ERRATA

p. 18 para 2 line 7: "These methods try to bridge the gap" for "These methods try to bridge to the gap"

p. 19, para 1, line 1: "professional discretion" for "profession discretion"

p. 24, para 2, last line: "Verdun-Jones" for "Verdun-Hones"

p. 27, para 3, line 3: "it will be done" for "it will do done"

p. 49: para 2, line 5: "Daffern & Howells, 2007" for "Daffern & Howell, 2007"

p. 56, para 3, line 4: "Andrews, Bonta, & Wormith, 2004" for "Andrews & Bonta, 2007"

p. 66, para 1, line 5: "Andrews et al., 2006, p. 8" for "Andrew et al., 2006, p. 8"

p. 88, para 2, line 1: "Andrews et al., 2004" for "Andrews & Bonta, 2007"

p. 119, Table 4.2, Mood Disorders: "11.4%" for "1.4%"

p. 120, Table 4.3, Note: "Most participants" for "The most participants"

p. 120, para 2, last line: "convicted of drug-related offences" for "convicted drug-related offences"

p. 121, para 2, line 4: "base rates of inpatient aggression for the sample" for "base rates of inpatient aggression were perpetuated by the sample"

p. 122, Table 4.5, Note: Added "Some participants were discharged from the hospital during follow-up."

p. 123, Table 4.6, VRAG, Range: "3 – 54" for "3 – 56"

p. 126, Table 4.8, 2 Days heading, 2nd column: "95% CI" for "AUC (SE)"

p. 126, Table 4.8, 1 Week heading, 1st column: "AUC (SE)" for "95% CI"

p. 137, Table 4.14: Change in spacing for the Clinical scale so that label does not flow over to the next line

p. 146, 5.2.2: Reference to 5.2.4 is changed to 5.2.5.

p. 147, para 3, line 7: "it did not significantly predict the nonoccurrence of making verbal threats" for "it was did not significantly predict the nonoccurrence of making verbal threat"

p. 149, para 2, line 3: "static risk assessment measures in the short term, and vice-versa for medium term" for "static risk assessment measures in the short term (e.g., 1 week to 1 month), and vice-versa for longer time periods"

p. 164, para 2, line 10: "measures that comprise" for "measures that comprises"

p. 172, para 1, last line: Nicholls et al., 2004 comes after Manchak, Skeem, Douglas, & Siranosian, 2009.

p. 207, references: "McNiel, D. E. (2009)" for "McNeil, D. E. (2009)"

p. 207, references: McNiel, D. E. (2009) is placed after McNiel, D. & Binder, R. (1994).

p. 224, references: "Webster, C. D., Martin, M.-L., Brink, J., Nicholls, T. L., & Desmarais, S. L. (2009)" is placed before "Webster, C. D., Martin, M. L., Brink, J., Nicholls, T. L., & Middleton, C. (2004)"

The Predictive Accuracy of Static and Dynamic Measures for Assessing Risk of Inpatient Aggression in a Secure Psychiatric Hospital

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Abstract

Given the significant implications on public safety, the assessment of violent behaviours of people with mental illnesses has become a key aspect of clinical practice for mental health clinicians. However, the prediction of violent behaviours has been difficult. Despite the advancement of violence risk assessment knowledge and practice over the past few decades, it is sometimes difficult to ascertain which measures the clinician should use to assess and make decisions about individuals on an ongoing basis, particularly, in the short to medium term. Within this context, the aims of this study are to compare the predictive accuracy of dynamic risk assessment measures for violence with static risk assessment measures over short- and medium-term follow-up periods (up to 6 months) in a forensic psychiatric inpatient setting, as well as to determine the time frame during which they are most suited for predicting inpatient aggression in a forensic inpatient psychiatric sample.

Data pertaining to the sociodemographic and offence characteristics, as well as the mental health, criminal justice, and institutional outcomes were collected for 70 patients who were housed on the acute wards of the Thomas Embling Hospital, a statewide forensic psychiatric hospital in Victoria, Australia, between June and October 2002. In addition to the prospective risk assessment data (the DASA:IV and the HCR-20 Clinical scale) that were previously collected for these participants, several risk assessment measures (the HCR-20, the LSI-R:SV, the PCL-R, the PCL:SV, the START, and the VRAG) were retrospectively coded for each of the 70 patients.

Results of this study showed that: (1) dynamic measures are more accurate for predicting inpatient aggression in the very short term (1 day to 1 week) than the short term (1 month); (2) dynamic measures also were accurate for short-term to medium-term predictions of inpatient aggression; (3) static risk assessment measures were generally not accurate for predicting inpatient aggression in the short to medium term; (4) short-term averages of risk states were accurate for predicting inpatient aggression and violence in the short to medium term (i.e., 1 week to 6 months), whereas the peak scores were generally predictive of inpatient aggression at longer follow-up periods (i.e., 3 and 6 months); and (5) protective factors predicted the nonoccurrence of interpersonal violence, property, and any inpatient aggression.

Despite the presence of several limitations and methodological issues, the findings of this study have provided information pertaining to the suitability of static and dynamic risk assessment measures for assessing short- and medium-term propensities for violence in the forensic inpatient context. In addition, the results of this study highlight the necessity of conducting multiple assessments of short-term risk within the forensic inpatient setting to improve the prediction of inpatient aggression, and also suggest that the short-term averages of risk states may be a suitable index for assessment and management purposes in the medium term (e.g., clinical teams can use this to review and manage aggressive patients in the hospital wards). Such knowledge can assist with the development of more accurate and efficient risk assessment procedures, so as to manage offenders with mental illnesses within the community and institutions better. Consequently, these improved assessment and management procedures can lead to better

outcomes and safety for the offenders, rehabilitation staff, as well as the community.

Declaration

I hereby declare that the following thesis contains no material that has been accepted for the award of any other degree or diploma in any university or other institution. I further declare that, to the best of my knowledge, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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Chapter One

Introduction

1.1 Background and Overview of Thesis

Violence is a major concern in contemporary society. For example, an estimated 520,00 people (i.e., an age-adjusted rate of 8.8 per 100,000 population) across the world died in 2000 as a result of homicides, and many more are afflicted by physical injuries and debilitation as a consequence of nonfatal violence (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002). Moreover, victims and witnesses of violence suffer from a range of social and mental health problems (Boden, Horwood, & Fergusson, 2007; Clemmons, Walsh, DiLillo, & Messman-Moore, 2007; Flannery, Wester, & Singer, 2004; Hedtke et al., 2008; Kitzmann, Gaylord, Holt, & Kenny, 2003; Krug et al., 2002; Lloyd & Turner, 2003). These problems reverberate in many nations across the world – costing economies billions of dollars in healthcare, legal costs, absenteeism from work, and lost productivity annually (Krug et al., 2002; World Health Organization, 2003).

Violence has long been associated with mental illness (Monahan, 1992), and it is a phenomenon that often causes public concern (Swanson et al., 2000). Although some scholars have rejected the view that violence is positively related to mental illness (Appelbaum, Robbins, & Monahan, 2000; Monahan, Steadman et al., 2001; Quinsey, Harris, Rice, & Cormier, 2006), contemporary research studies across different countries have demonstrated a relationship between certain

mental illnesses (e.g., schizophrenia, psychotic and delusional disorders, as well as substance abuse) and interpersonal violence (Brennan, Mednick, & Hodgins, 2000; Fazel, Långström, Hjern, Grann, & Lichtenstein, 2009; Wallace, Mullen, & Burgess, 2004; see also Douglas, Guy, & Hart, 2009; Fazel, Gulati, Linsell, Geddes, & Grann, 2009 for meta-analytical reviews).

Wallace et al. (2004) compared five cohorts of patients with schizophrenia (*n* = 2,861) and an equal number of community comparison subjects in Australia over 5-year intervals from 1975 to 1995. They found that the patients with schizophrenia were 4 to 6 times as likely as the control group to commit an offence, and the odds for patients who presented with substance abuse increased to 16 times for general offences and 8 times for violent offences. In a Danish birth cohort study (*N* = 335,990), Brennan and colleagues (2000) found a significant relationship between major mental disorders and violent offending behaviour. In particular, men with organic psychoses and those individuals with schizophrenia were significantly more likely than controls to be arrested for violent offences even after controlling for demographic factors, substance abuse and personality disorders.

In another large-scale study that compared patients with schizophrenia (*n* = 8,003) and general population controls (*n* = 80,025) in Sweden, Fazel, Långström and colleagues (2009) found that schizophrenia, though partially mediated by substance abuse, was significantly associated with an increased risk of violent crime. Specifically, patients with schizophrenia and comorbid substance abuse were 4.4 times as likely as general population controls to commit a violent

crime; comparatively, patients with schizophrenia but without comorbid substance abuse were 1.2 times as likely to commit a violent crime. In addition, a recent study of 1,410 patients with schizophrenia who were sampled from 57 mental health sites across 24 American states found that the positive symptoms of schizophrenia were associated with violence after controlling for various confounds and covariates (Swanson et al., 2006). Further, a recent reexamination of the data from the MacArthur Violence Risk Assessment Study (Monahan, Steadman, et al., 2001), which examined the risk assessment, mental health, and criminal recidivism data on an initial sample of 1,136 civil psychiatric patients, showed that patients with a diagnosis of schizophrenia were more likely to be violent than people in the nonpatient comparison group, but less likely to be violent than patients with other psychiatric diagnoses (e.g., depression, bipolar disorder, etc.) (Torrey, Stanley, Monahan, Steadman, & the MacArthur Study Group, 2008).

These results, in aggregate, were consistent with Fazel, Gulati, et al.'s (2009) meta-analytic review of 20 studies that examined a total of 18,423 individuals with schizophrenia and other psychoses. In particular, they found that individuals with psychosis were 19.5 times as likely as general population controls to commit homicide. Another large-scale meta-analytic review of 204 studies found that psychosis was associated with a 49% to 68% increase in the likelihood of engaging in violent behaviour, even though the effect size of mental illness on violence across studies is smaller than the effect attributed to antisocial traits such as psychopathy (Douglas et al., 2009). In addition, Douglas and colleagues also suggested that methodological differences in terms of design,

measurements, and comparison groups could have contributed to the differences in findings on violence and mental illness across some studies.

Concomitantly, individuals with mental illnesses show a propensity to commit interpersonal violence when admitted to a secure psychiatric facility. Doyle, Dolan, and McGovern (2002) found 28% of all patients were physically violent toward others during their admission to a secure unit in the United Kingdom. Gray and colleagues (2003) also reported that 33% of the patients within a secure unit in the United Kingdom were physically violent. Similarly, Daffern, Howells, Ogloff, and Lee (2005) reported a 34% prevalence rate for physical violence toward others within a secure forensic hospital in Australia. Upon discharge, forensic and general psychiatric patients often continue to exhibit interpersonal violence. For example, in America, 27.5% of the 951 discharged involuntarily hospitalised psychiatric patients committed at least one act of violence in the community during an average follow-up of 41 weeks (Steadman et al., 1998). Other studies in Canada found that 19% of general psychiatric patients (vs. 15% forensic psychiatric patients) engaged in physical violence, and 10% (vs. 13%) recorded a violent conviction during a follow-up period averaging 626 days (Douglas & Ogloff, 2003; Douglas, Ogloff, Nicholls, & Grant, 1999).

Another recent study in Australia showed that 51% offenders with mental illnesses reoffended within 2 years of release, and that 27% reoffended violently (Ferguson, Ogloff, & Thomson, 2009). These results were also consistent with Cloyes et al.'s (2010) study in America, which found that offenders with mental illnesses were also more likely to be reincarcerated than offenders without

mental illness. Specifically, 77% of the offenders with mental illnesses (vs. 62% of those without mental illness) were reincarcerated within 3 years, and the median time to return to prison was 381 (vs. 728) days. Given the propensity for violence and the severe implications on public safety, the assessment of an individual's risk of violence is a prominent issue in all areas of mental health care (Mullen, 2000; Ogloff & Davis, 2005), not just limited to correctional or forensic settings. As Borum (1996) aptly observed, "The assessment and management of violence risk are critical issues, not just for psychologists and psychiatrists in forensic settings but all practicing clinicians" (p. 954).

Clinicians providing services for people with mental illnesses will routinely encounter the challenge of managing the patient's risk of violence (Monahan, Steadman, et al., 2001). Hence, the assessment and management of violent behaviours of people with mental illnesses has become a key aspect of clinical practice for mental health clinicians (Monahan, 1981). Such assessments of violent behaviours are often used to estimate the risk of these individuals causing certain types of harm under particular conditions within particular time frames, and can significantly affect the lives of those assessed individuals, as well as their potential victims – especially in cases whereby the risk of violence in these individuals are not properly assessed (*Kansas v. Hendricks*, Monahan, 1993; Schlesinger, 1996). However, the prediction of violent behaviours is fraught with many conceptual difficulties, as well as debates about its accuracy and sociolegal impact (e.g., civil rights and public safety). In spite of the long-standing controversy about mental health professionals' accuracy with the prediction of violent behaviours (this will be discussed in Chapter 2), they are often expected, or even obliged, by the legal

system to assess and assist with decisions about the likelihood that an individual will be violent (VandeCreek & Knapp, 2001; Walcott, Cerundolo, & Beck, 2001).

With legal and mental health care system developments, the demands of violence risk assessment are also changing. Policies stipulating the provision of treatment within the least restrictive setting, as well as limited resources (Kiesler & Simkins, 1993; Lerman, 1981; Narrow, Regier, Rae, Manderscheid, & Locke, 1993) have inevitably led to a dramatic decrease in the length of hospitalisation over the past 20 years. For example, Monahan and colleagues (2000) stated, assuming that patients with mental illnesses (who are assessed to be at a high risk of violence) are even hospitalised in the first place, they are discharged within a few weeks, or increasingly, within a few days of inpatient admission. In Australia, there has been a 16.5% decrease (from 17.0 to 14.2 days) in the average length of stay between 1999–2000 and 2006–2007 for mental-health-related admissions to all hospitals (i.e., psychiatric *and* nonpsychiatric); similarly, the average length of stay in public psychiatric hospitals dropped 33.5% (from 71.7 to 47.7 days) during the same period (Australian Institute of Health and Welfare, 2005, 2009). Such practices have implications for the inpatient services, as it is important for clinicians to accurately assess (and reduce) the patients' risk of violence during the short admissions before they are discharged into the community. Nevertheless, there is a likelihood that potentially violent patients will be treated in community-based settings (Mulvey, Geller, & Roth, 1987; Slobogin, 1994), where the treating clinicians need to consider both the provision of effective outpatient services as well as the optimisation of public safety (Petrila, 1995; Rice & Harris, 1997).

Clearly, to achieve this fine balance of effective treatment and public safety, ongoing risk assessment that guides the management of factors relating to violence potential is needed. This is especially salient considering that violent incidents appear to be committed by a small but critical subgroup of the population (Monahan, Bonnie, et al., 2001). For example, Gardner and colleagues (1996) reported that the most violent 5% of the psychiatric patients accounted for almost half of all violent incidents. Violent psychiatric patients were also reported to have characteristics (e.g., histories of arrest and long psychiatric hospitalisation) that were similar with offenders with mental illnesses (Fisher et al., 2002; Skeem et al., 2004). As such, clinicians working with these high-risk psychiatric patients may have to grapple with the challenge of assessing and treating them in both community-based and institutionalised settings, across mental health and criminal justice systems.

Despite the advancement of violence risk assessment knowledge and practice over the past few decades, there is still uncertainty pertaining to what assessment measures are best suited for clinicians to use in their assessments and decision-making processes about these high-risk individuals on an ongoing basis. Past research has predominantly focused on identifying individuals who are at a high risk of violent behaviour relative to others (Mulvey, Lidz, Shaw, & Gardner, 1996), but has generally failed to acknowledge that the risk of violent behaviour fluctuates over time within each individual. Although many studies have examined the predictive accuracy of violence risk assessment measures on community samples, as well as the prevalence and functions of inpatient aggression, there are relatively few studies that have amalgamated these two areas of study. Given

the implications of inpatient aggression on the safety of the patients and staff, it is important to apply the risk assessment lens to inpatient aggression; in particular, to examine the predictive accuracy of violence risk assessment measures over different time frames.

1.2 Outline of Thesis Chapters

This thesis is organised into five chapters, followed by the reference list and appendices. The thesis will broadly discuss the literature relating to violence risk and assessment measures to set the background for the main focus of this thesis – that is, to examine the predictive accuracy of various violence risk assessment measures in a forensic inpatient setting over different time frames. Hence, Chapter Two will present a literature review relating to: (1) the historical background of violence risk assessment as well as the development of various violence risk assessment approaches (i.e., unstructured clinical judgement, actuarial prediction, and structured clinical judgement); (2) the conceptualisations of violence risk and the relevant violence risk factors, in particular, differentiating between the static and dynamic risk factors; and (3) the accuracy of commonly used violence risk assessment measures. In addition, the aims and hypotheses of this thesis are described in this chapter.

Chapter Three describes the methodology of the study, including a description of the participants, the literature search methods, the ethics applications and the relevant confidentiality issues, definitions, descriptions of the databases from which follow-up data were extracted, the various risk assessment

measures that were administered (including the relevant psychometric data), as well as the procedures that were employed to collect, manage and analyse the data during the study. Chapter Four details the results and analyses of the study, whereas the discussion of results, including the comparisons with other research studies as well as the theoretical and practical implications, are presented in the concluding Chapter Five. Chapter Five further discusses the limitations of this study, and offers suggestions for future research.

Chapter Two

Literature Review

2.1 Overview

The prediction of violent behaviour has a long and complicated history. The (in)accuracy of clinicians' predictions of violence risk and the resultant involuntary commitment of individuals with mental illnesses came under immense scrutiny in the aftermath of landmark court decisions and research studies in the 1960s and 1970s (e.g., *Baxstrom v. Herold*, 1966; Cocozza & Steadman, 1976; *Dixon v. Attorney General of the Commonwealth of Pennsylvania*, 1971; Steadman & Cocozza, 1974; Thornberry & Jacoby, 1979). Criticisms of clinicians' inaccurate (unstructured) predictions of violence risk ensued (Grove & Meehl, 1996; Monahan, 1981), but these subsequently led to the widespread empirical investigation of violence risk factors, as well as the development of many structured violence risk assessment approaches and measures over the past 20 to 30 years. Although the state of science has improved significantly in the risk assessment field (Douglas, Cox, & Webster, 1999; Ogloff & Davis, 2005), it is noted that research on dynamic risk assessment approaches, as well as dynamic risk factors for violence were relatively scant until the last 10 years.

This chapter will first provide a historical background to violence risk assessment, and will highlight the early problems that were associated with risk assessment, particularly the unstructured clinical approach. In addition to

examining the strengths and limitations of various risk assessment approaches (i.e., the unstructured clinical judgement, the actuarial prediction, and the structured clinical judgement), this chapter will discuss the concepts of static and dynamic violence risk, as well as the utility of and differences between static and dynamic risk factors for violence. The utility of structured risk assessment measures for different contexts and time frames will also be discussed. Further, the chapter will examine the state of science and the knowledge gaps pertaining to dynamic violence risk assessment. Finally, this chapter will conclude with a proposal of the research aims and hypotheses for this doctoral study.

2.2 Historical Background to Violence Risk Assessment

Prior to 1966, in an era when risk assessments were unstructured, few questions were asked regarding the accuracy of clinicians' violent risk assessments. The *Baxstrom v. Herold* (1966) ruling in the United States of America marked a watershed in the violence risk assessment history, drawing attention to the seemingly inaccurate nature of these assessments. In particular, the United States Supreme Court had ordered the release or transfer of 966 patients from maximum-security hospitals to the community or lower-security placements, and a follow-up study revealed that only 20% of these patients had been reconvicted after 4 years, the majority for nonviolent offences (Steadman & Cocozza, 1974). Similarly, in *Dixon v. Attorney General of the Commonwealth of Pennsylvania* (1971), only 14% of the 438 patients, who were released into the community, had exhibited violent behaviours after 4 years (Monahan, 1981; Thornberry & Jacoby, 1979). These studies raised doubts about the accuracy of violence predictions.

Another study during that era highlighted the limitations of such unstructured predictions. In a study of 257 indicted defendants, Cocozza and Steadman (1976) found that 14% of the "dangerous" group of patients (as assessed by two psychiatrists) as compared to 16% of the "not-dangerous" group were rearrested for violent offences during a 3-year period. These studies showed that the clinicians, using unstructured clinical judgements, were overpredicting violence, and fuelled the notion that clinicians had little expertise in predicting violence recidivism (Cocozza & Steadman, 1976; Thornberry & Jacoby, 1979). As Dietz (1985) pointed out, "psychiatrists and psychologists who have no knowledge in crime have no more business predicting crime than other citizens" (p. 98). Such was the pessimism in the violence risk assessment field that mental health clinicians were deemed to be "wrong about 95% of the time" with their predictions of dangerousness (Ennis & Emery, 1978).

This view about clinician's poor ability to predict violence appears to be supported by Monahan's (1981) review of the studies on unstructured clinical judgement approach to violence risk assessment, where he concluded that clinicians' predictions of violent behaviour (which relied mostly on unstructured, intuitive clinical judgements) were only accurate about one third of the time. In particular, the lack of specificity with regard to the definition of the prediction outcomes not accounting for the statistical base rates of violence, reliance on illusionary correlations, and the failure to account for contextual and situational information in the violence risk assessments were noted to have contributed to unreliable violence risk predictions (Monahan, 1981). Monahan reported that the best predictors of violence for patients with mental disorders were the same

demographic predictors among people without mental disorders, whereas psychological and personality factors were deemed to be the poorest predictors. However, these conclusions were challenged in subsequent studies, which demonstrated associations between violent offending and specific clinical diagnoses (e.g., Binder & McNiel, 1988; Brennan et al., 2000; Fazel, Gulati, et al., 2009; Fazel, Långström, et al., 2009; Taylor, 1982; Wallace et al., 2004). Furthermore, the MacArthur Violence Risk Assessment Study (Monahan, Steadman, et al., 2001) highlighted the importance of clinical features (e.g., psychiatric symptoms) and personality characteristics for the prediction of future violent behaviours within the nonforensic psychiatric population that was discharged from hospitals (Monahan, 2002).

2.3 Violence Risk Assessment Approaches

Traditionally, clinicians have employed the unstructured clinical judgement approach when assessing violence risk in individuals. However, violence risk assessment procedures have since evolved. Drawing on empirical knowledge from the decision-making literature, which showed that statistical predictions have regularly bettered human judgements (Grove & Meehl, 1996), actuarial and (later) structured clinical judgement approaches to violence risk assessment have been developed to aid risk assessment decision-making. These two types of risk assessment schemes have shown to be superior in terms of predictive validity than the unstructured judgement of clinicians (Bonta, Law, & Hanson, 1998; Quinsey et al., 2006).

2.3.1 Unstructured Clinical Judgement Approach to Violence Risk Assessment

In clinical practice, the most common violence risk assessment approach has, historically, been the unstructured clinical judgement. In the absence of structure, this decision-making process can be characterised as "intuitive" or "experiential" (Hart, 2001). The clinician has complete discretion over which information should be considered and used to reach a decision (Grove & Meehl, 1996). Although it is efficient, highly flexible and allows clinicians to focus on case-specific information and violence prevention (Hart, 1998), unstructured clinical judgement has been criticised for being subjective, unreliable, poorly validated, and unable to detail the decision-making process (Monahan & Steadman, 1994; Quinsey et al., 2006; Webster, Douglas, Eaves, & Hart, 1997). Such strong criticisms were epitomised by Monahan's (1981) conclusion that clinicians' predictions of violent behaviour were only accurate about one third of the time, over follow-up periods of many years, when they had used unstructured clinical judgements.

2.3.2 Actuarial Approach to Violence Risk Assessment

The research on the actuarial risk assessment among the patients with mental illness has evolved to overcome methodological and conceptual difficulties with prediction of violent behaviour. The actuarial approach to violence risk assessment is characterised by clinicians making decisions that are formulated according to explicit and fixed rules, and it is focused on relatively small numbers of risk factors that have been determined to be predictive of

violent behaviours across settings and individuals (Hart, 1998; Kraemer et al., 1997; Ogloff & Davis, 2005; Quinsey et al., 2006). Specifically, these risk factors are empirically determined, weighted, and combined according to a certain algorithm to predict a specific outcome in a specific population over a specific duration.

There is general agreement in the research literature that the actuarial risk assessment approach is statistically superior to unstructured clinical judgement, as it enhances the consistency and predictive accuracy of risk assessment with its transparency and direct empirical support (Dawes et al., 1989; Monahan, 1981; Quinsey et al., 2006). In a meta-analytic review of 136 studies that compared clinical and actuarial prediction, 64 studies showed more predictive accuracy for actuarial methods, eight studies showed more accurate predictions for clinical approaches, and 64 studies showed no difference between the methods of prediction (Grove & Meehl, 1996). More recent meta-analyses (Ægisdóttir et al., 2006; Grove, Zald, Lebow, Snitz, & Nelson, 2000) showed that actuarial methods of prediction were about 10% to 13% more accurate than clinical judgement methods. Specific to the area of violence prediction, Gardner and colleagues (1996) found that the actuarial prediction method was significantly more accurate than the clinical judgement approach, although the latter predicted violence with an accuracy that was better than chance. In their meta-analysis, Ægisdóttir and colleagues (2006) also showed that the actuarial prediction method was superior to the clinical judgement approach with regard to violence prediction, where the former predicted 9% better than the latter.

In spite of its advantages, there are some limitations to the actuarial approach of violence risk prediction (Gottfredson & Gottfredson, 1986; Hart, 1998). In particular, the actuarial risk assessment measures tend to minimise the role of professional judgement due to the fixed algorithmic manner that their empirical risk factors are employed to predict future violent outcomes. This can lead to a lack of consideration of idiosyncratic factors, which can be critical to the assessment and subsequent management of a potentially violent individual. Moreover, actuarial risk assessment measures are designed to predict a specific outcome, over a specific time frame in a specific population, and they can often lead to nonoptimal and even unusual decisions when applied to different settings instead of those specified. In addition, actuarial risk assessment measures tend to overfocus on relatively static variables and may not encapsulate the changes within certain risk factors that are useful for planning treatment, monitoring progress, as well as managing a patient's imminent risk for violence. In addition, the actuarial measures may not prioritise clinically relevant variables that are not proven empirically as yet (e.g., homicidal threats). Critics of the actuarial risk assessment instruments have also suggested that these measures are imprecise for the prediction of violence, as they cannot estimate an individual's risk with any reasonable degree of confidence (Hart, Michie, & Cooke, 2007); however, some scholars have rejected this claim of imprecision and argued that Hart et al. have "committed statistical error by misapplying confidence intervals" (Harris, Rice, & Quinsey, 2008, p. 154).

In addition to the abovementioned limitations, there is also a conflict between the concept of prediction and risk management. Specifically, the

function of actuarial methods is to predict, whereas the risk assessment in mental and forensic health services is associated with management and prevention. Moore (1996) highlighted the inherent contradiction of violence risk assessment within mental and forensic health services where successful predictions of violence will lead to the prevention of violent behaviours, thus ultimately rendering the clinician's predictions wrong (i.e., committing a false-positive error). Hence, violence prediction appears to be a misnomer when clinicians are ethically and legally bound to disprove their predictions of violence (Hart, 1998). Herein lies the fundamental difference between research and clinical practice, whereby the former seeks to identify variables that are highly predictive of violence, whereas the latter aims to estimate the risk for purposes of planning preventive intervention.

In summary, the actuarial approach to violence risk assessment has been demonstrated to be more accurate at predicting violence than unstructured clinical judgement. Actuarial risk assessment measures are designed to predict a specific outcome over a specific time frame in a specific population, and they are not recommended to use them in different settings instead of those specified. Further, these actuarial risk assessment measures tend to overfocus on relatively static variables and may not encapsulate the changes within risk factors that are useful for planning treatment, monitoring progress, as well as managing a patient's imminent risk for violence.

2.3.3 Structured Clinical Judgement Approach to Violence Risk Assessment

The introduction of structured clinical judgement approach to violence risk assessment witnessed the conceptual transition from the notion of "predicting dangerousness" to "assessing and managing risk." Although dangerousness was previously construed as a stable characteristic of the individual (McNiel et al., 2002; Mullen, 2000), risk assessment and management involve identifying the various facets of risk (i.e., nature, severity, imminence, frequency/duration, and likelihood of violent behaviours occurring), as well as determining what risk factors are present and then prescribing the relevant violence reduction interventions. Risk level is no longer a dichotomous construct whereby a patient is assessed to be either dangerous or not. Instead, a patient is assessed in terms of probabilities (i.e., what is the likelihood that the patient will reoffend violently?) that could fluctuate (Monahan & Steadman, 1994).

The structured clinical judgement risk assessment approach uses a set of rationally determined risk factors, obtained from the empirical literature, which the clinician assesses and codes. The combination of these variables and the final judgement are left to the clinician who considers the results of the violence risk assessment measure, as well as the idiosyncratic variables that are specific to the individual being assessed (Boer, Hart, Kropp, & Webster, 1997; Douglas & Ogloff, 2003; Webster, Douglas, Eaves, & Hart, 1997). These methods try to bridge the gap between the actuarial approach and the clinical practice of risk assessment by developing evidence-based guidelines that promote both consistency, as well as flexibility for idiosyncratic case and contextual information (Hart, 1998). Using

professional discretion that is based on sound scientific knowledge in relevant situations, structured clinical judgement measures can also promote transparency and accountability (Douglas, Cox, et al., 1999; Hart, 1998). Moreover, the structured clinical judgement approach focuses on the issue of risk management (i.e., prevention and treatment) and the conditions that will moderate or exacerbate the risk, rather than solely risk prediction. Furthermore, this approach acknowledges that violence risk assessment is a dynamic and continuous process, which is highly contextual in nature, and must be linked to risk management (Doyle, 2000). This approach is consistent with contemporary theories of aggression, which focus on the interaction between the person and the situational variables (e.g., the General Aggression Model; Anderson & Bushman, 2002)

Although a mechanical combination of variables is not recommended for structured clinical judgement procedures, numerical "actuarial" ratings can be assigned for each risk factor in the structured clinical judgement risk assessment measures whereby the total score can be further calculated. Structured clinical judgement measures have demonstrated comparable predictive validity to other tools when used in a mechanical actuarial manner in research. Nevertheless, the structured clinical judgement measures appear to be more accurate when utilised as guides to make a structured "clinical" rating than they are used in an actuarial fashion. For example, structured clinical judgement ratings were found to predict recidivism even after controlling for the actuarial ratings on the Historical, Clinical, Risk Management – 20 Factors (HCR-20; Webster et al., 1997) and the Spousal Assault Risk Assessment (SARA; Kropp, Hart, Webster, & Eaves, 1998) (Douglas,

Ogloff, & Hart, 2003; Kropp & Hart, 2000). In addition, de Vogel and de Ruiter (2005) reported that the HCR-20 structured clinical judgement ratings were more accurate than the actuarial scores when they were used to assess forensic psychiatric patients.

These studies suggest that structured clinical decision-making can be as accurate as, if not more than, a purely actuarial approach, and Grove and Meehl's (1996) descriptions of clinical judgement as impressionistic and subjective do not appear as pertinent to this method of clinical decision-making. Moreover, it would appear that using a structured measure will avoid many of the clinical pitfalls as identified by Monahan (1981), as it encourages specification of the criterion and consideration of contextual features. However, some critics have argued that the structured clinical decision-making lacks the flexibility of intuitive decision-making and that it is also not as objective as actuarial decision-making procedures (see Hart, 2001 for a review).

Taken together, it is clear that the structured clinical judgement approach to violence risk assessment, which tries to bridge to the gap between the actuarial approach and the clinical practice of risk assessment, has contributed substantially to the burgeoning field of violence risk assessment. In addition to static variables, the structure clinical judgement risk assessment measures also include clinically relevant and dynamic variables, and are able to account for idiosyncratic and context-specific information. Further, the predictive accuracy of structured clinical judgement risk assessment measures surpasses that of

unstructured clinical judgement and is comparable in predictive accuracy to the actuarial prediction methods.

2.3.4 Lessons from Violence Risk Assessment Developments

In the aftermath of court cases and research studies during the 1960s and 1970s (*Baxstrom v. Herold*, 1966; Cocozza & Steadman, 1976; *Dixon v. Attorney General of the Commonwealth of Pennsylvania*, 1971; Steadman & Cocozza, 1974; Thornberry & Jacoby, 1979), there were serious doubts regarding clinicians' ability to accurately predict violence (Monahan, 1981). However, several studies have since showed that clinicians could be possibly better at predicting violent behaviour than was previously believed. For example, clinicians using clinical judgement performed better than chance with their predictions even though actuarial risk assessment measures were shown to predict future violent behaviours better than clinical judgement (Gardner et al., 1996). In addition, when clinicians considered the contexts in which the patients perpetrated violence, the accuracy of prediction was enhanced (Mulvey & Lidz, 1985). Furthermore, Fuller and Cowan (1999) argued that multidisciplinary team consensus risk predictions were, under certain conditions, comparable with actuarial predictions over similar durations.

However, it is arguable whether consensus risk predictions (that are not guided by structured risk assessment approaches) can provide adequate structure and consistency across assessments that are conducted by different clinicians or clinical teams. Nevertheless, such clinical and contextual

considerations are formalised in structured clinical judgement risk assessment schemes. With the inclusion of such clinically and empirically relevant risk factors in the risk assessment decision-making process, structured clinical judgement risk assessment has been shown to be as accurate as actuarial methods (de Vogel & de Ruiter, 2005; Douglas et al., 2003; Kropp & Hart, 2000).

The violence risk assessment field has undoubtedly advanced over the past 30 years. In particular, there were less than 10 empirical studies on the prediction of "dangerousness" before Monahan reviewed the available literature in 1981, but since then there has been an explosion of research endeavours in the area of violence risk assessment. The result is a significant improvement of the predictive accuracy of violence risk assessment procedures. In general, clinicians, who use structured assessment methods, are able to predict violent behaviours with success rates that are much better than chance; notably, the effect size for violence risk assessment is superior to that of many other medical and psychological activities that have been used without controversy. In the comparisons of the statistically standardised effect sizes (Cohen's *d*; Cohen, 1988, 1992) of a variety of predictions, the effect size for violence risk assessment was between 0.91 and 1.19 across various studies, which surpassed that of chemotherapy for breast cancer (d = 0.08 to 0.11), the effects of by-pass surgery on angina (d = 0.80), psychotherapy in general (d = 0.76), and the effect of electroconvulsive therapy on depression (d = 0.80) (Douglas, Cox, et al., 1999; Lipsey & Wilson, 1998). However, this does not imply that violence risk assessment is infallible; rather, it indicates that significant progress has been made over the past 30 years to a point where such assessments *can be* fairly

accurate (Douglas, Cox, et al., 1999; Ogloff & Davis, 2005). As Steinert (2002) aptly stated, "The prediction is moderately good and certainly better than chance, but far from 100%" (p. 138).

2.4 Violence Risk Factors

In recent times, forensic mental health research has focused on the actuarial and structured clinical judgement risk assessment measures that are utilised by clinicians to identify high-risk offenders. It is noted that these risk assessment measures are often comprised of risk factors that are related to violent behaviours. In his discussion about the research on violence risk factors, Heilbrun (1997) divided the risk factors into two categories: static factors (e.g., history, personality, and demographics), and dynamic factors (e.g., clinical and environmental variables). Nevertheless, it is important to note that static and dynamic factors are highly intertwined concepts that operate along the key dimension of changeability over time. Dynamic factors have a higher potential to change than the static factors, but they can also become "static" and "historical" in nature with time. For example, active psychotic symptoms may be considered as a dynamic risk factor, but with time and the treatment, these symptoms may abate. Although it may not be considered as a dynamic risk factor after long periods of continual remission, it can still be considered as a historical risk factor (history of major mental illness).

A static risk factor for violence is a variable that is associated with violence, but it is usually not amenable to change over time, and is likely to be less useful to

the clinicians trying to reduce violent behaviours as compared to the dynamic risk factor for violence (Hart, 1998). A dynamic risk factor for violence, on the other hand, can be defined as a variable that relates to violence, fluctuates with time and circumstances, and can be changed as a result of deliberate intervention (Webster, Douglas, Belfrage, & Link, 2000). Although less attention has been paid to the dynamic violence risk factors in the risk assessment literature, many researchers have urged that dynamic risk factors be studied systematically given their bearing on risk assessment and violence reduction (Borum, 1996; Douglas & Skeem, 2005; Douglas & Webster, 1999; Heilbrun, 1997; Monahan, Steadman, et al., 2001).

2.4.1 Static Risk Factors for Violence

Some researchers have suggested that static factors such as criminological, historical, and sociodemographic variables are better predictors of violence than any clinical and psychopathological factors (Bonta et al., 1998; Buchanan, 1999; Harris & Rice, 1997; Monahan, 1981). In addition, studies have shown that future violent behaviours are strongly correlated to past violent behaviours (Klassen & O'Connor, 1988a, MacArthur Foundation, 2001). More recent studies on inpatient violence also indicate that patients with a prior record of violence were more likely to perpetrate inpatient violence repeatedly than those without (Daffern, Howells, & Ogloff, 2007b; Grassi et al., 2006; Lussier, Verdun-Jones, Deslauriers-Varin, Nicholls, & Brink, 2010). In their literature review, Litwack and colleagues (2006) concluded that:

> [W]hen an individual has clearly exhibited a recent history of repeated violence, it is reasonable to assume that the individual is likely to act violently again in the foreseeable future unless there has been a significant change in the attitudes or circumstances that have repeatedly led to violence in the recent past (p. 505).

Furthermore, other studies have shown that early onset of violent behaviours also predicts future violent and criminal offending behaviours (Borum, Swartz, & Swanson, 1996; Harris, Rice, & Quinsey, 1993; Moffit, Mednick, & Gabrielli, 1989).

Sociodemographic variables such as gender, socioeconomic status, and intelligence have also been found to correlate with violence. For example, males have been found to be 10 times more likely to perpetrate violence than females (Tardiff & Sweillam, 1980). Intellectual deficiency (Borum et al., 1996; Fullam & Dolan, 2008; Hodgins, 1992; Quinsey & Maguire, 1986) and lower socioeconomic status were also linked to higher rates of violence (Borum et al., 1996). In addition, brain injury or illnesses can cause individuals to be verbally and physically aggressive (Dinn, Gansler, Moczynski, & Fulwiler, 2009; National Institutes of Health, 1998; Tateno; Jorge, & Robinson, 2003), and certain personality disorders (e.g., borderline and antisocial) and psychopathy have been associated with violence (Coid et al., 2006; Fullam & Dolan, 2008; MacArthur Foundation, 2001; Meloy, 1992; Salekin, Rogers, & Sewell, 1996; Tardiff, 1999). In their meta-analytic review of 58 studies between 1959 and 1995, Bonta and colleagues (1998) found that static variables such as criminal history, history of mental disorder, early onset of violence, and antisocial personality disorder were the strongest

predictors of violence among the 74 variables that were examined. In particular, criminal history had the largest effect size and it was significantly greater than clinical factors. Many researchers (e.g., Monahan, 1981; Webster, Harris, Rice, Cormier, & Quinsey, 1994) believe that predictions based on some static risk factors are as accurate as (if not more) those based on detailed information (e.g., Dawes, Faust, & Meehl, 1989). Given their temporal stability and easily examinable nature, it is not surprising that static risk factors have good predictive utility in the long term and have since been the anchors of many violence risk assessment measures.

To summarise, static risk factors, such as criminological, historical, personality, and sociodemographic variables, have been shown in research studies to have good predictive utility for violence in the long term. However, they are usually not amenable to change and may be less useful for treatment planning and intervention.

2.4.2 Conceptualisation of Dynamic Risk of Violence

Previously conceptualised (and researched) as a static construct, violence risk is construed as a dynamic construct that ebbs and flows over time within each individual in different situations (Steinert, 2002). Although structured clinical judgement measures tend to include more dynamic risk factors, it is noteworthy that the majority of these risk assessment measures (actuarial *and* structured clinical judgement) are still used for making prediction of violence at particular points in time (e.g., release decisions) (Douglas & Skeem, 2005). It appears that

such single time-point risk assessment procedures, which are unable to track the changes in risk factors and account for contextual information (Gagliardi, Lovell, Peterson, & Jemelka, 2004), are inadequate to the process of making "ongoing, day-to-day decisions about the management and treatment of mentally disordered persons" (Steadman et al., 1993, p. 41). McNiel and colleagues (2003) also argued that dynamic risk factors are especially relevant in the immediate and short term, and they are expected to be good proximal indicators of future violence. Furthermore, Doyle and Dolan (2006a) reported that there was significant incremental validity to historical factors of structured clinical judgement risk assessment measures (i.e., HCR-20) when dynamic clinical and risk management factors were added. In summary, these research studies seem to suggest that dynamic risk factors play an important role in the future of violence risk assessment developments, and may be critical to shorter-term violence risk prediction and management efforts.

2.4.3 Situational and Contextual Considerations in Violence Risk Assessments

Based on their observations of mental health professionals working in emergency rooms, Mulvey and Lidz (1995) proposed an alternative model of violence prediction. According to Mulvey and Lidz's model:

> Clinicians' predictions about the occurrence of violence are based upon an assessment of what particular type of violence the patients might commit and the circumstances under which it will be done. Clinicians do not generally view a patient as either being "dangerous" or "not dangerous,"

> but instead see a patient possibly doing some type of act (e.g., beating his mother) if certain situations either persist or present themselves (e.g., his mother keeps living with her present boyfriend) (p. 135).

Rather than "context-free" actuarial predictions of violent behaviours (Mulvey & Lidz, 1995), context-specific information (e.g., enduring features of the individual's life situation, behavioural patterns, and foreseeable events or stressors) that will increase or decrease risk are required in these daily decisions (Skeem, Mulvey, & Lidz, 2000; Webster et al., 2000), especially since violence prevention is the ultimate goal of risk assessment (Hart, 1998).

To date, risk assessment procedures have adopted a "variable-centred perspective" (Monahan, 1981), which identifies personal characteristics that are generally associated to violence. There is, however, a strong need for research studies to investigate the role of situational and contextual factors, as recommended by Monahan. As Bjørkly (1995) remarked, "assessment of risk situations in a patient, combined with estimates of the likelihood that the patient will be exposed to such situations are crucial elements in the development of improved prediction instruments and violence prevention" (p. 497). Clearly, such situational influences must be accounted for in risk assessment procedures, but many risk assessment measures do not appear to focus much on these influences currently.

It is important for research to adopt a "situation-centred perspective" in future efforts in order to determine the influence of particular situations on different types of individuals. For example, Binder and McNiel (1988) illustrated

the importance of situational information when they found that patients with schizophrenia were more likely than those with mania to engage in violent behaviours within the community, but those patients with mania were more likely to be violent during hospitalisation. In a systematic review, Gadon and colleagues (2006) also highlighted the impact of situational risk factors on institutional violence and management endeavours. Specifically, security level, high traffic locations, prisoner mix, staff experience, management approaches, areas where there is low staff presence, and relationships between the staff groups are some of the situational risk factors associated with violent behaviour in prison settings. In closed psychiatric settings, the risk factors involve security level, amount of time spent with patient, staff position, times of high interaction among patients and staff, vulnerable times such as shift changes, as well as areas where there is high traffic and increased opportunities for interaction.

It is apparent that studies on situational and contextual variables may provide some important theoretical understanding of how particular risk factors are related to violence, and ultimately offering further guidance for risk management (McNiel et al., 2002). For this purpose, Johnstone and Cooke (2008) have developed a risk assessment instrument, Promoting Risk Intervention by Situational Management (PRISM), to facilitate the systematic evaluation of situational risk factors that are associated with institutional violence. This instrument focuses on institutional risk factors instead of risk factors in the patient or prisoner. Its main rationale is that situational risk factors can trigger and/or maintain a series of risk processes that affect the psychological climate of an institution, and this can subsequently lead to the perpetuation of violence.

In summary, situational and contextual factors (in addition to individual characteristics) have been postulated to play a role in violent behaviours, and there has also been more focus on these considerations in contemporary research relating to violence risk.

2.4.4 Violence Risk State

With respect to the variability of violence risk, Douglas and Skeem (2005) have differentiated between *risk status* and *risk state* in their conceptualisations of static and dynamic risk factors. The key notion is that the risk factors differ in terms of their *changeability*, ranging from highly static variables (e.g., age, gender, history of violence, and race) to highly dynamic variables (e.g., substance use, treatment responsiveness, and weapon availability) (Heilbrun, 1997; Kazdin, Kraemer, Kessler, Kupfer, & Offard, 1997; Kraemer et al., 1997). Risk status emphasises static risk factors for violence, which provide a baseline level of risk that is relative to other people. Risk status is considered as a baseline level of risk because it is a construct that is associated with static risk factors, and these static risk factors are good predictors of violence risk for the longer term and can indicate interindividual differences in risk. In contrast, risk state, which is based on the current combination of static and (predominantly) dynamic factors, focuses on the intraindividual variability of violence potential, and it can fluctuate as a function of biological, psychological or social situations (Douglas & Skeem, 2005; Skeem & Mulvey, 2002). Although some relevant static factors are included in the formulation of a risk state, dynamic factors (due to the fluctuating nature of the risk state) are the typically main consideration.

The concept of risk state has been posited as being related to intervention, causation, rapidity of change, as well as being multifactorial in nature (see Douglas & Skeem, 2005 for a review). Hart's (1998) assertion that risk assessment should focus on violence prevention, instead of "passive predictions" of violence, is similar to Heilbrun's (1997) argument that dynamic risk factors that can be changed by intervention should be the focus in risk assessments, given the current shift from conducting one-time predictions of violence to ongoing daily assessment and management of risk. With their principles of risk, need and responsivity, Andrews, Bonta, and Hoge (1990) linked offender risk assessment with interventions designed to reduce criminal recidivism. In a comprehensive review, Dowden and Andrews (2000) found that correctional treatment programmes that focused on criminogenic needs (i.e., dynamic risk factors that affect the likelihood of reoffending when changed; Andrews & Bonta, 2003) were more effective in lowering recidivism than those interventions that were focused on noncriminogenic needs. This finding clearly emphasises the importance of dynamic risk factors to intervention efforts.

In addition, Kraemer and colleagues (1997) have identified causal dynamic risk factors that should be targeted in violence reduction interventions. Such causal dynamic risk factors are likely: (1) to precede and increase the chance of violent behaviours; (2) to change spontaneously or through intervention; and (3) to predict changes in the probability of violence occurring when changed. It may be difficult, however, to conclude that causal relationships exist between the risk factors and outcomes due to influences from other variables. With regard to the risk state and its relevance to the rapidity of change, Hanson and Harris (2000)

differentiated between *stable* and *acute* dynamic risk factors. Although expected to stay unchanged for months or years, stable dynamic risk factors (e.g., hostility and impulsivity traits) can and may change gradually. In contrast, acute dynamic risk factors (e.g., negative affect and substance use) can fluctuate on a daily or even hourly rate. Further, Hanson and Harris suggested that acute dynamic risk factors could potentially inform clinicians when the individual will reoffend, but have less utility in the immediacy for predicting violence risk for the longer term. However, there is a general lack of systematic data on the rapidity of change pertaining to these dynamic risk factors. Therefore, this distinction between acute and stable risk factors, albeit useful, remains hypothetical for now.

The multifactorial nature of risk state must also be considered whenever there are two or more plausible causal risk factors for violence (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). Specifically, temporal precedence (i.e., which risk factor occurs first), correlation (i.e., whether the risk factors are related), and dominance (i.e., whether the influence of one risk factor overrides another or they interact) can help distinguish whether the dynamic risk factor is (1) a proxy risk factor for another variable, (2) overlapping with another variable, (3) mediating or moderating another variable, or (4) a causal risk factor for violence. Therefore, the identification of causal dynamic risk factors for violence is paramount for violence reduction interventions.

Scholars have differentiated between static and dynamic factors, and within the latter: acute and stable dynamic factors. In addition, researchers have also delineated the concepts of risk status and risk state, and how these are

related to static and dynamic risk factors, as well as the prediction of violence. The next section will discuss the studies that have examined the dynamic risk of violence.

2.4.5 Studies Examining Dynamic Risk of Violence

Although many studies have examined the association between single time-point estimates of hypothetical dynamic risk factors and violence, the vast majority of these studies have not investigated whether the changes in the violence risk are due to the changes in these risk factors. The question of whether *inter*individual levels of certain risk factors at a certain time can predict violence may be answered with studies of single time-point estimates, but such studies cannot address the issue of *intra*individual levels of risk factors. As Douglas & Skeem (2005) stated, "It is this intraindividual change aspect of a dynamic risk factor that makes it dynamic. It is also this aspect that holds promise for effective risk management and treatment" (p. 356).

Several studies have evaluated how changes in risk factors have influenced delinquency and aggression in children and adolescents (Kochenderfer-Ladd & Wardrop, 2001; McDermott & Nagin, 2001; Nagin, 1999; Nagin & Tremblay, 1999, 2001; Spieker, Larson, Lewis, Keller, & Gilchrist, 1999). The results are not directly pertinent to adults due to the developmentally dependent nature of these violence risk factors (Borum, Bartel, & Forth, 2006), but these studies have provided good methodological examples of how to assess longitudinal change in risk. Studies assessing changes in violence risk factors for adults have been

conducted via single time-point, dual time-point, and multiple time-point evaluations of dynamic risk factors. While there are relatively more studies on single time-point assessments, it is unsurprising that there are few studies of multiple time-point evaluations given the difficulty and costs associated with such assessments.

Although studies employing the single time-point estimates of a dynamic variable are more common, such studies cannot be viewed as true studies of dynamic risk as they cannot demonstrate that changes in these risk factors can predict violence. As Gagliardi and colleagues (2004) stated, "Unhappily, when clinical or dynamic factors have been compared with static factors in risk forecasting studies, they have generally been assessed only once, which necessarily forces them to function like static variables in prediction equations" (p. 150). Clearly, the fluidity of dynamic factors poses a considerable research challenge considering that information gathered from assessments tends to assume a static quality once they are recorded (Webster, Nicholls, Martin, Desmarais, & Brink, 2006).

There are some studies that use dual time-point evaluations to assess whether changes in risk factors predict violence. For example, Hudson, Wales, Bakker, and Ward (2002), in a study that employed prospective and dual time-point evaluative methodology, found that changes on 8 of 26 dynamic variables (e.g., anger, deviant and sexual fantasies) predicted sexual violence with small to moderate effect sizes ($rs < .30$). In addition, two small studies of offenders predicted increased levels of general recidivism when increases in Level of Service

Inventory-Revised (LSI-R; Andrews & Bonta, 1995) scores were reported between two assessment points (Andrews & Robinson, 1984; Motiuk, 1993). One study within the forensic psychiatric context (Belfrage & Douglas, 2002) suggests that the scales on the HCR-20 change over time. Specifically, patients had lower HCR-20 Clinical and Risk Management scale scores and reduced number of Clinical and Risk Management factors when they were in treatment for a longer period of time. These findings appeared to provide support that the Clinical and Risk Management factors are dynamic or amenable to change.

In addition, other studies suggest that the scores on these scales of the HCR-20 relate to violence (Belfrage, Fransson, & Strand, 2000; Dernevik, Grann, & Johansson, 2002; Douglas et al., 2003; Douglas, Cox, et al., 1999; Douglas & Webster, 1999; Douglas, Yeomans, & Boer, 2005; Gray et al., 2003; McNiel, Eisner, & Binder, 2003; Strand, Belfrage, Fransson, & Levander, 1999). Nevertheless, whether these changes in HCR-20 scores actually predict violence have yet to be fully ascertained. A promising study (Hodgins, Hiscoke, & Freese, 2003) has suggested that changes in several risk factors (i.e., symptoms of anxiety, depression, and psychosis) over two assessment periods predict future violent behaviours within the community, even after controlling for other risk factors such as antisocial and psychopathic personality traits and substance use. However, such dual time-point studies are still limited in utility because the single estimate (resulting from the two assessment points) may not reliably reflect the fluctuations that may occur within that time frame. Moreover, dual-time point estimates restricts the trajectory of change to a linear nature (i.e., either

increasing or decreasing) instead of what can be a curvilinear (i.e., quadratic or cubic) pattern (Douglas & Skeem, 2005).

Hence, it seems that multiple time-point estimates of dynamic risk factors are needed to accurately encapsulate rapid fluctuations in violence risk. In a sample of 132 patients with psychiatric conditions, Skeem and colleagues (2006) conducted 26 repeated measurements of hypothetically dynamic risk factors. Using the Brief Symptom Inventory (Derogatis & Melisaratos, 1983) and threat/control override[1] (TCO) scales, the young patients (who had histories of substance abuse and violence) and their collateral informants were interviewed weekly for 6 months to assess for changes in key dynamic risk factors and their relation to violence. These dynamic risk factors included anger, general psychological distress, as well as specific psychiatric symptoms such as anxiety, depression, and TCO. Using the same dataset of 132 high-risk psychiatric patients, Mulvey and colleagues (2006) also investigated the relationship between substance use and violence at a daily level. Findings from these two studies (Mulvey et al., 2006; Skeem et al., 2006) indicated that anger and substance use are dynamic risk factors for high-risk patients. Analyses revealed a unidirectional relationship between substance use and violence, whereby there was an increased likelihood of violence on days following the use of alcohol or drugs (with the exception of marijuana). In addition, a high-risk patient with increased anger during a week was significantly more likely to be involved in serious

[1] *Threat/control override* refers to a specific set of delusions (characterised by the fear of experiencing personal harm, thought insertion, and thought control) that may cause an individual to lose internal psychological control, and thus increasing the likelihood of committing a violent act.

violence the following week. In contrast, general psychological distress and the specific psychiatric symptoms did not predict immediate violence. These results suggest clinicians who are monitoring identified high-risk patients in the community are incorrect if they assumed that the patients' increasing general psychological distress (e.g., anxiety, depression and TCO) signified increased risk of imminent violence (Skeem et al., 2006).

Using multiple time-point estimates, Daffern and Howells (2007) tested the predictive validity of the Historical, Clinical, and Risk Management – 20 Factors (HCR-20; Webster et al., 1997) and Dynamic Appraisal of Situational Aggression: Inpatient Version (DASA:IV; Ogloff & Daffern, 2002) for the prediction of imminent aggressive and self-harm behaviours in patients with personality disorders of a high-security psychiatric hospital. The nursing staff completed daily assessments of the patients using the Clinical subscale of the HCR-20 and the DASA:IV for a period of 4 months. The results indicated that the measures performed significantly better than chance when used to predict imminent aggressive and self-harm behaviours. Moreover, patients with personality disorders who were irritable, impulsive, and disagreeable were at a higher risk of aggression and self-harm during involuntary psychiatric inpatient treatment. The two risk assessment measures (i.e., the DASA:IV and the HCR-20 Clinical scale) appeared to be able to predict such negative states.

There is one large-scale study that appears to be useful for understanding dynamic risk. Hodgins and colleagues (2007) conducted a prospective, multisite study of 186 civil and forensic psychiatric patients to evaluate risk assessment and

treatment approaches among persons with mental illnesses using a comprehensive assessment battery. Before discharging each patient into the community, the patient was assessed using the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996, 1997), the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987), TCO scales (Link & Stueve, 1994; Link, Stueve, & Phelan, 1998), the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960), the Wechsler Adult Intelligence Scale – Revised (WAIS-R; Wechsler, 1981), hair and urine screenings, the History of Aggressive Behavior form (Monahan, Steadman, et al., 2001), the HCR-20, and the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003). Each patient was interviewed four times over a 24-month period using the various assessment measures for clinical symptoms (e.g., the PANSS, TCO scales, and HRSD), drug and alcohol abuse (e.g., hair and urine screens), as well as violence (e.g., the Clinical and Risk Management scales of the HCR-20, and the History of Aggressive Behavior form). Furthermore, file information was followed up for 5 years after each patient's discharge into the community. Although no information was provided on the psychological and behavioural indicators, as well as the HCR-20 Clinical and Risk Management scale ratings across the different time periods, such a repeated measures approach will be useful to track changes in particular risk factors and also to examine whether they predict future violent behaviours within the community.

In summary, dynamic risk assessment measures have shown that they are generally capable of tracking changes in dynamic risk factors. However, research in this field is often compromised by the reliance of single time-point estimates

when examining dynamic risk factors. This is a serious limitation in dynamic risk assessment research considering that the information gathered from assessments tends to assume a static quality once they are recorded (Webster et al., 2006). Even those using dual time-point estimates are limited in their ability to measure changes in risk factors and their relationship to violence. Therefore, studies employing multiple time-point estimates of dynamic risk factors are needed to accurately encapsulate rapid fluctuations in violence risk and delineate their relationship with violence.

2.4.6 Dynamic Risk Factors for Violence

Many studies exist that examine the risk factors for violence, but few studies have specifically investigated dynamic risk factors of violence that are sensitive to changes over time and situations. In this section, we will look at the potential risk factors that are related to violence and are "changeable" in nature; these risk factors include: impulsivity, negative affect, psychotic symptoms, substance abuse, antisocial attitudes, interpersonal relationships and social support, as well as treatment adherence and therapeutic alliance.

Impulsivity. Impulsivity is conceptualised as the lack of control over affect, behaviour and cognition, and is included as a symptom in many mental disorders. Although there are contradictory findings about the role of impulsivity in violent behaviours (Enticott, Ogloff, Bradshaw, & Daffern, 2007; Enticott, Ogloff, Bradshaw, & Fitzgerald, 2008; Ross & Fontao, 2007), impulsivity has often been associated with aggression and targeted in violence reduction programmes

(Stanford et al., 2003; Webster & Jackson, 1997). In a large study of civil psychiatric patients, impulsivity was correlated with self-reported violent thoughts (Grisso, Davis, Vesselinov, Appelbaum, & Monahan, 2000) and violent recidivism (Monahan, Steadman, et al., 2001). In addition, Prentky and colleagues (1995) found that "lifestyle impulsivity" was able to predict recidivism within a group of sexual offenders. Although impulsivity is sometimes construed as a dispositional trait, it has been demonstrated to "ebb and flow over time within the individual" (Douglas & Skeem, 2005, p. 359). Using the Barratt Impulsiveness Scale (BIS-11; Barrat, 1994), two studies on patients with mental illnesses provided support for the changeable (and possibly dynamic) nature of impulsiveness (Corruble, Damy, & Guelfi, 1999; Swann, Anderson, Dougherty, & Moeller, 2001).

Negative affect. Generally considered to be a possible dynamic risk factor, Watson and colleagues (1988) defined negative affect as "a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness, with low [negative affect] being a state of calmness and serenity" (p. 1063). Although anger and hostility have been conceptualised as dispositional (Novaco, 1994), they are potentially dynamic in nature given that the intensity and expression of anger tend to fluctuate rapidly over time (Beck & Fernandez, 1998; Edmondson & Conger, 1996; Hanson & Harris, 2000; Spielberger, 1999). Studies have also found that anger is significantly correlated to violent behaviours within patients and offenders with mental illnesses (Doyle & Dolan, 2006b; Kay, Wolkenfeld, & Murrill, 1988; Menzies & Webster, 1995). In addition, anxiety and mood appear to be dynamic constructs (Benedict, Dobraski, & Goldstein, 1999;

Harmon-Jones, 2000) that are related to aggression (Hodgins et al., 2003). Furthermore, negative affect may be associated with irritability and impulsivity or may act as a proxy for other risk factors for violence (e.g., family discord, substance use and personality disorders).

Psychotic symptoms. There has been a continuing debate about the degree to which psychotic symptoms predict violence. Psychotic symptoms seem to be possible dynamic risk factors, as they tend to wax and wane over time (Cramer et al., 2001), and are responsive to treatment (see Lieberman & Murray, 2001, for a review). Although some studies (Appelbaum et al., 2000; Lidz, Mulvey, & Gardner, 1993; Monahan, Steadman, et al., 2001) did not find any significant positive association between psychotic symptoms and violence, others have reported that they can predict violence (Arango, Calcedo, Gonzalez-Salvador, & Calcedo, 1999; Cheung, Schweitzer, Crowley, & Tuckwell, 1997; Fazel, Gulati, et al., 2009; Fazel, Långström, et al., 2009; McNiel & Binder, 1994; Skeem et al., 2006; Swanson, Borum, Swartz, & Monahan, 1996; Swanson et al., 2006). In addition, TCO and active positive symptoms have been suggested as the key predictive components in this association between psychotic symptoms and violence (Bjørkly, 2002a, 2002b; Link & Stueve, 1994; Mulvey, 1994; Skeem et al., 2006; Swanson et al., 2006) instead of general psychopathological symptoms (Arango et al., 1999; Bartels, Drake, Wallach, & Freeman, 1991). In a recent meta-analytic review of 204 studies, Douglas et al. (2009) also found that psychosis was associated with a 49% to 68% increase in the likelihood of engaging in violent behaviour. Furthermore, Bonta and colleagues (1998) suggested that psychotic symptoms may precipitate

(and hence predict) violence and other antisocial behaviours in the immediacy, but "such symptoms may have little predictive validity in the long term" (p. 139).

Substance abuse. Research has shown that substance abuse (i.e., alcohol and drugs) is strongly correlated with violence among individuals with mental disorders (Coid et al., 2006; Fazel, Gulati, et al., 2009; Fazel, Långström, et al., 2009; Gran, Danesh, & Fazel, 2008; Monahan, Skeem et al., 2006; Steadman, et al., 2001; Wallace et al., 2004) and those without (Lipsey, Wilson, Cohen, & Derzon, 1997). Many researchers have also found that substance abuse was linked to more violent outcomes across different sample populations (Eronen, Hakola, & Tiihonen, 1996; Hodgins, 1992; Mulvey et al., 2006; Skeem at al., 2006; Swanson, 1994). Others have suggested that this relationship is related to current substance abuse and not just a diagnostic label (Lussier et al., 2010), or there is an interaction effect between substance abuse and mental illness (Elbogen & Johnson, 2009). Considering that intoxication and substance use may fluctuate quickly, and are predictive of imminent aggression (Mulvey et al., 2006), there is strong support for substance abuse as a robust dynamic risk factor for violence. However, there is a relative lack of studies on relationship of contextual and individual factors with substance abuse and violence.

Antisocial attitudes. Andrews and Bonta (2003, 2007) have referred antisocial attitudes as one of the main criminogenic risk factors for offenders, which have been shown in meta-analytic studies to be strongly associated with criminal recidivism (Gendreau et al., 1996) and prison institutional misbehaviour (Gendreau, Goggin, & Law, 1997). Antisocial attitudes have also been

demonstrated to change over time. For example, Walters and colleagues (2002) found that prisoners' criminal attitudes decrease significantly following group-based treatment. Associated with attitudes, violent fantasies have been shown to predict violence within a sample of civil patients (Grisso et al., 2000). Although there are no studies indicating that violent fantasies can change, it is reasonable to expect fluctuations in their frequency and intensity as with other cognitive phenomena (Douglas & Skeem, 2005).

Interpersonal relationships and social support. Interpersonal relationships and social support have been associated with violence (Kotler et al., 1993), and are generally conceptualised as dynamic risk factors for violence due to their fluctuations in quality and quantity (Hong, Seltzer, & Krauss, 2001; Torsheim, Aaroe, & Wold, 2003). Although individuals have been shown to be violent toward their friends or family members (e.g., Monahan, Steadman, et al., 2001), Estroff and Zimmer (1994) suggested that perceived hostility and threat from their family members and friends might have prompted such violent behaviours. Another study indicated that it was the quality of interpersonal relationships that is correlated with domestic violence and victimisation (Bookwala, Frieze, & Grote, 1994). Moreover, the lack of social support has also predicted violence among patients with mental disorders, criminals, and spouses (Gutierrez-Lobos, Schmid-Siegal, Bankier, & Walter, 2001; Klassen & O'Connor, 1988a, 1988b, 1989; Magdol et al., 1997).

Treatment adherence and therapeutic alliance. Treatment adherence and therapeutic alliance are considered to be possible dynamic risk factors for

violence due to their proclivity to changes (e.g., fluctuations in attendances and quality of therapeutic relationships), and their utility in predicting violent behaviours among psychiatric patients (e.g., Monahan, Steadman et al., 2001; Schwartz et al., 1998). When psychiatric patients' social networks have fewer mental health professionals, they tend to exhibit more violent behaviours (Estroff & Zimmer, 1994). Skeem and colleagues (2002, p. 599) also found that "adequate doses of treatment" reduced violent behaviours in civil psychiatric patients. In addition, Elbogen and colleagues (2006) found that treatment adherence, perceived treatment need, and perceived treatment effectiveness are inversely related to violence. Although medication noncompliance can be a possible outcome of poor therapeutic alliances (Olfson, et al., 2000), it has been demonstrated to be a strong predictor of psychiatric readmission (Haywood et al., 1995) and violence (Bartels et al., 1991). Similar to social support, treatment adherence and therapeutic alliance can be viewed as a risk factor or a protective factor. Specifically, disregard for the medication regime or failure to adhere to treatment conditions are risk factors for violence, but the involvement in treatment and the presence of therapeutic alliance may otherwise been seen as protective factors.

Taken together, risk factors such as antisocial attitudes, negative affect, impulsivity, interpersonal relationships and social support, psychotic symptoms, substance abuse, as well as treatment adherence and therapeutic alliance are considered as dynamic risk factors for violence (or even protective factors), and they have been demonstrated to be predictive of violence and changeable over time.

2.4.7 Summary

Since the reconceptualisation of violence risk as a dynamic construct, violence risk factors are often differentiated as "static" or "dynamic" according to their changeability within specified time frames (Douglas & Skeem, 2005). There is also a greater focus in dynamic risk factors (including an awareness to consider situational and contextual information), and a gradual shift from single to multiple time-point evaluations in violence risk assessment procedures to track changes in risk factors. However, studies of such multiple time-point risk evaluations are still relatively few given the difficulty and costs in conducting this type of research. With regard to violence risk factors, risk factors such as antisocial attitudes, negative affect, impulsivity, interpersonal relationships and social support, psychotic symptoms, substance abuse, as well as treatment adherence and therapeutic alliance have been demonstrated to be predictive of violence and changeable over time. Clearly, considerations of such risk factors will be important in the development of risk assessment and management procedures. In the following section, we will examine the various violence risk assessment measures and discuss their utility in dynamic violence risk prediction.

2.5 Violence Risk Assessment Measures

Arising from decades of conceptual development and debates, many structured violence risk assessment schemes have been developed to aid clinicians across many contexts for the purpose of case management, hospital release, parole, and treatment planning. In this section, several risk assessment

measures that have been demonstrated to be useful or promising in predicting violent behaviours will be reviewed, but this thesis will ultimately focus on a subset of the risk assessment measures that are discussed here (the reasons for the selection of the relevant measures will be further discussed in Chapter Three).

With regard to evaluating the predictive accuracy of these violence risk assessment measures, the Receiver Operating Characteristic (ROC), which generates an area under the curve (AUC), is a rather useful index as it provides a measure that is independent of the base rates of violence in the studied population (Mossman, 1994). The ROC-AUC parameter ranges from 0 to 1, and can be used for comparisons of predictive accuracy between the risk assessment measures. When used to distinguish between violent and nonviolent offenders or patients, AUCs that are approaching 1.0 are considered to be nearly perfect predictions. Generally, AUCs > .70 (Hosmer & Lemeshow, 2000) are considered acceptable. The psychometric properties, merits and limitations of some commonly used, as well as promising risk assessment measures are briefly described here. These risk assessment measures are grouped according to the time periods for prediction; specifically, *short term* implies a time period of a few days to a month; *medium term*: 1 to 12 months; and *long term*: more than 12 months.

2.5.1 Short-term Measures of Violence Risk

Brøset Violence Checklist. The Brøset Violence Checklist (BVC; Almvik, Woods, & Ramussen, 2000) is a 6-item violence risk assessment checklist that

assesses changes in six behaviours (confusion, irritability, boisterousness, physical threats, verbal threats, and attacks on objects) that are commonly known to precipitate inpatient violence (Linaker & Busch-Iversen, 1995). The BVC can be rated quickly and easily, and appears useful for predicting inpatient violence within 24 hours (Abderhalden et al., 2004; Almvik et al., 2000; Almvik, Woods, & Ramussen, 2007; Woods & Almvik, 2002). In the BVC's development study, 109 patients from four different psychiatric hospitals in Norway were rated daily on the BVC during their first 3 days of admission, and the BVC appeared to be accurate in predicting inpatient violence. Specifically, the BVC's AUC was .82, with a sensitivity and specificity of 63% and 92% respectively (Almvik et al., 2000; Woods & Almvik, 2002).

Abderhalden and colleagues (2004) also tested the predictive utility of the BVC using a German version of the checklist (BVC-G). In this study, 219 acute psychiatric patients were assessed using the BVC-G, which was found to have similar predictive utility as the BVC during a 12-hour follow-up. The sensitivity and specificity of the BVC-G was found to be 64.3% and 93.9% respectively; and its AUC was .88, suggesting a large effect size for its predictive accuracy. In a more recent study of the BVC's predictive utility with geriatric inpatients with mental illnesses, Almvik and colleagues (2007) found that the BVC was also accurate in predicting inpatient violence during the shift and within a 24-hour period. Specifically, the AUC of the BVC ranged from .94 (within the same shift) to .69 (within 24-hour period), highlighting the checklist items' sensitivity to time and fluctuation in risk state during the short term, which is an important consideration when examining dynamic risk.

Structured Outcome Assessment and Community Risk Monitoring. The Structured Outcome Assessment and Community Risk Monitoring (SORM; Grann et al., 2000) is a dynamic violence risk assessment measure developed for monitoring of forensic clients and offenders with mental illnesses who are discharged into the community. Containing 30 risk factors across six domains (current services and interventions, social situation, social network, clinical factors, subjective ratings, and criterion variables), the SORM includes continual assessment routines for community monitoring.

In an ongoing prospective study, 74 patients who presented with mental illnesses and violent behaviours were followed and reassessed, on average, 10 times each, and each patient is assessed on a monthly basis over 2 years (Grann, Sturidsson, Haggård-Grann, Hiscoke, Alm, Dernevik, et al., 2005). With regard to SORM's predictive validity, preliminary analyses indicated that the SORM (AUC = .71) was similar to the HCR-20 (AUC = .74) and Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995; AUC = .67) in predicting violence over a 10-month period (Grann et al., 2005). Although there are no other studies examining its predictive validity and ability to track changes in risk factors over time given the SORM's relatively recent introduction, it appears to be a promising measure that warrants further investigation.

Dynamic Appraisal of Situational Aggression: Inpatient Version. Using items from the BVC and the HCR-20 and novel items drawn from a functional analytical assessment of inpatient aggression, the DASA:IV (Ogloff & Daffern, 2002) was developed to assess the risk of imminent aggression in patients with mental

illnesses within an institutional setting. The DASA:IV is a 7-item violence risk assessment measure that comprises strictly dynamic violence risk factors and it attempts to compensate for the lack of situational considerations in violence risk assessments (Daffern, 2007). In the validation study for the DASA:IV, Ogloff and Daffern (2006) found that the odds that a patient who scored a total of 7 on the DASA:IV would be physically aggressive as compared to another patient who scored 0 is 29 times; the remaining odds ratios were 15.7 for a score of 6, 3.17 for 5, 4.48 for 4, 2.79 for 3, 2.69 for 2, and 1.31 for 1.

Although the DASA:IV appear to significantly predict inpatient violence (AUC = .82; Ogloff & Daffern, 2006), there are only two other published studies to date regarding its predictive accuracy within the very short term (i.e., within 24 hours). In a study conducted on personality-disordered violent and sex offenders within a high-secure unit in the United Kingdom (Daffern & Howells, 2007), the DASA:IV was found to significantly predict inpatient violent and self-harm behaviours (AUCs = .65 and .67 respectively). In another study, Barry-Walsh and colleagues (2009) found that the DASA:IV predicted general aggressive behaviour (i.e., physical violence, verbal aggression, and/or property damage; AUC = .69), physical violence toward staff (AUC = .80) and patients (AUC = .65), verbal aggression toward patient (AUC = .73), as well as property damage (AUC = .67) within a sample of offenders with mental illnesses in New Zealand. Taken together, the DASA:IV appears to have potential for assessment dynamic risk of violence, but more studies will be needed to ascertain its predictive utility across cultures, populations and settings.

Short-Term Assessment of Risk and Treatability. Based on the structured clinical judgement risk assessment scheme, the Short-Term Assessment of Risk and Treatability (START; Webster, Martin, Brink, Nicholls, & Desmarais, 2009; Webster, Martin, Brink, Nicholls, & Middleton, 2004; Webster et al., 2006) is designed to assess multiple risk domains that are pertinent to daily psychiatric clinical practice (i.e., self-harm and suicide, self-neglect, substance use, unauthorised leave, victimisation, and violence to others). Focusing on dynamic risk factors, the 20-item START aims to provide a platform for interdisciplinary collaboration regarding the periodic assessments and treatment interventions.

There are three published papers on the START currently. The results from a prospective study showed high rates of generally low-level adverse events (i.e., not resulting in injury), and a majority of inpatients engaged in some challenging behaviour during the 1-year follow-up period (Nicholls et al., 2006). Not surprisingly, verbal aggression (61%) was the most common, followed by physical violence against others (39%), and property damage (37%). It is noted that most of START scores were meaningfully associated with the outcomes measured by a modified Overt Aggression Scale. For example, the START scores were found to significantly predict physical violence (AUC = .65), verbal aggression (AUC = .67), and property violence (AUC = .69). Depending on the confidence of the rater, the START showed adequate predictive accuracy for physical violence (exhibited by forensic psychiatric patients) toward others (AUCs = .63 to .73), physical violence toward objects (AUCs = .69 to .78), and verbal aggression toward others (AUCs = .68 to .79) (Desmarais, Nicholls, Read, & Brink, 2010). In summary, this measure appears promising with regard to the assessment of dynamic risk for violence

considering its breadth of dynamic risk factors, as well as its platform for conducting multiple assessments and comparisons over time (e.g., the recommended reassessment time frame is 1 to 8 weeks).

Violence Screening Checklist. The Violence Screening Checklist (VSC; McNiel & Binder, 1994) was developed for prerelease decision-making within inpatient settings following difficulties associated with risk assessment procedures. In the validation study (McNiel & Binder, 1994), the VSC was shown to have a sensitivity of 55% and specificity of 64% for physical violence, as well as a sensitivity of 57% and specificity of 70% for any aggressive behaviour. Further evaluation of the VSC's predictive validity indicated that its AUC was .74 (McNiel, Gregory, Lam, Sullivan, & Binder, 2003). However, when a revised version of the VSC was used (VSC-R; in which the marital status item was removed), its AUC improved to .77 and analyses also revealed strong correlations between the VSC-R and violence (McNiel, Gregory, et al., 2003).

The brevity and simplicity of the 5-item VSC suggest that it is useful for settings whereby quick and numerous risk assessments of patients with violent tendencies are needed. However, one of VSC's caveats is its population-specific nature. Specifically, it may not work as well for male inpatients that present with schizophrenia and a history of violent behaviour. A subsequent study on the VSC's predictive accuracy in a long-term psychiatric setting (Nicholls, Ogloff, & Douglas, 2004) was not able to replicate the results that were reported by McNiel and colleagues (1994, 2003) in acute psychiatric settings. In particular, the VSC's predictive accuracy in such long-term psychiatric settings was only slightly better

than chance for any inpatient aggression (AUC = .58 for males; AUC = .59 for females) and for physical violence (AUC = .53 for both genders). Furthermore, the VSC may be compromised by its reliance on static items and hence its inability to track the trajectories of the risk factors that fluctuate rapidly.

2.5.2 Medium-term Measures of Violence Risk

Classification of Violence Risk. In the MacArthur Violence Risk Assessment Study (Monahan, Steadman, et al., 2001), 939 patients involuntarily committed to civil psychiatric hospitals were evaluated regarding the extent to which they exhibited a multitude of violence risk factors. These patients were followed up in the community for up to a year (upon their discharge from hospitals) in order to examine the extent to which the violence risk factors predicted violent behaviours. The study highlighted the associations between violence and risk factors such as anger, childhood experiences, criminality, delusion, diagnosis, gender, hallucinations, neighbourhood context, prior violence, and violent thoughts (see Monahan, 2002, for a summary). Furthermore, some of the violence risk factors were found to be amenable to treatment. According to Monahan, "substance abuse, anger, and violent fantasies stand out as candidates for being targets of violence risk reduction efforts" (p. 139).

These results prompted the development of an actuarial model of violence risk assessment for persons with mental disorders. The model consists of a series of decision trees (i.e., iterative classification trees) or a combination of them, which can maximise the accuracy of violence predictions (Monahan et al., 2000,

2005). For example, relying merely on information provided by hospital personnel, an iterative classification tree was able to classify 73% of the patients as either high or low risk of violence, contingent on whether they exhibited more than twice or less than half of the postrelease violence rate of the mentally ill population. Using a series of five iterative classification trees, each starting with a different risk factor, the patients could be classified into one of the five risk levels. The iterative classification tree method's ROC for violent recidivism has been reported to be high (AUC = .82) (Monahan et al., 2000). An interactive software programme, the Classification of Violence Risk (COVR; Monahan et al., 2006) has since been developed to estimate the violence risk of acute psychiatric patients following their discharge from hospital. The COVR guides the clinician through a chart review and brief interview with the patient before generating a report that estimates the patient's violence risk. A more recent study by Snowden et al. (2009) found that the COVR significantly predicted physical violence in a sample of forensic psychiatric inpatients over a period of 6 months (AUC = .73).

Historical, Clinical, Risk Management – 20 Factors. The HCR-20 (Webster et al., 1997) is a checklist of risk factors for violent behaviour that was developed by incorporating empirically determined violence risk factors, as well as those variables that have been deemed relevant to violence prediction by experienced forensic clinicians. Based on a structured clinical judgement risk assessment scheme, it has 20 items organised around thee scales: Historical, Clinical, and Risk Management. The Historical scale contains 10 relatively static risk factors (e.g., history of violence, early maladjustment, and personality disorder); whereas the Clinical scale contains five potential dynamic risk factors that reflect current

mental and clinical status (e.g., lack of insight and impulsivity). The Risk Management scale contains another five potentially dynamic risk factors that reflect future situational variables (e.g., lack of personal support and stress).

Studies have found the HCR-20 to be generally useful for the risk assessment and management of offenders with mental illnesses, general offenders, forensic patients, and psychiatric patients, within community and institutional settings (e.g., Douglas et al., 1999; Doyle & Dolan, 2006a; Gray, Taylor, & Snowden, 2008; McDermott, Edens, Quanbeck, Busse, & Scott, 2008; McNiel, Gregory, et al., 2003; Mossman, 2000; Nicholls et al., 2004; Witt, 2000). With the inclusion of dynamic risk factors, the HCR-20 has an advantage over risk assessment schemes that rely exclusively on static risk factors. Specifically, these dynamic factors can be the focus of the violence risk reduction efforts, and the HCR-20 Clinical and Risk Management scales can be used to evaluate clinical progress. The Clinical and Risk Management items can also be utilised to guide daily appraisals of risk for imminent aggression (Ogloff & Daffern, 2006). The median AUC for the HCR-20 total score (across 42 studies) is .69 (Guy, 2008). The median AUCs for the Historical, Clinical and Risk Management scales were slightly lower than that of the total score at .68 (range = .40 to .85), .62, (range = .46 to .80) and .65 (range = .48 to .88) respectively (see Douglas & Reeves, 2010 for a review).

Table 2.1

Predictive accuracy of the HCR-20 in forensic psychiatric settings (published studies)

HCR-20	Study	$M_{follow\text{-}up}$	Predictive Accuracy (AUC) Violent	Nonviolent	Any
Total	Dernevik et al. (2002)	60 wks			.64 – .82
	Dolan & Fullam (2007)	12 mths	.72		
	Fujii et al. (2005)	193 days			.58 – .73
	Langton et al. (2009)	12 mths	.58	.60[p]	
	Lindsay et al. (2008)	12 mths	.72		
	McDermott et al. (2008)	2.48 yrs	.65		
	McNiel, Gregory, et al. (2003)	9.5 days[Ø]	.65		
	Morrissey et al. (2007)	12 mths	.68	.77	
	Tengström et al. (2006)	12 mths	.65[s], .32[pd], .60[ci]	.71[v,s,pd], .67[v,ci]	.65[s], .66[pd]
"H" scale	Dernevik et al. (2002)	60 wks			.62 – .83
	Dolan & Fullam (2007)	12 mths	.66		
	Doyle et al. (2002)	12 wks	.70	.66	
	Fujii et al. (2005)	193 days			.47 – .62
	Gray et al. (2003)	3 mths	.77	.73[v], 82[p]	
	Grevatt et al. (2004)	6 mths	.54	.28[v], .32[p]	.40
	Langton et al. (2009)	12 mths	.41	.55[p]	
	Lindsay et al. (2008)	12 mths	.68		
	McDermott et al. (2008)	2.48 yrs	.61		
	McKenzie & Curr (2005)	2 yrs			.55
	McNiel, Gregory, et al. (2003)	9.5 days[Ø]	.56		
	Nicholls et al. (2004)	108 days	.56[m], .57[f]		.58[m], .69[f]
"C" scale	Daffern & Howells (2007)	24 hrs	.63		
	Dernevik et al. (2002)	60 wks			.59 – .75
	Dolan & Fullam (2007)	12 mths	.73		
	Fujii et al. (2005)	193 days			.58 – .74
	Gray et al. (2003)	3 mths	.79	.74[v], 77[p]	
	Grevatt et al. (2004)	6 mths	.60	.81[v], .65[p]	.72
	Langton et al. (2009)	12 mths	.58	.71[p]	
	Lindsay et al. (2008)	12 mths	.67		
	McDermott et al. (2008)	2.48 yrs	.61		
	McKenzie & Curr (2005)	2 yrs			.69
	McNiel, Gregory, et al. (2003)	9.5 days[Ø]	.77		
	Nicholls et al. (2004)	108 days	.55[m], .62[f]		.58[m], .70[f]
	Ogloff & Daffern (2006)	24 hrs	.75		
"R" scale	Dernevik et al. (2002)	60 wks			.60 – .65
	Dolan & Fullam (2007)	12 mths	.67		
	Fujii et al. (2005)	193 days			.55 – .73
	Langton et al. (2009)	12 mths	.73	.66[p]	
	Lindsay et al. (2008)	12 mths	.62		
	McDermott et al. (2008)	2.48 yrs	.66		
	McNiel, Gregory, et al. (2003)	9.5 days[Ø]	.58		

Note: "Violent," "nonviolent," and "any" refers to physical violence, verbal threat/property damage, and any inpatient aggression respectively.
[ø] denotes the median length of follow-up. [m, f, v, p] denote male, female, verbal threat, and property damage respectively. [ci, pd, s] denote patients with cognitive impairment, personality disorder, and schizophrenia respectively.

Of note, a recent study by Gray et al. (2008) revealed that the Historical subscale was more accurate in predicting violent convictions than Clinical and Risk Management scales over different time periods in a sample of forensic psychiatric patients who were released into the community. The AUCs for the Historical subscale ranged from .77 (6-month follow-up period) to .68 (5-year follow-up period), whereas the AUCs for Clinical and Risk Management scales (same follow-up periods) ranged from .61 to .57 and .69 to .63 respectively. Although Doyle & Dolan (2006a) have demonstrated that the addition of dynamic variables improves on purely historical baseline measures over 24 weeks for a similar sample, Gray et al. showed that historical risk factors were more predictive of future violence than dynamic risk factors from 6 months to 5 years.

Table 2.1 (p. 55) shows the predictive accuracy of the HCR-20 for violent and nonviolent misconduct in forensic psychiatric settings. Overall, the HCR-20 Total score, as well as the Historical, Clinical, and Risk Management scales appear to demonstrate some utility for predicting inpatient aggression over the medium term, and the predictive accuracy was generally in the mediocre to acceptable range. However, there are fewer studies that have examined the predictive accuracy of the HCR-20 during time periods of less than 6 months.

Level of Service/Case Management Inventory & Level of Service Inventory – Revised: Screening Version. Based on the principles of risk, need and responsivity (Andrews, Bonta, & Hoge, 1990), the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta, & Wormith, 2004) is a 54-item general risk assessment measure that shares characteristics of the structured clinical

judgement approach but uses an algorithm to make decisions. In the LS/CMI, a new case management and review module is added to the existing LSI-R (Andrews & Bonta, 1995). The LS/CMI is one of the best measures of general recidivism, but it has been shown to be useful for predicting violent recidivism (Gendreau, Goggin, & Smith, 2002; Gendreau, Little, & Goggin, 1996). The Level of Service Inventory-Revised: Screening Version (LSI-R:SV; Andrews & Bonta, 1998) is a time- and cost-efficient, screening version comprising 8 of the 54 items that were originally in the LSI-R. It was introduced as a preliminary instrument for agencies with limited resources when faced with extremely large numbers of cases that had to be assessed. Those cases that were assessed to be of Medium or Maximum risk on the LSI-R:SV should be subjected to the full Level of Service (LS) assessment for purposes of progress planning (Andrews, Bonta, & Wormith, 2010).

The LS/CMI (and its predecessors), as well as the LSI-R:SV evaluate both static (e.g., criminal history) and dynamic risk (education/employment and alcohol/drug problems) factors. They have also been used and validated in correctional and community settings, as well as detention facilities of all types (Andrews & Bonta, 2007; Bonta et al., 1998; Kroner & Mills, 2001; Nussbaum, 2006; Ogloff, Lemphers, & Dwyer, 2004; see also Andrews et al., 2010 for a review). Using a validation sample of 51,648, Washington State Institute for Public Policy (2007) reported that the LSI-R's predictive accuracy for violent recidivism is moderate (AUC = .73). In a recent meta-analytic comparison of risk assessment measures, Campbell and colleagues (2009) showed that the LSI/LSI-R's adjusted mean effect sizes for predicting institutional violence and violent recidivism were

.24 and .28 respectively; these were comparable to those adjusted mean effect sizes for the HCR-20, the PCL/PCL-R, the PCL:SV, and the VRAG. In addition, the mean effect size for the LS/CMI for the prediction of violent recidivism is .41 (Andrews, Bonta, & Wormith, 2006). There is much less research on the predictive accuracy for the LSI-R:SV when compared to the LSI-R or LS/CMI, and its predictive accuracy for inpatient violence (AUC = .60) and violent recidivism (AUCs of .50 to .71) appears to be mixed (Daffern, Ogloff, Ferguson, & Thompson, 2005; Ferguson et al., 2009; Yessine & Bonta, 2006). The LSI-R:SV total score has also been found to predict seclusion (an outcome often associated with physical violence, verbal aggression, and property violence) within a forensic hospital; and using three variables on the measure (in addition to two other risk factors), the predictive accuracy for seclusion was moderate at AUC of .74 (Thomas et al., 2009).

Violence Risk Scale – 2nd Edition. The Violence Risk Scale – 2nd Edition (VRS-2; Wong & Gordon, 1999) is a violence risk assessment measure that consists of six static and 20 dynamic items that are either empirically or theoretically associated with violent recidivism. The VRS-2 has been demonstrated to be useful in predicting violent and nonviolent recidivism with shorter and longer follow-up time frames (i.e., 1 to 4 years); the AUCs for the VRS-2 ranged from .62 to .82 (Dolan & Fullam, 2007; Dolan, Fullam, Logan, & Davies, 2008; Wong & Gordon, 2006). Similar to the HCR-20, the VRS-2's inclusion of dynamic variables gives it an advantage over comparable violence risk assessment measures (in terms of predictive accuracy and capacity to organise treatment) that rely exclusively on static variables. Specifically, these dynamic variables allow the structured,

periodic reviews of treatment progress that can assist release decision-making. In their validation study, Wong and Gordon (2006) claimed that the dynamic variables in the VRS-2 are closer in nature to those that have been described as "stable dynamic variables" (Hanson & Harris, 2000). These variables, though dynamic, tend not to fluctuate over short durations; rather they can potentially change over longer duration (e.g., after 6 to 12 months posttreatment). As such one limitation of the VRS-2 is the lack of items assessing more acute, transient and situational variables (e.g., active psychotic or mood symptoms in relation to different contexts) that can fluctuate within a short period of time (Daffern, 2007).

2.5.3 Long-term Measures of Violence Risk

Hare Psychopathy Checklist-Revised & Psychopathy Checklist: Screening Version. The PCL-R (Hare, 1991, 2003) was not originally designed as a violence risk assessment measure, but it has been gradually used to assess the risk of violent recidivism – often on its own and sometimes through its inclusion in actuarial and structured clinical judgement risk assessment measures. Consisting of 20 items that are rated on a 3-point (0 to 2) scale according to specific criteria, the PCL-R assesses the characteristics of psychopathy via semistructured interview and file reviews. A cut-off score of more than 30 generally indicates the presence of psychopathy in North America, whereas a score of more than 25 is indicative of psychopathy in Europe (Cooke, 1998; Cooke & Michie, 1999). Its psychometric properties have been assessed to be good (Cooke, 1998), and the PCL-R has a stable two-factor structure of interpersonal/affective traits, and unstable

lifestyle/social deviance (Hare, 1991, 2003). However, there has been considerable debate over the factor structure of the PCL-R in recent years, with researchers proposing three-factor (Cooke & Michie, 2001; Hall, Benning, & Patrick, 2004) and four-factor models (Forth, Kosson, & Hare, 2003; Neumann, Kosson, & Salekin, 2007; Vitacco, Rogers, Neumann, Harrison, & Vincent, 2005).

The PCL-R is a well-recognised measure of psychopathy for offenders with mental illnesses as well as those without (Grann, Långström, Tengström, & Kullgren, 1999; Hare, 2003; Heilbrun et al., 1998; Hemphill, Hare, & Wong, 1998; McDermott et al., 2008; Stadtland, Kleindienst, Kröner, Eidt, & Nedopil, 2005; Walters, 2003a, 2003b), and the PCL-R scores have been incorporated into some violence risk assessment measures (e.g., the HCR-20 and the Violence Risk Appraisal Guide [VRAG, Quinsey et al., 1998, 2006]). The PCL:SV (Hart et al., 1995), on the other hand, is a 12-item abridged version of the PCL-R. It has similar psychometric properties to the PCL-R (Cooke, Michie, Hart, & Hare, 1998), with scores ranging from 0 to 24 and the cut-off is at 18. The PCL:SV Total scores are also highly correlated with the PCL-R Total scores for forensic or correctional samples (Guy & Douglas, 2006).

In a large-scale meta-analysis of 95 nonoverlapping studies (N = 15,826) on the PCL and PCL-R, Lestico and colleagues (2008) revealed that the Total, Factor 1, and Factor 2 scores were associated with antisocial conduct (broadly defined to include recidivism and institutional misconduct), with mean weight effect sizes (Hedges' d) of 0.55, 0.38, and 0.60 respectively. Other meta-analyses have shown that the Total scores on the PCL/PCL-R (and the PCL:SV to a lesser extent) have

moderate to large effect sizes for predicting violent recidivism in the community and institutional misconduct (*d*s = 0.43 to 0.79, and 0.47 to 0.56 respectively), whereas Factor 1 and Factor 2 scores have wide ranging effect sizes for predicting violent recidivism (*d*s = 0.24 to 0.37, and 0.37 to 0.54 respectively), and institutional misconduct (*d*s = 0.24 to 0.34, and 0.34 to 0.45 respectively) (Gendreau et al., 1996, 2002; Guy, Edens, Anthony, & Douglas, 2005; Hemphill et al., 1998; Salekin et al., 1996; Walters, 2003a, 2003b; see also DeMatteo, Edens, & Hart, 2010; Lestico et al., 2008 for reviews). When examined on its own, the PCL:SV demonstrated some variability in its predictive validity for community (AUCs = .63 to .73) and institutional violence (AUCs = .58 to .76) (e.g., Dernevik et al., 2002; Dolan & Davies, 2006; Dolan et al., 2008; Douglas, Strand, Belfrage, Fransson, & Levander, 2005; Doyle & Dolan, 2006a; Doyle et al., 2002; Edens, Skeem, & Douglas, 2006; Ho, Thomson, & Darjee, 2009; McNiel, Gregory, et al., 2003; Nicholls et al., 2004; Skeem & Mulvey, 2001; Tengström et al., 2006; Vitacco et al., 2009).

In spite of the numerous studies conducted on the PCL measures, there are relatively few studies (like the HCR-20) that have examined the predictive accuracy of the PCL measures in follow-ups of less than 6 months. Table 2.2 shows the predictive accuracy of the PCL measures for violent and nonviolent misconduct in forensic psychiatric settings. Overall, the PCL-R and the PCL:SV appear to demonstrate limited utility for predicting inpatient aggression in the short to medium term, with their predictive accuracy generally in the mediocre range.

Table 2.2

Predictive accuracy of the PCL-R and PCL:SV in forensic psychiatric settings (published studies)

PCL	Study	$M_{follow\text{-}up}$	Predictive Accuracy (AUC) Violent	Nonviolent	Any
PCL-R Total	Gray et al. (2003)	3 mths	.70	.60[v], .76[p]	
	McDermott et al. (2008)	2.48 yrs	.58		
	Morrissey et al. (2007)	12 mths	.54	.49	
	Walter & Heilbrun (2010)	6 mths			.57 – .63[$]
PCL:SV Total	Dernevik et al. (2002)	60 wks			.62 – .67
	Dolan & Davies (2006)	12 wks	.65		.65
	Dolan et al. (2008)	371 days[Ø]	.63		.68
	Douglas et al. (2005)[Δ]	12 mths[Ø]			.65
	Doyle et al. (2002)	12 wks	.76	.74	
	McNiel, Gregory, et al. (2003)	9.5 days[Ø]	.61		
	Nicholls et al. (2004)	108 days	.59[m], .63[f]		.60[m], .72[f]
	Tengström et al. (2006)	12 mths	.63[s], .38[pd], .62[ci]	.65[v,s], .77[v,pd], .62[v,ci]	.65[s], .76[pd]
	Vitacco et al. (2009)	6 mths			.54

Note: "Violent," "nonviolent," and "any" refers to physical violence, verbal threat/property damage, and any inpatient aggression respectively.
[ø] denotes the median length of follow-up. [Δ] denotes a mixed sample of forensic psychiatric patients and prisoners. [$] denotes that the AUCs for the PCL-R Facet scores presented instead of the AUC for the Total score. [m, f, v, p] denote male, female, verbal threat, and property damage respectively. [ci, pd, s] denote patients with cognitive impairment, personality disorder, and schizophrenia respectively.

Violence Risk Appraisal Guide. The VRAG (Quinsey et al., 1998, 2006), a 12-item actuarial instrument, is one of the most widely used violence risk assessment measures. It was developed retrospectively on a mixed sample of 618 offenders with mental illnesses from the Penetanguishene Mental Health Center and later recalibrated on an extended sample of more than 800 of these offenders who were followed for 10 years. Violent recidivism within this studied population was significantly correlated with the VRAG total score, which is based on a weighted rating of the significant predictor variables that were derived through regression analyses. Rice and Harris (1995) found that the VRAG predicted violent recidivism

with AUCs of .75, .74 and .74 during follow-ups at 3.5, 6 and 10 years respectively. In 35 nonoverlapping samples, Rice and Harris (2005) showed that the VRAG's predictive accuracy was within the moderate range (mean AUC = .72). Further, Harris and Rice (2003) found that the VRAG was highly predictive of violence (AUC ≈ .85) under optimal conditions – where there is high inter-rater reliability; no dropping, replacing, or modifying of the items; and the presence of fixed and equal follow-up periods (see also Quinsey et al., 2006 for a review).

A recent study by Snowden et al. (2007) found that the VRAG is predictive of violent recidivism for a sample of 421 offenders with mental illnesses who were discharged from medium secure units. The AUCs reported were .86, .86, .78, .75, and .76 for follow-up periods of 6 months, 1, 2, 3, and 5 years respectively. Other studies also showed that the VRAG predicted violent incidents (24 months follow-up) and violent recidivism (mean follow-up of 58 months) in the community, with AUCs of .68 and .70 respectively (Ho et al., 2009; Kröner, Stadtland, Eidt, & Nedopil, 2007). In addition, Gray and colleagues (2007) demonstrated that the VRAG was predictive of violent recidivism during a 5-year follow-up of offenders with intellectual disabilities (AUC = .73) as compared with .73 and .79 for the PCL:SV and the HCR-20, respectively.

Apart from community prediction of violence, there were mixed findings on VRAG's predictive utility within forensic inpatient settings. For example, the VRAG's ROCs for predicting future inpatient violence were poor to acceptable (AUCs = .54 to .77) (Dolan et al., 2002; Lindsay et al., 2008; McDermott et al., 2008; Snowden et al., 2009; see Table 2.3 for a summary). Although the VRAG has been

previously criticised for its reliance on static factors, the authors addressed this criticism by including the Dynamic Risk Appraisal Scale (Quinsey et al., 2006), which is not an actuarial measure but a guide for clinicians. However, there is no published study on the predictive accuracy of the Dynamic Risk Appraisal Scale according to the author's knowledge.

Table 2.3

Predictive accuracy of the VRAG in forensic psychiatric settings (published studies)

			Predictive Accuracy (AUC)		
Measure	Study	$M_{follow\text{-}up}$	Violent	Nonviolent	Any
VRAG	Doyle et al. (2002)	12 wks	.71	.64	
	Lindsay et al. (2008)	12 mths	.71		
	McDermott et al. (2008)	2.48 yrs	.54		
	Snowden et al. (2009)	6 mths	.54		

Note: "Violent," "nonviolent," and "any" refers to physical violence, verbal threat/property damage, and any inpatient aggression respectively.

This section has described a number of risk assessment measures (i.e., the BVC, the DASA:IV, the SORM, the START, the VSC, the HCR-20, the LS measures, the VRS-2, the PCL measures, and the VRAG) that are generally predictive of violent behaviours in the inpatient and community settings over the short, medium, and long terms. In particular, the research pertaining to the measures' predictive accuracy and their suitability for different settings were reviewed accordingly. For the purposes of this study, a subset of these measures (i.e., the DASA:IV, the START, the HCR-20, the LSI-R:SV, the PCL measures, and the VRAG) will be further discussed in Chapter Three.

2.5.4 Assessing Dynamic Risk of Violence – What Can We Currently Use?

Clearly, the violence risk assessment measures that are described in the preceding section vary in psychometric properties, evaluation approach (e.g., actuarial vs. structured clinical judgement), as well as applicability to different populations, settings, and time frames. Although the aforementioned violence risk assessment measures are categorised according to their predictive utility in different time frames, they can also be classified into two types of measures: (1) *General* risk assessment measures that include some ostensibly dynamic violence risk factors; and (2) *specific* violent risk assessment measures that explicitly focus on evaluating the risk state.

Some general risk assessment measures include scales or items that assess putatively changeable risk factors and may be useful for assessing dynamic risk of violence. These measures tend to adopt the structured clinical judgement model rather than the actuarial model. As described above, the Level of Service (LS) instruments (i.e., the LSI-R, the LS/CMI, and the LSI-R:SV), the HCR-20, and the VRS-2 are risk assessment measures with structured clinical judgement features that appear to be useful for dynamic risk assessment. The HCR-20 has been shown to be sensitive to changes in risk factors related to violent recidivism in many studies, whereas the LS assessment measures have not been specifically evaluated in terms of their utility for assessing dynamic violence risk factors. However, the LS measures are found to be useful for assessing dynamic risk factors that are associated with general recidivism and may be promising for assessing dynamic risk of violence given their general utility in the prediction of

violent behaviours. In fact, the LS/CMI, with its case management module, as well as the adoption of both structured clinical judgement and actuarial decision-making approaches, has been touted as an evolution in the risk assessment field; it notably "guides and follows service and supervision from intake through case closure" (Andrews et al., 2006, p. 8). With the majority of its items being dynamic in nature, the VRS-2 seems to tap on the risk state because only posttreatment (not pretreatment) VRS scores are significantly associated with violent recidivism (Wong & Gordon, 1999, 2006). However, further research will be needed to elucidate on the ability of the VRS to measure changes in risk state given the stable dynamic nature of its dynamic items.

Pertaining to the actuarial risk assessment approaches, the COVR and the VRAG are two measures that have been empirically demonstrated to be useful in medium to long-term risk assessments of violence (e.g., Monahan et al., 2000; Quincy et al., 2006). However, the utility of these actuarial risk assessment approaches in dynamic violence risk assessment is debatable. Although the COVR can estimate the violence risk of acute psychiatric patients following their discharge from hospital with high degrees with accuracy, there are doubts about the COVR's ability to account for the rapid fluctuations in some (dynamic) risk factors given its actuarial operations. The VRAG can purportedly assess both static and dynamic risk factors for violence with the addition of the DRAS, and appear to be sensitive to changes within putatively dynamic risk factors (Quinsey et al., 2006). Nevertheless, there are some concerns about the derivation and breadth of items on the Violence subscale of the DRAS that may affect its capability in

assessing dynamic risk of violence (Douglas & Skeem, 2005). Moreover, there is no published study on the DRAS currently.

In contrast to general risk assessment measures that comprise dynamic risk factors, some violence risk assessment measures concentrate on assessing risk state changes over time or in response to interventions. However, there have been few studies that examined the psychometric properties of these specific risk state assessment measures. The BVC and the VSC are two of the specific risk state assessment measures that have a few studies to date. The BVC is a quick and easy-to-use violence risk assessment measure for inpatient settings and has been demonstrated empirically as a reliable and predictive measure of violence within 12 to 24 hours (Abderhalden et al., 2004; Almvik et al., 2000, 2007). In particular, the BVC shows early signs of suitability for tracking changes in certain dynamic risk factors for violence.

Although the VSC was shown to be rather useful as a quick violence risk assessment measure within acute psychiatric settings (McNiel & Binder, 1994; McNiel, Gregory, et al., 2003), a replication study within a longer-term psychiatric setting did not yield similar results (Nicholls et al., 2004). Moreover, some of the VSC's caveats include its population-specific nature, and its reliance on static items – limiting its ability to track the trajectories of the risk factors that fluctuate rapidly. The DASA:IV, the SORM, and the START are other dynamic risk assessment measures that seem promising in view of their development and validation studies. The DASA:IV has been designed specifically for assessing the risk state of institutionalised offenders with mental illnesses and forensic patients,

but has been used to assess prisoners with severe personality disorders. It incidentally also uses a multiple-time point methodology. Although there are only three studies to date on the DASA:IV (Barry-Walsh et al., 2009; Daffern & Howells, 2007; Ogloff & Daffern, 2006), the DASA:IV appears to have potential for assessing dynamic risk of violence. On the other hand, the SORM is used to assess dynamic risk of violence in forensic clients and offenders with mental illnesses who are discharged into the community. The SORM also uses a multiple time-point assessment procedure and its development study indicates the SORM showed promise when compared with the much-researched HCR-20 in terms of assessing dynamic risk of violence. Comprising a wide range of dynamic items, the START is another risk assessment measure that utilises the structured clinical judgement scheme and recommends frequent reassessment of its dynamic risk and protective factors. In spite of its appeal, there has been a relative lack of published research studies on the predictive utility of the START as with the DASA:IV and the SORM.

Until recently, the focus on dynamic risk and risk management has been more conceptual than empirical, and there has been a dearth of empirically validated measures to assess dynamic risk of violence, specifically the violence risk state. Considering the purpose of the various risk assessment measures, it may be prudent to use the *specific risk state* measures (e.g., the BVC, the DASA, the START, and the SORM) for more acute (time sensitive) assessments, together with the more established, *general* measures (e.g., the HCR-20, the LS measures, or the VRS-2) that may be more suited for medium-term assessments. However, more studies will undoubtedly be needed to elucidate the utility of the static and

dynamic risk assessments across populations, time frames, and contexts. Nevertheless, the future of dynamic violence risk assessment does look encouraging with the availability of several promising measures with different focus on prediction period and breadth of risk factors.

2.6 Where Do We Go from Here - Using Static or Dynamic?

Violence risk assessment research and practices have come a long way since the 1960s. Much has been debated on the philosophy and utility of various risk assessment schemes, and violence risk factors have been researched in varying degrees (static more so than dynamic factors) during the past decades. There is no doubt that many static risk factors (e.g., past criminal history, personality, intelligence, brain damage, and early onset of violence) have significant influences in today's violence risk assessment procedures given their predictive utility (Bonta et al., 1998, Borum et al., 1996; Webster et al., 1997). Nevertheless, static risk factors, due to their "unchanging" or "slow-changing" nature, are unable to accurately capture or characterise rapid fluctuations in certain situations.

Although violence has since been conceptualised as a dynamic construct that fluctuates over time within each individual in different situations (Douglas & Skeem, 2005; Steinert, 2002), research pertaining to dynamic risk factors for violence appears to be in its infancy presently. Clear conclusions cannot be drawn from the extant studies of dynamic risk of violence because there are relatively few studies that have truly evaluated the nature of dynamic risk factors.

Specifically, apart from a few promising studies on dynamic risk factors recently, many others have been plagued with methodological limitations such as retrospective designs, small sample, and few assessment points, which curtail the full portrayal of the nature of change. Most studies that rely on single time-point estimates to measure ostensibly dynamic factors cannot be considered as true studies of dynamic risk factors. There are also very few studies that have examined the relative predictive accuracy of static and dynamic risk factors using such time-point follow-up studies. However, even dual time-point estimates are limited measures of change in risk factors and their relation to violence as they can only provide a "snapshot" and cannot accurately represent change (Douglas & Skeem, 2005).

More importantly, there have been few studies looking at the interaction between static and dynamic risk factors for violence. Wong and Gordon (2006) suggested that:

> [D]ynamic variables can predict risk just as well as, if not better than, static variables because the two are highly correlated. Static variables, such as criminal history, can be considered as proxy measures of the consequences of individual's problematic social and interpersonal functioning, many of which are reflected by the dynamic variables. Static and dynamic risk variables are two sides of the same coin, reflecting the same underlying construct of a dysfunctional and criminal lifestyle (p. 305).

In contrast, other researchers have suggested that dynamic variables may play an important role in predicting violence in the short term (Douglas, Ogloff, et

al., 1999; McNiel, Gregory, et al., 2003), and that static methods may be more suited for longer-term predictions (Quinsey et al., 2006). In fact, Doyle and Dolan (2006a) have demonstrated that the addition of dynamic variables improves on purely historical baseline measures over 24 weeks, and Gray et al. (2008) showed that historical risk factors were more predictive of future violence than dynamic risk factors from 6 months to 5 years. However, there is no prospective study that has systematically compared the utility of static vs. dynamic risk factors for predicting violence in the very short term (e.g., few days to several weeks). Arguably, this is the most important period within the psychiatric setting since the clinicians will want to accurately assess the risk before the patients are discharged. This will enable appropriate risk management to take place following the discharge from hospital (McNiel, 2009). Although intuitive, the hypothesis that dynamic variables are more apt in predicting violence in the short-term and that static methods may be more suited for longer-term predictions has not been formally investigated. Currently, the risk assessment field is unsure about the trajectories of the predictive validity for the dynamic violence risk factors over time. More specifically, the point at which dynamic risk factors cease to be predictive, and the time period when more consideration should be given to static risk factors during violence risk assessments is unknown.

In addition, there are several other areas pertaining to dynamic violence risk assessment that will warrant empirical investigation: How accurate is a short-term average of risk states for the longer-term prediction of inpatient aggression? In contrast, how predictive is the "peak" risk state for a defined period of time of future inpatient aggression? Are these indices predicting better than a dynamic

risk assessment evaluation at a single time point? It is also necessary to compare the predictive accuracy of the more static risk assessment measures with the more dynamic risk assessment measures in shorter follow-up periods (e.g., 1 week or 1 month). Answers to these queries may provide clinicians with a sense of the general level of (stable dynamic) risk over a specified period of time. For example, the multidisciplinary teams in the hospital can use such indices to track the patients' risk levels and make decisions about their risk management plans during the teams' weekly review meetings. Moreover, these indices may inform whether clinicians should be considering the "average" or "peak" risk states over a specified assessment period when scoring dynamic or clinically relevant items on risk assessment measures. Most of the current risk assessment measures do not explicitly state whether the clinicians should consider the average or peak risk states when rating the dynamic or clinically relevant items.

Studies examining such research questions will undoubtedly increase mental health clinicians' understanding of the risk factors associated with short- and longer-term propensities for violence in different contexts. This increased knowledge can lead to the development of more accurate and efficient risk assessment procedures, and also assist the mental health clinicians and the relevant authorities manage offenders with mental illnesses within the community and institutions better. Consequently, better outcomes and safety for society can be achieved.

2.7 Research Aims and Hypotheses

Within this context, the purpose of this study is to compare the predictive accuracy of dynamic risk assessment measures for violence with static risk assessment measures over short- and medium-term follow-up periods in a forensic psychiatric inpatient setting, as well as to determine the timeframe during which they are most suited for predicting violent behaviour in a forensic psychiatric sample. In the context of this study, short term refers to 1-week and 1-month follow-up periods, whereas medium term refers to 3-month and 6-month follow-ups. Moreover, this study seeks to compare the predictive validity of the short-term average and the peak risk states (as measured by risk assessment measures) for inpatient aggression.

To the best of the author's knowledge, there is no published research study that has examined the predictive accuracy of dynamic and static risk assessment measures for *inpatient aggression over various time periods in the short to medium term*, as well as the predictive accuracy of short-term average and peak risk states. Given these considerations, this study seeks to test general (instead of highly specific) hypotheses:

(1) There will be significant differences in the predictive accuracy of dynamic and static risk assessment measures for inpatient aggression – specifically, the dynamic risk assessment measures will be more accurate than the static risk assessment measures in the short term, and vice-versa for medium term; and

(2) The short-term average of multiple dynamic risk assessment evaluations (i.e., mean score of the multiple risk ratings) and the peak dynamic risk scores will provide accurate predictions of risk in the medium term during hospitalisation, and that there are no significant differences in predictive accuracy for inpatient aggression between the mean and peak scores.

These hypotheses, though intuitive, have not been explicitly tested in the past research studies on violence risk assessment.

Chapter Three

Research Methodology

3.1 Overview

In this chapter, the research design that had been employed in this study, as well as the source sample and the relevant contextual information will be described. Due to issues pertaining to the research design, sensitivity of the data, and concerns about the data collection, this chapter will provide a detailed discussion of the ethical guidelines, confidentiality and privacy laws, as well as the consequent ethics applications and consultation with the relevant authorities. The method for conducting the literature search, and the definitions that were used in this study are also reported in this chapter. In addition to a discussion of the psychometric properties and the rationale for including each risk assessment measure in the study, the descriptions of the relevant databases that were used and the linkage processes are provided. Furthermore, this chapter will provide a comprehensive description of the logistical and statistical procedures that were used in this study.

3.2 Design and Source Sample

This is a retrospective cohort study of 70 patients, who were present or admitted into the acute wards of the Thomas Embling Hospital between June and

October 2002. A 6-month follow-up of inpatient aggression was also conducted for the participants.

The Thomas Embling Hospital is a statewide, high-security forensic mental health hospital that provides psychiatric assessment and treatment for men and women in Victoria, Australia. It is operated by the Victorian Institute of Forensic Mental Health (Forensicare). The hospital is purpose-designed and built to further the delivery of clinical services. It opened in April 2000, with 80 beds originally commissioned. The hospital was fully commissioned with a 100-bed capacity in October 2002, and further increased to the current capacity of 118 in June 2007. There are seven accommodation units covering acute (60 beds) and continuing care (58 beds). In addition, there are comprehensive education and recreation facilities within the premises of the hospital.

The patients who are admitted to the Thomas Embling Hospital were either: (1) transferred from prisons or courts as *security patients* under section 16(3)(b) of the Mental Health Act (Vic)(1986); (2) transferred from the courts as security patients under section 93(1)(e) of the Sentencing Act (Vic)(1991); (3) admitted to the hospital as *forensic patients* under the Crimes (Mental Impairment and Unfitness to be Tried) Act (Vic)(1997); (3) transferred from other hospitals as *involuntary patients* under section 12 of the Mental Health Act (Vic)(1986); or (4) transferred from the courts as involuntary patients under section 93(1)(d) of the Sentencing Act (Vic)(1991). From July 2002 to June 2003, there were 142 admissions to the Thomas Embling Hospital, of which 82% were admitted as security patients, 6% as forensic patients, and 12% as involuntary patients

(Victorian Institute of Forensic Mental Health, 2003). The sample characteristics are discussed further in Chapter Four.

3.3 Ethics

Approvals for this research study were obtained from the Forensicare Research Committee, the Department of Justice Research Ethics Committee, the Monash University Standing Committee on Ethics in Research involving Humans (SCERH), the Victoria Police Research Coordination Committee (RCC), and the Victoria Police Human Research Ethics Committee (VPHREC) before the commencement of data collection. The following subsections will describe the issues and sensitivity pertaining to data collection for this study, as well as necessary steps and consultation undertaken to ensure conformity to the ethical standards and privacy laws.

3.3.1 Ethical Issues Pertaining to Data Collection

Due to the retrospective nature of the study, informed consent could not be obtained from the participants for the release of information. In addition, the need to link up three databases (the Law Enforcement Assistance Program database, the Prisoner Information Management System, and the Victorian Psychiatric Case Register) prevented the collection of data in a completely deidentified form *initially*. However, the data were completely deidentified after the successful linkage of the databases. Given the sensitivity of the data collected, it was necessary to assure the various agencies (i.e., Corrections Victoria,

Forensicare, Monash University, and Victoria Police) that the study would be conducted in accordance with the necessary ethical standards and privacy laws, as stipulated in the National Statement on Ethical Conduct on Human Research (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007) and the Information Privacy Act (Vic)(2000). Inquiries from Corrections Victoria and Victoria Police about the informed consent and confidentiality issues subsequently led to a 2-year consultation process regarding the access parameters to their respective databases before the ethical approvals were finally given to proceed with this study.

3.3.2 Conformity to Ethical Guidelines and Privacy Laws

The National Statement on Ethical Conduct on Human Research (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007) sets out the national standards for the ethical design, review and conduct of human research. In addition to providing guidelines for researchers, Human Research Ethics Committees, and others who conduct ethical review of research studies, it highlights the responsibilities of the institutions to ensure quality, safety, and ethical acceptability of the research that they sponsor or permit to be undertaken. The Information Privacy Act's (Vic)(2000) primary purposes are to establish a regime for the responsible data collection and handling of personal information within the public sector in Victoria. In addition, it provides individuals with the right to access and correct their personal information that is held by organisations, including contracted

service providers. The Act also provides remedies for interferences with the information privacy of an individual, and has provisions for the appointment of a Privacy Commissioner.

With regard to the data linkage studies, section 3.2.4 of the National Statement on Ethical Conduct on Human Research guidelines (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007, p. 30) stipulates that:

> [A]pproval may be given to the use of identifiable data to ensure that the linkage is accurate, even if consent has not been given for the use of identifiable data in research. Once linkage has been completed, identifiers should be removed from the data to be used in the research unless consent has been given for its identifiable use.

Although the data for this study was initially stored in a reidentifiable form for the purpose of accurate linkage during the linkage process, the data were completely deidentified once the linkage was complete and before any analyses were conducted (in accordance with section 3.2.4 of the guidelines)[2]. Moreover, the author is a registered psychologist and is bound by professional and research ethics to ensure that confidentiality is maintained.

Sections 4.3.2 and 4.5.7 in the National Statement on Ethical Conduct on Human Research guidelines (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007) stipulate that "researchers should wherever possible invite potential participants

[2] See section 3.7 of this thesis for more details on the procedures (e.g., data collection, data linkage, deidentification process, and data storage) that were employed in this study.

to discuss their participation with someone who is able to support them in making their decision…" (p. 59) and that "[t]he process of seeking the person's consent should include discussion of any possibility that his or her capacity to consent or to participate in the research may vary or be lost altogether" (p. 66). As such, it would have been ideal to discuss and obtain consent from participants for the use of information. However, such an approach was not practical, as this study was retrospective in nature. Consent could not be easily obtained from the participants directly as many were discharged from the hospital and a few were deceased. Moreover, the participants might be unduly stigmatised if they were to be contacted now. Hence, it might be against their best interests to contact them to seek consent. It was also noted that this is a valid and widely used methodology in data linkage research studies.

In addition, the research procedures involved in the data linkage for this study were also in accordance with the Information Privacy Act (Vic)(2000). Specifically, Principle 2c states that:

> An organisation must not use or disclose personal information about an individual for a purpose other than primary purpose of the collection unless the use or disclosure is necessary for the research, or the compilation or analysis of statistics in the public interest, other than for publication in a form that identifies any particular individual.

Furthermore, it was, as stated in the preceding paragraphs, impracticable for the organisation to seek the individual's consent before use or disclosure as detailed in Principle 2c(i). Consistent with Principle 2c(ii), there were procedures to ensure

that the information was deidentified immediately after the successful data linkage. Similarly, with regard to sensitive information, Principle 10.2 states that:

> [A]n organisation may collect sensitive information about an individual if (a) the collection is necessary for research..., (b) there is no reasonably practicable alternative to collecting the information for that purpose, and (c) it is impracticable [in this case, potentially harmful as well] for the organisation to seek the individual's consent to the collection.

In spite of the sensitivity of the information sought as well as the consent issues, it was in the public interest that this study was conducted to inform the organisations (e.g., Corrections Victoria, Forensicare, and Victoria Police) about the effectiveness of assessment and management efforts for the forensic patients and prisoners, which will have significant implications on the future management strategies for offenders with mental illnesses, patient and community safety, as well as staff and public confidence. In addition, the study procedures pertaining to data security and access were in accordance with Principle 4, which states that "[a]n organisation must reasonable steps to protect information it holds from misuse and loss and from unauthorised access, modification and disclosure," and that it "must take reasonable steps to destroy or permanently de-identify personal information when it is no longer needed for any purpose."

Steps were taken to ensure that any identifying information for the participants was removed completely as soon as possible and that data analyses did not proceed before the deidentification of the data. Moreover, the study did

not examine individual characteristics of the subjects and was only concerned with reporting of the results in aggregate (i.e., the sample as a whole). As such, the participants could not be identified in any way following the successful linkage of databases, and that the procedures were adequate in safeguarding any procedural risks with regard to obtaining and linking the data.

3.4 Literature Search

The literature search was conducted on the PsychINFO and Web of Science databases using keywords such as "mental illness," "risk assessment," "violence," "aggression," "institution," "psychopathy," "offenders," "risk factors," "static," and "dynamic," as well as key authors. Combinations of these key words and phrases were also employed in the literature search. In addition, relevant articles and book chapters pertaining to violence risk assessment and related risk factors were obtained from the references of reviewed literature. Additional information on the risk assessment measures was sourced from their respective manuals. Furthermore, information on the databases was obtained from the Internet websites of the respective organisations.

3.5 Risk Assessment Measures

Several criteria were used to choose the risk assessment measures for this study: (1) whether it is a commonly used risk assessment measure; (2) whether it has been validated with a forensic psychiatric population; and (3) whether it has good psychometric properties. Further, those risk assessment measures that

meet the above criteria and are currently used by the relevant forensic mental health professionals within the study site were preferred. However, it should be highlighted that whilst some of these risk assessment measures were used to assess the patients at the Thomas Embling Hospital in 2002 when the study sample was sourced, others were not routinely employed for such purposes yet. The following subsections will discuss the reasons pertaining to the inclusion of particular risk assessment measures for this study, and a description for each of these chosen risk assessment measures and the relevant reliability indices[3] will also be provided.

3.5.1 Dynamic Appraisal of Situational Aggression – Inpatient Version

The DASA:IV (Ogloff & Daffern, 2002) is a relatively new violence risk assessment measure that comprises strictly dynamic violence risk factors and it attempts to compensate for the lack of situational considerations in violence risk assessments (Daffern, 2007). It has been used in several general psychiatric and forensic psychiatric settings in Australia, New Zealand, and the United Kingdom. In particular, it is routinely used in the Thomas Embling Hospital for the assessment and management of acute violence risk. Early indications suggest that the DASA:IV appears to have adequate psychometric properties and its predictive validity has been described in several peer-reviewed research papers (Barry-Walsh et al., 2009; Daffern & Howells, 2007; Ogloff & Daffern, 2006).

[3] However, as the predictive validity issues have been discussed in Chapter 2, and such information will not be repeated in the following subsections.

Usage and user qualifications. The DASA:IV can be used to assess patients' risk of aggression in adult psychiatric and forensic settings on a day-to-day basis. It is brief and takes less than 5 min to complete. The DASA:IV can be used by any qualified mental health professional (e.g., nurses, psychologists, psychiatrists, and social workers), and being formally trained in the use of the DASA:IV is recommended (M. Daffern, personal communication, March 26, 2010).

Items. The DASA:IV contains seven items that assess strictly dynamic risk factors for aggression and/or violence: (A) Irritability, (B) Impulsivity, (C) Unwillingness to follow instructions, (D) Sensitive to perceived provocation, (E) Easily angered when requests are denied, (F) Negative attitudes, and (G) Verbal threats.

Coding. Each item is scored as "0" for the absence of the corresponding behaviour in the past 24 hours, and "1" for its presence. For well-known patients, an increase in the assessed behaviour is scored as "1," whereas the habitual behaviour whilst being nonviolent is scored as "0." For example, if the patient was not generally unwilling to follow directions or easily angered when requests are denied but had behaved in this way during the past 24 hours, then he or she would be scored as "1" on these items. Conversely, for a patient who was usually unwilling to follow directions or is easily angered when requests are denied, yet he or she is not verbally or physically aggressive. This patient would score a "0" for these items on the DASA:IV. The total score is derived from summing the scores from the seven items.

Reliability indices. Unfortunately, none of the published peer-reviewed papers or the DASA:IV manual has reported any information on the internal consistency or inter-rater reliability. However, in an unpublished study that examined the predictive utility of the DASA:IV for institutional violent and nonviolent behaviours in youth offenders, a group of supervision staff (N = 43) had rated a series of vignettes using the DASA:IV following a training session; inter-rater reliability was found to be high (intraclass correlation coefficient for single rater = .91) (Chu, Hoo, Daffern, & Tan, 2010).

3.5.2 Historical, Clinical, Risk Management – 20 Factors

The HCR-20 (Webster et al., 1997) is one of the most commonly used risk assessment measures across the world and is based on the structured clinical judgement approach. It has been used with general psychiatric, forensic psychiatric and correctional services. The HCR-20 has good psychometric properties, and its predictive validity has been widely published in numerous peer-review research papers and books (see Douglas & Reeves, 2010 for a review).

Usage and user qualifications. The HCR-20 is intended for use with men and women aged 18 years and above, and can be used in the following settings and contexts: (1) Admission and release decision making from correctional, psychiatric or forensic facilities; and (2) monitoring of risk during incarceration, institutionalisation or whilst on community supervision. The user qualifications for the HCR-20 include "expertise in conduct of individual assessments" and "expertise in the study of violence" (Webster et al., 1997, p.17), which includes

being familiar with the risk assessment and management literature, as well as having training and experience in interviewing, administration and interpretation of standardised tests.

Scales and items. As mentioned in Chapter 2, the HCR-20 has 20 items organised around thee scales: Historical, Clinical, and Risk Management (see Table 3.1). The Historical scale contains 10 relatively static risk factors for violence that may have occurred or transpired at some point in an individual's personal history. Although relatively static in nature, it would be a mistake to deem these factors as unchanging. Moreover, these factors are likely to be relevant for understanding an individual's current and future risk of violence (Douglas & Reeves, 2010).

Table 3.1

The scales and items of the HCR-20

Historical scale (10 items)	Clinical scale (5 items)	Risk Management scale (5 items)
H1: Previous Violence	C1: Lack of Insight	R1: Plans Lack Feasibility
H2: Young Age at First Violent Incident	C2: Negative Attitudes	R2: Exposure to Destabilisers
H3: Relationship Instability	C3: Active Symptoms of Major Mental Illness	R3: Lack of Personal Support
H4: Employment Problems	C4: Impulsivity	R4: Noncompliance with Remediation Attempts
H5: Substance Use Problems	C5: Unresponsive to Treatment	R5: Stress
H6: Major Mental Illness		
H7: Psychopathy		
H8: Early Maladjustment		
H9: Personality Disorder		
H10: Prior Supervision Failure		

Note: Adapted from Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *HCR-20: Assessing risk of violence* (Version 2). Burnaby, British Columbia, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University.

The Clinical scale contains five dynamic risk factors that reflect recent and current mental and clinical status. The risk factors on the Clinical scale are focused on phenomena that can change rapidly, and hence should be reevaluated regularly. Lastly, the Risk Management scale contains five dynamic risk factors that reflect future situational variables that may affect the individual's risk. It is focused on the development of appropriate future risk management plans, to speculate on the possible barriers to the successful implementation of these plans, as well as to the possible ways to address these impediments. Similar to the Clinical scale, the items on the Risk Management scale can change over time and should be reevaluated on a regular basis (Douglas & Belfrage, 2001).

Coding. The HCR-20 items are coded on a 3-point scale (0, 1, and 2) in accordance with the presence of risk factors. A "0" indicates that the risk factor is definitely absent or does not apply when considered with the information gathered. A "1" indicates that the risk factor is possibly or partially present, and a "2" indicates that the risk factor is definitely or clearly present. If the available information does not permit the reliable coding of an item, the item may be omitted. For clinical practice, it is recommended that the assessors make a summary risk rating on the risk for violence using a 3-point scale of *Low* (i.e., the individual is assessed to be at no risk or very low risk for violence), *Moderate* (i.e., the individual is assessed to be at somewhat elevated risk for violence), or *High* (i.e., the individual is assessed to be at a high or very elevated risk for violence) (Webster et al., 1997).

Reliability indices. The internal consistency for the HCR-20's Historical, Clinical, and Risk Management scales was high (αs = .94, .90, and .95 respectively; Dunbar, Quinones, & Crevecoeur, 2005). Although the inter-rater reliability for the HCR-20 total score ranged from .67 to .95 (25 studies), the majority of studies reported inter-rater reliability coefficients of .80 or greater (see Douglas & Reeves, 2010 for a review). The inter-rater reliability for the Historical scale ranged from .58 to .97 (24 studies), with a median of .86. For the Clinical and Risk Management scales, the inter-rater reliability ranged from .55 to .95 (20 studies) and .47 to .98 (19 studies) respectively, with medians of .74 and .68; whereas the intraclass correlation coefficients for the summary risk ratings ranged from .41 to .76, with a median of .65 (see Douglas & Reeves, 2010 for a review).

3.5.3 Level of Service Inventory –Revised: Screening Version

The LSI-R (Andrews & Bonta, 1995) and LS/CMI (Andrews et al., 2004) are two of the most widely used risk assessment instruments and have been shown to be predictive of violent and general recidivism in many peer-reviewed publications. Although there are far fewer published studies on the LSI-R:SV (Andrews & Bonta, 1998), it is an abbreviated version of the LSI-R that can be rated quickly. In spite of the relative lack of research studies on the LSI-R:SV as compared to the LSI-R and LS/CMI, three studies (Daffern et al., 2005; Ferguson et al., 2009; Thomas et al., 2009) have been published in recent years with regard to its predictive validity with the forensic psychiatric population in the Thomas Embling Hospital.

Usage and user qualifications. The LSI-R:SV is designed for use as a screening measure in settings with high offender intakes, where the completion of a full LSI-R or LS/CMI may not be feasible for every offender. As such, the LSI-R:SV will assist with identifying those offenders that require a more in-depth assessment, of which the findings will be used for identifying treatment targets and planning programme interventions. Six of the eight items on the LSI-R:SV are changeable and can be used for monitoring progress. The LSI-R:SV has been used with offenders without mental illness and forensic psychiatric populations.

According to the LSI-R:SV manual, the "LSI-R:SV is not intended to be the only instrument [used to assess] an offender's level of service and it is not a substitute for professional judgment" (Andrews & Bonta, 1998, p. 2). It further states that the "users should have some rudimentary understanding of psychological testing and an appreciation of the limitations of such screening procedures" (p. 2). It is also desirable for users to be familiar with the relevant ethical and professional standards for psychological testing.

Items. The LSI-R:SV is a risk assessment measure that consists of eight items that are drawn from 7 of the 10 subcomponents of the LSI-R. The LSI-R:SV items are: (1) Two or more prior adult convictions, (2) Arrested under age of 16, (3) Currently unemployed, (4) Some criminal friends, (5) Alcohol/drug problems: School/work, (6) Psychological assessment indicated, (7) Non-rewarding, parental, and (8) Attitudes/orientation: Supportive of crime.

Coding. The first six items of the LSI-R:SV are coded "Yes," "No," or "Omitted," whereas the last two items are rated on a 4-point scale (0, 1, 2, and 3),

which represent varying degrees of satisfaction for the individual's current situation with "0" being the lowest and "3" being the highest. Similarly, these two items can also be omitted if there is not enough information for rating purposes. The ratings for these two items are then converted to a score of "0" (for a rating of "2" or "3" on the 4-point scale) or "1" (for a rating of "0" or "1" on the 4-point scale) before they are summed with the other six items to derive the LSI-R:SV total score. The manual states that the LSI-R:SV total score can still be calculated if there is an omitted item, but not if there are two or more omissions (Andrews & Bonta, 1998). Table 3.2 shows the LSI-R:SV classifications and recommendations in accordance with the total scores (Andrews & Bonta, 1998).

Table 3.2

The LSI-R:SV total score, classifications and recommendations

LSI-R:SV total score	Classification	Recommendations
0 to 2	*Minimum* risk/needs	LSI-R follow-up is desirable
3 to 5	*Medium* risk/needs	LSI-R follow-up is strongly recommended
6 to 8	*Maximum* risk/needs	LSI-R follow-up should be mandatory

Note: Adapted from Andrews, D. A., & Bonta, J. (1998). *The Level of Service Inventory-Revised: Screening Version.* Toronto, Ontario, Canada: Multi-Health Systems.

Reliability indices. The LSI-R:SV manual does not report any information on the test-retest reliability and the inter-rater reliability of the LSI-R:SV (Andrews & Bonta 1998), and the recent published studies on the LSI-R:SV did not provide such reliability indices (e.g., Daffern et al., 2005; Ferguson et al., 2009; Thomas et al., 2009; Yessine & Bonta, 2006). However, Andrews and Bonta stated that there

is likely to be significant variability with regard to test-retest reliability because many of the items on the LSI-R:SV are fairly dynamic in nature. The internal inconsistency, as reported in the manual, was .54 for samples of male inmates and probationers, and the authors of the LSI-R:SV rationalised that such low values could be attributed to the low number of items that form the measure, as well as the distinctiveness of the components that have been included (Andrews & Bonta, 1998).

3.5.4 Psychopathy Checklist

Although the PCL-R (Hare, 1991, 2003) and the PCL:SV (Hare et al., 1995) are not risk assessment measures and are designed to measure the construct of psychopathy, they have an established (albeit moderate) relationship with violent behaviour (DeMatteo et al., 2010). More importantly, psychopathy is a risk factor that is included in measures like the HCR-20 and the VRAG. The utility of the PCL measures have also been extensively researched and published, and appear to have adequate to good psychometric properties (see DeMatteo et al., 2010 for a review).

Usage and user qualifications. The PCL-R and PCL:SV can be used in clinical forensic contexts with correctional and forensic psychiatric populations. The PCL-R and PCL:SV manuals (Hare, 2003; Hart et al., 1995) suggests that the minimum qualifications for using the PCL measures in a clinical context include: (1) the possession of an advanced degree in social, medical, or behavioural sciences; (2) the completion of graduate courses in psychometrics, statistics and

psychopathology; (3) familiarity with the clinical and research literature on psychopathy; (4) possession of professional credentials or be legally authorised to conduct psychological assessments; (5) having experience with forensic or other relevant populations; and (6) having adequate training and experience in the use of the PCL measures. Formalised training in the PCL measures is also desirable; for example, highly reliable psychopathy scores based on measures of inter-rater reliability have emanated from research laboratory training programmes (DeMatteo et al., 2010).

Table 3.3

The factor and facet structure of the PCL-R

Factor 1 (Interpersonal/Affective)		Factor 2 (Social Deviance)	
Facet 1 (Interpersonal)	Facet 2 (Affective)	Facet 3 (Lifestyle)	Facet 4 (Antisocial)
1. Glibness or Superficial Charm	6. Lack of Remorse or Guilt	3. Need for Stimulation or Proneness to Boredom	10. Poor Behavioural Controls
2. Grandiose Sense of Self Worth	7. Shallow Affect	9. Parasitic Lifestyle	12. Early Behavioural Problems
4. Pathological Lying	8. Callous or Lack of Empathy	13. Lack of Realistic, Long-term Goals	18. Juvenile Delinquency
5. Conning or Manipulative	16. Failure to Accept Responsibility for Own Actions	14. Impulsivity	19. Revocation of Conditional Release
		15. Irresponsibility	20. Criminal Versatility

Note: Adapted from Hare, R. D. (2003). The *Hare Psychopathy Checklist–Revised manual* (2nd ed.). North Tonawanda, NY: Multi-Health Systems.

Subscales and items. The PCL-R consists of 20 items (see Table 3.3), which are grouped into two factors, with Factor 1 reflecting the interpersonal and affective characteristics of psychopathy, and Factor 2 reflecting the antisocial and

socially deviant characteristics that are commonly observed in criminal offenders. Items in these two factors can be further classified into four facets.

The PCL:SV consists of 12 items and has excluded items from the PCL-R "that are scored on the basis of detailed, highly specific, or difficult-to-confirm information (e.g., marital or sexual history)" (Hart et al., 1995, p. 15). Similar to the PCL-R, the PCL:SV is divided into 2 parts, with each part comprising six items (see Table 3.4). Part 1 reflects the severity of the interpersonal and affective markers of psychopathy, whereas Part 2 reflects the severity of the social deviance markers of psychopathy.

Table 3.4

The structure and items of the PCL:SV

Part 1 (Interpersonal/Affective)	Part 2 (Social Deviance)
1. Superficial	7. Impulsive
2. Grandiose	8. Poor Behavioural Controls
3. Deceitful	9. Lacks Goals
4. Lacks Remorse	10. Irresponsible
5. Lacks Empathy	11. Adolescent Antisocial Behaviour
6. Doesn't Accept Responsibility	12. Adult Antisocial Behaviour

Note: Adapted from Hart, S. D., Cox, D., & Hare, R. D. (1995). *The Hare Psychopathy Checklist: Screening Version* (PCL: SV). Toronto, Ontario, Canada: Multi-Health Systems.

Coding. Each item on the PCL-R and PCL:SV is rated on a 3-point scale (0, 1, and 2) based on the degree to which the personality trait or behaviour of the assessed individual matches the item description in the manual. A score of "0"

indicates that the item does not apply to the individual or is inconsistent with the intent of the item; a score of "1" indicates that the item applies to a certain extent or that there is a match with the item description in some respects, but there are some exceptions; whereas a score of "2" indicates that the item applies to the individual and there is a good match between the individual's behaviour or personality trait with the item description in most essential respects. A total score is obtained by summing the score on each item. On the PCL-R, no more than 5 of 20 items can be omitted and no more than two items can be omitted from either factor. Similarly, no more than two items can be omitted from the PCL:SV, and each factor should not have more than one omission. A valid profile with omitted item(s) can be prorated to a 20-item Total score for the PCL-R (range = 0 to 40) and 12-item Total score for the PCL:SV (range = 0 to 24). As described in section 2.4.3, the cut-off score (i.e., indicative of significant psychopathic traits) for the PCL-R is 30 in North America and 25 in Europe (Cooke, 1998; Cooke & Michie, 1999; Hare, 2003), whereas the cut-off score is 18 for the PCL:SV (Hart et al., 1995). Although there are currently no norms for PCL measures in Australia, the cut-off scores for the PCL-R and PCL:SV are often taken to be 30 and 18 respectively in most forensic contexts (J. R. P. Ogloff, personal communication, April 29, 2010).

Reliability indices. The mean internal consistency across pooled samples when using both standard and file-review-only administration procedures for the PCL-R Total score was high (αs = .84 and .87 respectively) (Hare, 2003). In addition, the inter-rater reliability (intraclass correlation coefficient) for the PCL-R across pooled samples appeared to be high at .87 for a single rating and .93 for averaged ratings (Hare, 2003). More recent studies on the PCL-R's psychometric

properties have found that the PCL-R inter-rater reliability indices are greater than .90 when comparing amongst practicing correctional psychologists and between these psychologists and trained research coders (Kroner & Mills, 2001; Porter, Woodworth, Earle, Drugge, & Boer, 2003). Similarly, the internal consistency for the PCL:SV Total score across pooled samples was high (α = .84), with its inter-rater reliability (intraclass correlation coefficient) at .84 for a single rating and .92 for averaged ratings (Hart et al., 1995). With regard to test-retest reliability, Alterman and colleagues (1993) reported correlations of .85 and .89 for PCL-R scores obtained at baseline and 1 month later when used with a sample of clients receiving substance abuse treatment. Furthermore, Rutherford et al. (1999) obtained an intraclass correlation coefficient of .60 when examining the 2-year test-retest reliability for the PCL-R Total score in a sample of patients seeking methadone treatment. Taken together, the reliability indices of the PCL-R appear to be generally robust.

3.5.5 Short-Term Assessment of Risk and Treatability

The START (Webster et al., 2004, 2009) is a relatively new, 20-item risk assessment measure that is based on the structured clinical judgement risk assessment scheme. It is designed to assess multiple risk domains that are pertinent to daily psychiatric clinical practice (e.g., self-harm and suicide, self-neglect, substance use, unauthorised leave, victimisation, and violence to others). It focuses on dynamic risk factors, and aims to provide a platform for interdisciplinary collaboration regarding the periodic assessments and treatment interventions. Although there are published studies on the START currently, and

that it has not been widely adopted by civil psychiatric and forensic mental health services in Australia, the START has been included in this study because of its focus on dynamic factors for violence and other related clinical factors.

Usage and user qualifications. The START has been developed for forensic mental services and may also be applicable to general psychiatric or correctional settings. However, further research is needed to establish its applicability in these other settings. Similar to other structured professional guides (e.g., the HCR-20), the START should be considered as an *aide mémoire* rather than a diagnostic or actuarial instrument (Webster et al., 2004). The purpose of the START is to provide mental health professionals (e.g., nurses, psychiatrists, psychologists, social workers, and programme therapists) with a structured approach to organise (1) mental health status evaluations, (2) treatment planning, and (3) communication of risk-related information to other professionals in an accurate and consistent manner. Although an experienced clinician can rate the START independently, it should be noted that the START is designed to specifically integrate ideas of other mental health professionals, who are working together as a team, through a process of team discussion and consensus (Webster et al., 2004). With regard to the user qualifications, the manual does not state further requirements other than having "experience" and being "qualified" as a mental practitioner or researcher (Webster et al., 2004, p. 25).

Items. The START items include: (1) Social Skills, (2) Relationships, (3) Occupational, (4) Recreational, (5) Self-care, (6) Mental State, (7) Emotional State, (8) Substance Use, (9) Impulse Control, (10) External Triggers, (11) Social

Support, (12) Material Resources, (13) Attitudes, (14) Medication Adherence, (15) Rule Adherence, (16) Conduct, (17) Insight, (18) Plans, (19) Coping, and (20) Treatability. In addition, the START has allowances for the addition of case specific items to cater for the individual differences in the respective patients or offenders.

Coding. For each item on the START, there are two scales (i.e., *Risk* and *Strengths*) that are each rated on an identical 3-point scale (0: *Minimally Present*, 1: *Moderately Present*, and 2: *Maximally Present*). In addition, the assessor can indicate whether each strength and risk is a critical item for the risk management or treatment planning of the patient or offender who is being assessed. Furthermore, the START allows the assessor to indicate the *signature risk signs*, which are likely to be "invariant for that person and may serve as a highly reliable predictor of impending relapse and elevated risk of violence toward the (sic) self or others" (Webster et al., 2004, p. 29).

The assessor can then rate the *Specific Risk Estimates* (over a specific time period), using anchors of *Low*, *Moderate*, or *High*, for: (1) Risk to Others, (2) Self-harm, (3) Suicide, (4) Unauthorised Leave, (5) Substance Abuse, (6) Self-neglect, and (7) Being Victimised. Additional risk estimates can be indicated according to the presentation of the assessed individual. Lastly, two sections on the START Summary Sheet, the *Current Management Measures* and the *Community Access*, are completed to communicate the relevant risk management plans (e.g., the need for seclusion, one-to-one observation, suspension of privileges, hospitalisation, or supervised community access) to other professionals.

Reliability indices. Webster et al. (2006) reported that the inter-rater reliability (intraclass correlation coefficients) between the three assessor professions (psychiatrists, case managers, and social workers) was .87 for averaged ratings, and the internal consistency coefficients (Cronbach's alpha) of the START total scores for all raters, psychiatrists, case managers, and social workers were .87, .80, .88, and .92, respectively.

3.5.6 Violence Risk Appraisal Guide

The VRAG (Quinsey et al., 1998, 2006), a 12-item strictly actuarial instrument, is one of the most widely used violence risk assessment measure across the world. It has been shown to predict various violent outcomes (e.g., institutional violence, number of violent offences, rapidity of violent reoffending, self-reported violence, severity of violent recidivism, and very serious violence) across offender populations (e.g., emergency psychiatric patients, forensic patients, general offenders, offenders with mental illnesses, and violent offenders) and countries, as well as being applicable across different time frames (12 weeks to 10 years) (see Quinsey et al., 2006 for a review). It has good psychometric properties, and its utility has been extensively detailed in numerous publications (see Quinsey et al., 2006; Rice, Harris, & Hilton, 2010 for reviews).

Usage and user qualifications. As described in the previous paragraph, the VRAG can be used to assess the risk of violent and general recidivism in general psychiatric, correctional and forensic psychiatric populations. A comprehensive psychosocial history (e.g., childhood conduct, family background, antisocial and criminal behaviour, past and present psychiatric and psychological problems, as

well as the details of all offences) is needed to score the VRAG for both research and clinical purposes. As such, it may be necessary for the users of the VRAG to conduct interviews with the client and obtain collateral sources of information (including those from family members, correctional and psychiatric facilities, and law enforcement agencies) (see Rice et al., 2010). It is be advantageous for users to have knowledge about mental health issues and risk assessment, as well as interviewing skills. Users of the VRAG should also have training in scoring the PCL-R, and should be able to demonstrate that they can score the VRAG reliably (Rice et al., 2010; Quinsey et al., 2006).

Items and coding. The VRAG comprises 12 items, which are: (1) Lived with both biological parent by age 16 (except for the death of parent), (2) Elementary school maladjustment score, (3) History of alcohol problems, (4) Marital status (at time of index offence), (5) Criminal history score for convictions and charges for nonviolent offences prior to the index offence (using Cormier-Lang system), (6) Failure on prior conditional release, (7) Age at index offence, (8) Extent of victim injury (index offence only), (9) Presence of female victim (index offence only, with most serious injury scored), (10) Meets *DSM-III* criteria for any personality disorder, (11) Meets *DSM-III* criteria for schizophrenia, and (12) Hare Psychopathy Checklist –Revised score. These items are assigned to a weighted scoring system that calculates the weight on the basis of how different the individual is from the base rate. The total score on the VRAG can range from -26 to +38, and nine groups of scores are formed – each with equal size categories of seven points and bearing known likelihoods of violent recidivism (see Quinsey et al., 2006 for a detailed discussion).

Reliability indices. The first evaluation of inter-rater reliability for the VRAG involved the independent coding of 20 randomly chosen subjects by two trained raters, and this yielded a Pearson correlation coefficient of .90 (see Rice et al., 2010 for a review). High inter-rater reliability coefficients (> .90) have been generally reported in other studies examining the VRAG (e.g., Gray, Fitzgerald, Taylor, MacCulloch, & Snowden, 2007; Harris, Rice, & Cormier, 2002).

3.6 Databases

In addition to the information obtained from the clinical files and risk assessment measures, data were obtained from three databases (i.e., the Law Enforcement Assistance Program database, the Prisoner Information Management System, and the Victorian Psychiatric Case Register). These sources information were subsequently integrated with each other. The following subsections will provide a description of the three databases.

3.6.1 Law Enforcement Assistance Program Database

The Victoria Police implemented the Law Enforcement Assistance Program (LEAP) database, a dynamic database designed primarily for operational policing purposes, in 1993. The LEAP database is fully relational and contains the details of all crimes that were brought to the attention of the police, as well as information pertaining to family incidents and missing persons (Victoria Police, 2010a). In addition, the details pertaining to the locations of the crimes committed, as well as the persons and vehicles involved are stored in the LEAP database. The LEAP

database is online and is updated constantly, whenever new or additional information becomes available. The Central Data Entry Bureau of Victoria Police also amends records when it identifies inaccurate or incomplete information during quality control checks (Victoria Police, 2010b). It is also used by the Victoria Police to generate crime statistics and conduct data analyses. There are more than 4,000 individual or statutory offences recorded on the LEAP and they are grouped into 27 broad offence categories (Victoria Police, 2010a). These offence categories are further divided into general classes of offence: Crime Against the Person, Crime Against Property, Drug Offences, and Other Crime. Those offences dealt with by penalty notice and/or traffic offences are not recorded in the LEAP database. In addition to convicted offences and court outcomes, the LEAP database also records all charges that are laid against the offender or alleged offender. Furthermore, the LEAP database contains all information pertaining to the victims of the crimes that were committed. Information pertaining to participants' contacts with the police as either an offender or as a victim was retrieved from the LEAP database for this study.

3.6.2 Prisoner Information Management System

The Prisoner Information Management System (PIMS), which was introduced in 1985, is the Corrections Victoria's computerised operational database. It is used in the daily management of the prisoners within the state, and contains the details of prisoners who were or are currently in custody. This includes their personal information (e.g., ethnicity, country of birth, date of birth, marital status, employment status, and highest education level achieved),

documented histories of special education, learning disabilities, mental disorders, self-injurious behaviour, as well as drug and alcohol use, past and current convictions in Victoria, dates of current and past episodes of incarceration in Victoria, dates of release from custody, as well as dates and nature of incidents during past and current episodes of incarceration in Victoria. Due to the sensitivity and the logistical issues surrounding the retrieval of the data, only the number of episodes of incarceration, dates of incarceration and release from custody were retrieved, at the advice of Corrections Victoria (personal communication, A. Bruce, September 14, 2009), from the PIMS for the purpose of this study.

3.6.3 Victorian Psychiatric Case Register

The Victorian Psychiatric Case Register (VPCR) was developed in 1961 and is considered as one of the oldest and most comprehensive psychiatric registers in the world (Eaton et al., 1992). The VPCR records virtually all contacts that individuals have with the statewide public mental health system, and includes information on diagnoses of all patients who were admitted to public mental health services, admissions, and treatment (see Short, Thomas, Luebbers, Ogloff, & Mullen, 2010). Using the *International Classification of Diseases* 9th or 10th Editions (World Health Organization, 1977, 1992), qualified mental health professionals record the diagnoses within 1 month of admission or at the time of service discharge. The VPCR has undergone a number of revisions, with the most recent occurring in 2000. In particular, persons who are registered with the mental health system prior to 2000 have their psychiatric history retained in archive, whereas any post-2000 mental health contacts are fully listed on the

contemporary register. Although the VPCR includes the mental health contacts of non-Victorians (e.g., interstate residents and international citizens), those contacts by Victorians with the services in other Australian states, as well as mental health services provided by general practitioners or by private clinicians are not included in the VPCR (Short et al., 2010). Nonetheless, the VPCR is likely to register the majority of the mental health contacts for the sample in this study, as many of the participants have schizophrenia-spectrum disorders and are likely to make contact with the public mental health system at some point during the course of their illness through involuntary admissions or mandated psychiatric treatment. It should also be highlighted that the public mental health system in Victoria primarily serves those individuals who present with psychotic illnesses, thereby dictating that persons with so-called "high-prevalence" disorders (e.g., affective and/or substance use disorders) seek psychiatric treatment elsewhere (Short et al., 2010). For the purpose of this study, all mental health information (e.g., diagnoses, dates of hospitalisation and discharge, number and duration of hospitalisation stints, self-harm and suicidal gestures, and the types of treatment received) contained within the VPCR will be examined.

3.7 Procedure

This section will provide information on the author's training on the relevant risk assessment measures. In addition, the procedures that were adopted to collect, link, store, access, and analyse the data are also discussed.

3.7.1 Training on the Administration of Risk Assessment Measures

The staff on the Thomas Embling Hospital wards received training on violence risk assessment, as well as the administration of the DASA:IV, as part of an ongoing training programme for the ward staff to manage and reduce inpatient aggression. Professor James R. P. Ogloff and Dr. Michael Daffern provided training and consultation to the ward staff on the administration of the DASA:IV in 2002.

In addition, the author is familiar with the relevant literature on risk assessment; and has also received comprehensive training on the use of the various risk assessment measures that were used in this study during the course of his doctoral candidature. In particular, the author has completed his clinical forensic psychology internship in an acute psychiatric ward within the Thomas Embling Hospital and the Community Forensic Mental Health Service (Melbourne, Victoria). In addition, the author has also attended formal training workshops on the clinical administration and scoring of the DASA:IV (half day), the HCR-20 (2 days), the PCL measures (two workshops for a total of 5 days), and the START (1 day).

3.7.2 Data Collection

The participants' demographic information was collected and maintained in the clinical case files for purposes of daily case management in the Thomas Embling Hospital. Specifically, the ward staff (e.g., nurses, psychologists, psychiatrists, and social workers) had gathered the mental health, as well as risk

assessment and management information via clinical interviews and observations in the wards. This information is entered into the case files in the form of routine contact and care planning documentation. The DASA:IV was rated for the participant during their stay at the Thomas Embling Hospital between June and September 2002. Up to 7 days of the DASA:IV and HCR-20 Clinical scale ratings were used for the analyses during this study. Considering that the study was conducted in a working hospital, it was highly likely that the ward staff, as part of their duties and responsibilities, had acted on their ratings of possible inpatient aggression and intervened accordingly to prevent the occurrence of any aggressive incident. Therefore, the observed predictive accuracy of the risk assessment measures might be a conservative estimate of the actual accuracy (i.e., predictive accuracy was likely to be higher).

In addition, the author reviewed the clinical case files to obtain the relevant information on sociodemographics, diagnoses, drug and alcohol use, as well as to retrospectively rate the other risk assessment measures (i.e., the Historical, Clinical, and Risk management scales of the HCR-20, the LSI-R:SV, the PCL-R, the PCL:SV, the START, and the VRAG) in accordance with the patients' behaviours during their index admission to the Thomas Embling Hospital. The author ensured that the rating of these risk assessment measures involved only case file information up to the period when the DASA:IV and HCR-20 Clinical scale ratings were made. The author required, on average, 5 hours to review each patient's clinical case files and to rate the risk assessment measures. Information on inpatient aggression (i.e., physical violence to other patients and staff, verbal threat to other patients and staff, and property damage) was collected after the

coding of the risk assessment measures. Physical violence includes biting, hitting, kicking, punching, and throwing objects intending to injure. Verbal threat refers to threats to kill or cause bodily harm to others, whereas property damage includes the destruction or damaging of walls, furniture, crockery, or electronics within the hospital ward.

In addition, the relevant authorities (e.g., Department of Human Services, Department of Justice, and Victoria Police) routinely collate information pertaining to mental health contacts, criminal histories, release from custody, and institutional misconduct on their respective electronic databases. Hence, core data were sourced for the 70 participants to ascertain their previous contacts with health, justice and police organisations via the respective databases of Victoria Police (LEAP database), Department of Justice (PIMS), and Department of Health and Human Services (VPCR). The VPCR was also used to determine when the participants were discharged from the Thomas Embling Hospital for the index admission. The study examined up to 6 months of follow-up data on the participants' inpatient aggression (i.e., interpersonal violence, verbal threat, and property damage), and mental health outcome data from the date of the initial assessment in Thomas Embling Hospital. The data from the case file review, the risk assessment measures, and the various databases were subsequently linked together.

Furthermore, it should be highlighted that the DASA:IV and the HCR-20 Clinical scale were rated (by ward staff) in the routine assessment and case management of the participants between June and October 2002. As clinical

information was routinely collated and recorded in clinical case files at Thomas Embling Hospital, the case files were examined for sociodemographics, information on the patients' mental health status, daily ward behaviour, and inpatient aggression (i.e., interpersonal violence, verbal threat, and property damage). The author had subsequently used the case file information to complete the following risk assessment measures for each participant:

(1) Historical and Risk management scales of the Historical, Clinical, Risk Management – 20 Factors (HCR-20);

(2) Level of Service Inventory – Revised: Screening Version (LSI-R:SV);

(3) Psychopathy Checklist – Revised (2nd Edition; PCL-R);

(4) Psychopathy Checklist – Screening Version (PCL:SV);

(5) Short-Term Assessment of Risk and Treatability (START); and

(6) Violence Risk Appraisal Guide (VRAG).

3.7.3 Data Linkage

To complete accurate linkage between data sources, a Master List containing only the key identifiers listed above (full name, date of birth, sex and area of residence) was drawn up. The participants on this Master List were listed alphabetically by their surnames, and then unique study numbers were assigned to each participant. This Master List was then delivered to the agency personnel (who have signed confidentiality agreements) at Corrections Victoria, the Department of Human Services, and Victoria Police along with a separate list

requesting specified data fields from the respective electronic databases (i.e., the LEAP database, the PIMS, and the VPCR). This data file remained active for 1.5 months for the purpose of data extraction from the respective database, after which it was returned to the researcher. Once the agency personnel had collected the required data, 20% of the newly collated data file was checked to ensure the completeness and accuracy of the linkages at each agency. All identifying data (i.e. full name) were removed from the data file. The working data files and Master List were each stored in a compact disc, which were collected and combined (using study id) into a complete data file for analysis by the author, who is a provisional psychologist and is bound by professional and research ethics to ensure that confidentiality was maintained. Once the deidentified files were returned and linked, the Master List was permanently destroyed and therefore completely deidentifying the data.

3.7.4 Data Storage and Access

Data storage for the study was conducted in accordance with the National Statement on Ethical Conduct on Human Research guidelines 3.2.1 and 3.2.5 (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007). Specifically, all of the information and documents were stored, in a locked filing cabinet in a locked room, at the Centre for Forensic Behavioural Science, School of Psychology and Psychiatry, Monash University. All of the electronic data were stored on a password-protected computer in encrypted files. In addition, the entire building, in which the Centre for Forensic Behavioural Science is situated, is further protected by a

security system after office hours. Lastly, in line with the National Statement on Ethical Conduct on Human Research guidelines 3.2.7 and 3.2.8 (National Health and Medical Research Council, Australian Research Council, and Australian Vice-Chancellors' Committee, 2007), the custodians of the data were the members of the research team listed in the submitted ethics applications, which included the author and his supervisors, Professor J. R. P. Ogloff, Dr. S. D. M. Thomas, and Dr. M. Daffern; only these members of the research team had access to the collected data.

3.7.5 Statistical Analyses

To examine the research questions proposed in this current study, statistical analyses were carried out using the PASW Statistics 18. The sample was first characterised using descriptive statistics, with categorical data reported as numbers and percentages, and continuous data presented in relation to the mean, median, standard deviation, and range. Preliminary checks for data entry errors were conducted by examining the range of values for the variables (e.g., the scores for risk assessment measures). In addition, histograms of the continuous data were plotted to check for skewed distributions and kurtosis, and bivariate scatterplots were also plotted to check for linearity and homoscedasticity between the continuous variables. These were deemed important initial steps during the early stages of descriptive characterisation of the data due to the nature of the inferential statistics that were subsequently undertaken (Tabachnick & Fidell, 2007). Data checks did not reveal any failures of normality, linearity and homoscedasticity for the scores of the various risk

assessment measures, except for the DASA:IV and HCR-20 peak scores, which exhibited considerable negative skew. However, transformation was not conducted in these cases, as the interpretation of variables was difficult following transformation.

With regard to the prorating the scores to account for omitted items, the HCR-20 total and scale scores were prorated using the following formula:

$$S_p = \frac{S_r \times N}{N - n}$$

where S_p refers to the prorated score, S_r refers to the raw scale or total score of the HCR-20, *N* refers to the total number of items in scale or HCR-20, and *n* refers to the number of omitted items. If there were more than two omitted HCR-20 items in a single case (i.e., for one participant), that case was not used for analyses. However, there were no cases with such multiple item omissions on the HCR-20. It should be noted that such prorated procedure was only conducted for the HCR-20. This is because the scoring criteria for the PCL-R and the PCL:SV prorated for omitted items, and omitted items on the LSI-R:SV were not included in the total score. For all cases, there were no omissions for the DASA:IV, the START and the VRAG, and therefore did not require any prorating considerations. In addition, a decision was made to add a constant of +26 to the raw scores of the VRAG, which could range from -26 to +38, to facilitate statistic analyses. Hence, the VRAG scores that were used for statistical analyses could potentially range from 0 to +64.

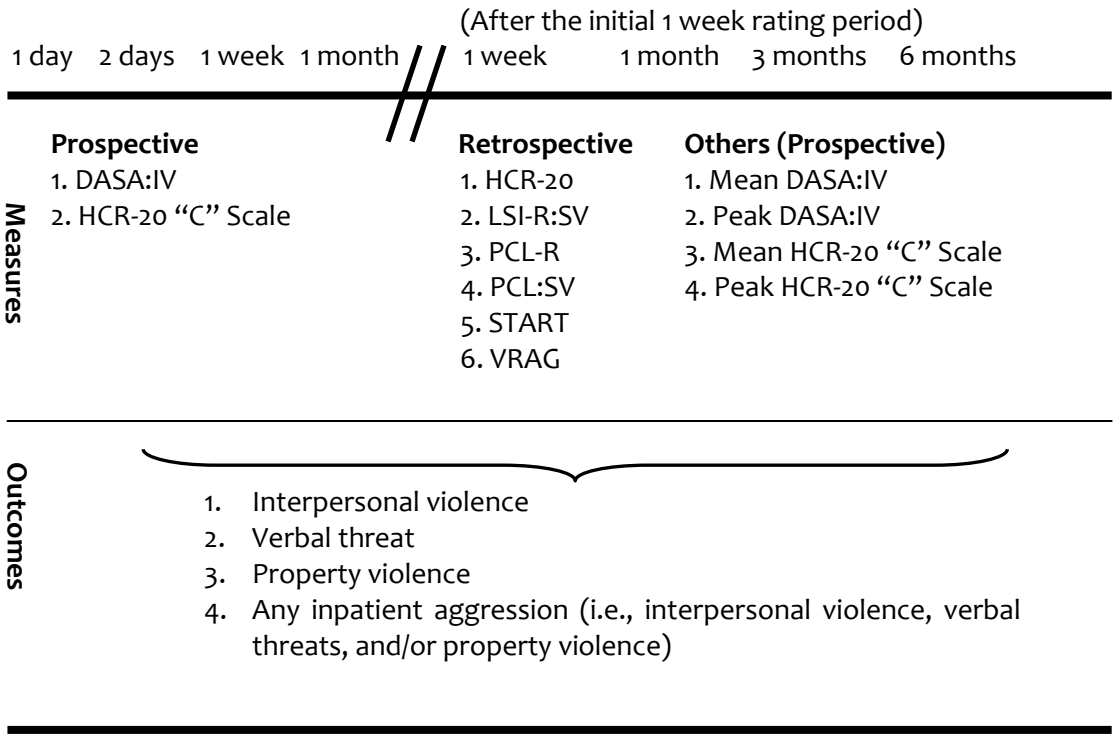
Although up to 6 months of follow-up data were obtained for each participant, it should be highlighted that the period of follow-up for such comparisons in the inpatient setting were restricted to the period of index inpatient admission at the Thomas Embling Hospital from the start of the follow-up (i.e., the commencement of prospective DASA:IV and HCR-20 Clinical scale ratings) to the end of the 6-month follow-up period or index admission, whichever earlier. Figure 3.1 summarises the plan of comparison for the various risk assessment measures over different time periods for the forensic inpatient setting (i.e., Thomas Embling Hospital). With regard to the comparisons of the risk assessment measures, the scores of the DASA:IV and the HCR-20 Clinical scale (rated prospectively by the ward staff) were used to compare their predictive accuracy for interpersonal violence, verbal threats, property damage, and any inpatient aggression (i.e., interpersonal violence, verbal threat, and/or property damage) during time periods of 1 day, 2 days, 1 week, and 1 month. In addition, the total and scale scores for the HCR-20, the LSI-R:SV, the PCL-R, the PCL:SV, the START, and the VRAG were used for the prediction of inpatient aggression for periods of 1 week, 1 month, 3 months and 6 months after the initial 1 week prospective-rating-period. These measures were retrospectively coded by the author.

Further, the mean and the peak scores of the prospective DASA:IV and HCR-20 Clinical scale ratings for each participant were also used to predict inpatient aggression over similar periods of 1 week, 1 month, 3 months and 6 months after the initial 1 week prospective-rating-period. These means for the prospective ratings, in particular, were used to determine whether the average

clinical state or the most severe clinical state during the rating period was useful for longer-term predictions of inpatient aggression.

Figure 3.1

Plan of comparison for the predictive accuracy of the risk assessment measures



Note: HCR-20 "C" Scale refers to the HCR-20 Clinical scale

Bivariate correlational analysis was conducted to examine the association between the retrospective ratings by the author and the prospective ratings by the frontline hospital staff. The Pearson product-moment correlation coefficient, *r*, was reported as the strength of association between the two sets of ratings. Logistic regression allows the prediction of a discrete outcome (e.g., recidivism) from a set of variables that may be continuous, discrete, dichotomous, or a mix. Therefore, logistic regression models were developed to examine how scores on

the various risk assessment measures would significantly predicted inpatient aggression in the inpatient setting (i.e., Thomas Embling Hospital). The "goodness of fit" test of the prediction models checked using the Hosmer-Lemeshow test (Agresti, 1996).

Receiver Operating Characteristics (ROC) analyses were used to examine the predictive accuracy of the risk assessment measures over different time periods. The ROC Curve, which originated from signal detection theory, shows how the receiver operates that existence of signal in the presence of noise by plotting the probability of detecting the true signal (sensitivity) and false signal (1 – specificity) for the entire range of possible cut points. The Area Under Curves (AUC) of the ROC Curve, which range from 0 (perfect negative prediction) to 1.0 (perfect positive prediction) are often considered indices of overall predictive accuracy. As a general rule, AUCs of more than .90 are considered as outstanding discrimination, .80 to .89 are excellent, .70 to .79 are acceptable, and .50 is equal to chance (i.e., the false positive rate is equal to the true positive rate) (Hosmer & Lemeshow, 2000, p. 162). The AUCs, standard errors and the 95% confidence intervals were reported.

To compare the AUCs of ROC Curves when examining the predictive accuracy of the various risk assessment measures, *z*-tests for dependent groups (Hanley & McNeil, 1983) were used to ascertain whether the AUCs differed significantly *between* the various risk assessment measures for each of the follow-up period. The critical ratio *z* is defined as:

$$z = \frac{A_1 - A_2}{\sqrt{SE_1^2 + SE_2^2 - 2rSE_1SE_2}}$$

where A_1 and SE_1 refer to the observed area and the estimated standard error of the area under the ROC Curve associated with the risk assessment measure 1 or the time period 1 depending on the nature of comparison; and A_2 and SE_2 refer to the corresponding quantities for risk assessment measure 2 or the time period 2. The correlation *r* can be expressed as:

$$r = \frac{Cov(A_1, A_2)}{SE_1 SE_2}$$

where *Cov* refer to the covariance. However, Hanley and McNeil (1983) have provided a table of *r* coefficients for to simplify the calculation of the critical ratio *z*. The areas under the respective ROC Curves (i.e., A_1 and A_2), and the correlation coefficients r_N and r_A, for the risk ratings of the recidivists and nonrecidivists respectively (i.e., when comparing two risk assessment measures at one time period, or comparing two time periods for one risk assessment measure), were needed when using this table to derive the *r* coefficient. Each of these correlation coefficients (r_N and r_A) could be calculated using the Pearson product-moment correlation method (for results derived from an interval scale) or the Kendall tau (for results derived from an ordinal scale). Using the averages of A_1 and A_2, as well as r_N and r_A, the *r* coefficient could be derived from the table provided by Hanley and McNeil to calculate the critical ratio *z*. Once the critical ratio *z* was obtained, it was then referred to tables of the normal distribution where values of ≥ +1.96 or ≤ -1.96 were taken as evidence that the "true" areas under the ROC Curves were different.

For this study, the author had calculated the areas under the ROC Curves (i.e., A_1 and A_2) and their respective standard errors (i.e., SE_1 and SE_2), as well as

the correlation coefficients (i.e., r_N and r_A) for the various risk assessment measures and time periods were calculated using PASW Statistics 18. These were then used to derive the correlation coefficient, *r*, using the table provided by Hanley and McNeil (1983). To derive the critical ratio *z*, these values (i.e., A_1, A_2, SE_1, SE_2, and *r*) for the various risk assessment measures and time periods were subsequently entered into a mathematical formula (i.e., $z = (A_1 - A_2) / \sqrt{SE_1^2 + SE_2^2 - 2rSE_1SE_2}$) that was prepared on a Microsoft Excel spreadsheet.

Further, to examine the predictive accuracy of each risk assessment measure for different follow-up periods, *z*-tests for independent samples (Hanley & McNeil, 1982) were used instead. In this case, the critical ratio *z* is defined as:

$$z = \frac{A_1 - A_2}{\sqrt{SE_1^2 + SE_2^2}}$$

where A_1 and A_2 are the respective areas under the curve that are derived from the ROC analyses, and SE_1 and SE_2 are the respective estimated standard errors of AUCs. Similarly, *z* values of ≥ +1.96 or ≤ -1.96 were taken as evidence that the "true" areas under the ROC Curves were different. The AUCs, standard errors, 95% confidence intervals, as well as the significant differences between the AUCs were reported in tables.

Chapter Four

Results

4.1. Overview

This chapter will start by characterising the source sample through descriptions of the participants' sociodemographic characteristics, psychiatric hospitalisation and diagnoses, legal status, as well as offence characteristics. In addition, the frequency of inpatient aggression, and the risk assessment ratings that were obtained during the follow-up were reported. With regard to the comparisons of the predictive accuracy of the various risk assessment measures, the short-term predictive accuracy of the DASA:IV and the HCR-20 Clinical scale during the follow-up periods (i.e., 1 week, 1 month, 3, months, 6 months) was examined. Secondly, a comparison of the predictive accuracy of the all the other measures (and their scales) across the various follow-ups was also conducted; these measures included the HCR-20, the LSI-R:SV, the PCL-R, the PCL:SV, the START, and the VRAG. Posthoc comparisons were conducted to determine whether there were statistically significant differences in predictive accuracy between the measures (for each follow-up period), as well as across the various follow-up periods (for the same measure). Furthermore, the predictive accuracy of the mean and peak scores of the DASA:IV and the HCR-20 Clinical scale was examined and compared for the various follow-up periods. Their predictive accuracy was also compared with other risk assessment measures.

4.2 Sample Characteristics

4.2.1 Sociodemographics

The sample comprised 70 participants; of whom, 55 (78.6%) were male and 15 (21.4%) were female. More than three quarters of the sample (55/70, 78.6%) were Caucasian; 8.6% (6/70) were Asian, 5.7% (6/70) were of Aboriginal or Torres Straits Islander descent, 5.7% (6/70) were of Middle Eastern descent, and 1.4% (1/70) was Maori. More than half of the participants (41/70, 58.6%) were never married at the point of risk assessment for the current study; 5 (7.2%) were currently married or engaged in a de facto relationship, 18 (25.7%) were divorced or separated, and 6 (8.6%) were widowed. In addition, most of the participants (63/70, 90%) were unemployed prior to their index hospitalisation; 60% (42/70) were receiving some form of pension or social welfare payment. Further, almost a quarter (17/70, 24.3%) was homeless and living on the streets before the index hospitalisation.

The mean age of the participants at the point of assessment during their index admission was 34.33 years (*Mdn* = 32.00; *SD* = 12.91), with the youngest participant aged 17 years and the oldest aged 83 years. With regard to the age at the first psychiatric hospitalisation, the mean was 30.47 years (*SD* = 12.42). With its distribution being positively skewed, the median was 27.18 years, and the age at the first psychiatric hospitalisation ranged from 13 to 76 years. The majority of the participants had prior forensic (48/70, 68.6%) and nonforensic (48/70, 68.6%) psychiatric admissions. Table 4.1 shows the length of time that the participants had spent in psychiatric institutions previously. The mean length of follow-up for

the purpose of this study was 85.10 days (*Mdn* = 64.00; *SD* = 68.48), ranging from 1 to 182 days.

Table 4.1

Length of past psychiatric hospitalisation

Past Psychiatric Hospitalisation	Mean (Days)	Median (Days)	*SD* (Days)	Range (Days)
Forensic Psychiatric	275[†]	85	478	0 – 2,250
Nonforensic Psychiatric	90[†]	15	235	0 – 1,786
Any Psychiatric	362[†]	166	588	0 – 3,352

[†] The means do not tally as there was missing information on the nonforensic psychiatric admission for one of the cases.

4.2.2 Legal Status

Of the 70 participants, 57 (81.4%) participants were admitted as security patients, 6 (8.6%) as forensic patients, and 7 (10%) as involuntary patients during the index Thomas Embling Hospital admission between June and October 2002 (i.e., the admission during which the risk assessment ratings were completed).

4.2.3 Mental Illnesses and Personality Disorders

Table 4.2 shows the mental illnesses and personality disorders that were present in the source sample. The majority of participants (56/70, 80%) presented with psychotic disorders during their admission to the Thomas Embling Hospital, and 20% (14/70) of the sample also presented with personality disorders. More than half (42/70, 60%) of the sample had only one diagnosis, as recorded by the attending psychiatrist. However, 31.4% (22/70) had a comorbid diagnosis, 7.2% (5/70) had three diagnoses, and 1.4% (1/70) had four diagnoses.

Table 4.2

Mental illnesses and personality disorders in the source sample

Mental Illnesses and Personality Disorders	*n* (*N*= 70)	%
Psychotic Disorders	56	80.0
Schizophrenia	47	67.1
Schizophreniform Psychosis	2	2.9
Drug-induced Psychosis	2	2.9
Brief Psychotic Disorder	1	1.4
Delusional Disorder	1	1.4
Paranoid Psychosis	1	1.4
Schizoaffective Disorder	1	1.4
Unspecified Psychosis	1	1.4
Mood Disorders	8	11.4
Bipolar Disorder	4	5.7
Major Depression Disorder	4	5.7
Personality Disorders	14	20.0
Borderline	6	8.6
Antisocial	5	7.1
Narcissistic	1	1.4
Schizoid	1	1.4
Unspecified	1	1.4
Other Diagnoses		
Substance Abuse/Dependence	52	74.3
Intellectual Disability	3	4.3
Posttraumatic Stress Disorder	2	2.9
Adjustment Disorder	1	1.4
Autistic Disorder	1	1.4
Ganser Syndrome	1	1.4

Note: Many of the participants had more than one diagnosis of mental or personality disorder, therefore the numbers add up to > 70.

Although there was a high prevalence of substance abuse/dependence diagnoses within the current sample, the participants were never admitted into the Thomas Embling Hospital solely because of substance abuse or dependence; rather, the participants were always diagnosed with at least one other comorbid mental illness and/or personality disorder (which was usually the main reason for admission).

4.2.4 Drug and Alcohol Use

Table 4.3 shows the participants' history of drug and alcohol use: (1) lifetime use, and (2) use during the 12 months prior to the start of follow-up.

Table 4.3

History of drug and alcohol use

	Lifetime Use (*N* = 70)		Use in Past 12 Months (*N* = 70)	
Type of Substance	*n*	%	*n*	%
Alcohol	64	91.4	52	74.3
Cannabis	56	80.0	41	58.6
Amphetamines	39	55.7	26	37.1
Heroin	31	44.3	22	31.4
Cocaine	12	17.1	6	8.6
Benzodiazepines[†]	4	5.7	1	1.4
Hallucinogens	3	4.3	0	0.0

Note: The most participants had more than one type of drugs or alcohol use, therefore the numbers add up to > 70.

[†] Benzodiazepine use refers to illicit, nonmedical or recreational use.

4.2.5 Offence Characteristics

More than two thirds (50/70, 71.4%) of the participants had an index violent offence, and more than half (39/70, 55.7%) were convicted of a past violent offence. However, 28.6% (20/70) did not have a past offence history. As shown in Table 4.4, assault, property damage, and theft/fraud were the most common forms of index offences. In spite of the high prevalence rate of substance abuse/dependence diagnoses in this sample (52/70, 74.3%), comparatively fewer participants (8/70, 11.4%) were convicted of drug-related offences.

Table 4.4

Type of past and index offences

Type of Offence	Past (*N* = 70)		Index (*N* = 70)	
	n	%	*n*	%
Arson	2	2.9	0	0.0
Assault	27	38.6	31	44.3
Breach of Court Orders	23	32.9	8	11.4
Burglary/Criminal Trespass	18	25.7	7	10.0
Murder/Manslaughter	3	4.3	12	17.1
Possession/Use of Drugs	18	25.7	8	11.4
Possession/Use of Weapons	10	14.3	11	15.7
Property Damage	17	24.3	13	18.6
Resist Arrest	6	8.6	5	7.1
Robbery	10	14.3	8	11.4
Sexual-related	5	7.1	3	4.3
Stalking-related	1	1.4	2	2.9
Theft/Fraud-related	34	48.6	18	25.7
Threats to Kill	8	11.4	10	14.3
Traffic-related	16	22.9	8	11.4
Others	24	34.3	12	17.1

Note: Many participants had more than one type of offence, therefore the numbers add up to > 70. Although some of the patients were found not guilty by reason of mental illness for their offences (i.e., the forensic patients), these offences were included in this tabulation to illustrate the offence characteristics of the source sample. Examples of "other" offences included begging for alms, drunk and disorderly behaviour, prostitution, and use of indecent language.

4.3 Incidents of Inpatient Aggression

One third of the sample (23/70, 32.9%) was either violent towards staff or other patients (16/70, 22.9%), made verbal threats of physical harm to others (10/70, 14.3%), or engaged in property damage (10/70, 14.3%). Table 4.5 shows the base rates of inpatient aggression for the sample during the 6-month follow-up period in the Thomas Embling Hospital.

Table 4.5

Base rates of inpatient aggression during follow-up

Violent Behaviour	1 Week (*n* = 66)		1 Month (*n* = 60)		3 Months (*n* = 44)		6 Months (*n* = 29)	
	n	%	*n*	%	*n*	%	*n*	%
Interpersonal Violence	6	9.1	10	16.7	9	20.5	8	27.6
Verbal Threat	4	6.1	6	10.0	4	9.1	6	20.7
Property Damage	4	6.1	5	8.3	6	13.6	4	13.8
Any Inpatient Aggression	10	15.1	14	23.3	13	29.5	11	37.9
No Inpatient Aggression	56	84.8	46	76.7	31	70.5	18	62.1

Note: "Any Inpatient Aggression" refers to interpersonal violence, verbal threat, and/or property damage. Some participants were discharged from the hospital during follow-up.

4.4 Risk Assessment Ratings

Table 4.6 summarises the total and scale scores of the various risk assessment measures that were rated for the participants in this study. The sample means for the 1-week average of the HCR-20 Clinical scale and the DASA:IV (prospective) scores were 4.53 (*SD* = 2.03; range = .25 to 8.29) and 2.80 (*SD* = 1.84; range = 0 to 6.60) respectively. In addition, the sample mean for the peak HCR-20 Clinical scale (1-week) scores was 7.83 (*SD* = 2.35). There was considerable negative skew in the distribution of the peak HCR-20 Clinical scale scores, with the median being 9; scores ranged from 1 to 10. Similarly, there was considerable negative skew in the distribution of the peak DASA:IV (1-week) scores. The sample mean was 5.40 (*SD* = 1.86); its median was 6, and the scores ranged from 0 to 7.

The correlation between the retrospectively coded HCR-20 Clinical scale scores and the individual means of the prospectively coded HCR-20 Clinical scale scores was moderate, $r = .55$, $p < .001$, two-tailed. The correlations between the

various risk assessment measures are presented in Table 4.7. The risk assessment measures were generally highly positively correlated with each other (*rs* = .30 to .93), with the exception of the DASA:IV and the LSI-R:SV (*r* = .13, *ns*, two-tailed). The START Strength score was negatively correlated with the other risk assessment measures that examined risk factors for violence, *rs* = -.32 to -.80.

Table 4.6

Total and scale scores of the risk assessment measures

Risk Assessment Measure		Mean	*SD*	Range
DASA:IV				
Total (Prospective)	(Out of 7)	2.73	2.40	0 - 7
HCR-20				
Total	(Out of 40)	26.32	6.00	13 – 39
Historical Scale	(Out of 20)	12.37	3.58	4 – 20
Clinical Scale (Prospective)	(Out of 10)	4.51	2.75	0 – 10
Clinical Scale	(Out of 10)	6.83	2.28	0 – 10
Risk Management Scale	(Out of 10)	7.10	1.90	3 – 10
LSI-R:SV				
Total	(Out of 8)	4.44	1.64	1 – 8
PCL-R				
Total	(Out of 40)	14.92	6.21	2.1 – 34.0
Factor 1	(Out of 16)	4.40	2.51	0.0 – 13.0
Facet 1	(Out of 8)	0.77	1.05	0.0 – 6.0
Facet 2	(Out of 8)	3.66	1.78	0.0 – 8.0
Factor 2	(Out of 20)	9.67	4.39	2.0 – 19.0
Facet 3	(Out of 10)	5.43	2.21	1.0 – 9.0
Facet 4	(Out of 10)	4.10	2.62	0.0 – 10.0
PCL:SV				
Total	(Out of 24)	10.70	4.26	1.0 – 23.0
Factor 1	(Out of 12)	4.06	2.33	0.0 – 11.0
Factor 2	(Out of 12)	6.59	2.91	0.0 – 12.0
START				
Risk	(Out of 40)	23.09	5.78	9 – 35
Strength	(Out of 40)	8.86	4.33	1 – 22
VRAG				
Total (Raw Score + 26)	(Out of 54)	27.32	11.41	3 – 54

Table 4.7

Correlations between total scores of the risk assessment measures

Measure	1.	2.	3.	4.	5.	6.	7.	8.
1. DASA:IV Mean	–	.47***	.13	.41***	.41***	.64***	-.56***	.30*
2. HCR-20 Total	.47***	–	.56***	.82***	.78***	.78***	-.72***	.64***
3. LSI-R:SV Total	.13	.56***	–	.63***	.49***	.32**	-.32**	.66***
4. PCL-R Total	.41***	.82***	.63***	–	.93***	.66***	-.57***	.77***
5. PCL:SV Total	.41***	.78***	.49***	.93***	–	.65***	-.58***	.67***
6. START Risk	.64***	.78***	.32**	.66***	.65***	–	-.80***	.44***
7. START Strength	-.56***	-.72***	-.32**	-.57***	-.58***	-.80***	–	-.49***
8. VRAG	.30*	.64***	.66***	.77***	.67***	.44***	-.49***	–

* $p < .05$; ** $p < .01$; *** $p < .001$; all two-tailed

4.5 Predictive Accuracy of the Risk Assessment Measures

4.5.1 Short-term Predictive Accuracy of the DASA:IV and HCR-20 Clinical Scale

In terms of the prospective ratings, the DASA:IV scores significantly predicted interpersonal violence, verbal threats, property damage, as well as any inpatient aggression (i.e., interpersonal violence, verbal threats, or property damage) during 1-day, 2-day, 1-week, or 1-month follow-up in the Thomas Embling Hospital (see Table 4.8). In general, the HCR-20 Clinical scale scores also significantly predicted interpersonal violence, verbal threats, property damage,

and any inpatient aggression across the three follow-up periods. The only exception was interpersonal violence, for which the HCR-20 Clinical scale scores did not significantly predict during the immediate 24 hours.

The very-short-term (i.e., 1 day to 1 week) predictive accuracy for the DASA:IV was mediocre to acceptable for physical violence (AUCs = .66 to .72), acceptable to outstanding for verbal threat (AUCs = .87 to .90), excellent for property damage (AUCs = .82 to .84), and acceptable for any inpatient aggression (AUCs = .76 to .78) (see Hosmer & Lemeshow, 2000 for a classification index, p. 162). In comparison, the HCR-20 Clinical scale short-term predictive accuracy was poor to mediocre for physical violence (AUCs = .59 to .69), excellent for verbal threat (AUCs = .81 to .82), acceptable to excellent for property damage (.73 to .84), and acceptable for any inpatient aggression (.70 to .76). However, there was a general decrease in the DASA:IV and the HCR-20 Clinical scale's predictive accuracy for all types of inpatient aggression at 1-month follow-up.

Pertaining to the predictive accuracy across the follow-up periods (i.e., comparisons AUCs within the same *row*), there were significant differences between the predictive accuracy for inpatient aggression (with the exception of interpersonal violence) between the very short term (i.e., 1 day to 1 week) and the short term (i.e., 1 month) for both measures. The differences between the DASA:IV and HCR-20 Clinical scale for the inpatient aggression across the follow-up periods were also generally nonsignificant (i.e., comparisons within the same *column*). The DASA:IV was only better than the HCR-20 Clinical scale at predicting any inpatient aggression during the 1- and 2-day follow-up periods (see Table 4.8).

Table 4.8

Short-term predictive accuracy of the DASA:IV and HCR-20 Clinical Scale

	1 Day		2 Days		1 Week		1 Month	
Measure	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI
Interpersonal Violence								
DASA:IV	.66 (.06)*	.55 – .78	.72 (.04)***	.64 – .80	.69 (.03)***	.63 – .76	.63 (.03)***	.58 – .67
HCR-20 Clinical Scale	.59 (.05)$^{\Omega}$	.50 – .69	.67 (.04)**	.58 – .75	.69 (.03)$^{***\Omega}$	. 62 – .75	.62 (.03)***	.57 – .67
Verbal Threat								
DASA:IV	.90 (.03)$^{***\Omega}$	.85 – .94	.87 (.03)$^{***\pi}$	.81 – .93	.87 (.02)$^{***\partial}$	.83 – .91	.71 (.03)$^{***\Omega\pi\partial}$	.65 – .77
HCR-20 Clinical Scale	.82 (.05)$^{***\Omega}$	.72 – .92	.82 (.04)$^{***\pi}$	.73 – .90	.81 (.03)$^{***\partial}$	.76 – .87	.66 (.03)$^{***\Omega\pi\partial}$	.70 – .72
Property Damage								
DASA:IV	.82 (.06)**	.71 – .94	.84 (.03)$^{***\Omega}$	.78 – .91	.83 (.03)$^{***\pi}$	.78 – .88	.70 (.03)$^{***\Omega\pi}$	.65 – .75
HCR-20 Clinical Scale	.73 (.06)*	.62 – .85	.81 (.04)***	.73 – .89	.84 (.03)$^{***\Omega}$	.79 – .89	.72 (.03)$^{***\Omega}$	.67 – .78
Any Inpatient Aggression								
DASA:IV	.76 (.04)***‡	.69 – .84	.78 (.03)$^{***\Omega‡}$	.72 – .83	.78 (.02)$^{***\pi}$	.73 – .82	.69 (.02)$^{***\Omega\pi}$	.65 – .73
HCR-20 Clinical Scale	.70 (.04)***‡	.62 – .77	.73 (.03)***‡	.67 – .79	.76 (.02)$^{***\Omega}$	.71 – .80	.68 (.02)$^{***\Omega}$	.64 – .72

Note: These results pertain to the prospective ratings completed by the ward staff between June and October 2002.

$^{\Omega, \pi, \partial}$ Denote significant differences when comparing the AUCs within the same row (i.e., $|z| > 1.96$).

* $p < .05$; ** $p < .01$; *** $p < .001$

‡ Denotes that the AUCs for the DASA:IV and HCR-20 Clinical Scale were significantly different (i.e., $|z| \geq 1.96$).

4.5.2 Predictive Accuracy for Interpersonal Violence

Table 4.9 shows the predictive accuracy of the risk assessment measures and scales for interpersonal violence. Overall, the HCR-20 Total score appeared to be the most predictive of interpersonal violence (AUCs = .75 and .78 respectively; i.e., acceptable discrimination) over the shorter term (i.e., 1 week and 1 month), and the START Risk score were the most predictive during the 3- and 6-month follow-ups (AUCs = .78 and .73 respectively). The predictive accuracy for the majority of the risk assessment measures were fairly stable across follow-ups, though the HCR-20 Total, the HCR-20 Clinical scale, the LSI-R:SV, and the PCL:SV Factor 1 appeared to show larger decreases in AUC values during the 3- and 6-month follow-up periods. However, posthoc comparisons of these AUC values did not reveal significant differences between the predictive accuracy for any of the risk assessment measures across the follow-up periods (i.e., comparisons within the same row; $|z| < 1.96$).

The majority of the dynamic risk measures showed similar or lower predictive accuracy for interpersonal violence than the static measures at the 6-month follow-up period; only the HCR-20 Risk Management scale and the START Risk scores (both dynamic measures) showed acceptable levels of predictive accuracy (AUCs = .70 and .73 respectively). Notably, the START Risk scale was the only measure that predicted interpersonal violence at acceptable levels of accuracy (AUCs = .71 to .78) across all follow-up periods. The START Strength scale also significantly predicted the nonoccurrence of interpersonal violence during the 1- and 3-month follow-up periods (see Table 4.9).

Table 4.9
Predictive accuracy for interpersonal violence

Measure	1 Week AUC (*SE*)	1 Week 95% CI	1 Month AUC (*SE*)	1 Month 95% CI	3 Months AUC (*SE*)	3 Months 95% CI	6 Months AUC (*SE*)	6 Months 95% CI
HCR-20 Total	.75 (.07)$^{*}_{a}$	.61 – .89	.78 (.06)$^{**}_{abc}$	.65 – .91	.76 (.09)$^{*}_{abc}$	.59 – .93	.64 (.11)	.42 – .86
Historical Scale	.63 (.10)	.43 – .83	.68 (.08)$_{a}$	.52 – .84	.67 (.11)	.45 – .89	.60 (.13)	.36 – .85
Clinical Scale	.76 (.13)*	.48 – 1.00	.72 (.09)*	.53 – .90	.75 (.10)$^{*}_{d}$	.56 – .94	.60 (.12)	.36 – .84
Risk Management Scale	.68 (.10)	.48 – .87	.74 (.08)*	.59 – .89	.72 (.10)$^{*}_{e}$	.53 – .92	.70 (.11)$_{a}$	.48 – .91
LSI-R:SV Total	.61 (.12)	.38 – .84	.67 (.09)	.51 – .83	.52 (.10)$_{afghi}$	.33 – .71	.49 (.12)$_{bcd}$	.25 – .73
PCL-R Total	.68 (.10)	.49 – .88	.73 (.08)$^{*}_{d}$	.58 – .89	.70 (.10)$_{f}$	.50 – .89	.68 (.11)$_{be}$	.46 – .89
Factor 1	.59 (.12)	.36 – .83	.63 (.10)	.45 – .82	.59 (.10)	.40 – .79	.57 (.11)$_{f}$	.37 – .78
Factor 2	.64 (.11)	.43 – .86	.70 (.08)*	.54 – .86	.70 (.10)$_{gjk}$	.51 – .89	.67 (.10)$_{c}$	.47 – .87
PCL:SV Total	.67 (.12)	.44 – .91	.69 (.10)†	.50 – .88	.66 (.11)$_{l}$	.45 – .86	.63 (.11)$_{g}$	.41 – .84
Factor 1	.60 (.13)	.34 – .85	.58 (.10)$_{bd}$	.38 – .78	.44 (.11)$_{bdejlmn}$	.22 – .67	.44 (.11)$_{aefghi}$	.22 – .65
Factor 2	.67 (.12)	.44 – .90	.71 (.08)*	.53 – .88	.71 (.10)$^{\dagger}_{hm}$	.51 – .91	.72 (.10)$_{dhj}$	.52 – .92
START Risk	.71 (.10)	.51 – .90	.73 (.08)*	.58 – .89	.78 (.09)$^{*}_{in}$	.59 – .96	.73 (.10)$^{\dagger}_{i}$	.53 – .93
START Strength	.32 (.14)	.15 – .49	.26 (.07)*	.12 – .40	.23 (.08)*	.07 – .38	.31 (.10)	.12 – .50
VRAG Total	.57 (.11)$_{a}$	.34 – .79	.62 (.09)$_{c}$	.45 – .80	.54 (.11)$_{ck}$	.32 – .76	.57 (.11)$_{j}$	.35 – .80

Note: These results pertain to the retrospective coding of the various risk assessment measures by the author. The differences between the AUCs for each risk assessment measure across different periods (i.e., comparisons within the same row) were nonsignificant. The START Strength score was not included in the between-measure comparisons due to its focus on protective instead of risk factors.

* $p < .05$; ** $p < .01$; † $p = .05$ to .06

$_{a, b, c, d, e, f, g, h, i, j, k, l, m, n}$ Denote significant differences when comparing the AUCs within the same column (i.e., $|z| \geq 1.96$).

4.5.3 Predictive Accuracy for Verbal Threat

Table 4.10 shows the predictive accuracy of the risk assessment measures and scales for verbal threat. In the very short term (i.e., 1 week and 1 month), only the HCR-20 Clinical and Risk Management, as well as the START Risk scales showed acceptable levels of predictive accuracy for verbal threats ($AUC_{HCR\text{-}20\text{-}C}$ = .72; $AUC_{HCR\text{-}20\text{-}R}$ = .68 and .72; $AUC_{START\text{-}Risk}$ = .74 and .78). The rest of the risk assessment measures and scales demonstrated poor to mediocre predictive accuracy for verbal threat during the 1-week and 1-month follow-up periods. Moreover, only the HCR-20 Clinical and START Risk scales significantly predicted verbal threat at 3 to 6 months, and 1 to 6 months respectively.

However, most of the risk assessment measures' predictive accuracy for verbal threats improved over the follow-up periods. In particular, the majority of the risk assessment measures (i.e., HCR-20 Total, Historical, Clinical, and Risk Management scales; PCL-R Total, Factors 1 and 2; PCL:SV Total and Factor 2; as well as START Risk scale) showed acceptable to excellent levels of predictive accuracy at 3- and 6-month follow-ups, with the START Risk score showing the highest predictive accuracy amongst all of the measures (AUCs = .83 and .84 respectively). Nevertheless, the differences in AUCs across the follow-up periods for each risk assessment measure were statistically nonsignificant (i.e., $|z| < 1.96$). Further, it was noted that the LSI-R:SV (AUCs = .50 to .61) and the VRAG (AUCs = .39 to .59) were rather inadequate for predicting verbal threats across the follow-up periods (see Table 4.10). Poor model fit was likely to have resulted in the large confidence interval for one of the AUCs obtained.

Table 4.10

Predictive accuracy for verbal threat

Measure	1 Week AUC (*SE*)	1 Week 95% CI	1 Month AUC (*SE*)	1 Month 95% CI	3 Months AUC (*SE*)	3 Months 95% CI	6 Months AUC (*SE*)	6 Months 95% CI
HCR-20 Total	.62 (.15)$_{a}$	.34 – .90	.68 (.12)$_{a}$	.44 – .91	.70 (.16)	.36 – 1.00	.71 (.13)	.46 – .95
Historical Scale	.53 (.16)	.21 – .85	.61 (.14)	.34 – .88	.65 (.20)	.21 – 1.00	.65 (.15)	.35 – .95
Clinical Scale	.72 (.09)$_{b}$	.56 – .89	.72 (.08)	.56 – .88	.83 (.07)$^{*}_{a}$	.69 – .97	.78 (.09)*	.60 – .95
Risk Management Scale	.68 (.13)	.43 – .94	.72 (.10)	.52 – .92	.70 (.14)	.43 – .97	.69 (.13)	.44 – .94
LSI-R:SV Total	.61 (.12)$_{c}$	.38 – .84	.53 (.13)$_{b}$	.27 – .79	.50 (.17)$_{abcde}$	.17 – .83	.55 (.15)$_{ab}$	.26 – .83
PCL-R Total	.56 (.14)$_{d}$	.29 – .84	.62 (.13)	.37 – .87	.72 (.18)$_{b}$	.00 – 1.00§	.73 (.13)$_{ac}$	.47 – .99
Factor 1	.64 (.08)$_{e}$	.47 – .80	.66 (.10)	.46 – .85	.79 (.12)$^{\dagger}_{c}$	.54 – 1.00	.75 (.10)$^{\dagger}_{d}$	.56 – .94
Factor 2	.55 (.15)$_{f}$	.26 – .85	.62 (.12)	.38 – .86	.73 (.17)$_{d}$	.00 – 1.00§	.72 (.14)$_{e}$	.44 – 1.00
PCL:SV Total	.59 (.14)$_{g}$	.31 – .86	.63 (.13)	.37 – .88	.70 (.17)	.33 – 1.00	.72 (.12)	.48 – .95
Factor 1	.53 (.14)	.25 – .81	.59 (.12)	.35 – .83	.65 (.18)	.29 – 1.00	.62 (.13)$_{d}$	.37 – .88
Factor 2	.59 (.14)$_{h}$	.32 – .86	.64 (.12)	.41 – .87	.73 (.16)	.33 – 1.00	.74 (.13)$_{f}$	.48 – .99
START Risk	.74 (.14)$_{i}$	.45 – 1.00	.78 (.10)$^{*}_{bc}$	.58 – .98	.83 (.15)$^{*}_{e}$	.00 – 1.00§	.84 (.10)$^{*}_{bg}$	.60 – 1.00
START Strength	.41 (.09)	.23 – .58	.32 (.09)	.15 – .50	.31 (.11)	.09 – .53	.29 (.09)	.10 – .47
VRAG Total	.39 (.13)$_{abcdefghi}$	.13 – .64	.51 (.13)$_{ac}$	.26 – .77	.59 (.20)	.20 – .98	.55 (.13)$_{cefg}$	.30 – .81

Note: These results pertain to the retrospective coding of the various risk assessment measures by the author. The differences between the AUCs for each risk assessment measure across different periods (i.e., comparisons within the same row) were nonsignificant. The START Strength score was not included in the between-measure comparisons due to its focus on protective instead of risk factors.

* $p < .05$; † $p = .05$ to .06; § Poor model fit was likely to have resulted in the estimation problems pertaining the confidence interval.

$_{a, b, c, d, e, f, g, h, i}$ Denote significant differences when comparing the AUCs within the same column (i.e., $|z| \geq 1.96$).

4.5.4 Predictive Accuracy for Property Damage

As shown in Table 4.11, the majority of the risk assessment measures and scales demonstrated acceptable to excellent predictive accuracy for property damage across the different periods of follow-up; only the Factor 1 scores of the PCL-R and PCL:SV showed poor to mediocre predictive accuracy. Notably, the HCR-20 Total score significantly predicted property damage during 1-, 3-, and 6-month follow-ups (AUCs = .85, .80, and .85 respectively), and its predictive accuracy during the 1-week follow-up was close to statistical significance (AUC = .79, *SE* = .10, 95% Confidence Interval [95% CI] = .61 – .98; *p* = .06). In addition, the HCR-20 Risk Management scale significantly predicted property damage at 3- and 6-month follow-ups (AUCs = .79 and .84).

In the short term (i.e., during 1-week and 1-month follow-ups), Factor 2 scores of the PCL-R and PCL:SV significantly predicted property damage and had the best predictive accuracy amongst the risk assessment measures ($AUC_{PCL\text{-}R}$ = .82 and .83; $AUC_{PCL:SV}$ = .86 and .84). It was further noted that the START Strength score significantly predicted whether there was a nonoccurrence of property damage during 1-, 3-, and 6-month follow-ups (see Table 4.11). Nevertheless, as with interpersonal violence and verbal threat, the differences in predictive accuracy of each risk assessment measure for property damage across the follow-up periods were statistically nonsignificant (i.e., $|z| < 1.96$).

Table 4.11

Predictive accuracy for property damage

Measure	1 Week AUC (*SE*)	1 Week 95% CI	1 Month AUC (*SE*)	1 Month 95% CI	3 Months AUC (*SE*)	3 Months 95% CI	6 Months AUC (*SE*)	6 Months 95% CI
HCR-20 Total	.79 (.10)†	.61 – .98	.85 (.05)$^{*}_{ab}$	.74 – .95	.80 (.06)$^{*}_{ab}$	.68 – .93	.85 (.07)$^{*}_{abcd}$	.71 – .99
Historical Scale	.75 (.08)	.60 – .90	.79 (.08)$^{*}_{cd}$	.63 – .95	.73 (.10)	.54 – .93	.70 (.11)	.49 – .91
Clinical Scale	.72 (.18)	.00 – 1.00	.72 (.15)$_{e}$	.42 – 1.00	.56 (.15)	.26 – .86	.71 (.18)	.15 – 1.00
Risk Management Scale	.73 (.07)	.60 – .87	.71 (.08)$_{f}$	.56 – .87	.79 (.08)$^{*}_{c}$	.64 – .94	.84 (.07)$^{*}_{ef}$	.70 – .98
LSI-R:SV Total	.71 (.11)	.49 – .93	.84 (.06)$^{*}_{gh}$	.72 – .96	.73 (.11)	.52 – .93	.69 (.12)	.44 – .93
PCL-R Total	.76 (.08)$_{ab}$	.59 – .92	.74 (.10)$_{lj}$	.54 – .94	.72 (.10)	.53 – .91	.71 (.11)$_{ag}$	.50 – .91
Factor 1	.50 (.16)$_{acdef}$	.19 – .81	.43 (.15)$_{acefgiklmn}$	.15 – .72	.53 (.13)$_{acd}$	.28 – .78	.57 (.11)$_{beghij}$	.27 – .83
Factor 2	.82 (.06)$^{*}_{cg}$	.70 – .94	.83 (.07)$^{*}_{ko}$	.69 – .97	.72 (.09)	.53 – .90	.73 (.09)$_{c}$	.55 – .91
PCL:SV Total	.78 (.11)$^{\dagger}_{dh}$	.58 – .99	.74 (.10)$_{lp}$	.54 – .93	.75 (.08)$^{*}_{d}$	.59 – .91	.77 (.09)$_{h}$	.58 – .95
Factor 1	.54 (.15)$_{bghij}$	.25 – .84	.47 (.14)$_{bdhjopq}$	.21 – .74	.61 (.12)$_{b}$	.37 – .85	.62 (.12)$_{df}$	.38 – .86
Factor 2	.86 (.07)$^{*}_{ei}$	.73 – .99	.84 (.07)$^{*}_{mq}$	.70 – .97	.70 (.10)	.51 – .90	.81 (.09)$^{\dagger}_{i}$	.63 – .99
START Risk	.79 (.09)†	.63 – .96	.74 (.11)$_{n}$	.52 – .95	.68 (.10)	.48 – .87	.77 (.10)$_{j}$	.58 – .95
START Strength	.24 (.06)	.12 – .35	.18 (.05)*	.08 – .28	.24 (.07)*	.10 – .38	.17 (.09)*	.00 – .34
VRAG Total	.79 (.07)$^{\dagger}_{fj}$	.66 – .93	.74 (.11)	.52 – .95	.71 (.10)	.53 – .90	.71 (.10)	.52 – .90

Note: These results pertain to the retrospective coding of the various risk assessment measures by the author. The differences between the AUCs for each risk assessment measure across different periods (i.e., comparisons within the same row) were nonsignificant. The START Strength score was not included in the between-measure comparisons due to its focus on protective instead of risk factors.

* $p < .05$; † $p = .05$ to .06

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q Denote significant differences when comparing the AUCs within the same column (i.e., $|z| \geq 1.96$).

4.5.5 Predictive Accuracy for Any Inpatient Aggression

Overall, the START Risk score appeared to be the most predictive of any inpatient aggression both over the short term (i.e., 1 week and 1 month; AUCs = .71 and .76), and the medium term (i.e., 3 and 6 months; AUCs = .82 and .81). These AUC values were considered to be acceptable to excellent in terms of predictive accuracy. Moreover, the START Risk score was the only risk assessment measure that significantly predicted any inpatient aggression across all the follow-up periods. Further, the START Strength score significantly predicted whether there is a nonoccurrence of interpersonal violence, verbal threats and/or property damage during 1-, 3-, and 6-month follow-ups (see Table 4.12).

In addition, the HCR-20 Total, Clinical, and Risk Management scales showed mediocre to acceptable predictive accuracy for any inpatient aggression in the short term (AUCs = .67 to .75), and acceptable to excellent predictive accuracy in the medium term (AUCs = .72 to .83). The HCR-20 Total and scale scores significantly predicted any inpatient aggression during 1-, 3-, and 6-month follow-ups. The predictive accuracy of the HCR-20 Clinical scale for any inpatient aggression was also close to statistical significance during the 1-week follow-up (AUC = .69, *SE* = .11, 95% CI = .48 – .89, *p* = .06). However, the HCR-20 Historical scale, the PCL-R, the PCL:SV, the LSI-R:SV, and the VRAG were poor to mediocre for predicting any inpatient aggression (see Table 4.12). Comparisons of the predictive accuracy of each measure across the follow-up periods did not reveal any significant differences. Complete separation was likely to have resulted in the large confidence intervals for some of the AUCs (Hosmer & Lemeshow, 2000).

Table 4.12

Predictive accuracy for any inpatient aggression

Measure	1 Week		1 Month		3 Months		6 Months	
	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI
HCR-20 Total	.67 (.08)$_{ab}$	.52 – .83	.75 (.07)$^{**}_{abcde}$	.62 – .88	.83 (.07)$^{**}_{abcd}$	.70 – .96	.75 (.07)$^{**}_{abcde}$	.62 – .88
Historical Scale	.61 (.09)	.43 – .79	.65 (.08)$_{a}$	.49 – .81	.75 (.09)$^{**}_{e}$	.59 – .92	.65 (.08)$_{af}$	.49 – .81
Clinical Scale	.69 (.11)$^{\dagger}_{c}$	.48 – .89	.74 (.07)$^{**}_{fg}$	.60 – .89	.72 (.09)$^{*}_{f}$	.55 – .90	.74 (.07)$^{**}_{gh}$	.60 – .89
Risk Management Scale	.68 (.08)$_{de}$	.52 – .84	.75 (.07)$^{**}_{hi}$	.62 – .89	.81 (.08)$^{**}_{gh}$	.66 – .96	.75 (.07)$^{**}_{i}$	.62 – .89
LSI-R:SV Total	.49 (.10)$_{afg}$	.30 – .69	.61 (.08)	.45 – .78	.62 (.09)$_{aij}$	.44 – .80	.62 (.08)$_{bj}$	.45 – .78
PCL-R Total	.62 (.09)	.45 – .79	.66 (.08)$_{j}$	.50 – .81	.74 (.09)$^{*}_{k}$	.58 – .91	.66 (.08)$_{kl}$	.50 – .81
Factor 1	.50 (.09)$_{dh}$	.31 – .68	.55 (.08)$_{bfhkl}$	.39 – .72	.62 (.09)$_{bgl}$	.44 – .79	.55 (.08)$_{cgikm}$	.39 – .72
Factor 2	.64 (.09)$_{f}$	.47 – .82	.68 (.08)$^{*}_{mn}$	.53 – .83	.76 (.08)$^{**}_{imn}$	.61 – .91	.68 (.08)$^{*}_{n}$	.53 – .83
PCL:SV Total	.60 (.10)	.42 – .79	.62 (.08)$_{cop}$	.45 – .78	.73 (.09)$^{*}_{o}$	.57 – .90	.62 (.08)$_{do}$	.45 – .78
Factor 1	.46 (.10)$_{bcei}$	.26 – .65	.48 (.09)$_{dgijkmoqr}$	.31 – .66	.54 (.10)$_{cfhkmop}$	.34 – .75	.54 (.11)$_{ehp}$	.32 – .75
Factor 2	.66 (.09)$_{g}$	.48 – .89	.68 (.08)$^{*}_{qs}$	.53 – .83	.74 (.09)*	.58 – .91	.68 (.08)*	.53 – .83
START Risk	.71 (.09)$^{*}_{hi}$	.54 – .88	.76 (.07)$^{**}_{lprt}$	.62 – .90	.82 (.07)$^{**}_{jlpq}$	.68 – .96	.81 (.08)$^{**}_{fjlmnop}$	.65 – .97
START Strength	.33 (.07)	.19 – .47	.25 (.07)**	.12 – .38	.20 (.07)**	.07 – .34	.24 (.09)*	.07 – .42
VRAG Total	.56 (.11)	.35 – .76	.56 (.09)$_{enst}$	.39 – .73	.63 (.09)$_{denq}$	.45 – .82	.61 (.11)	.40 – .82

Note: These results pertain to the retrospective coding of the various risk assessment measures by the author. The differences between the AUCs for each risk assessment measure across different periods (i.e., comparisons within the same row) were nonsignificant. The START Strength score was not included in the between-measure comparisons due to its focus on protective instead of risk factors.

* $p < .05$; ** $p < .01$; † $p = .05$ to .06

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t Denote significant differences when comparing the AUCs within the same column (i.e., $|z| \geq 1.96$).

4.5.6 A Summary of Predictive Accuracy over Follow-up Periods

As shown in Table 4.13, the dynamic risk assessment measures (with the exception of the LSI-R:SV) were generally useful for predicting inpatient aggression in the forensic inpatient setting in the short to medium term (1 to 6 months); comparatively, the static measures' predictive accuracy during these time frames were generally poor.

Table 4.13

Predictive accuracy of measures over follow-up periods

		HCR-20			LSI-R:			START		
Measure	Tot+	H	C#	R#	SV#	PCL-R	PCL:SV	Risk#	Str#	VRAG
Interpersonal Violence										
1 Week	X		X							
1 Month	X		X	X		X		X	X	
3 Months	X		X	X				X	X	
6 Months								X		
Verbal Threat										
1 Week										
1 Month								X		
3 Months			X					X		
6 Months			X					X		
Property Damage										
1 Week										
1 Month	X	X			X				X	
3 Months	X			X			X		X	
6 Months	X			X					X	
Any Inpatient Aggression										
1 Week								X		
1 Month	X		X	X				X		
3 Months	X	X	X	X		X	X	X	X	
6 Months	X		X	X				X	X	

Note: "X" denotes prediction of the type of inpatient aggression at $p < .05$ level. "Tot," "H," "C," "R," and "Str" denote "Total Score," "Historical scale," "Clinical scale," "Risk Management scale," and "Strength scale" respectively.
+ denotes a risk assessment instrument with a mixture of dynamic and static measures.
# denotes a dynamic risk assessment measure.

4.5.7 Predictive Accuracy of the DASA:IV and HCR-20 Clinical Scale Mean Scores

Table 4.14 shows the predictive accuracy of the DASA:IV and the HCR-20 Clinical Mean scores. In general, both the DASA:IV and the HCR-20 Clinical scale mean scores displayed acceptable to outstanding levels of predictive accuracy for inpatient aggression. In terms of the DASA:IV and the HCR-20 Clinical scale's predictive accuracy for interpersonal violence, verbal threat, property damage, and any inpatient aggression, curvilinear patterns emerged across the follow-up periods, with the troughs for predictive accuracy typically occurring during the 1-month follow-up (see e.g., Figure 4.1). However, apart from the predictive accuracy of the DASA:IV for interpersonal violence during the 1-month and 6-month follow-up periods, posthoc comparisons of the predictive accuracy of the DASA:IV and the HCR-20 Clinical scale across the follow-up periods did not reveal statistically significant differences. Notwithstanding the significant difference between the predictive accuracy of the DASA:IV and the HCR-20 Clinical scale for interpersonal violence, there were no significant differences between both measures' predictive accuracy across the follow-up periods.

Table 4.15 lists those risk assessment measures that were significantly different (i.e., $|z| \geq 1.96$) from the DASA:IV and the HCR-20 Clinical scale means with regard to predictive accuracy for interpersonal violence, verbal threat, property damage, and any inpatient aggression across the follow-up periods. Notably, in the medium term (i.e., 3- and 6-month follow-ups), these mean risk ratings were better than some of the static risk assessment measures (e.g., the HCR-20 Historical scale, the PCL measures, and the VRAG).

Table 4.14

Predictive accuracy of the DASA:IV and HCR-20 Clinical scale mean scores

Measure	1 Week		1 Month		3 Months		6 Months	
	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI
Interpersonal Violence								
DASA:IV Mean	.77 (.09)*	.58 – .95	.70 (.08)$^{\dagger\Omega}$	.54 – .86	.85 (.07)**	.59 – .93	.93 (.05)$_{\ddagger}^{***\Omega}$	.00 – 1.00§
HCR-20 Clinical Scale Mean	.81 (.11)*	.52 – 1.00	.70 (.10)*	.51 – .90	.77 (.09)*	.60 – .94	.78 (.09)$^{*}_{\ddagger}$	.60 – .97
Verbal Threat								
DASA:IV Mean	.96 (.04)**	.00 – 1.00§	.80 (.11)*	.56 – 1.00	.85 (.07)*	.70 – .99	.90 (.08)**	.00 – 1.00§
HCR-20 Clinical Scale Mean	.89 (.09)**	.00 – 1.00§	.73 (.13)†	.49 – .98	.74 (.10)	.55 – .93	.85 (.08)*	.70 – 1.00
Property Damage								
DASA:IV Mean	.88 (.05)*	.78 – .97	.78 (.08)*	.62 – .93	.76 (.08)*	.62 – .91	.79 (.09)	.62 – .95
HCR-20 Clinical Scale Mean	.92 (.05)**	.00 – 1.00§	.85 (.06)**	.74 – .97	.75 (.10)*	.56 – .94	.75 (.14)	.45 – 1.00
Any Inpatient Aggression								
DASA:IV Mean	.83 (.06)**	.71 – .95	.77 (.07)**	.64 – .90	.86 (.05)***	.76 – .97	.92 (.05)***	.00 – 1.00§
HCR-20 Clinical Scale Mean	.83 (.08)**	.68 – .98	.76 (.08)**	.60 – .91	.76 (.08)**	.61 – .92	.84 (.08)**	.70 – .99

* $p < .05$; ** $p < .01$; *** $p < .001$; † $p = .05$ to .06

§ Issues relating to complete separation were likely to have resulted to estimation problems in terms of the confidence interval.

$^{\Omega}$ Denotes significant differences when comparing the AUCs within the same row (i.e., $|z| \geq 1.96$).

‡ Denotes that the AUCs for the DASA:IV and HCR-20 Clinical Scale mean scores were significantly different (i.e., $|z| \geq 1.96$).

Figure 4.1

Curvilinear pattern of predictive accuracy (interpersonal violence)

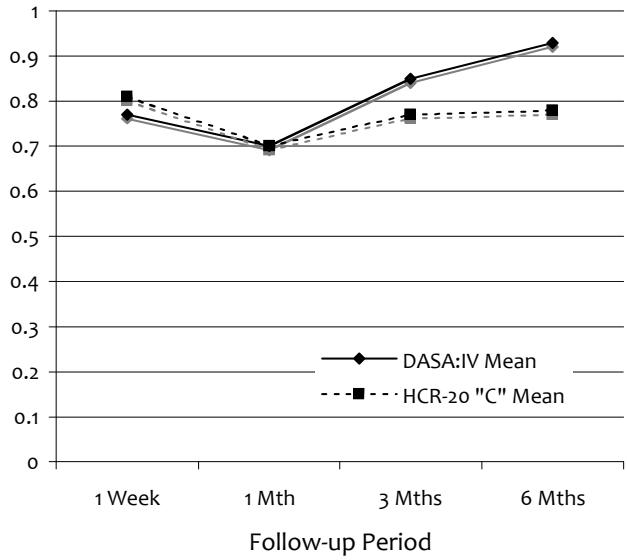


Table 4.15

Posthoc comparisons of predictive accuracy: Mean scores versus the rest

Measure	1 Week	1 Month	3 Months	6 Months
Interpersonal Violence				
DASA:IV Mean	–	–	5, 7, 10, 13	1 – 13
HCR-20 Clinical Scale Mean	2	–	5, 10, 13	3, 5, 10
Verbal Threat				
DASA:IV Mean	1 – 11, 13	13	5	4, 5, 10, 13
HCR-20 Clinical Scale Mean	2, 4 – 11, 13	–	–	5, 13
Property Damage				
DASA:IV Mean	5, 7, 10	7, 10	7	7
HCR-20 Clinical Scale Mean	2, 5, 7, 10	7, 10	–	–
Any Inpatient Aggression				
DASA:IV Mean	2, 4 – 10, 13	7, 10, 13	5, 7, 10, 13	1 – 11, 13
HCR-20 Clinical Scale Mean	2, 4 – 7, 9, 10, 13	7, 10	–	2, 5, 7, 9, 10, 13

Note: The AUCs of the above listed risk assessment measures were significantly different from the AUCs of the DASA:IV or HCR-20 Clinical scale means (i.e., $|z| \geq 1.96$).
1 = HCR-20 Total; 2 = HCR-20 Historical scale; 3 = HCR-20 Clinical Scale; 4 = HCR-20 Risk Management scale; 5 = LSI-R:SV; 6 = PCL-R Total; 7 = PCL-R Factor 1; 8 = PCL-R Factor 2; 9 = PCL:SV Total; 10 = PCL:SV Factor 1; 11 = PCL:SV Factor 2; 12 = START Risk; 13 = VRAG.

4.5.8 Predictive Accuracy of the DASA:IV and HCR-20 Clinical Scale Peak Scores

As shown in Table 4.16, the predictive accuracy of the DASA:IV and the HCR-20 Clinical scale peak scores ranged from acceptable to outstanding levels. Notably, both the DASA:IV and HCR-20 Clinical peak scores significantly predicted verbal threat and any inpatient aggression across all the follow-up periods. In addition, the peak scores of both measures also significantly predicted interpersonal violence during the 3- and 6-month follow-ups. Although the DASA:IV and HCR-20 Clinical scale peak scores showed the curvilinear pattern (similar to Figure 4.1) of predictive accuracy across the follow-up periods when used to predict verbal threat and property damage, both measures showed increasing predictive accuracy when used to predict interpersonal violence and any inpatient aggression. In particular, the DASA:IV and HCR-20 Clinical peak scores appeared to be better at predicting any inpatient aggression during longer follow-up periods (i.e., 6 months > 3 months and so forth); this was also the case when the DASA:IV peak score was used to predict interpersonal violence.

However, apart from significant differences in the predictive accuracy of the HCR-20 Clinical peak score for any inpatient aggression, any differences in the predictive accuracy for interpersonal violence, verbal threat, and property damage across time periods were statistically nonsignificant. Furthermore, differences in predictive accuracy between the DASA:IV and the HCR-20 Clinical scale were also generally nonsignificant; the only exception was for property damage during the 1-week follow-up.

A series of posthoc comparisons was conducted to test for significant differences in predictive accuracy between the DASA:IV/HCR-20 Clinical scale peak scores and the rest of the risk assessment measures. Table 4.17 shows the measures that differed significantly from the DASA:IV and HCR-20 Clinical scale peak scores in terms of their predictive accuracy for the various types of inpatient aggression during the follow-up periods. In particular, the DASA:IV and HCR-20 Clinical scale peak scores were better predictors of interpersonal violence and any inpatient aggression than most of the other risk assessment measures (including the more static measures such as the HCR-20 Historical scale, the PCL measures, and the VRAG) in the longer term (e.g., at 6-month follow-up).

4.5.9 Comparisons between Mean and Peak Scores

As shown in Table 4.18, the DASA:IV mean scores were significantly more accurate than the DASA:IV peak scores at predicting the likelihood of interpersonal violence, verbal threat, and any inpatient aggression during the 1-week follow-up; the DASA:IV mean scores were also better at predicting interpersonal violence at the 6-month follow-up. In contrast, the HCR-20 Clinical scale mean scores were significantly more accurate than the peak scores at predicting property damage during the 1-week follow-up. All other differences in the predictive accuracy for various types of inpatient aggression across the follow-ups were nonsignificant. Taken together, it appears that the mean scores (at least for the DASA:IV) were generally better than the peak scores in the very short term (i.e., 1 week).

Table 4.16

Predictive accuracy of the DASA:IV and HCR-20 Clinical scale peak scores

	1 Week		1 Month		3 Months		6 Months	
Measure	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI	AUC (*SE*)	95% CI
Interpersonal Violence								
DASA:IV Peak	.64 (.10)	.46 – .83	.70 (.08)†	.54 – .85	.77 (.08)*	.62 – .91	.82 (.08)**	.67 – .97
HCR-20 Clinical Scale Peak	.74 (.09)†	.57 – .92	.69 (.08)	.52 – .86	.80 (.08)**	.66 – .95	.87 (.07)**	.74 – 1.00
Verbal Threat								
DASA:IV Peak	.83 (.06)*	.71 – .95	.76 (.09)*	.59 – .94	.85 (.06)*	.73 – .98	.84 (.08)*	.67 – 1.00
HCR-20 Clinical Scale Peak	.87 (.05)*	.77 – .97	.76 (.11)*	.55 – .98	.87 (.06)*	.75 – .98	.85 (.07)*	.71 – .99
Property Damage								
DASA:IV Peak	.83 (.06)$^{*}{}_{\ddagger}$	.71 – .95	.78 (.08)*	.64 – .93	.70 (.08)	.55 – .86	.76 (.09)	.58 – .94
HCR-20 Clinical Scale Peak	.65 (.09)$_{\ddagger}$	.48 – .82	.75 (.08)†	.60 – .91	.68 (.08)	.52 – .85	.77 (.09)	.59 – .95
Any Inpatient Aggression								
DASA:IV Peak	.74 (.07)*	.60 – .88	.77 (.07)**	.64 – .90	.80 (.07)**	.68 – .93	.86 (.07)**	.72 – .99
HCR-20 Clinical Scale Peak	.76 (.07)$^{*\Omega}$	.62 – .89	.75 (.07)$^{**\pi}$	.61 – .89	.81 (.07)**	.69 – .94	.93 (.05)$^{***\Omega\pi}$	.00 – 1.00§

* $p < .05$; ** $p < .01$; *** $p < .001$; † $p = .05$ to .06

§ Issues relating to complete separation were likely to have resulted to estimation problems in terms of the confidence interval.

$^{\Omega, \pi}$ Denotes significant differences when comparing the AUCs within the same row (i.e., $|z| > 1.96$).

‡ Denotes that the AUCs for the DASA:IV and HCR-20 Clinical Scale peak scores were significantly different (i.e., $|z| > 1.96$).

Table 4.17

Posthoc comparisons of predictive accuracy: Peak scores versus the rest

Measure	1 Week	1 Month	3 Months	6 Months
Interpersonal Violence				
DASA:IV Peak	–	–	5, 10, 13	3, 5, 7, 10, 13
HCR-20 Clinical Scale Peak	–	–	5, 10	1 – 3, 5, 7 – 10, 13
Verbal Threat				
DASA:IV Peak	2, 5 – 11, 13	–	3, 5, 7, 10, 13	5, 13
HCR-20 Clinical Scale Peak	2, 3, 5 – 11, 13	13	3, 5, 7, 10, 13	5, 13
Property Damage				
DASA:IV Peak	7	7, 10	–	–
HCR-20 Clinical Scale Peak	8, 11	7, 10	–	–
Any Inpatient Aggression				
DASA:IV Peak	5, 7, 10	7, 9, 10, 13	10	2, 5 – 11, 13
HCR-20 Clinical Scale Peak	5, 7, 10	7, 10, 13	10	1 – 11, 13

Note: The AUCs of the above listed risk assessment measures were significantly different from the AUCs of DASA:IV or HCR-20 Clinical scale peak scores (i.e., $|z| \geq 1.96$).
1 = HCR-20 Total; 2 = HCR-20 Historical scale; 3 = HCR-20 Clinical Scale; 4 = HCR-20 Risk Management scale; 5 = LSI-R:SV; 6 = PCL-R Total; 7 = PCL-R Factor 1; 8 = PCL-R Factor 2; 9 = PCL:SV Total; 10 = PCL:SV Factor 1; 11 = PCL:SV Factor 2; 12 = START Risk; 13 = VRAG.

Table 4.18

Posthoc comparisons of predictive accuracy: Mean versus peak scores

Measure	1 Week	1 Month	3 Months	6 Months
Interpersonal Violence				
DASA:IV	Mean > Peak	–	–	Mean > Peak
HCR-20 Clinical Scale	–	–	–	–
Verbal Threat				
DASA:IV	Mean > Peak	–	–	–
HCR-20 Clinical Scale	–	–	–	–
Property Damage				
DASA:IV	–	–	–	–
HCR-20 Clinical Scale	Mean > Peak	–	–	–
Any Inpatient Aggression				
DASA:IV	Mean > Peak	–	–	–
HCR-20 Clinical Scale	–	–	–	–

Chapter Five

Discussion

5.1 Overview

The aims of the present study were to compare the predictive accuracy of static and dynamic risk assessment measures for violence in the short (i.e., few days to 1 month) and medium (i.e., 3 to 6 months) terms within a forensic psychiatric inpatient setting, as well as to determine the timeframes during which these risk assessment measures were most suited for predicting violent behaviour in a forensic psychiatric sample. Furthermore, this study sought to compare the predictive accuracy of short-term average and the peak risk states (as measured by risk assessment measures) for the various types of inpatient aggression.

The research aims were achieved by comparing (1) the predictive accuracy of the various static and dynamic risk assessment measures (i.e., between measures) for interpersonal violence, verbal threat, property damage, and any inpatient aggression; (2) the predictive accuracy of each measure across the follow-up periods (i.e., within measures); and (3) the predictive accuracy of the mean and peak scores of two dynamic violence risk assessment measures, the DASA:IV and the HCR-20 Clinical scale. These research aims enabled the testing of intuitive but untested assumptions about the utility of static and dynamic risk assessment measures for predicting violent and nonviolent behaviours in a forensic inpatient context. Considering that risk assessment measures are

comprised of different combinations of static and dynamic risk factors, clarification of these assumptions will contribute to the understanding about the trajectories of both the static and dynamic violence risk factors over time. Moreover, these research aims can also inform about the suitability of using a short-term average or peak measure of risk states for predicting various types of inpatient aggression in a forensic inpatient setting.

In terms of organisation, this chapter will first summarise the key findings of this study. The findings of this study will then be discussed in the context of the hypotheses, and further compared with previous research to determine the presence of any parallels or inconsistencies. Having addressed the key findings, hypotheses, and comparisons with previous research, the clinical implications of the findings will be discussed. The discussion will also examine the limitations and methodological issues of this study, and will conclude by suggesting future directions for research.

5.2 Key Findings

This section provides a summary of the key findings that had emerged from this study.

5.2.1 Dynamic Measures Were More Accurate for Very-short-term Predictions

Overall, the DASA:IV and the HCR-20 Clinical scale were predictive of interpersonal violence, verbal threat, property damage, and any inpatient aggression in the short term (i.e., 1 day to 1 month). However, they were generally

significantly more accurate in the very short term (i.e., 1 day to 1 week) than the slightly longer term (1 month). In particular, there were significant differences between the predictive accuracy for inpatient aggression (with the exception of interpersonal violence) between the very short term (i.e., 1 day to 1 week) and the short term (i.e., 1 month) for both the DASA:IV and the HCR-20 Clinical scale. The DASA:IV significantly predicted all forms of inpatient aggression across the follow-up periods. Similarly, the HCR-20 Clinical scale also predicted all forms of inpatient aggression with the exception of interpersonal violence during the 1-day follow-up.

5.2.2 Dynamic Measures Were Also Accurate for Short- to Medium-term Predictions

Notwithstanding the DASA:IV and the HCR-20 Clinical scale's higher predictive accuracy in the very short term, most of the dynamic risk assessment measures (with the exception of the LSI-R:SV) significantly predicted inpatient aggression between 1 to 6 months. Therefore, they were considered to be useful for short- to medium-term predictions of inpatient aggression within the forensic inpatient context. The HCR-20 Clinical and START Risk scales also significantly predicted interpersonal violence, and any inpatient aggression, respectively, during 1-week follow-up. These dynamic risk assessment measures generally showed acceptable and outstanding predictive accuracy for inpatient aggression over the follow-up periods. Further, a closer examination of the HCR-20 revealed that its Clinical and Risk Management scales could be largely responsible for the

HCR-20 Total score's predictive accuracy in the short to medium term within the forensic inpatient setting, as the Historical scale had performed inadequately.

As noted, the LSI-R:SV was the only dynamic risk assessment measure that performed poorly when used to predict inpatient aggression in the short to medium term. Although the LSI-R:SV showed mediocre to excellent predictive accuracy for property damage, its predictive accuracy for interpersonal violence, verbal threat and any inpatient aggression was poor to mediocre. Apart from predicting property damage, the LSI-R:SV did not significantly predict other types of inpatient aggression across the follow-up periods. On the other hand, the START Risk scale was particularly suited for predicting inpatient aggression in the short to medium term. It significantly predicted interpersonal violence, verbal threat, and any type of inpatient aggression during most of the follow-up periods, and showed acceptable to outstanding levels of predictive accuracy for all types of inpatient aggression across the follow-up periods. Moreover, the START Strength scale was complementary to its Risk scale (see 5.2.5 for details).

5.2.3 Static Measures Were Inadequate for Short- to Medium-term Predictions

Static measures, such as the HCR-20 Historical scale, the PCL-R, the PCL:SV, and the VRAG were generally inadequate for predicting inpatient aggression in the short to medium term (i.e., 1 week to 6 months). In particular, these measures generally showed poor to mediocre predictive accuracy, and did not significantly predict inpatient aggression in the short to medium term. It was, however, noted that these static risk assessment measures demonstrated acceptable predictive

accuracy for predicting property damage. In comparison with the dynamic risk assessment measures, the static risk assessment measures were generally inferior to the former when used to predict inpatient aggression in the short to medium term of 1 week to 6 months.

5.2.4 Means Were Better Than Peak Scores for Predicting Inpatient Aggression

The mean and peak scores of the DASA:IV and HCR-20 Clinical scale were examined to determine whether they were useful for predicting inpatient aggression in the forensic inpatient setting. The comparisons revealed that the mean scores were significantly more accurate than the peak scores for predicting inpatient aggression in the very short term (i.e., 1 week), but the differences between the mean and peak scores were generally nonsignificant in the subsequent follow-up periods.

5.2.5 Protective Factors Predicted Nonoccurrence of Inpatient Aggression

The START Strength scale, which is a measure of protective factors and resilience (Webster et al., 2004, pp. 27–28), significantly predicted the nonoccurrence of interpersonal violence, property damage, and any inpatient aggression within the forensic inpatient context. In particular, it significantly predicted the nonoccurrence of interpersonal violence during the 1- and 3-month follow-ups, as well as property damage and any inpatient aggression during 1-, 3-, and 6-month follow-ups. However, it did not significantly predict the nonoccurrence of making verbal threats.

To reiterate, five key findings have emerged from this present study, they are: (1) dynamic measures are more accurate for predicting inpatient aggression in the very short term than the short term; (2) dynamic measures also showed adequate predictive accuracy for short-to medium-term predictions of inpatient aggression within a forensic inpatient context; (3) static risk assessment measures were generally inadequate for predicting inpatient aggression in the short to medium term; (4) short-term averages of risk states were significantly more accurate than the peak risk states for predicting inpatient aggression in the very short term, but both predicted well in the medium term; and (5) protective factors significantly predicted the nonoccurrence of interpersonal violence, property, and any inpatient aggression. These findings have the potential to make a significant contribution to the violence risk assessment field, and the clinical and practical implications will be discussed in the latter sections of this chapter.

5.3 Test of Hypotheses and Comparisons with Past Research

This section will examine the research aims and hypotheses in relation to the key findings of this study, and these key findings will then be discussed in the context of past research where available.

5.3.1 What is the Predictive Accuracy of Static and Dynamic Measures in Short to Medium Term?

One of the aims of this study was to compare the predictive accuracy of dynamic risk assessment measures for violence with static risk assessment

measures over short term (i.e., 1 week and 1 month), and longer-term follow-up periods (i.e., 3 months and 6 months) in a forensic psychiatric inpatient setting, as well as to determine the timeframe during which they were most suited for predicting violent behaviour in a forensic psychiatric sample. To investigate this research question, the first hypothesis of this study was formulated accordingly:

> There will be significant differences in the predictive accuracy of dynamic and static risk assessment measures for inpatient aggression – specifically, the dynamic risk assessment measures would be more accurate than the static risk assessment measures in the short term (e.g., 1 week to 1 month), and vice-versa for longer time periods.

As described in sections 5.2.1 to 5.2.3 (pp. 144–147), the key findings of this study suggest that there is partial support for the abovementioned hypothesis. In particular, dynamic risk assessment measures appeared to be more generally accurate than static risk assessment measures at predicting inpatient aggression in the short to medium term. However, static risk assessment measures were also mostly inferior to dynamic risk assessment measures with regard to predicting inpatient aggression even at slighter longer time periods (such as at 3- and 6-month follow-ups). Although there were no comparisons of predictive accuracy between the static and dynamic risk assessment measures in the very short term (i.e., a few days to a week), this study has demonstrated that dynamic risk assessment measures (e.g., the DASA:IV and the HCR-20 Clinical scale) were more accurate for predicting inpatient aggression in the very short term (1 day to 1 week) as compared with the short term (1 month) within a forensic inpatient

context. Presumably, the items on these dynamic risk assessment measures were sensitive to the changes in dynamic risk factors (e.g., negative affect and psychotic symptoms) that were operating within the context and population.

When the predictive accuracy of the risk assessment measures from this study is compared to the available literature, the findings are generally consistent, but there are also some differences. Nevertheless, a caveat should be lodged at this point about the difficulty with the direct comparisons with past literature given the relative lack of empirical scrutiny on the predictive accuracy of risk assessment measures in the very short- and short-term follow-ups.

Dynamic Appraisal of Situational Aggression. In this study, the DASA:IV showed mediocre to outstanding levels of predictive accuracy for inpatient aggression during follow-ups of a day to a month. In particular, it was generally more accurate in predicting inpatient aggression in the very short term (1 day to 1 week) as compared with the slightly longer term (1 month). For the very short term, it was very accurate for predicting verbal threats (AUCs = .87 to .90) and property damage (AUCs = .82 to .84), and moderately accurate for interpersonal violence (AUCs = .66 to .72) and any inpatient aggression (AUCs = .76 to .78). The DASA:IV also significantly predicted all types of inpatient aggression at 1-month follow-up, but with significantly lower AUCs than those obtained in the very short term (i.e., 1 day to 1 week). The DASA:IV's good predictive utility in the inpatient setting is expected considering that it has been designed specifically for the use within an inpatient setting. Moreover, the DASA:IV comprises strictly dynamic violence risk factors, and its coding criteria are based on behavioural markers that

are typically observed within the inpatient setting. These items are not only directly pertinent to the inpatient context, but they are also relatively easy and quick to code. The results from the present study were generally consistent with past studies in terms of predicting interpersonal violence in the next 24 hours. However, there were also some differences. For example, when compared with Ogloff and Daffern's (2006) validation study, the predictive accuracy for interpersonal violence in the next 24 hours was somewhat lower (AUCs = .82 vs. .66). It is, however, noted that other studies (i.e., Barry-Walsh et al., 2009; Daffern & Howell, 2007) had obtained similar results as this study in spite of differences in the samples. On the other hand, this study obtained somewhat higher predictive accuracy for property damage than Barry-Walsh et al.'s study (AUCs = .82 vs. .67).

One possible explanation for this difference could be the differences in the context of the environment. Specifically, the current study was conducted in a high secure forensic psychiatric hospital, whereas in Barry-Walsh et al. (2009), the study took place in a low secure forensic psychiatric hospital. Although interpersonal violence is likely to be reported when it occurs (either by the victim or staff), property damage might not be observed or reported depending on the severity of the damage and level of staff supervision. This could lead to an underreporting of the recidivistic outcome and may affect the prediction indices for the measures. When compared to a similar acute dynamic risk assessment measure, the predictive accuracy of the DASA:IV appeared to be comparable to the BVC; specifically, the latter's predictive accuracy (AUC) for interpersonal violence (24-hour follow-up) ranged from .69 to .82 (Almvik et al., 2000, 2007).

Until now, there is no study that has examined the predictive accuracy of the DASA:IV beyond 24 hours.

Historical, Clinical, Risk Management – 20 Factors. In the present study, the predictive accuracy for the HCR-20 Total, Clinical and Risk Management scales were generally within the acceptable range of predictive accuracy, whereas its Historical scale was generally predicting inpatient aggression at a mediocre level. The HCR-20 consists of a mixture of risk factors that are either static (10 items in the Historical scale) or dynamic (five items in each of the Clinical and Risk Management scales) in nature. Therefore, it is unsurprising that the Total score, as well as the Clinical and Risk Management scales were accurate for predicting inpatient aggression in the short to medium term. In fact, the Clinical scale was found in this study to be generally predictive of inpatient aggression in the very short term, which suggests that the Clinical scale items are able to encapsulate fluctuations in the risk states of the patients. In addition, the results from the present study also suggest that the Risk Management scale is fairly accurate for predicting inpatient aggression in the short to medium term. Apart from predicting verbal threat, the Risk Management scale appears to be comparable to the Clinical scale in terms of predicting inpatient aggression in the short to medium term.

In comparison, Douglas and Reeves (2010) reported that the HCR-20 Total score predicted recidivistic outcomes in forensic psychiatric samples with mediocre predictive accuracy (AUCs .60 to .69) in 37% (20/54) of the studies, 29.6% (16/54) obtained AUCs of .70 to .79, and 14.8% (8/54) had AUCs of .80 to .89. For

the Historical scale, the majority of the reviewed studies (45%, 18/40) had obtained AUCs of .60 to .69; 20% (8/40) reported AUCs of .70 to .79, and 10% (4/40) had AUCs of .80 to .89. For the Clinical and Risk Management scales, the breakdown was accordingly: for AUCs of .60 to .69: 36.6% (15/40) and 54.3% (19/35) respectively; for AUCs of .70 to .79: 30% (12/40) and 11.1% (4/35); and for AUCs of .80 to .89: 2.4% (1/41) and 2.9% (1/35). However, it is noted that many of these studies had examined discharged patients and had often examined longer follow-up periods. A more useful comparison (as described in the next paragraph) would be to examine the current findings with those from studies conducted in forensic inpatient settings within similar follow-up periods.

Several studies that had followed up patients for 6 months or less are extracted from the list of studies on the HCR-20 that were previously presented in Table 2.1 for comparisons (see Table 5.1 for an extraction of these studies). Overall, the results from these extracted studies are generally comparable to the current study's findings after accounting for the differences in follow-up periods. However, Grevatt et al.'s (2004) predictive accuracy of the Historical scale for nonviolent and any inpatient aggression seems markedly discrepant from those from the present study as well as other comparative studies. It is unclear as to why the predictive accuracy for verbal threat, property damage, and any inpatient aggression is much lower in the study conducted by Grevatt and colleagues given the similarities in the characteristics of the samples and contexts.

Table 5.1

An extracted list of published studies on the HCR-20 (≤ 6-month follow-up)

HCR-20	Study	$M_{follow\text{-}up}$	Predictive Accuracy (AUC) Violent	Nonviolent	Any
Total	Fujii et al. (2005)	193 days			.58 – .73
	McNiel, Gregory, et al. (2003)	9.5 days[ø]	.65		
"H"	Doyle et al. (2002)	12 wks	.70	.66	
scale	Fujii et al. (2005)	193 days			.47 – .62
	Gray et al. (2003)	3 mths	.77	.73[v], .82[p]	
	Grevatt et al. (2004)	6 mths	.54	.28[v], .32[p]	.40
	McNiel, Gregory, et al. (2003)	9.5 days[ø]	.56		
	Nicholls et al. (2004)	108 days	.56[m], .57[f]		.58[m], .69[f]
"C"	Daffern & Howells (2007)	24 hrs	.63		
scale	Fujii et al. (2005)	193 days			.58 – .74
	Gray et al. (2003)	3 mths	.79	.74[v], .77[p]	
	Grevatt et al. (2004)	6 mths	.60	.81[v], .65[p]	.72
	McNiel, Gregory, et al. (2003)	9.5 days[ø]	.77		
	Nicholls et al. (2004)	108 days	.55[m], .62[f]		.58[m], .70[f]
	Ogloff & Daffern (2006)	24 hrs	.75		
"R"	Fujii et al. (2005)	193 days			.55 – .73
scale	McNiel et al. (2003)	9.5 days[ø]	.58		

Note: "Violent," "nonviolent," and "any" refers to physical violence, verbal threat/property damage, and any inpatient aggression respectively.
[ø] denotes the median length of follow-up instead of mean.
[m, f, v, p] denote male, female, verbal threat, and property damage respectively

Notwithstanding that Gray et al. (2008) had examined discharged psychiatric patients, it was noteworthy that the predictive accuracy of the HCR-20 scales for violence over time periods of 6 months to 5 years showed that the Clinical scale was generally mediocre at predicting violence even at 6-month follow-up (i.e., medium term) (AUC = .61), and was much poorer than the Historical scale (AUC = .77) in terms of predictive accuracy; the Risk Management scale's predictive accuracy (AUC) for violent recidivism was at .69. In contrast, the results from this study showed that the Clinical and Risk Management scales

performed much better than the Historical scale at 6-month follow-up (as well as during shorter follow-up periods) when used to predict all forms of inpatient aggression.

Level of Service-Revised: Screening Version. As discussed previously in Chapter Two, there is a lack of research on the predictive accuracy for the LSI-R:SV when compared to the LSI-R or the LS/CMI. Although the LSI-R:SV showed mediocre to acceptable predictive accuracy for property damage across the follow-up periods in this study, its predictive accuracy for interpersonal violence, verbal threat, and any inpatient aggression were generally poor to mediocre. In comparison, other studies have shown the LSI-R:SV's predictive accuracy for inpatient violence was mediocre (AUC = .60), acceptable for general inpatient misconduct (AUC = .74), and poor to acceptable for violent recidivism (AUCs of .50 to .71) (Daffern, Ogloff, et al., 2005; Ferguson et al., 2009; Thomas et al., 2009; Yessine & Bonta, 2006). Restricting the comparisons to the studies conducted within forensic inpatient settings, the current findings show that the predictive accuracy of the LSI-R:SV is generally consistent with Daffern, Ogloff, et al.'s findings (12-month follow-up), but is somewhat lower than Thomas et al.'s (2-year follow-up). Comprising of eight items that assess seven criminogenic domains, the LSI-R:SV may be too broad in its focus, thus not examining the relevant risk factors that are associated with some types of inpatient aggression in the short to medium term. In contrast, Thomas et al. had examined inpatient aggression over a longer follow-up period, but had obtained much better predictive accuracy for general inpatient misconduct using a subset of the risk factors in the LSI-R:SV. Moreover, Ferguson et al. have found that the LSI-R:SV was not particularly

accurate when it was used to predict recidivistic outcomes in offenders with substance abuse issues, and it is noted that almost three quarters of the current sample had a substance abuse diagnosis during the index admission. This could have further contributed to the poor predictive accuracy of the LSI-R:SV that was found in the current study. Moreover, the LSI-R:SV was designed to measure general rather than violent recidivistic outcomes per se. Taken together, the current findings suggest that the LSI-R:SV was an inadequate measure for predicting aggression and violent behaviour within an inpatient context in the short to medium term.

Psychopathy Checklist. Previous meta-analytical reviews (Guy & Douglas, 2006; Lestico et al., 2008) have suggested that the PCL measures are useful for predicting violent and general recidivism as well as institutional misconduct. However, many of the studies that were reviewed have either examined correctional or discharged psychiatric samples. Moreover, there was also much variability in the length of follow-ups for the studies that were reviewed. These reviews have undoubtedly clarified whether the PCL measures can predict recidivism or institutional misconduct *in general*, but have not elucidated on the issue of predictive accuracy in different follow-up periods. Furthermore, most studies have looked at the relationship between psychopathy measures and any inpatient aggression at *any* time during the inpatient stay using single time-point evaluations. In the present study, the PCL measures showed poor to acceptable predictive accuracy for inpatient aggression during the follow-up periods.

Taking into account of the length of follow-up, the results of the current study were generally comparable to those from previous studies that were conducted on forensic psychiatric samples (see Table 5.2 for an extracted list of published studies on the PCL measures). It is noted that the PCL measures were poor for predicting verbal threat in the short term (i.e., 1 week to 1 month), but showed acceptable predictive accuracy for interpersonal violence and property damage. This could be, in part, due to the PCL measures' lack of sensitivity to rapid changes in dynamic variables (e.g., irritability, disagreeableness, and psychotic symptomatology) that were operating within the forensic psychiatric inpatient context.

Table 5.2

An extracted list of published studies on the PCL measures (≤ 6-month follow-up)

			Predictive Accuracy (AUC)		
PCL	Study	$M_{follow\text{-}up}$	Violent	Nonviolent	Any
PCL-R	Gray et al. (2003)	3 mths	.70	.60[v], .76[p]	
Total	Walter & Heilbrun (2010)	6 mths			.57 – .63[$]
PCL:SV	Dolan & Davies (2006)	12 wks	.65		.65
Total	Doyle et al. (2002)	12 wks	.76	.74	
	McNiel, Gregory, et al. (2003)	9.5 days[ø]	.61		
	Nicholls et al. (2004)	108 days	.59[m], .63[f]		.60[m], .72[f]
	Vitacco et al. (2009)	6 mths			.54

Note: "Violent," "nonviolent," and "any" refers to physical violence, verbal threat/property damage, and any inpatient aggression respectively.
[ø] denotes the median length of follow-up.
[$] denotes that AUCs are for Facet scores instead of total score.
[m, f, v, p] denote male, female, verbal threat, and property damage respectively

Short-Term Assessment of Risk and Treatability. The results from the current study suggest that the START has good potential for predicting inpatient

aggression in the short to medium term within a forensic psychiatric setting. In particular, the START significantly predicted interpersonal violence, verbal threat, and any inpatient aggression during most of the follow-up periods. Its predictive accuracy for interpersonal violence (AUCs = .71 to .78), verbal threat (AUCs = .74 to .84), property damage (AUCs = .68 to .79), and any inpatient aggression (AUCs = .71 to .82) also remained fairly stable across the follow-up periods. Similar to the DASA:IV, as well as the HCR-20 Clinical and Risk Management scales, the START consists of strictly dynamic risk factors and has been designed for use in a context where relatively rapid fluctuations in clinical presentation of psychiatric patients are expected. Therefore, these results appear to be in line with its intended purpose.

Compared to Nicholls et al.'s study (2006), which had a 12-month follow-up, the START showed slightly higher predictive accuracy for the inpatient aggression in this study. On the other hand, the predictive accuracy for interpersonal violence was somewhat lower in Desmarais et al.'s (2010) study, which had a 6-month follow-up; the predictive accuracy for verbal threat and property damage was similar to those found in this study. A possible reason for these differences in findings could be due to dissimilar rating systems in the studies for the START items. Specifically, this current study has examined the predictive utility of the START Risk and Strength scales separately (i.e., the 20 START items were rated on both scales) as recommended in the START manual (Webster et al., 2004, p. 28); whereas it is noted that Nicholls et al. and Desmarais et al. had combined both the Risk and Strength scales together by using a continuous 6-point rating scale for each of the 20 items. As stated in Webster et

al. (p. 28), "a client can have both risks and strengths simultaneously," and by rating them on a single continuous scale the "actual" effects of the risk and strength items could be attenuated in the process, which may affect the predictive accuracy of the measure. Unfortunately, there is no other study, to the best of the author's knowledge, which has examined the predictive accuracy of the START Strength scale. The results of this study suggest that the START Strength scale complements the Risk scale, and the former appears to hold promise for predicting nonoccurrence of inpatient aggression in the short to medium term. Moreover, these findings are also consistent with the preliminary research findings on a relatively new, 17-item measure of protective factors, the Structured Assessment of Protective Factors for Violence Risk (SAPROF) (de Vogel, de Ruiter, Bouman, & de Vries Robbé, 2009). In particular, de Vries Robbé and de Vogel (2009) protective factors are accurate at predicting violent (non)recidivism.

Violence Risk Appraisal Guide. In this study, the VRAG was generally inadequate for predicting inpatient aggression in the short to medium term, and was typically poorest at predicting outcomes during 1-week follow-up but would improve slightly (albeit nonsignificantly) with longer follow-ups. Although the VRAG showed acceptable predictive accuracy for property damage, these predictions during the various follow-up periods did not reach statistical significance (at $p < .05$ level). Again, it is unsurprising, as with the HCR-20 Historical scale and the PCL measures, that the VRAG was generally inadequate for predicting inpatient aggression especially in the short term given its focus on static and historical factors. As discussed previously, static factors have their role

in risk assessment and are good predictors of inpatient aggression or recidivistic outcomes in the long run, but they have much less utility in the short term as they do not encapsulate information arising from rapid changes (Douglas & Skeem, 2005; Quinsey et al., 2006). Dynamic factors, on the other hand, are better predictors of inpatient aggression or recidivistic outcomes in situations where there are rapid changes in risk state (Douglas, Ogloff et al., 1999; McNiel, Gregory, et al., 2003).

Notwithstanding the amount of research conducted on the VRAG, only two published studies have examined the predictive accuracy of the VRAG in forensic psychiatric settings during the short to medium term (i.e., up to 6 months). Specifically, Doyle et al. (2002) found that the VRAG's predictive accuracy for violent and nonviolent inpatient behaviour during a 12-week follow-up was .71 and .64 respectively; whereas, Snowden et al. (2009) reported that the VRAG's predictive accuracy for violent inpatient behaviour was .54 during a 6-month follow-up. The current study's results are more similar to Snowden et al.'s. In particular, the predictive accuracy for interpersonal violence was somewhat lower in this study (AUCs = .54).

In summary, dynamic risk assessment measures were shown to be accurate for predicting inpatient aggression in the very short term, and also appeared, in general, to be more accurate than static risk assessment measures at predicting inpatient aggression in the short to medium term. Accounting for differences in contexts, sample characteristics and follow-up periods, the results from this study are generally consistent with the existing literature. The intuitive,

but untested, assumption that the dynamic measures are better than the static measures for predicting inpatient aggression in the shorter follow-ups appears to be substantiated.

5.3.2 Can Short-term Average and Peak Scores Provide Accurate Predictions?

In addition to the aforementioned aim of comparing the predictive accuracy of static and dynamic risk assessment measures in the short to medium term, this study also sought to compare the predictive accuracy of short-term average and the peak risk states for inpatient aggression. Therefore, the second hypothesis proposed that:

> The short-term average of multiple dynamic risk assessment evaluations (i.e., mean score of the multiple risk ratings) and the peak dynamic risk scores would provide accurate predictions of risk in the medium term during hospitalisation, and that there are no significant differences in predictive accuracy for inpatient aggression between the mean and peak scores.

As described in section 5.2.4 (p. 147), the results suggest that there is partial support for the second hypothesis. Overall, the mean and peak scores of the DASA:IV and the HCR-20 Clinical scale were generally predictive of inpatient aggression in the forensic inpatient setting with a few exceptions. For example, the peak scores did not appear to be useful for predictions of interpersonal violence in the short term, and the peak scores of the HCR-20 Clinical scale also did not significantly predict property damage across the follow-ups. Although

these static measures (using single-point evaluation methodology) are purportedly more accurate at predicting inpatient aggression over the longer term, the mean and peak scores of two acute dynamic risk assessment measures have outperformed them in this study, even for longer periods of 3 to 6 months. Clearly, there are advantages to use repeated measures in dynamic violence risk assessment, but such mean and peak scores may be useful for making management decisions during weekly review meetings in hospital wards.

Further comparisons revealed that the mean scores were significantly more accurate than the peak scores for predicting inpatient aggression in the very short term (i.e., 1 week), but the differences between the mean and peak scores were generally nonsignificant in the subsequent follow-up periods. These results, in aggregate, suggest that the mean and peak scores can be useful indices for predicting inpatient aggression within inpatient settings in the short to medium term, but the former is likely to be the more accurate measure in the acute short term. One possible explanation for the utility of short-term averages of risk states is that the "attenuation" of the individual peak and trough risk scores through the use of means would also reduce the error variance of these extreme states when they are used for predictions, thus improving the predictive accuracy of the measures. On the other hand, the peak scores are associated with the peak risk states, which indicate that there are many dynamic risk factors present at the point of evaluation. These risk factors, depending on their potential for change, sensitivity to time, and interaction with the environment, may continue to have significant effects on the violence risk that is posed by the individuals. Although the peak scores were fairly accurate for predicting violent risk states in the short

to medium term, they may be useful for predicting the severity of violent behaviours over the longer term. However, this hypothesis needs to be investigated in future research.

5.4 Using Static or Dynamic? Clinical and Practical Implications

The findings of the current study have several significant implications regarding the use of static and dynamic risk assessment measures in forensic inpatient settings.

First, the results speak to the necessity of conducting repeated violence risk assessments of inpatients using relevant dynamic measures that are suited for both an inpatient context, and the short to medium term. Moreover, single-point risk evaluations using static risk assessment measures should be avoided, as they are inadequate for predicting inpatient aggression during hospitalisation in the short to medium term. It is also important to consider the predictive accuracy of the risk assessment measures for different time frames and different types of inpatient aggression. Those measures that consist of dynamic or clinically relevant variables are likely to play an important role in predicting violence in the short term (Douglas, Ogloff, et al., 1999; McNiel, Gregory, et al., 2003), whereas static methods may be more suited for medium- (or may be even longer) term predictions. That said, dynamic risk measures do not necessarily work well in every context or with any population in the short to medium term; much also depends on the relevance of the items to the outcomes that are examined. For example, the LSI-R:SV did not appear to be predictive of inpatient aggression in

this study despite its focus on relatively stable dynamic risk factors, this highlights the need to use relevant risk assessment measures for specific purposes. Clearly, few assessment measures (or none) are deemed excellent for short- to long-term predictions of violence risk across all contexts and thus, it is reasonable to expect that a combination of risk assessment measures may be required to formulate an individual's short- to long-term potential for violence risk. More importantly, it is imperative that we understand how the static and dynamic risk factors interact.

Second, static risk factors for violence, which are typically included in many actuarial measures, contribute toward a formulation of risk status – a baseline level of risk that is relative to other people and can indicate interindividual differences in risk (Douglas & Skeem, 2005). Static risk factors have very limited potential to encapsulate rapid changes in risk during short- to medium-term time frames. In contrast, risk state, which is based on predominantly dynamic factors, focuses on the intraindividual variability of violence potential fluctuates as a function of biological, psychological or social situations. Accurate acute to medium-term assessments are based on assessments using measures that comprise dynamic or clinically relevant variables. Notwithstanding that past violent behaviour is strongly correlated with future violent behaviour (e.g., Daffern et al., 2007b; Grassi et al., 2006; Klassen & O'Connor, 1988a; Lussier et al., 2010), clinicians should not jump to the (erroneous) conclusion that a history of past violent behaviours is an indication of high risk for inpatient violence, without careful considerations of dynamic risk factors, as well as situational and contextual information.

Third, in addition to the consideration of risk factors, clinicians should also assess protective factors during the course of assessment as shown by the utility of the START Strength scale in predicting the nonoccurrence of inpatient aggression. Although clinicians are often concerned with the identification of risk factors for intervention, the results from this study (which are consistent with the findings on the SAPROF – a measure of protective factors for violence risk; de Vries Robbé & de Vogel, 2009) suggest that the identification of protective factors can assist with the assessment of the risk for violence. On a related matter, risk assessment measures would, as the current findings suggest, benefit from including a measure of strengths or protective factors. For example, the START Risk scale is well complemented by its Strength scale for usage within a forensic context during the short to medium term.

Fourth, it appears that the short-term average of multiple dynamic risk assessment evaluations (i.e., mean score of the multiple risk ratings) and the peak dynamic risk scores can provide accurate predictions of risk in the medium term during hospitalisation. Moreover, these indices are comparable to, if not better than, a static or dynamic risk assessment evaluation at a single time point for the same follow-up period. Such a short-term average of risk states is not a contraindication to the need for repeated evaluations of risk (as indicated in the first point of discussion on pp. 163–164), but rather it complements the process. More specifically, multiple evaluations of risk states are needed to assess and manage the individuals whose clinical presentations can potentially fluctuate rapidly due changes in their psychiatric symptomatology or the situational

characteristics within a restrictive environment (Daffern, Howells, & Ogloff, 2007a; Douglas & Skeem, 2005).

These repeated assessments can inform the clinicians whether the individuals are likely to perpetuate violent or other problematic behaviours in the immediate or near future (e.g., next shift or 24 hours), so that they can implement preventive strategies to avert imminent inpatient aggression. However, these daily assessments are less useful in the longer term if they are considered as single time points because they pertain only to the risk states at a certain point in time. Risk state can change rapidly and its clinical significance for that particular point in time becomes less relevant over time. In the longer term, a short-term average of risk states (i.e., the average of daily risk state evaluations) can provide clinicians with a measure of the general level of (stable dynamic) risk over a specified period of time that would also account for the fluctuations in the risk state. These indices may be useful for clinical teams when reviewing the treatment progress and the management plans during their weekly multidisciplinary team meetings.

Finally, the findings on the short-term average and peak risk states may provide preliminary information as to whether it is more accurate for clinicians to consider the "average" or "peak" risk states over a specified assessment period when scoring dynamic or clinical items on other risk assessment measures. Currently, risk assessment measures (e.g., the HCR-20) do not provide explicit instructions whether to consider the peak or average risk state when rating the dynamic or clinically relevant items. It is possible that many clinicians and ward

staff are more concerned about the peak, rather than the average, risk states conducting violence risk assessments. The findings of this study suggest that clinicians may obtain more accurate evaluations of risk, at least for the short term, if they consider the average rather than the most severe risk states when rating the risk assessment measures. This may offer possibilities for improving risk assessment coding procedures in the future.

In summary, the key findings from this study have contributed to a better understanding of what type of risk assessment measures are suitable for assessing short- and medium-term propensities for violence in the forensic inpatient context. In addition, the results of this study highlight the necessity of conducting multiple assessments of short-term risk within the forensic inpatient setting to improve the prediction of inpatient aggression, and also suggest that short-term averages of risk states may be a suitable index for assessment and management purposes in the short to medium term. Such knowledge can assist with the development of more accurate and efficient risk assessment procedures, so as to better manage offenders with mental illnesses within the institutions. Consequently, these improved assessment and management procedures can lead to better outcomes and safety for the offenders and hospital staff.

5.5 Limitations and Methodological Issues

There were several limitations and methodological issues in this study that must be taken into consideration when examining the results and drawing conclusions. First, although prospective data collection methods were used for

part of this study (i.e., when investigating the predictive accuracy of the DASA:IV and the HCR-20 Clinical scale in the very short term), the majority of this study employed retrospective methodology to examine the predictive utility of various static and dynamic risk assessment measures. As such, the study generally relied on data collected for the purpose of assessment and management of clinical disorders and behaviours within the inpatient units, and the data were not necessarily always useful for the specific purposes of the research questions or coding of all the risk assessment measures.

For example, although the case files contained highly specific and useful notes on sociodemographic, behavioural, and mental health information (on average, 1–2 pp. of observation notes were recorded for each patient per day) to characterise the sample and retrospectively code several risk assessment measures, it was more difficult to code some items incorporated within the Facet 1 on the PCL measures without a face-to-face interview where the assessor could gather information and nuances that would otherwise inform about the interpersonal style of the participant. Using a retrospective coding methodology, the author had to rely on behavioural descriptions of the participants' interaction styles and affective characteristics. This was likely to yield less accurate information (and risk assessment ratings) than a face-to-face interview. Nevertheless, it is noted that there is support for the use of file and archival information in the retrospective scoring of risk assessment measures (e.g., Gray et al., 2008).

Second, as case file reviews were used to track the incidents of inpatient aggression, there would be an inevitable underestimate of inpatient aggression due to the further misconduct not having been disclosed or observed. Moreover, the Thomas Embling Hospital is a high-secure forensic psychiatric hospital, and with a high staff to patient ratio, the frontline staff members were likely to have identified and diffused many instances of potentially violent behaviour via psychological (e.g., counselling or relaxation), biological (e.g., medication) and/or social (e.g., social or sporting activities) interventions before the undesirable conduct escalated. Such strategies, as part of the hospital's standard operating procedures, were likely to have reduced the frequency of the violent behaviours and other misconduct that were exhibited by the participants. For example, the hospital staff members might have noted that the participants were showing unstable risk states (and had given the participants high scores on the dynamic risk assessment measures accordingly), but inpatient aggression was subsequently averted due to the staff members' proactive administration of intervention strategies. Such an outcome would lead to a lower predictive accuracy for the risk assessment measure even if it had accurately predicted the potentially violent risk state. Therefore, it is likely that the reported predictive accuracy of the examined risk assessment measures in this study is a conservative estimate of the actual predictive accuracy, and this is a general issue noted by many researchers.

Third, the ward staff could have considered the most severe risk states when they rated the DASA:IV and the HCR-20 Clinical scale. If so, this could somewhat confound the results on the mean and peak risk state predictive

indices, as the short-term average of risk states will then, in essence, be a short-term average of the most severe risk states. Future research should provide clear instructions for such considerations, so that the utility of these indices can be further evaluated.

Another limitation of this study was the sample size, and the associated increased risk of committing Type II errors (i.e., not finding a difference between groups when one actually exists). Although the use of Receiver Operating Characteristics and its nonreliance on base rates may negate the extent of this limitation to some degree, the reader should be cautious about drawing conclusions from the lack of differences in the posthoc comparisons across the time periods and between measures, especially in the longer term (i.e., at 6-month follow-up) where the participants available for analyses are smaller. Conversely, the reader can be relatively confident that the significant findings that emerged from this study were reliable and valid, and not a result of Type I errors (i.e., observing a difference or a relationship when there was none).

Notwithstanding these limitations and methodological issues, this study provides a novel comparison of the predictive accuracy of the various risk assessment measures over different time periods, and has yielded much needed information on the applicability of such measures within a forensic inpatient setting during the short to medium term. The following section provides several suggestions for future research, including some strategies to overcome some of the limitations associated in this study.

5.6 Directions for Future Research

Although this study has contributed to the extant literature regarding the predictive utility of static and dynamic risk assessment measures in a forensic inpatient setting during the short to medium term, future research efforts should attempt to replicate and extend the key findings from this study in different settings, as well as to implement new investigative strategies to advance the state of science in this area of violence risk assessment research.

First, pertaining to the extensions of the present study, future research should determine whether the key findings could be replicated using a prospective methodology. In particular, it will be advantageous to use face-to-face interviews with the participants and frontline hospital staff to gather the relevant data, in addition to reviews of case file information and archival records, as these prospective data collection methods will ensure that the information collected are specific to the purpose of the research questions, and will improve the reliability of the ratings for the various risk assessment measures.

Second, future research should incorporate more extensive repeated measures designs. The present study employed daily evaluations of risk state (using the DASA:IV and the HCR-20 Clinical scale) in the short term (1 day to 1 month). However, such a repeated measures methodology can also be applied to other risk assessment measures. It will be interesting to track and assess the patients' risk level at multiple time points during, as well as at the end of, their inpatient stays. Such follow-ups, when supplemented with detailed records of clinical presentation and relevant psychological measures, can help us better

understand the predictive accuracy of static and dynamic risk assessment measures, as well as the nature and trajectories of static and dynamic risk factors within a specified time frame and different contexts (see fourth suggestion for a further discussion, pp. 172–173). Further, it will be advantageous to evaluate whether these risk assessment measures have comparable predictive utility for males and females, as several scholars have suggested that gender differences should be considered when conducting risk assessments (e.g., Coid et al., 2009; Manchak, Skeem, Douglas, & Siranosian, 2009; Nicholls et al., 2004).

Third, future research should employ larger samples in their investigations. Specifically, with larger sample sizes, we can be more confident about the significant findings (or the lack of) pertaining to the predictive accuracy of the risk assessment measures for various types of inpatient aggression or recidivistic outcomes across different follow-up periods. Future studies should also consider the recruitment of participants from civil psychiatric inpatient settings, where there is also an immense need to accurately assess and prevent inpatient violence. This will not only allow researchers to compare the nature of violence within forensic and civil psychiatric inpatient settings, but also inform about the applicability of the risk assessment measures for a different population or context. This study provides a good foundation for future research endeavours in this area.

Fourth, although the present study has shown that dynamic risk assessment measures were suited for predictions from the very short term to the medium term and that static risk assessment measures were inadequate for such

purposes, the study was unable to examine whether the opposite was true – static risk assessment measures being more accurate than dynamic measures in the long term. As such, future research should compare the predictive accuracy of static and dynamic risk assessment measures over a much longer period of time (e.g., 1 to 5 years). This can be conducted entirely within a psychiatric inpatient context (which is likely to involve forensic psychiatric patients given the relative short duration of civil psychiatric inpatient stays). In this way, we will be able to map the point at which dynamic risk factors cease to be predictive (if this is indeed what they do), and that more consideration should be given to static risk factors during violence risk assessments. Furthermore, we can determine whether there is incremental predictive improvement of dynamic risk factors beyond static ones, as well as whether the static and dynamic risk factors interact or are additive in nature.

Fifth, the mean and peak risk states over short to medium term have been demonstrated to be generally accurate and significantly predicted inpatient aggression in the short to medium term. These findings can also provide guidance about how risk assessment instruments should be rated procedurally in order to achieve the better predictive accuracy. That is, should clinicians consider the "most severe" examples or the "average" risk states over a specified period of time when rating the dynamic or clinical items of risk assessment measures? In addition, it will be interesting to examine whether peak risk states in such inpatient settings are associated with increased frequency or severity of violent behaviour within inpatient or community settings in the future.

Finally, research on protective factors has been scant when compared with the empirical literature on risk factors. Hence, it would be advantageous to expand research into the predictive utility of protective factors within the violence risk assessment field, which is currently in its infancy. In particular, how well do protective factors predict desistance from inpatient aggression? What are the trajectories of protective factors over the time? In what settings are these protective factors useful? The START has shown promise with respect to the predictive validity of its protective factors; specifically, the START Strength items can be further examined for use within the community, as well as its predictive utility for longer follow-ups. These can also be compared with other violence risk assessment measures that examine protective factors. However, it is noted that there are few available risk assessment measures that have systematically incorporated protective factors into their assessment approaches. In addition to the START, other notable examples of risk assessment measures that examine protective factors include the LS/CMI and its derivative for use with youth – the Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge, Andews, & Leschied, 2002), as well as the Structured Assessment of Violence Risk in Youth (SAVRY; Borum et al., 2006). This area of violence risk assessment will benefit from further empirical investigation, as well as integration of expertise on protective factors and risk assessment.

In summary, this section has highlighted several ways in which future research can advance our understanding about (1) the utility of static and dynamic risk assessment measures within inpatient and community settings; (2) the trajectories of static and dynamic risk factors in different populations and

contexts; (3) the utility of short-term average and peak risk states for the purpose of predicting inpatient aggression, and as a procedural consideration when rating items on risk assessment measures; and (4) the utility of protective factors in risk prediction and prevention. These suggestions will undoubtedly improve our knowledge with regard to violence risk prediction and prevention, and bolster our efforts at improving public and patient safety, as well as community confidence.

5.7 Conclusion

The primary objectives of this study were to compare the predictive accuracy of dynamic risk assessment measures for violence with static risk assessment measures over short term (e.g., 1 week and 1 month), and medium-term follow-up periods (e.g., 3 months and 6 months) in a forensic psychiatric inpatient setting, as well as to determine the time frame during which the different measures are most suited for predicting aggression and violent behaviour in a forensic psychiatric sample. Moreover, this study sought to compare the predictive accuracy of short-term average and the peak risk states (as measured by risk assessment measures) for inpatient aggression. Although intuitive, these research aims have not been explicitly examined in past studies on static and dynamic violence risk assessment measures.

Notwithstanding a number of limitations associated with this study, the findings presented here contribute to the violence risk assessment field in several ways: (1) dynamic measures are accurate for predictions of inpatient aggression in the very short to medium term; (2) static risk assessment measures are generally

inadequate for predicting inpatient aggression in the short to medium term; (3) short-term averages of risk states are accurate for predicting inpatient aggression in the short to medium term, whereas the peak scores were generally predictive of inpatient aggression at longer follow-up periods (i.e., 3 and 6 months); and (4) protective factors predict nonoccurrence from interpersonal violence, property, and any inpatient aggression.

These findings speak to the necessity of conducting repeated violence risk assessments of inpatients using relevant dynamic measures that are suited for both an inpatient context, and the short to medium term. Moreover, it is clear that static risk assessment measures have limited utility for predicting inpatient aggression in the short to medium term. This further suggests that clinicians should be cautious about relying too much on historical (static) risk factors in their short-term evaluations of violence risk. They will be better served by considering the relevant dynamic risk factors instead. Further to the consideration of dynamic risk factors, clinicians should also assess protective factors during the course of assessment. This proposition is important as it has implications for understanding why certain high-risk individuals desist from violence, and how to incorporate these protective factors into risk assessment schemes. In particular, the START offers a good starting point for such a consideration.

In addition, a short-term average of risk states could provide the clinicians with a measure of the general level of (stable dynamic) risk over a specified period of time and account for the changes in these risk states over the specified time period. These indices may be useful for clinical teams when reviewing the

treatment progress and the management plans for the short to medium term. Moreover, the data presented here on the short-term average and peak risk states may provide preliminary information as to whether it is more accurate for clinicians to consider the "average" or "peak" risk states over a specified assessment period when scoring items on risk assessment measures. Future elucidation on the utility of these indices may offer promise for improving risk assessment measures.

In view of the aforementioned findings, as well as the various implications, future research in this area should use a prospective and repeated measures design, as well as larger samples. In addition, it will be beneficial to compare the utility of these assessment measures for different populations, contexts, and short- to long-term follow-ups. Moreover, it is imperative that trajectories of protective factors and the utility of the short-term average and peak risk states are further investigated. Although Steinert (2002) did not think that, "developing more sophisticated and comprehensive [violence risk assessment] instruments for research and clinical practice will be a promising path for the future" (p. 138), results from the current study may offer possibilities for clinicians to better understand the how static and dynamic risk assessment measures, as well as the risk and protective factors may operate. Given the "high stakes" of patient, staff and community safety, it may be too premature to stop trying.

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Approvals from Ethics Committees

MONASH University

Standing Committee on Ethics in Research Involving Humans (SCERH)
Research Office

Human Ethics Certificate of Approval

Date:	**9 October 2008**
Project Number:	**CF08/2404 - 2008001230**
Project Title:	**Using static or dynamic? Violence risk assessment of offenders with mental illness**
Chief Investigator:	**Prof James Ogloff**
Approved:	**From: 9 October 2008 to 9 October 2013**

Terms of approval

1. SCERH has granted an exemption under the guidelines approved under the Health Records Act 2001 (Vic) Statutory Guidelines on Research issued for the purposes of Health Privacy Principles 1.1(e) and 2.2 (g) (iii).
2. The Chief investigator is responsible for ensuring that permission letters are obtained and a copy forwarded to SCERH before any data collection can occur at the specified organisation. **Failure to provide permission letters to SCERH before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research**.
3. Approval is only valid whilst you hold a position at Monash University.
4. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by SCERH.
5. You should notify SCERH immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
6. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must contain your project number.
7. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to SCERH and must not begin without written approval from SCERH. Substantial variations may require a new application.
8. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
9. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
10. **Final report:** A Final Report should be provided at the conclusion of the project. SCERH should be notified if the project is discontinued before the expected date of completion.
11. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by SCERH at any time.
12. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]
Professor Ben Canny
Chair, SCERH

Cc: Dr Stuart David Michael Thomas; Dr Michael David Daffern; Mr Chi Meng Chu

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Department of Justice

Human Research Ethics Committee

Level 21, 121 Exhibition Street
Melbourne 3000
Telephone: (03) 8684 1514
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DX210077

11 February 2010

Reference: CF/09/25946

Prof James Ogloff
School of Psychology, Psychiatry and Psychologcial Medicine, Monash University

Re: Using Static or Dynamic? Violence Risk Assessment of Offenders with Mental illness

Dear Prof James Ogloff,

I am happy to inform you that the Department of Justice Human Research Ethics Committee (JHREC) considered your response to the concerns raised in relation to the project *Using Static or Dynamic? Violence Risk Assessment of Offenders with Mental illness* and granted full approval for the duration of the investigation. The Department of Justice (DOJ) reference number for this project is CF/09/25946.

Please note the following requirements:

- The JHREC needs to be notified immediately of any matter that arises that may affect the conduct or continuation of the approved project.
- To enable the JHREC to fulfil its reporting obligations, you are required to provide an Annual Report every 12 months (if applicable) and to report on the completion of your project. Annual Report and Completion of Research forms are available on the Justice Research Ethics website which is located at www.justice.vic.gov.au About Us > Our Values > Ethics.
- The DOJ would also appreciate receiving copies of any relevant publications, papers, theses, conferences presentations or audiovisual materials that result from this research.
- All future correspondence regarding this project must be sent electronically to ethics@justice.vic.gov.au and include the DOJ reference number and the project title.
- Hard copies of signed documents or original correspondence should be sent to The Secretary, JHREC at: Level 21, 121 Exhibition St, Melbourne, VIC 3000.

Please sign the Undertaking attached and return within ten business days. If you have any queries regarding this application you are welcome to contact me on (03) 8684 1514 or email: ethics@justice.vic.gov.au.

Yours sincerely,

[redacted]

Dr Yasmine Fauzee
Secretary,
Department of Justice Human Research Ethics Committee

Victoria
The Place To Be

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23 September 2008

Dear Mr Chu

Re: Using static or dynamic? Violence Risk Assessment of Offenders with Mental Illness

The Forensicare Research Committee has given operational approval for your research to be conducted at Forensicare. This approval is subject to approval by the Monash University Standing Committee on Ethics in Research Involving Humans.

Approval is given for the period between the anticipated commencement and completion dates as set out in the documentation. If the study has not been completed by the nominated completion date, an application for extension will be required.

To enable the Committee to meet its obligations in relation to monitoring Forensicare's research program, you are required to provide a report within 12 months or on completion of your project, whichever is earlier.

Forensicare must report ongoing research activities to the Minister of Mental Health quarterly. As such you may be asked to provide information on the progress of your research.

Please ensure that the Research Committee is notified of any matter that arises that may affect the conduct of the approved program.

Should you have any queries please don't hesitate to contact Ms Mitali Gupta on 94959145 or email mitali.gupta@forensicare.vic.gov.au .

Yours sincerely

[redacted]

Professor James Ogloff

VICTORIA POLICE

RESEARCH ACCESS AGREEMENT

206162_FC

Access Agreement

between
The State of Victoria, as represented by Victoria Police
of 637 Flinders Street, Melbourne VIC 3005

(Victoria Police)

and
The Centre for Forensic Behavioural Science, Monash University
of 505 Hoddle Street, Clifton Hill Victoria 3068

(Research Organisation)

1. Definitions

1.1 In this Agreement, unless the contrary intention appears, the following definitions will apply:

Data means information (in whatever form) in the possession of Victoria Police including but not limited to Law Enforcement Data, Personal Information, and technical, scientific and financial information which comes into the possession of the Research Organisation through intentional or unintentional disclosure, excluding information which:

(a) is or comes into the public domain other than by disclosure in breach of the terms of this Agreement;

(b) is or becomes available to the Research Organisation from a third party lawfully in possession of it and with the lawful power to disclose it to the Research Organisation;

(c) is rightfully known by the Research Organisation (as shown by its written record) prior to the date of disclosure to it under this Agreement; or

(d) is independently developed by an employee of the Research Organisation who has no knowledge of the disclosure made under this Agreement.

(e) which is disclosed pursuant to legal requirement or order.

Full Security Check comprises the following;

a) a name search of the National Names Index, however titled;

b) a name search of LEAP and/or other jurisdictions where identified by the search of the National Names Index;

c) a search of LEAP for pending charges; and

d) a comparison of the prospective user's fingerprints with those kept on the National Automated Fingerprint Identification System (NAFIS) register, however titled.

Law means:

(a) principles of law or equity established by decisions of courts within the Commonwealth of Australia;

(b) statutes, regulations, by-laws, ordinances, orders, awards, proclamations and local laws of the Commonwealth, State of Victoria, any local government or a Government Agency;

(c) the Constitution of the Commonwealth;

(d) binding Requirements and mandatory approvals (including conditions) of the Commonwealth, the State of Victoria or a Government Agency which have the force of law; and

(e) guidelines of the Commonwealth, the State of Victoria or a Government Agency which have the force of law.

Law Enforcement Data means any information obtained, received, or held by Victoria Police:

(a) for the purposes of one or more of its, or any other law enforcement agency's, law enforcement functions or activities; or

(b) for the enforcement of laws relating to the confiscation of proceeds of crime; or

(c) in connection with the conduct of proceedings commenced, or about to be commenced, in any court or tribunal; or

(d) for the purposes of its community policing functions.

Personal Information means information or an opinion (including information or an opinion forming part of a database), that is recorded in any form and whether true or not, about an individual whose identity is apparent, or can reasonably be ascertained, from the information or opinion;

Project means the project named and described at **Item 1** of **Schedule 2**;

Protocols means the document entitled 'Victoria Police Research Protocols for External Researchers', a copy of which is attached at **Schedule 4**;

Purpose means the purpose of the Project as defined at **Item 1** of **Schedule 2;**

Recipients means the individuals who will be receiving the Data on behalf of or from the Research Organisation and are named at **Item 3** of **Schedule 2** of this Agreement;

RCC means the Research Coordinating Committee of Victoria Police; and

Victoria Police Personnel means any person employed by Victoria Police, including any member of the force as defined by the *Police Regulation Act 1958* (Vic), any person employed by Victoria Police pursuant to the *Public Administration Act 2004* (Vic) and any individuals training to become members of Victoria Police.

Interpretation

1.2 In this Agreement unless the context indicates to the contrary:

(a) words importing a gender include any other gender;

(b) words importing persons includes a partnership and a body whether corporate or otherwise;

(c) words in the singular include the plural and the words in the plural include the singular;

(d) clause headings are inserted for convenient reference only and have no effect in limiting or extending the language of provisions to which they refer;

(e) reference to any statute or other legislation (whether primary or subordinate) is to a statute or other legislation of the Commonwealth and the State of Victoria amended or replaced from time to time;

(f) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form in respect of that word or phrase has a corresponding meaning;

(g) reference to a Schedule or an Appendix is a reference to a Schedule or an Appendix to this Agreement;

(h) a Schedule and any Appendix forms part of this Agreement; and

(i) where a conflict or inconsistency arises between the terms and conditions contained in the clauses of this Agreement and any part of the Schedule, the terms and conditions of the clauses prevail to the extent of the conflict or inconsistency.

2. Term

2.1 Victoria Police will provide the Research Organisation with access to Victoria Police resources from the date of execution of this Agreement until 30 April 2010.

3. Purpose of this Agreement

3.1 This Agreement articulates the responsibilities of the Research Organisation with respect to the use and disclosure of Information which Victoria Police discloses to the Research Organisation

4. Research Protocols

4.1 The Research Organisation must at all times comply with the Protocols.

4.2 Where any condition contained within the Protocols conflicts with this Agreement, this Agreement will prevail to the extent of the inconsistency.

5. Release of Data

5.1 The Research Organisation acknowledges and agrees that:

(a) only Data relevant to the Project will be released by Victoria Police to the Research Organisation. Victoria Police will only provide the Data to the Research Organisation;

(b) the Research Organisation may only use the Data for the Purpose of the Project or as directed by Victoria Police. The Research Organisation shall not use the Data for any other purpose;

(c) the Data shall at all times remain the property of Victoria Police;

(d) Victoria Police will release the Data to the Research Organisation either in electronic form or in printed format. The Research Organisation will have no direct access to any Victoria Police data repository;

(e) The Research Organisation is only permitted to disclose the Data to the Recipients named at **Item 3** of **Schedule 2** of this Agreement;

(f) The Research Organisation is prohibited from disclosing the Data to any other individual (including any new staff members) or party without the express written consent of the Victoria Police Representative named at **Item 1** of **Schedule 1;**

(g) Victoria Police will determine whether the Research Organisation is entitled to disclose the Data to any other party or individual other than the Recipients, and will determine when and where any such disclosure may occur;

(h) Victoria Police may restrict or revoke access by the Research Organisation to Data at any time without prior notice; and

(i) the Research Organisation will take all necessary precautions to prevent unauthorised access to the Data in accordance with **Clause 8** of this Agreement.

6. Probity

~~6.1 The Recipient(s) must undergo a Full Security Check prior to accessing the Da~~ [redacted]

~~6.2 The Recipient(s) are obligated to organise the Full Security Check at their exp~~

~~6.3 No Recipient will be permitted access to the Data without first providing evide~~ ~~their Full Security Check to the Victoria Police representative named at **Item** **Schedule** 1 of this Agreement.~~

7. Progress Reporting

7.1 The Research Organisation will provide Victoria Police with a progress report in relation to the Project at the dates and in the manner specified at **Item 2** of **Schedule 1.**

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8. Data Security

8.1 The release of Law Enforcement Data is subject to the Standards for Victoria Police Law Enforcement Data Security (2007), established under the *Commissioner for Law Enforcement Data Security Act 2005.*

8.2 Law Enforcement Data may take the form of any text, images, audio and video, may be stored on computing devices, in hard copy, or on other storage media, and includes (but is not limited to) data related to individuals, aggregated data, written reports and correspondence, memoranda, police diaries, official notebooks, running sheets and other data repositories.

8.3 The Data which will be released to the Research Organisation by Victoria Police is classified as Law Enforcement Data.

8.4 The Research Organisation agrees that the following requirements apply to all Data provided to them by Victoria Police;

(a) the release of Data by the Research Organisation to any other party or individual is strictly prohibited unless authorised by Victoria Police or by law;

(b) the storage of documents containing the Data must only occur in a secure facility that is physically protected against unauthorised access, including the use of lockable containers, cabinets, and restricted access rooms;

(c) the storage of electronic Data must only occur on a computer and/or system which is appropriately protected against unauthorised access, including the use of passwords, encryption, firewalls, and other appropriate protections;

(d) any exchange of Data via electronic messaging (including email) must be subject to appropriate routing, encryption and auditing in order to protect the Data from being viewed or altered by anyone other than the intended recipient;

(e) the exchange of Data via insecure consumer applications, such as file sharing and instant messaging, is strictly prohibited;

(f) strict security measures must be implemented to protect the Data during storage, handling and transport, particularly Data contained on portable computing devices or portable data storage devices;

(g) unless otherwise agreed, all physical copies of the Data in the possession or control of the Research Organisation or any other authorised party will either be returned to Victoria Police, or be securely destroyed, within a timeframe agreed by Victoria Police and the Research Organisation.

(h) unless otherwise agreed, all electronic copies of the Data in the possession or control of the Research Organisation or any other authorised party must be deleted and the storage device sanitised such that no Data can be recovered, within a timeframe agreed by Victoria Police and the Research Organisation.

(i) procedures for managing and reporting Law Enforcement Data security incidents to Victoria Police will be implemented by the Research Organisation.

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(j) the Research Organisation will, upon receipt of the Data, ensure that the Data is de-identified in accordance with the Methodology specified by the Research Organisation at **Item 1** of **Schedule 2**.

9. Confidentiality and Privacy

Confidentiality

9.1 The Research Organisation will (and will ensure that its employees, agents and advisers will) use and reproduce the Data only for the Purpose of the Project.

9.2 The Research Organisation agrees that the Data will only be able to be accessed by the Recipients named **at Item 3 of Schedule 2** of this Agreement or any other person who has written authorisation from Victoria Police to access the Data in accordance with **Clause 5.1(f)**.

9.3 All Recipients and other individuals who have been granted access to the Data in accordance with **Clause 5.1(f)** must execute a Deed of Confidentiality **before** they are provided with access to the Data. The agreed format of the Deed of Confidentiality forms **Schedule 3** to this Agreement.

9.4 Each Party's obligations under this section will survive termination of this Agreement and will continue in relation to Data until the Data disclosed to it lawfully becomes part of the public domain.

Privacy

9.5 The Research Organisation acknowledges that they will be bound by the Data Privacy Principles and any applicable Code of Practice with respect to any act done or practice engaged in by the Research Organisation under or in connection with this Agreement in the same way and to the same extent as Victoria Police would have been bound had it been directly done or engaged in by Victoria Police.

9.6 The Research Organisation will cooperate with Victoria Police to ensure they do not cause it to breach the privacy obligations that it has at law.

10. Release and Publication of Project Findings

10.1 During the term of this Agreement, all publications, presentations or communications of a public nature by the Research Organisation as a result of work created or developed in the course of the Project shall acknowledge the involvement of Victoria Police only in the manner specified in **Item 4** of **Schedule 2**.

10.2 The Research Organisation may not use the name or logo of Victoria Police in any promotional material or advertising without the written consent of the Victoria Police representative named at **Item 1** of **Schedule 1**.

10.3 The Research Organisation will not publish any of the Data in a form that identifies any particular individual, or has the capacity to do so, without the express written prior consent of that individual.

10.4 The publication of any document by the Research Organisation containing the Data, or any extract of the Data, is strictly prohibited without the express written permission of the Victoria Police representative named at **Item 1** of **Schedule 1**;

10.5 All proposed publications, presentations or communications of a public nature by the Research Organisation as a result of the Project shall be submitted to the Victoria Police representative referred to at **Schedule 1** of this Agreement prior to submission for publication, presentation or communication. Victoria Police shall have a period of 60 days to consent to the publication, presentation or communication. Such consent shall not be unreasonably withheld.

11. Access to Datasets of the Research Organisation

11.1 The Research Organisation agrees to release to Victoria Police any dataset created using the Data in the conduct of the Project at any time upon receiving a written request from the Victoria Police representative named at **Item 1** of **Schedule 1**.

11.2 The Research Organisation grants to Victoria Police, including a right to sublicense, a non-exclusive, royalty free, perpetual right to use any dataset delivered pursuant to clause 11.1 for any purposes.

12. Termination

12.1 Victoria Police reserves the right to withdraw support for the Project at any time and for any reason.

12.2 This Agreement may be terminated at any time by Victoria Police giving written notice to the Research Organisation.

13. Contact Details

13.1 Contact details for the Research Organisation and Victoria Police and that person's contact details information, are contained at **Item** 1 of **Schedule 1** of this Agreement.

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Signed for and on behalf of **The State of Victoria as represented by Victoria Police** by

~~***Alison Creighton***~~ FREDERICK JOHNSTON

in the presence of:

[redacted]

Signature

[redacted]

[title of authorised signatory]

[redacted]

Name (print)

[redacted]

Witness signature

[redacted]

Witness Name (print)

Signed for and on behalf of **Monash University** by

Prof. James R. P. Ogloff

in the presence of:

[redacted]

Signature

[redacted]

[title of authorised signatory]

[redacted]

Name (print):

[redacted]

Witness signature

[redacted]

Witness Name (print)

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SCHEDULE 1

ITEM 1: CONTACT DETAILS

Victoria Police

The Secretary
Research Coordinating Committee
c/- Strategic Research Unit
Corporate Strategy & Performance Department

Email: research.committee@police.vic.gov.au
Telephone: 03) 9247 3690
Fax: 03) 9247 6712

Research Organisation

Name: Prof. James R. P. Ogloff

Position: Director of Centre for Forensic Behavioural Science, Monash University

Email: James.Ogloff@med.monash.edu.au
Telephone: 03-9947-2602
Fax: 03- 9947 -3650

ITEM 2: REPORTING

The Research Organisation will provide Victoria Police with progress report(s) in relation to the Project.

This progress report will comply with the following requirements.

Progress reports will be provided on 30 June and 31 December every year, starting from the date of execution of the Agreement. Reporting will continue until the completion of the Project, except by the mutual agreement of the parties named at Item 1.

Content
The report must contain the following information:

1) The expected completion date for the Project
2) Any changes to the protocol for the Project approved by Victoria Police
3) Any complaints received about the Project
4) Details of any new staff members or other individuals who will have access to the data
5) Details of proposed publications, presentations or communications of a public nature that will require review by Victoria Police

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SCHEDULE 2

ITEM 1: PROJECT

Name of Project:
Using static or dynamic?: Violence risk assessment of offenders with mental illness

Purpose of Project:
The study aims to investigate risk factors for violence to others, self-harm, self-neglect, substance abuse and victimisation in people with a history of forensic mental disorders. In particular, the study will examine:

(a) Changeable (dynamic) risk factors and how they relate to static risk factors in the forensic psychiatric population over time;
(b) Predictive accuracy of dynamic risk assessment measures for the prediction of violence over longer-term, as compared to the existing static risk assessment instruments; and
(c) Inter-relationship between violence to others and related risks (i.e., self-harm, self-neglect, substance abuse, unauthorised leave and victimisation by others).

Outline of Project:

Participants
Participants are 100 persons (aged 18-85 years) admitted to Thomas Embling Hospital under the Mental Health Act between July and December 2002. These participants were either forensic patients found not guilty due to the reason of insanity and ordered to reside within the Hospital or prisoners who were transferred to receive assessment and treatment for their mental illness.

Methodology
The project methodology involves extraction and matching of personal records from criminal justice and health databases. These data sources will be matched with a range of data taken from clinical records of mental health assessment and treatment conducted by Forensicare. A description of the agreed process for data extraction and matching of LEAP records is detailed as follows:

1. A sample of 100 participants admitted to Thomas Embling Hospital in 2002 will be identified in the Forensicare database. For each of these participants, the following information is extracted: full name, date of birth, gender, and suburb of residence; and this information is burnt on a CD and collected by the Recipient, a Monash University student researcher.

2. The 100 cases are sorted alphabetically by surname and each is assigned a study ID number from 1-100, this forms a Source Master List to be used later in the data matching process. This list is burnt on three CDs, one each for Victoria Police, the Department of Justice and the Department of Human Services.

3. One of these CDs is delivered by the Recipient to Victoria Police Research Assistants in the Operations Coordination Department who use the personal information provided in the Source Master List to search LEAP for records pertaining to the participant during the period between their release from Thomas Embling Hospital in 2002 and 31 December 2008.

4. For each matched participant, the data listed in Item 2 below will be extracted.

5. Following extraction, the Research Assistant will de-identified records for all parties other than the participant. All identifying information (name, address, location) of any party other than the participant e.g. victim, offender, reporting police member, witness, is removed from the records.

6. The data files are then subject to a validity check. The Recipient meets with the Victoria Police Research Assistant to check that the names and ID numbers match the same on the Source Master List for a randomly selected sub-sample of the participant files.

7. Once validity check is complete the participants' personal information (full name, date of birth, gender, and criminal record number) is deleted from the data file.

8. The resultant de-identified data files are burnt to a CD.

9. The Victoria Police Research Assistant releases the CD with the matched LEAP data files along with the CD containing the Source Master List to the Recipient.

10. The Recipient merges the data files from Victoria Police, the Department of Justice and the Department of Human Services into one working file, using the study ID number.

11. At the same time as the data merge, the three CDs containing the Source Master List are destroyed.

Publishing Details
The findings will be used in a Doctor of Psychology thesis to be submitted by the Recipient Mr Chi Meng Chu.

ITEM 2: DATA

The following data will be extracted by the Victoria Police Research Assistant for each participant and fully de-identified before release to the Recipient.

a Offences
   i. Date and name of each offence on LEAP where the study participant was the offender
   ii. Outcome of each offence (whether convicted or not convicted, the sentence type, and the length of sentence when convicted)
   iii. Relationship between offender and victim, if any, for each offence

b Victims
   i. Data and name of each offence where the study participant was the victim
   ii. Relationship between the victim and offender for each offence

c Family incident reports
   i. Date of each report
   ii. Relationship between the study participant and aggrieved family member
   iii. Relationship to any other parties involved
   iv. Type of agency that the family was referred to if applicable (esp. if DHS child protection service is notified)
   v. Whether threats of violence were recorded in each incident

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vi. Other identified risk factors for each incident
vii. Incident code classifications: criminal abuse, non-criminal abuse, as well as non-abusive and non-criminal

d Intervention orders
   i. Dates of IVOs where the study participant was the defendant
   ii. Dates of IVOs where the study participant was the complainant
   iii. Relationships between the parties for all IVOs

e Field contacts
   i. Number of field contacts
   ii. Stated reason for suspicion at each field contact

f Death reports
   i. Occasions where the study participant is recorded on LEAP as being deceased
   ii. Cause and date of death

ITEM 3: RECIPIENTS

Mr Chi Meng Chu

ITEM 4: ACKNOWLEDGEMENT OF VICTORIA POLICE

Victoria Police

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SCHEDULE 3
DEED OF CONFIDENTIALITY

SCHEDULE 4
VICTORIA POLICE RESEARCH PROTOCOLS FOR EXTERNAL RESEARCHERS

Victorian Government
Solicitor's Office

Deed of Variation of Agreement

between

The State of Victoria as represented by Victoria Police

and

The Centre for Forensic Behavioural Science, Monash University

Level 25 | Tel +61 3 8684 0444
121 Exhibition Street | Fax +61 3 8684 0449
Melbourne Vic 3000 | www.vgso.vic.gov.au
DX 300077 Melbourne | Ref:

Table of Contents

Level 25
121 Exhibition Street
Melbourne Vic 3000
DX 300077 Melbourne

Tel +61 3 8684 0444
Fax +61 3 8684 0449
www.vgso.vic.gov.au
Ref:

Details

Date: 27 November 2009

Parties:

The State of Victoria as represented by Victoria Police
of 637 Flinders Street, Melbourne, Vic, 3000.

(**Victoria Police**)

And

The Centre for Forensic Behavioural Science, Monash University
of 505 Hoddle Street, Clifton Hill Victoria 3068

(**Research Organisation**)

Background

A. Victoria Police and the Research Organisation are parties to the Agreement.

B. The parties have agreed to vary the Agreement as set out in this Deed.

Agreed terms

1. Definitions and Interpretation

1.1 Definitions

In this Deed, unless the context otherwise requires or a contrary intention appears:

Agreement means the Research Access Agreement dated 4 September 2009 between Victoria Police and the Research Organisation;

Deed means this document and any schedules, annexures or attachments to this document; and

Effective Date means the date on which this Deed is executed by both parties.

1.2 Interpretation

In this Deed, unless the context otherwise requires:

(a) a defined word or expression in the Agreement has the same meaning in this Deed;

(b) the interpretation provisions in clause 1.2 of the Agreement apply to this Deed; and

(c) headings are included for convenience and do not affect the interpretation of this Deed.

2. Effective Date

This Deed takes effect, and the parties are bound by the Agreement as varied by this Deed, on and from the Effective Date.

3. Variation

On and from the Effective Date the Agreement is varied as set out in the Schedule.

4. Confirmation of Agreement

Except as expressly varied by this Deed, the Agreement remains in full force and effect.

5. Inconsistency

If there is any conflict between the Agreement and this Deed the terms of this Deed prevail.

6. Confidentiality

6.1 Obligations

The provisions of clause 9 of the Agreement form part of this Deed (mutatis mutandis).

6.2 Survival

This clause 6 survives the termination or expiry of this Deed.

7. Costs

Each party shall pay its own legal and other costs and expenses of negotiating, preparing, executing and performing its obligations under this Deed.

8. General

8.1 Entire Understanding

This Deed contains the entire understanding between the parties as to its subject matter. All previous agreements, representations, warranties, explanations and commitments, express or implied, affecting this subject matter are superseded by this Deed and have no effect.

8.2 Variation

This Deed may only be varied or replaced by a document executed by the parties.

8.3 Rights cumulative

Except as expressly stated otherwise in this Deed, the rights and remedies of a party under this Deed are cumulative and are in addition to any other rights and remedies of that party at law.

8.4 Further assurance

Each party must, at its own expense, promptly execute and deliver all documents and take all other action necessary or desirable to effect, perfect or complete the transactions contemplated by this Deed.

8.5 No merger

The rights and obligations of the parties under this Deed do not merge on completion of any action or transaction contemplated by this Deed.

8.6 Counterparts

This Deed may consist of a number of counterparts and, if so, the counterparts taken together constitute one document.

8.7 Severability

Any provision of this Deed which is invalid or unenforceable shall be read down, if possible, to be valid and enforceable. Where that provision cannot be read down it shall, to the extent that it is capable, be severed without affecting the remaining parts of this Deed.

8.8 Waiver

(a) A single or partial exercise or waiver by a party of a right provided by law or under this Deed does not prevent any other exercise of that right or the exercise of any other right.

(b) A waiver by a party of a right under this Deed is only effective and binding on that party if it is in writing and signed by the party.

(c) A party is not liable for any loss, cost or expense of any other party caused or contributed to by the waiver, exercise, attempted exercise, failure to exercise or delay in the exercise of a right by the first party

8.9 Governing Law

(a) This Deed is governed by the laws of the State of Victoria.

(b) The parties irrevocably and unconditionally submit to the non-exclusive jurisdiction of the courts of the State of Victoria and any courts that may hear appeals from those courts and waive any right to object to proceedings being brought in those courts

Signing page

Executed as a deed.

Signed, Sealed and Delivered by **Monash University** in the pres[redacted]

Sign[redacted]son

[redacted]

Name of authorised person (print)

[redacted]

Sig[redacted]

[redacted]

Name of witness (print)

Signed Sealed and Delivered for and on behalf of the **State of Victoria as represented by Victoria Police** in the presence of:

[redacted]

Signature of authorised person

[redacted]

Name of authorised person (print)

[redacted]

Signature of witness

[redacted]

Name of witness (print)

Schedule to Deed of Variation of Agreement

Amendment

Schedule 2 of the Agreement is amended by **deleting** the following two paragraphs:

from: **ITEM 1: PROJECT**

"3. One of these CDs is delivered by the Recipient to Victoria Police Research Assistants in the Operations Coordination Department who use the personal information provided in the Source Master List to search LEAP for records pertaining to the participant during the period between their release from Thomas Embling Hospital in 2002 and 31 December 2008." and

from: **ITEM 2: DATA, Methodology**

"a Offences

i. Date and name of each offence on LEAP where the study participant was the offender
ii. Outcome of each offence (whether convicted or not convicted, the sentence type, and the length of sentence when convicted)
iii. Relationship between offender and victim, if any, for each offence."

And in their place, **substituting** the following two paragraphs:

into: **ITEM 1: PROJECT**

"3. One of these CDs is delivered by the Recipient to Victoria Police Research Assistants in the Operations Coordination Department who use the personal information provided in the Source Master List to search LEAP for all records pertaining to the participants dated up until 31 December 2008."

into: **ITEM 2: DATA, Methodology**

"a Offences

i. Date and name of each offence on LEAP where the study participant was the offender
ii. Outcome of each offence (whether convicted or not convicted, the sentence type, and the length of sentence when convicted)
iii. Relationship between offender and victim for each offence
iv. Copies of IBR dockets or cards where available."

Yessine, A. K., & Bonta, J. (2006). Tracking high-risk violent offenders: An examination of the National Flagging System. *Canadian Journal of Criminology and Criminal Justice*, *48*, 574–607.