant, albeit small, relationship between mental illness and violence, given the fact that the vast majority of mentally disordered individuals are not violent (Binder & McNiel, 1990; Mulvey, 1994; Torrey, 1994).

Monahan (1992) noted that “demonstrating the existence of a statistically significant relationship between mental disorder and violence is one thing; demonstrating the social and policy significance of the magnitude of that relationship is another” (p. 519). Monahan (1992) went on to describe the magnitude of risk presented by mentally ill individuals in comparison to young males with low socioeconomic status, and with the increased risk presented by individuals who abuse drugs or alcohol. He concluded that the increase in risk associated with an Axis I disorder is “at best a trivial contribution to the overall level of violence in society” (p. 519). Any intention to limit the rights and freedoms of mentally ill individuals should be tempered with a recognition that research suggests that the relative risk presented by young lower class males, or alcohol and drug abusers, would make them the more logical target of such unfounded discrimination. As Lidz and Mulvey (1995) noted in an article dedicated to the memory of Saleem Shah, “What clearly survived throughout his professional career was a conviction that it was unjust to use preventive detention for persons with mental disorder if others, who were equally dangerous, were not so detained” (p. 46).

To summarize, consistent with previous research, men and women were found to have comparable base rates of inpatient violence with almost most half engaging in some form of aggression during hospitalization. Also consistent with previous findings, the base rate of outpatient violence was found to differ significantly by sex, with men engaging in significantly

more aggression in general, and physical aggression and violent crimes. The results are consistent with prior research indicating that setting may moderate the relationship between gender and violence. Strong support was found for the HCR-20 with both sexes in both inpatient and outpatient violence. McNiel and Binder's Screening Tool and the PCL:SV were found to have modest associations with violence in this sample.

Conclusion

The findings of the present study support the growing body of consistent research results to suggest that the base rate of violence by female patients is comparable to that of male patients during hospitalization. The results indicate that male patients are significantly more violent following community discharge, but these results are tempered by the fact that follow-up, although thorough, did not include patient and collateral interviews. Unexpectedly, this study found that despite the fact that the measures evaluated in this research were developed and tested almost exclusively with males (this is not true of M&B's screening instrument), they have stronger predictive ability with inpatient violence by women and comparable associations with outpatient violence in both sexes. In general, the results provide strong support for the relationship between HCR-20 scores and inpatient and outpatient violence by men and women. The results for McNiel and Binder's Screening Tool and the PCL:SV were less impressive.

Given the fact that the BC Mental Health Act and almost all mental health acts in North America require the detainment of mentally ill individuals for their protection or the protection of others, it is necessary to improve our ability to assess risk of violence in this population. The most obvious advantage of reliable risk assessments is the prevention of harm to others. In addition,

though, reliable assessments also would prevent the detention of individuals who do not present a significant risk of harm to others and are therefore entitled to their liberties.

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Appendix A
Riverview Hospital Research Coding Protocol

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Patient Information

Patient Status: _____ Sex: 1 (male) 2 (female)
Admission Date: _____ DOB: _____
Discharge Date: _____ Age at Admission: _____
Date of Application for Panel: _____ Age at Discharge: _____
Psychiatrist at Admission: _____ Height: _____
Psychiatrist at Discharge: _____ Weight: _____
Ward at Admission: _____ Distinguishing marks (i.e., scars) _____
Ward(s) transferred to: _____ Length of index hospitalization _____

Ethnicity: _____

If appropriate, check

1 White, not of Hispanic origin

5 Black, not of Hispanic origin

2 Hispanic

6 East Indian

3 Aboriginal/Native

7 Bi-racial

4 Asian

8 Other (specify) _____

Birthplace: _____

Hospital's rating of potential assaultiveness: 1 low 2 med 3 high

First language: _____

Hospital's rating of potential for suicide: 1 low 2 med 3 high

Length of time in BC: _____

Hospital's rating of potential for elopement: 1 low 2 med 3 high

Education (last program and/or grade completed): _____

Age patient left school: _____

Training/Skills: _____

Children: 0 No 1 Yes

Number _____

Does patient have custody? 0 No 1 Yes

If no custody, does patient have contact? 0 No 1 Yes

If no custody, were children apprehended by MSS? 0 No 1 Yes

If children were apprehended, why? (i.e., physical abuse) _____

Life Situation

Living arrangement prior to index hospitalization

- 1 Living by self in own apartment/house/condo etc
- 2 Living in boarding home
- 3 Living in scid row hotel
- 4 Living with family (nonmarital)
- 5 Living with partner
- 6 Living with friends
- 7 Living on the street
- 8 Extended care home
- 9 Other (specify) _____

Patient has lived in community living settings in the past (i.e., group home): 0 No 1 Yes

If yes, when? _____

Problems in community living settings? 0 No 1 Yes

Specify: 1 Physical aggression

2 Verbal aggression and/or threatening behaviour

3 Substance abuse

4 Fail to comply with rules

5 Other (Specify) _____

Employment

Amount of money received per month: _____

Equity (i.e., home): 1 Yes (specify) _____

2 No

Mother's occupation: _____

Father's occupation: _____

Sources of financial support: 1 Social assistance

2 Employment

3 Dependent on family

4 Dependent of friends

5 No income

6 Other (specify) _____

Patient employed at time of index hospitalization: 0 No 1 Yes

If no, why did patient leave job? _____

Most recent type of job _____

Patient has not sustained employment in last 5 years (i.e., is unemployed for at least half of the year, most years):

0 No 1 Yes

Employment history (dates and types of jobs)

Marital Status

- 1 Never married
- 2 Never married or common law
- 3 Presently married (duration) _____
- 4 Presently common law, 2 yrs, . (duration) _____
- 5 Divorced (duration of last marriage) _____
- 6 Divorced and remarried (duration of each marriage) 1st _____ 2nd _____
- 7 Widowed (duration) _____
- 8 Widowed and remarried (duration of each marriage) 1st _____ 2nd _____
- 9 Separated

If relationship, it was: 1 heterosexual 2 homosexual

Sexual orientation: 1 heterosexual 2 homosexual 3 bisexual

In current nonmarital/noncommonlaw relationship? 0 No 1 Yes (duration) _____

Addition Life Situation Information (Code 0=no; 1=yes; uk=unknown/not specified in file)

- _____ Unemployed for 9 of 12 past months in community
- _____ No fixed address or homeless (living on streets) immediately prior to hospitalization
- _____ Ever had no fixed address or been homeless (living on streets)
- _____ Has never been involved in long-term intimate relationship as an adult (2+ years)
- _____ Relationship(s) have been marked by conflict (abusiveness; frequent breakups)
- _____ Estranged from family as an adult
- _____ History of threatening or assaulting family
- _____ Regular arguments with family members as an adult
- _____ Statements/feelings of negativity, resentment, blame, anger, or disappointment in family
- _____ Local family support
- _____ Visitors in hospital
- How may visits? _____
- Who has visited (relationship to patient), and how many times each? _____
- _____
- _____

Childhood Factors

****Each variable is coded 0=no or unknown; 1=yes**

- _____ History of sexual abuse
if yes, describe _____
- _____ History of physical abuse
if yes, describe _____
- _____ History of emotional abuse
if yes, describe _____

- _____ Family substance abuse
- _____ Parental separation, not due to death (at what age of child?) _____

- _____ Parent(s) died under the age of 16
- _____ Parental criminal involvement
- _____ Parental spousal abuse
- _____ Witness parental spousal abuse
- _____ Did not complete elementary school
- _____ Did not complete high school
- _____ Elementary school maladjustment

If yes, check all that apply:

- | | |
|---------------|-----------------------------|
| 1 fighting | 4 failed one grade |
| 2 suspensions | 5 failed two or more grades |
| 3 expulsions | 6 other _____ |

- _____ Maladjustment at high school
- If yes, check all that apply:

- | | |
|---------------|-----------------------------|
| 1 fighting | 4 failed one grade |
| 2 suspensions | 5 failed two or more grades |
| 3 expulsions | 6 other _____ |

Patient grew up with/which family above infor based on: 1 Biological parent(s) 2 Foster parent(s)
3 Adoptive parent(s) 4 Extended biological family 5 Other (specify) _____

Criminological History

****Each variable is coded 0=no or uk; 1=yes**

Note: Violent arrests and violence include anything with the potential to cause harm (including robbery and sexual offences); "weapon"=any object used against a person

- _____ Past arrests
Number of past arrests _____
Age at first known criminal activity _____
- _____ Past arrests for violent offences
Number of past violent arrests _____
Age at first known violence _____
- _____ Self report of past crimes
- _____ Self report of past violence
- _____ Documented past physical violence, non arrest (i.e., from previous hospitalizations, etc)
- _____ Documented past verbal aggression or threatening behaviour
- _____ Physical violence in community during two weeks prior to hospitalization
- _____ Verbal aggression or threatening behaviour during two weeks prior to hospitalization
- _____ Two to four past known violent incidents
- _____ Five or more known past violent incidents
- _____ Age at first known violence under 19

- _____ Age at first known violence under 16
- _____ Prior breach of community condition release from penal or psychiatric institution
- _____ Prior escapes or attempted escapes or unauthorized absences
- _____ Prior breach of court orders or failure to appear
- _____ Past weapon use
- _____ Targets of past violence A (1=male; 2=female; 3=both)
- _____ Targets of past violence B (1=family; 2=friend or acquaintance; 3= stranger; 4=professional; 5=two of the prior; 6=three of the prior; 7=all of the prior; 8=animals)
- _____ Targets of past violence C (1=child; 2=adult; 3=both)

Current Criminality

_____ Current criminal charges

How many? _____

Type (specify all that apply)

1 against person

2 against property

3 violation of conditions of parole or probation

Specific offences (record actual CCC number) _____

Description (incident, victim, weapon used, alcohol/drugs involved, injury, property damage etc) _____

History of criminal charges:

Date/Age

Charge (with CCC#)

Outcome/Disposition

Suicide and Self-Harm History

Code 0=no or uk; 1=yes

_____ Suicide history

_____ Suicide attempts

Describe and date _____

Timing: 1 incident occurred in current month

2 incident in current year

3 incident more than one year ago

Number: 1 only one incident in life

2 two to four incidents

3 five to ten incidents

4 more than ten incidents

_____ Suicidal ideation

Describe and date _____

Timing: 1 incident occurred in current month

2 incident in current year

3 incident more than one year ago

Number: 1 only one incident in life

2 two to four incidents

3 five to ten incidents

4 more than ten incidents

_____ Self-harm

Describe and date _____

Timing: 1 incident occurred in current month

2 incident in current year

3 incident more than one year ago

Number: 1 only one incident in life

2 two to four incidents

3 five to ten incidents

4 more than ten incidents

Substance Abuse History

****Each variable is coded 0=no or uk; 1=yes**

_____ Substance abuse (past or present)

Note: "past" refers to more than one year ago

- _____ Past abuse (anything)
- _____ Current abuse (anything)
- _____ Current abuse of alcohol
- _____ Current abuse of marijuana or hashish
- _____ Current abuse of other drugs
- _____ Current abuse of both alcohol and drugs
- _____ Current polysubstance abuse (3+ drugs [not alcohol] used concurrently for least 6 months)
- _____ Current presence of delirium tremens
- _____ Ever experienced delirium tremens
- _____ Current presence of substance induced psychosis
- _____ Ever experienced substance induced psychosis
- _____ Past abuse of alcohol
- _____ Past abuse of marijuana or hashish
- _____ Past abuse of other drugs
- _____ Past abuse of both alcohol and drugs
- _____ Past polysubstance abuse (3+ drugs [not alcohol] used concurrently for least 6 months)
- _____ Substance abuse began prior to age 18
- _____ Substance abuse began prior to age 16
- _____ Substance abuse has persisted for a period of 12 months up to date of hospitalization
- _____ Substance abuse has persisted for a period of 12 months in past

Psychiatric History

****Each variable is coded 0=no or uk; 1=yes**

_____ Prior hospitalizations? (does not include transfers from another hospital to RVH or ER visits unless admitted/committed)

Number 1 one

2 two to four

3 five to nine

4 ten or more

Specific number

_____ First hospitalization under age 19 (specific age: _____)

_____ Age of onset of mental illness under 19 (specific age: _____)

_____ History of medication noncompliance

_____ History of medication nonresponsiveness

_____ Longest past hospitalization equal to or greater than three months

_____ Longest past hospitalization equal to or greater than six months

Specific duration of longest past hospitalization _____

_____ Family history of mental illness

Relationship to patient and diagnoses _____

Events Preceding Admission

How patient got to hospital

1 police

2 transfer from another hospital (specify _____)

3 relative or friend

4 voluntary patient, status changed to involuntary

5 other (specify _____)

Code 0=no or uk; 1=yes

_____ Any aggression in the two weeks prior to admission (if transferred from another hospital, two weeks prior to that hospitalization)

_____ Physical aggression in the two weeks prior to admission (if transferred from another hospital, two weeks prior to that hospitalization)

_____ Verbal aggression and/or threatening behaviour in the two weeks prior to admission (if transferred from another hospital, two weeks prior to that hospitalization)

_____ Suicidal behaviour, attempts, gestures, ideation, or self harm in the two weeks prior to admission (if transferred from another hospital, two weeks prior to that hospitalization) -- *circle all that apply*

Diagnostic and Medication Information -- Current Hospitalization

Admission Diagnoses

Axis I: _____
Axis II: _____
Axis III: _____
Axis IV: _____
Axis V: _____

Discharge Diagnoses

Axis I: _____
Axis II: _____
Axis III: _____
Axis IV: _____
Axis V: _____

Discharge Medication

Psychiatric Medication _____
Nonpsychiatric medication _____

Medication noncompliance 0=no 1=yes

Medication refractoriness (non-responsiveness for any reason) 0=no 1=yes

Psychiatric medication changes (list them with start and stop dates)

Admission Psychiatric Symptomatology/Mental Status

Code 0=no or uk; 1=yes

Code from mental status examination and from nursing notes/summaries/notes from transfer hospital

 Any psychotic symptoms Presence of delusions Due to specified organic causes Presence of paranoid delusions Presence of grandiose delusions Presence of delusions of reference Presence of delusions of poisoning Presence of other delusions (specify) Presence of hallucinations Due to specified organic causes Presence of visual hallucinations Presence of auditory hallucinations Presence of auditory hallucinations in which the voices are recognized Presence of command hallucinations Presence of command hallucinations to harm or kill others Presence of hallucinations and delusions concurrently Hallucinations and delusions thematically congruent Number of threat/control-override psychotic symptoms; one point for each of: Belief that others control how one moves or thinks Belief that one is being plotted against or others are trying to harm one Thought insertion or withdrawal Belief that others are following one Thought insertion Thought withdrawal Thought broadcasting Disoriented or confused Derailment Incoherence Disorganized speech or thinking (thought disorder) Irritable, agitated, tense, or excited Bizarre behaviour or speech Anger Impulsivity/reactivity Labile affect Inappropriate affect (does not include blunted affect) Hostile, suspicious, paranoid, or guarded Uncooperativeness Coercive, manipulative, or "tests the limits" Absence of negative symptoms (motor retardation, withdrawal, blunted affect) Absence of insight into mental illness Absence of depression Homicidal ideation

OTHERS!! (LIST) _____

Discharge Psychiatric Symptomatology/Mental Status

Code 0=no or uk; 1=yes

Code from mental status examination, discharge summary, and from nursing notes/summaries – last two weeks of hospitalization

- Any psychotic symptoms
- Presence of delusions Due to specified organic causes
 Presence of paranoid delusions
 Presence of grandiose delusions
 Presence of delusions of reference
 Presence of delusions of poisoning
 Presence of other delusions (specify)
- Presence of hallucinations Due to specified organic causes
 Presence of visual hallucinations
 Presence of auditory hallucinations
 Presence of auditory hallucinations in which the voices are recognized
 Presence of command hallucinations
 Presence of command hallucinations to harm or kill others
- Presence of hallucinations and delusions concurrently
 Hallucinations and delusions thematically congruent
- Number of threat/control-override psychotic symptoms; one point for each of:
 Belief that others control how one moves or thinks
 Belief that one is being plotted against or others are trying to harm one
 Thought insertion or withdrawal
 Belief that others are following one
- Thought insertion
 Thought withdrawal
 Thought broadcasting
- Disoriented or confused Derailment Incoherence
 Disorganized speech or thinking (thought disorder)
 Irritable, agitated, tense, or excited
 Bizarre behaviour or speech
- Anger
 Impulsivity/reactivity
 Labile affect
 Inappropriate affect (does not include blunted affect)
- Hostile, suspicious, paranoid, or guarded
 Uncooperativeness
 Coercive, manipulative, or "tests the limits"
- Absence of negative symptoms (motor retardation, withdrawal, blunted affect)
 Absence of/limited insight into mental illness
 Absence of depression
 Homicidal ideation
- OTHERS!! (LIST) _____

Behaviour during Index Hospitalization

Code 0=no or uk; 1=yes

Note: You can specify exact #s of aggressive incidents in the relevant categories if it is possible

- Any aggression
 Any aggression against copatients
 Any aggression against staff

 Number of any aggressive incidents two to four
 Number of any aggressive incidents five to nine
 Number of any aggressive incidents ten or greater

 Any physical aggression
 Any physical aggression against copatients
 Any physical aggression against staff

 Number of physically aggressive incidents two to four
 Number of physically aggressive incidents five to nine
 Number of physically aggressive incidents ten or greater

 Any verbal aggression or threatening behaviour
 Any verbal aggression or threatening behaviour against copatients
 Any verbal aggression or threatening behaviour against staff

 Number of verbally aggressive or threatening behaviour incidents two to four
 Number of verbally aggressive or threatening behaviour incidents five to nine
 Number of verbally aggressive or threatening behaviour incidents ten or greater

 Any aggression against self, suicide attempts, or self-mutilation
 Number of aggressive incidents against self two to four
 Number of aggressive incidents against self five to nine
 Number of aggressive incidents against self ten or more

 Any seclusions, hospital-initiated prns, or special attentions for unpredictable behaviour
 Number of seclusions, etc two to four
 Number of seclusions, etc five to nine
 Number of seclusions, etc ten or greater

Timing of Aggressive Incidents

Number of days after admission to first incident of...

- Any aggression against copatients _____
 Any aggression against staff _____
 Any aggression toward self _____
 Any physical aggression against copatients _____
 Any physical aggression against staff _____
 Any verbal aggression or threatening behaviour against copatients _____
 Any verbal aggression or threatening behaviour against staff _____

Aggression in Prior Transfer Hospital (immediately prior to RVH admission)

- _____ Any
- _____ Physical
- _____ Verbal aggression or threatening behaviour
- _____ Aggression against self, suicide attempts, or self mutilation

Do not try to code the number of these incidents, just whether there were any

Absences (Authorized and Unauthorized)

Code 0=no or uk; 1=yes

_____ Authorized absences (i.e., day or weekend passes)

Number of authorized absences _____

Number of days until first absence _____

- Arrangement: 1 With family
 2 With friends
 3 Alone, in boarding home
 4 Other _____

- Problems: 1 Aggression (specify physical, verbal, etc)
 2 Substance use
 3 Decompensation
 4 Other _____

Number (be exact if possible) _____ 1=1 2 = 2-4 3= 5-9 4= 10+

_____ Unauthorized absences/escapes

Number of days until first unauthorized absence _____

- Problems: 1 Aggression (specify physical, verbal, etc)
 2 Substance use
 3 Decompensation
 4 Other _____

Number (be exact if possible) _____ 1=1 2 = 2-4 3= 5-9 4= 10+

_____ Attempted unauthorized absences/escapes

Number of days until first attempted unauthorized absence/escape _____

Release Plan

Check where appropriate

- No plan
- On boarding or group home waiting list
- To live with spouse or family members
- To live with friends
- To live alone
- Back to general hospital (psychiatric unit)
- Other _____

Code 0=no or uk; 1=yes

- Is released without community agency involvement or supervision
- Is released without family support or assistance
- Is released with no fixed address
- Is released to scid row hotel
- Is released to environment similar to the one which lived in prior to hospitalization
- Is released to environment in which drugs and alcohol are readily available

HCR-20 and other Risk Items (0,1,2, omit)

Historical

Clinical

Risk

H1____
H2____
H3____
H4____
H5____
H6____
H7____
H8____
H9____
H10____

(Adm) (Disch)
C1____|____
C2____|____
C3____|____
C4____|____
C5____|____

R1____
R2____
R3____
R4____
R5____

H total_____

C total____|____

R total____

|⇒ Grand total (Adm)____

|⇒ Grand total (Disch)____

McNiel & Binder (0=No; 1=Yes)

- 1) ____ Physical attacks and/or fear inducing behaviour within two weeks prior to admission (if transferred from another hospital, within two weeks of that admission).
- 2) ____ *Absence* of suicidal behaviour, threats, gestures, ideation within two weeks prior to admission (if transferred from another hospital, within two weeks of that admission).
- 3) ____ Diagnosis of mania or schizophrenia (given during this admission).
- 4) ____ Male gender.
- 5) ____ Currently married or living together (e.g., just prior to hospitalization).

- 1) ____ Physical attacks and/or fear inducing behaviour during hospitalization.
- 2) ____ *Absence* of suicidal behaviour, threats, gestures, ideation during hospitalization.

PCL-SV Items (0,1,2)

1____
2____
3____
4____
5____
6____

7____
8____
9____
10____
11____
12____

PCL-SV Factor 1_____

PCL-SV Factor 2_____

PCL-SV Total Score____