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**COMPARISONS OF RISK FACTORS FOR
VIOLENCE IN DEFENDANTS REFERRED FOR
PSYCHIATRIC ASSESSMENT**

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ABSTRACT :

COMPARISONS OF RISK FACTORS FOR VIOLENCE IN DEFENDANTS REFERRED FOR PSYCHIATRIC ASSESSMENT**AIMS:**

- a. to determine which static and dynamic risk factors contributed to the commission of violent offences, and to habitual violence in offenders that had been referred for pre-trial psychiatric assessment.
- b. to assess, by logistic regression modelling, the relative importance of the significant risk factors.

METHOD :

All defendants admitted to the Forensic Psychiatry Unit at Valkenberg Hospital for 30 day pre-trial assessments over a 6 month period were entered. All subjects were assessed by 2 psychiatrists and a clinical psychologist, who used semi-structured interviews. A forensic social worker interviewed family members. Court documentation provided information about the events of the offence and conviction record.

A psychometrist administered Barrat's Impulsivity Scale (BIS), Zuckerman's Sensation Seeking Scale (ZSS), and Annett's Handedness Test (Zuckerman et al. 1964). Nursing staff and occupational therapists compiled daily reports on the subjects' behaviour in the ward.

RESULTS :

During the study period 181 subjects satisfied the inclusion criteria, of which 36 were excluded, which resulted in 155 study subjects.

A history of habitual violence was established in 96 (61.9%) of the total sample. The index offence was violent in 69 (44.5%), and of these 53 (76.8%) had histories of habitual violence. The association between violent index offence and a history of habitual violence was significant ($\chi^2=12.003$; $p=0.0005$). Amongst those with histories of habitual violence 31 (32.3%) had a psychotic illness, whereas 15 (21.7%) of the violent offences were committed by psychotic subjects.

The most important risk factor for a violent index offence was a history of previous psychiatric admissions, followed by having experienced provocation beforehand, scoring higher on the Disinhibition subscale of Zuckerman's Sensation Seeking Scale, and a history of having often issued threats to commit violence. Other significant factors were a history of habitual violence, a higher number of previous convictions (especially violent convictions), being intoxicated with alcohol at the time, the use of a weapon, followed by impulsive (that is, precipitous) actions, and acquaintance with the victims (although the psychotic subjects were more likely to have offended violently against strangers)..

Habitual violence had the strongest association with being declared mentally ill (that is, incompetent to stand trial or not being criminally responsible), followed by having displayed violent behaviour during the admission. Other significant variables were a history of conduct disorder, unemployment, previous psychiatric admissions and long duration of

psychiatric disorder, alcohol and substance abuse (although not with any specific substance), alcohol intoxication when committing a violent offence (although in contrast the psychotic violent subjects were less likely to be intoxicated when violent), and having carried a weapon during the commission of any offence. They were also more likely to have often issued threats to commit violence in the past, and to have been psychotic.

Thought withdrawal or insertion were the only psychotic symptoms that claimed importance. Their scores on the BIS were higher. The issuing of threats of violence during the assessment period in the ward was also important.

CONCLUSIONS

Risk assessment and management in this population should focus primarily on impulsive and disinhibited habitually violent individuals that are cognitively impaired (in that they are more likely to be incompetent to stand trial), have histories of conduct disorder, and who are admitted recurrently to psychiatric hospitals (where they are also violent).

AIMS

a. To determine the occurrence of risk factors associated with habitual violent behaviour in a heterogeneous sample of criminal defendants that had been referred to Valkenberg Hospital by the courts for psychiatric assessment.

b. To determine which risk factors are associated with the commission of violent offences in individuals that are referred for forensic psychiatric assessment.

c. To determine, by generating odds ratios in a logistic regression model, the relative importance of the significant risk factors, in order to provide 'weightings' for the significant risk factors for use in a future risk assessment tool.

INTRODUCTION

“Violence and victimization have been part of collective life and daily relationships from time immemorial and the use of crude force instead of good reasoning is a long-standing habit of humankind.” (Palermo 1995a) (p.4).

There is a peculiar ambivalence towards violence. Many highly valued human activities depend on the use of aggression, such as the enforcement of authority, protection of the vulnerable, and creation of group solidarity (such as initiation rites and gang fights) (Wrangham & Peterson 1996). In some communities child rearing is regarded as incomplete without spanking (“spare the rod, and spoil the child”), and fighting between children is often condoned as legitimate displays of competition (Scott 1958;Storr 1968). Lavish displays of violence in the media and on sporting fields are enjoyed as legitimate entertainment, yet abhorred when they occur within the community. Therefore the distinction between acceptable and offensive violence really seems to depend on its context of occurrence, rather than its inherent nature.

Socialisation teaches individuals to use aggression judiciously, and successful psychological development is inversely associated with the frequency of violent acting out behaviours (Diamond 1974). Habitual violence is usually maladaptive because despite short-term gains, it can produce negative long-term consequences, such as social rejection and incarceration (Gunn 1993).

During this century the belief that criminality, especially violent criminality, is a mental aberration, and therefore properly ought to be investigated and treated by the medical

profession has gained strength (Dinitz & Conrad 1978). Because violence is a major cause of trauma, the medical profession is now being entreated to regard it as a public health problem (Koop & Lundberg 1992; Mencken 1992; Rosenberg, O'Carroll, & Powell 1992). This was supported by the findings in the Epidemiologic Catchment Area (ECA) Surveys in the USA, which found that 3.7% of 10 000 respondents (from 5 cities) admitted to have engaged in at least one type of violent behaviour during the preceding one year (Swanson et al. 1990). Domestic violence, once regarded as being a 'personal affair', has increasingly become a public concern, and physicians now realise that they have an ethical responsibility to intervene (Jecker 1993).

Despite the lack of verifiable statistical data it is well known that violence, and especially criminal violence in South Africa has assumed alarming proportions.

Most interpersonal violence remains unreported, and, clothed in shamefulness, purposefully hidden. Therefore official statistics, however derived, underestimate the actual rate of violence, particularly that occurring within families. Criminal behaviour is the most extreme and easily identifiable form of unaccepted rule-breaking behaviour, because specific authorities, such as the police, courts and prisons, are dedicated to identifying cases. Also, although definitions of some crimes vary considerably, there is universal consensus that most, such as theft, damage to property, rape, murder, assault etc. are offences (Newman 1979; Palermo 1995a; Reiss & Roth 1993; Rosenberg, O'Carroll, & Powell 1992; Wessely & Taylor 1991). Therefore research into criminal behaviour provides a useful initial step towards understanding interpersonal aggression.

In 1993 the Criminal Procedure Act (Act 51 of 1977) was amended to include sections 286A and 286B, which provided that “.. a superior court or a regional court which convicts a person of one or more offences, may if it is satisfied that the said person represents a danger to the physical or mental well-being of other persons and that the community should be protected against him, declare him a dangerous criminal.(section 286A(1))” The court then is empowered to commit the accused to a psychiatric hospital for a 30 day period for assessment. The resulting report must, according to section 286A(3)(d), make a direct finding on whether the accused represents ‘a danger to the physical or mental well-being of other persons’. There is no prerequisite that the accused should be found mentally ill. If the psychiatric report confirms that the accused fulfils the definitions, he (or she) will be given an indefinite sentence and a future date (usually 25 years later) for return to court for re-consideration of the sentence. Other than requiring psychiatrists to perform these assessments the legislation provides no guidance as to what variables ought to be considered and how this investigation should be conducted.

Currently most forensic psychiatric assessments at Valkenberg Hospital are referred under section 79(2) of the Criminal Procedure Act, which requires that the multidisciplinary team evaluates whether ‘mental illness or mental defect’ affects competence to stand trial and criminal capacity. Although it is not specifically required that these observations provide an assessment of a defendant’s potential to commit violence the courts often do request such an opinion (especially when imminent discharge is being considered). Unfortunately forensic psychiatry units in South Africa have not settled on a systematic procedure that focuses on certain variables, or on known combinations of factors that distinguish violent offences and habitually violent defendants.

A diversity of many seemingly unrelated phenomena have been associated with violence. It is not surprising that no general theory presently exists that satisfactorily includes all possible causes (Reiss & Roth 1993) (Monahan 1994). Certainly socio-cultural factors are recognised as critical influences as violence does not occur uniformly across communities. The USA homicide rate is 5 times that of Japan, its rape rate 22 times higher, and its armed robbery rate 114 times higher. However within the USA the murder rate in the South is almost twice as high as in the Northeast, whereas robbery has a converse relationship. Generally, the smaller the community the lower the rate of violence, although within certain cities some neighbourhoods have violent crime rates that are as much as 300 times higher than the others (Monahan 1993). Similar patterns seem to prevail in the Cape, although no systematic study yet exists that explores which factors operate most strongly here. Although sociological perspectives add valuable insights information is still lacking why the majority of people living in abject circumstances are law-abiding, and how those varying percentages of violent 'others' really differ.

This study will attempt to ascertain which risk factors, which have been associated elsewhere in the world with violent behaviour, significantly differentiate habitually violent offenders from other offenders, and which are significantly associated with violent offences. In addition, this investigation will set out to determine the strength of association between these risk factors by means of logistic regression models. Hopefully these results will be used to construct risk assessment schemes for this population.

REVIEW OF THE LITERATURE

PREDICTION AND RISK ASSESSMENT: THE LIMITS OF EXPERTISE

Since the 19th century juridical sanction for public psychiatry has been grounded in legal provisions concerning dangerousness (Lovell & Scheper-Hughes 1986). The drafting and application of legislation in most countries for the involuntary admission and subsequent discharge of patients is generally predicated on the perceived risk of future violent behaviour (Appelbaum 1994). Legislators and the courts seem to believe that psychiatrists and psychologists possess special abilities for predicting the dangerousness of individuals within a myriad of contexts (Appelbaum 1994; Bloom & Williams 1994; Cohen & Freeman 1945; Coid 1996; Coles & Grant 1991; Harding & Adserballe 1983; Monahan 1995b; Zabow & Cohen 1993d). Psychiatric opinion has also been used for the disposal of a wide range of offenders, even though psychiatrists have long fretted about their inability to apply their expertise where psychiatric disorder is not present (Dix 1980; Monahan 1995b). Stone (1984a) has accordingly argued that psychiatry has assumed a double agent identity, that of therapist and police roles. The law struggled to find fair moral principles for depriving individuals' of their liberty (to protect the public), then identified psychiatrists as the agents to execute this function, and finally everyone concentrated on the latter's inability to predict dangerousness. But as Floud (1982a) eloquently stated:

“..there is no such psychological or medical entity as a ‘dangerous’ person and ‘dangerousness’ is not an objective concept. Dangers are unacceptable risks. We can measure risk - actuaries make a profession of it. Risk is, in principle, a matter of fact; but danger is a matter of judgement or opinion - a question of what we are prepared to put up with. People tolerate enormous risks

without perceiving them as dangers, when their fears are not aroused or when it suits their convenience" (p.213).

Her argument continues with the observation that 'violence is almost universally regarded as the hall-mark of dangerousness', and that there is a small number of repetitively violent offenders who should be removed from society for substantial periods in the interests of public safety. Scott (1977a) regarded incorrigibility and a tendency to repetitive acts of threatened or actual destructiveness as defining the core of dangerousness. But he was quick to point out that the man who insists on smoking atop a petrol tanker is also dangerous. Likewise industrialists who ignore the toxic emissions from their factories, which may kill many indiscriminately, can also be gathered into this category. Monahan (1995b) quotes a federal judge who once ruled that writing a bad cheque was dangerous because if everyone did the economy would collapse.

Dangerousness, therefore, has a wide range of meanings, but essentially is composed of 'risk factors' (the variables used to predict violence), 'harm' (the degree and type of violence being predicted) and 'risk' (the likelihood that harm will occur) (Steadman et al. 1994a).

Mental health professionals have generally confined their predictions to mentally disordered individuals. The category of mental disorder has conventionally included all psychotic disorders, dementias, mental handicap, and occasionally personality disorders and depression. Psychopathy has enjoyed a special status, especially as legislation in many countries (including South Africa until the recent amendments to the Mental Health Act in 1993) has tended to include it as a certifiable disorder (Steadman 1983a). Psychiatrists have

participated in writing such legislation, especially the so-called sexual psychopath laws in the USA, without possessing a clear unequivocal notion of 'dangerousness' (Dinitz & Conrad 1978). A WHO study in 3 developed and 3 developing countries found that although all had legislation that referred to 'dangerousness' (or 'dangerous'), none provided precise or clear definitions, which had led to a haphazard application of the law (Harding & Adserballe 1983; Prins 1996). In fact there is often confusion between recidivism and dangerousness, the latter representing the extreme of aggressiveness (Scott 1977a).

For the past 3 decades the literature has concentrated on mental health professionals' inability to predict, mostly as a result of a lack of expertise (and knowledge), and use of standardised methods. Menzies et al (1981a) found that Canadian psychiatrists generally did not believe that the mentally disordered were more dangerous than the general population, but considered at least 10% of their own patients and more than one-fifth of their forensic patients to be dangerous. They tended to rely predominantly on criminal history, verbal and non-verbal cues noted during interview, and the circumstances and seriousness of the present offence as the most important predictor variables, and ranked psychological testing and actuarial methods 8th and 9th (out of 10) in a list of important assessment methods. They also tended to disregard information gleaned about the subjects' family and social circumstances. In their study forensic psychiatrists were generally correct when they predicted that a patient would not be dangerous (to a ratio of about 6:1), but were usually wrong when predicting that he would be dangerous (about 3 false positives to 1) (Menzies, Webster, & Sepejack 1985a). However their most striking finding was that some professionals were very much better than others at predicting, that regardless of any extra variables added to their lists (to be applied in evaluations) few could better a prediction correlation of 0.4, which they called the 'forensic sound barrier'. A survey of 98

South African psychiatrists revealed that their assessments of dangerousness mostly relied on previous convictions for violent offences (93%), a history of dangerous behaviour (88%)¹, antisocial behaviour (76%) and gang membership (69%). Only 3 psychiatric variables, namely, persecutory delusions, a history of substance abuse (46%) and a diagnosis of mania were regarded as important, but were cited as extremely important only by a very low proportion of the psychiatrists (Zabow & Cohen 1993d).

The WHO study presented 193 raters (from a diversity of mental health, criminological and juridical professions) with 16 case vignettes (Harding & Adserballe 1983). The degree of agreement of dangerousness varied markedly between cases, the highest level (in excess of 60% agreement) occurred where 'no dangerousness' was the predominant finding. The lowest degrees of agreement were in those vignettes in which mental illness and a unique history of a violent outburst were described. Psychiatrists did not agree with one another more than the other professions, but did significantly agree more often on the management of perceived dangerousness.

Psychiatrists and psychologists generally display high reliability on the variables used to predict imminent violence (such as recent assaultiveness, hostility and depression) but compared to objectively obtained measures are not accurate (Werner, Rose, & Yesavage 1983). An enduring impression is that clinicians use their own intuitively generated list of variables (of which previous acts of violence is the most common) and give each variable differing weightings based on their own personal experience when arriving at a finding of 'dangerous' (Menziés, Webster, & Sepejack 1985a).

¹ Dangerousness was defined as 'the propensity, at any time, to commit a crime against the person of another and thus to cause physical harm to that person.'

As already mentioned, violence prediction is usually applied to those who have previously displayed aggressive acts. Criminologists have long agonised over the release of convicted prisoners, even though two thirds of those convicted of a violent offence do not become recidivists (Prins 1991;Prins 1996). However those whose original offences involved very poor impulse control were more likely to break parole (Heilbrun, Heilbrun, & Heilbrun 1978b;Heilbrun, Knopf, & Bruner 1976). Nevertheless, violence potential, even in high risk offender groups, is relatively low. A one year follow up of 1 630 highly aggressive parolees produced 3.1 violent crimes per thousand cases amongst those previously assessed as being high risk, compared to 2.1 per thousand for those previously assessed as low risk (Wenk, Robison, & Smith 1972). Even in offender populations violent activity has a relatively low base rate, although prediction is most accurate in the small group of habitually violent who have high base rates (Menzies, Webster, & Sepejack 1985a).

Prediction generally fails because the interactions between risk variables vary depending on the context in which they occur. Therefore all predictions are now regarded as conditional (Prins 1996). According to Greenland (1985a) forensic psychiatry ‘..still acts as if the impulse to rape, maim, or kill resides like a malignancy within the individual offender’ (p.38), and is not the culmination of many factors colliding at some contextual point.

Another weakness is that predictions are seldom time limited. Long-term prediction is arguably a different and more arduous task than determining short-term potential (Dix 1980). In a clinical sample of 136 subjects 75% of those assessed as being potentially assaultive on admission were involved in violent acts within 17 days following admission (Apperson, Mulvey, & Lidz 1993f). In addition, those perceived as representing high risk

often influenced authorities to take added precautions (such as lengthier sentences), which ultimately prevented expression of the expected behaviour, and so created a false outcome (Dix 1980).

The limitations of long term predictions were exposed when those predicted to be dangerous, and therefore confined for lengthy periods in various institutions were followed up following release into the community.

Tong and Mackay (Tong & MacKay 1959) followed up 587 such cases released between 1945-1956 in 1957. In their sample 85 were returned to hospital and 86 were convicted of crimes. Violent behaviour was more evident before their initial hospitalisation than after discharge. In fact property offences were the most likely to have a repetitive pattern, whereas a previous history of violence predicted a good prognosis, but then almost all of the subsequent violent offenders (17/19) had previous histories of violence. Significantly they observed that the behaviours observed in an institution and hospital could not really be compared to that expected in general society, even though in their sample repetitive aggression and destructive behaviour committed while in hospital was associated with later violence. Their study unfortunately did not indicate the diagnoses of subjects and the follow up periods for subjects varied from 1 to 11 years.

Through the decades of the 1960's and 1970's psychiatric hospitals were pressurised to discharge inpatients, which indirectly forced mental health research to consider the validity of predictions. In 1966 the US Supreme Court ordered the release of Johnnie Baxtrom who had been committed to a state psychiatric hospital from prison hospital on expiration of his sentence. Consequently some 1 000 similarly affected forensic patients were

transferred to civil mental hospitals and about half were released into the community. The following year it was noted that these patients had generally caused no problems in their new hospitals, (in fact they were regarded as better workers than the others), and that almost 20% had been discharged (Hunt & Wiley 1968). In a follow up of 98 of the latter 20 were re-arrested, of which 17 (85%) were under the age of 50 and had had a more serious history of criminal activity (Cocozza & Steadman 1974). Only 14 (15%) cases displayed dangerous behaviour (i.e. violent assaultive behaviour), of which 7 were arrested and 7 re-hospitalised. The sample consisted of a group of middle aged men that had been institutionalised for an average of 14 years, which, the authors conceded, could have accounted for the low rate of repeated dangerous behaviour. However, these data created an enduring impression that even those considered to be high risk actually were overwhelmingly at low risk of future violent recidivism.

In an influential review Steadman (1983a) had noted that clinical predictions seldom achieved greater accuracy than chance, regardless of the base rate of the behaviour. In his view

“In an examination for violence there is no specific disease entity to be identified. There is no range of interventions that within definable ranges have known chances of success. Still, however, clinical judgement is central and the art of diagnosis is applicable. The crucial difference in evaluations of dangerousness is that there are few known links between the current presenting symptoms and the future exhibition of the proscribed dangerous behaviours. It is in the attempted accomplishment of this task that medical science slips almost imperceptibly into the exercise of magic” (p.383).

A further problem was that in samples, such as released patients, violent behaviour has a low base rate and predictions almost invariably over-estimated the numbers who would

eventually re-commit. This produced a high false positive rate (ie. those designated as high risk that do not re-commit), which is ethically unacceptable. Subsequently investigators realised that long-term prediction was an unreasonable exercise, and instead concentrated on refining short-term predictions (that is, for imminent violence). Clinicians in an acute admission unit were asked to rate newly admitted patients on a 12 item 7-point scale following a brief assessment for their potential of assaultiveness during the subsequent hospitalisation (Apperson, Mulvey, & Lidz 1993f). Of those rated as likely to be assaultive 75% demonstrated violent behaviour or made threats compared to 12.5% of the general sample. In contrast only 56% of the patients who were committed because they were perceived as being a danger to others in the community (compared to 42% of the general sample) were actually violent. Most of the violence occurred within 17 days following admission. This supported the view that clinicians do possess superior abilities to predict violent behaviour, especially if these behaviours occur relatively soon after clinical contact.

Instead of predicting an uncertain outcome current research initiatives have been concerned with identifying risk factors that contribute to the likelihood of violence. As defined by Kraemer et al (1997a)

“ a risk factor is a measurable characterization of each subject in a specified population that precedes the outcome of interest and which can be used to divide the population into 2 groups (the high-risk and the low-risk groups that comprise the total population) (p.338)”.

Ideally risk factors should be identified and followed up in subjects before the occurrence of the outcome. The period of follow up ought to be the same for each subject, and age-related differences controlled (i.e. the incidence and prevalence of disorders differ according to age of onset). Both the factor and outcome have to allow for a certain degree

of heterogeneity, because the more homogeneous the population is the more difficult it is to demonstrate that the factor is a potent risk factor (Kraemer et al. 1997a).

Current research has therefore shifted attention to identifying those factors that increase the likelihood of future violent behaviour, a process of risk assessment.

Mental health practitioners have now been confronted with the choice of using either 'clinical' or 'actuarial' methods. The former relies on a subjective interpretation of personalised information extracted from an interviewee (usually the patient), whereas the latter relies on statistical associations of risk factors (that have been extracted objectively).

Clinical prediction generally focuses on a particular individual and is based on a combination of experience, knowledge, and intuition (which often includes the clinician's subjective responses). Actuarial methods generate quantifiable data that can be analysed and computed into models that describe classes of individuals or variables (Dix 1980).

Meehl (1954) disputed that these methods are mutually exclusive. According to him most clinicians routinely determine whether particular outcomes are 'likely' or 'probable' without actually quantifying the degree of risk. Also clinicians are often more skilful at extracting sensitive information that cannot be quantified. Therefore relying solely on either actuarial or clinical approaches will be ineffective. Unfortunately clinical observations are subjective in nature, and are vulnerable to inaccuracies, bias and unreliability, which can be improved with training and the use of standardised terminology and research instruments (Haynes 1985). Clinical findings rarely can be quantified, and depends on clinical judgement and experience. Therefore the magnitude of error or accuracy cannot be determined.

Greenland (1985a) has proposed that actuarial findings should be used to direct the clinical assessment.

Criticisms of actuarial methods are that they are empirically driven and neglect theoretical foundations (which makes them less generalisable), they rely on static historical data, do not make use of rare or exceptional facts that may be important for a particular individual's offending, and that although they are applicable to groups they are of little use in assisting in individual cases (Grubin 1997). Clinical judgement has been undervalued in most research, yet has been shown in a 6 month follow up study of patients discharged from an emergency unit to have been better than chance in differentiating high from low risk subjects, even though generally with low specificity and sensitivity (Lidz, Mulvey, & Gardner 1993e). Investigations into predictions of criminal violence have generally avoided populations that included mentally ill individuals, and therefore have relied almost entirely on criminological analyses and not clinical assessments (Moffitt, Mednick, & Gabrielli 1989), even though it has been well established that criminal populations have rates of mental disorder and that clinical populations have histories of high rates of arrests and imprisonment (Holcomb & Ahr 1988;McFarland et al. 1989;Robertson 1988;Steadman, Vanderwyst, & Ribner 1978).

Even so, the assessment of risk in the forensic setting will almost invariably depend mostly on the clinical evaluations of a wide variety of professionals, such as psychiatrists, psychologists, social workers, occupational therapists and nursing staff. The current challenge is to generate objectively derived variables that can assist them.

SUMMARY

Psychiatrists have been required to provide predictions on the 'dangerousness' of individuals in a great variety of situations. They have been more successful at identifying

those who will not recommit violence than those who will. This has been partly due to their lack of expertise generally and to their use of clinical assessments, which tend to be subjective and sometimes idiosyncratic in their application. Current research has become more concerned with providing a risk assessment of violence, which uses objective tests to elicit data that can be processed to provide probabilities.

RISK ASSESSMENT

Steadman et al (1994a), as described above, dissembled 'dangerousness' into its components of 'risk factors' (the variables used to predict violence), 'harm' (the amount and type of violence being predicted) and 'risk' (the likelihood that harm will occur). The resulting risk assessment was to be regarded as a dynamic probability that depended on contexts and varying time periods. They proposed that a 'rich array of theoretically-chosen risk factors in multiple domains' be chosen, and that priority be given to actuarial research that establishes a relationship between risk factors and harm. Risk factors were selected if they had been associated with violence in previous research, were believed to be associated with violence by experienced clinicians, or were hypothesised to be associated with violence by existing theories (of violence or mental disorder). Accordingly they grouped risk factors into four 'generic' domains: i) dispositional factors, ii) historical factors, iii) contextual factors, and iv) clinical factors (table 1). These were used as risk factors in their MacArthur Violence Risk Assessment Study.

TABLE 1. CUE DOMAINS IN THE MACARTHUR RISK ASSESSMENT STUDY

Dispositional Factors*Demographic*

Age

Gender

Race

Social Class

Personality

Personality Style

Anger

Impulsiveness

Psychopathy

Cognitive

IQ

Neurological impairment

Historical Factors*Social History*

Family History

Child rearing

Child abuse

Family deviance

Work History

Employment

Job perceptions

Educational History

Mental Hospitalization History

Prior Hospitalizations

Treatment Compliance

History of Crime and Violence

Arrests

Incarcerations

Self-reported Violence

Violence toward Self

Contextual Factors*Perceived Stress**Social Support*

Living Arrangements

Activities of Daily Living

Perceived Support

Social Networks

*Means for Violence (i.e., guns)***Clinical Factors***Axis I Diagnosis**Symptoms*

Delusions

Hallucinations

Symptom severity

Violent Fantasies

*Axis II Diagnosis**Functioning**Substance Abuse*

Alcohol

Other Drugs

from Steadman et al (1994a).

They conceded that their list probably excluded other important variables. It is pertinent to note that this risk assessment scheme was created for the population of mentally disordered individuals that are presumed to represent a risk mostly by reason of their mental illness. They enrolled 1136 male and female patients from 3 acute psychiatric facilities in 3 cities in the USA (Steadman et al. 1998). Subjects had to have a medical record diagnosis of schizophrenia, schizophreniform disorder, schizoaffective disorder, depression, dysthymia, mania, brief reactive psychosis, delusional disorder, alcohol or other drug abuse or dependence, or a personality disorder. Subjects were excluded if they had been hospitalised for longer than 21 days. Their ages ranged from 18 to 40 years. They were interviewed 5 times (every 10 weeks) following discharge for one year following discharge. The comparison group consisted of 519 people that lived in the neighbourhoods in which the patients lived after discharge. The sample consisted mostly of younger patients who were less likely to have a diagnosis of schizophrenia, and more likely to have diagnoses of alcohol or other drug abuse and personality disorder (compared to those who refused to participate), and depression was the most frequent primary diagnosis. Overall the 1-year rate of violence in the group was 27.5%. Substance abuse emerged as the single most important risk factor, but perhaps more importantly, the effect varied according to the primary diagnosis of the subject. The rate for patients with a major mental disorder and substance abuse disorder was 31.1% (and 17.9% without substance abuse), and for those with some other form of mental disorder (primarily personality disorder) 43.0%.

The two major findings of this study were that risk factors have varying impacts depending on the presence (or absence) of other risk factors, and that most violence occurred either in the period just before or during the 3 month period following discharge (that is, the longer the period of follow up the weaker the effects of a risk factor).

The Oak Ridge study was a comprehensive attempt to score risk variables in order to compute long term risks (Webster, Harris, & Quinsey 1994). A total of 618 men referred to a secure mental health facility (332 received treatment, 286 assessed only) were followed up over an average of 7 years. The mean recidivism rate was 31%. Of the variety of variables entered into a step wise discriminant analysis 12 variables (table 2) were identified that best predicted a violent or non-violent outcome. Each variable was given a weighting of -1 or +1 for every 5% it accounted for the variance from the mean of 31% for its own recidivism rate (table 3). When applied to a subject the resulting Risk Assessment Guide (RAG) score was located on a table that generated risks for 7 and 10 year follow ups. Although it was developed to assess risk in mentally disordered offenders the diagnosis of schizophrenia and alcohol abuse were the only psychiatric variables included; the other factors were predominantly criminological. The authors do concede that clinical phenomena should ideally be integrated into an actuarial scheme but assert that empirical evidence for their usefulness is lacking. The clinical variables that they conceded could be important include social and psychological adjustment, insight, pro-social plans, delusions, suicide intent, quality of supervision in the community, compliance with medication, fantasy content, and behaviour within an institution (especially escapes and aggression). However, they insisted that the actuarial score is the 'anchor' of the assessment and should not be modified by more than 10% by clinical judgement.

DO RISK FACTORS HAVE A CUMULATIVE EFFECT?

Actuarial methods of risk assessment assume that an accumulation of risk factors confers increasing risk. In the Epidemiologic Catchment Area survey only 14% of men had predicted adult antisocial disorders when there was no history of childhood conduct

problems, but the rate rose to 75% when there had been 5 or more problems (for women the parallel increase was from less than 4% to 50%) (Robins & Price 1991). A 10 year follow up of 313 released sex offenders found that 5% of those with no or one risk factor for a non-violent sex offence, 21% of those with two, and 41% of those with three were later reconvicted for a non-violent sex offence. Similarly 6% of those with no or one risk factor for general violence, 23% of those with two, and 51% of those with three were reconvicted for a violent offence (Grubin 1997). But the essence of these findings was the unacceptable false positive rate in that almost 2 thirds identified as belonging to the high risk did not re-offend. In other words actuarial methods that count risk factors are best at identifying those at low risk (Grubin 1997). The effects of variables may also follow the saturation model, whereby individuals with multiple risk factors reach a saturation point, and that the addition of other factors (however powerful) have no demonstrable effect (Luntz & Widom 1994c). Conversely some factors may nullify the effects of others, even though each has an independent effect, or certain factors become important only when particular others are present (Scott 1977a). Current research into violence is concerned with investigating models that account for these patterns.

In the following sections the literature has been reviewed to establish which risk factors have been established as important contributors to violence in individuals.

CONCEPTUAL ISSUES: HOMOGENEITY OR HETEROGENEITY

Two seemingly incompatible assumptions exist. One view insists that violent propensities are present in everyone and are acted out when expected controls fail (Diamond 1974;Storr 1968). As Simon (1996a) has declared

“Humankind has a dark side, and its existence ought not to come as a surprise to those who think of themselves as good people. Most religions conceive of humankind as bad, unregenerate, and in dire need of redemption” (p.1).

Psychodynamic theorists almost universally assume that humans possess an aggressive instinct that has self destructive potential but is important for normal development (Blackburn, Gunn, & Taylor 1995;Storr 1968). As Scott (1958) observed fighting is widespread and common in the animal kingdom, and appears to be a useful part of the daily lives of many animals. Displays and acts of aggression are mostly natural behaviours that occur throughout the animal kingdom (especially to gain stature in a hierarchy, or to ensure the survival of one’s genes), and almost always are accompanied by signs of physiological arousal (due to conflict) (Plutchik & van Praag 1989).

The opposing view is that violence and aggression are not inherent but are acquired either by behavioural learning or through pathological processes (Blackburn, Gunn, & Taylor 1995). De Zulueta (1998a) contends that violence is a ‘preventable disease’, and identifies early exposure to trauma (especially within the family), which disrupts early attachments, as the cause. Social learning theorists, like Dollard and Bandura (quoted in Gunn (1995c)), regarded aggression as being shaped by environmental contingencies, such as reward,

modelling (observational learning), or frustration of goal directed activity. In this model aggressive behaviour is acquired via the same processes that determine all social behaviours. Many early experiments, such as those of Tinbergen on stickleback fish and Seward on rats, assumed that animals acted aggressively because of frustration of goals (Scott 1958). Contemporary theory would probably regard these as being biologically inherent (and stereotyped) responses to set situations (Brain & Benton 1981; Eichelman 1992; Mirsky & Siegel 1994).

The implications for research methodology are profound. If violence is to be regarded as inherent then research should be directed at identifying generic facilitatory (or release) factors that may occur in any variety of seemingly unrelated groups. If it is presumed to be due to social shaping, then findings derived from specific groups may not be generalisable to others.

It is also important to distinguish between violent episodes, which are rare occurrences in most people, and the tendency to be violent, which may reside in many who never actually act it out (Krakowski et al. 1989c).

CLASSIFICATIONS OF VIOLENT BEHAVIOUR

Aggression has customarily been divided into predatory (or instrumental) and defensive (or affective) types. The former is presumed to occur in a state of underarousal, where aggression is used as a calculated measure to achieve a specific end. The latter has been

characterised as a high arousal state in which behaviour is less controlled, impulsive and often is a response to perceived threat, provocation or frustration (Scarpa & Raine 1997); (Aarsland et al. 1996; Scott 1958). There is a compelling view that all violence, regardless of its affective accompaniments, serves a clear instrumental purpose, namely that of interpersonal control (Campbell & Muncer 1994). There have been no empirical studies that have explored and compared the phenomenological experiences during various types of violent acting out. Tanay (1978a) contended that all homicide perpetrators act according to their underlying psychodynamic conflicts, which implies that there are always affective and instrumental components.

In short, the dispassionate killer, if he exists, is very rare. However it remains unclear whether contract killers, for example, truly are calm and under-aroused while fulfilling their calling. In other so-called instrumental situations, such as warfare, fear and high arousal are almost inescapably present. Even individuals who are deluded or have paranoid ideation often experience anger that ultimately motivates their aggression (Kennedy 1992; Kennedy, Kemp, & Dyer 1992). A recent neurology review concluded that no studies had substantiated that predatory, or non-affective, aggression really exists in humans (Elliott 1992a).

None of the manuals used for psychiatric diagnosis has differentiated between types of violence, even though all include aggression and violence either as diagnostic criteria or associated features of various disorders (Table 2).

TABLE 2: DSM DIAGNOSES ASSOCIATED WITH VIOLENT BEHAVIOUR

DSM III-R DIAGNOSES	DSM IV DIAGNOSES
<p><i>Violent behaviour is an essential feature</i></p> <p>Antisocial personality disorder Borderline personality disorder Conduct disorder Intermittent explosive disorder Sexual masochism / sadism</p>	<p>Antisocial personality disorder Borderline personality disorder Conduct disorder Intermittent explosive disorder Sexual masochism / sadism</p>
<p><i>Violent behaviour is an associated feature</i></p> <p>Attention deficit disorder Bipolar affective disorder Brief reactive psychosis Delusional (persecutory) disorder Mental retardation Organic mental disorders Post traumatic stress disorder Psychoactive substance use disorder Schizoaffective disorder Schizophrenia</p>	<p>Attention deficit/ hyperactivity disorder Bipolar affective disorder Brief psychotic disorder Delusional (persecutory) disorder Mental retardation Mental disorders due to a general medical condition Post traumatic stress disorder Substance related disorders Schizoaffective disorder Schizophrenia</p>
<p><i>Violent behaviour occurs infrequently</i></p> <p>Adjustment disorder with disturbance of behaviour Cyclothymia Late luteal phase disorder Major depression Paranoid personality disorder Psychogenic fugue Psychotic disorders Schizoid personality disorder</p>	<p>Adjustment disorder with disturbance of conduct Bipolar II disorder Pre-menstrual dysphoric disorder Major depression Paranoid personality disorder Dissociative fugue Psychotic disorders Schizoid personality disorder</p>

(adapted from Burrowes et al (1988a)).

RISK FACTORS ASSOCIATED WITH CRIMINAL VIOLENCE

The National Research Council commission (Reiss & Roth 1993) has proposed that risk factors be organised according to a matrix that recognises the interaction between social and individual factors, and includes predisposing, situational and activating variables. Social factors are macrosocial, with predisposing variables such as socio-economic circumstances, sex-role socialization, oppositional cultures, and microsocial (with predisposing variables such as gangs, illegal markets, family disorganisation, community structures).

Within the individual biological imperatives and psychosocial influences (that limit the capacity to select non-violent coping techniques) combine with situational variables violent acts result (1993a).

PREDISPOSING FACTORS

NEUROBIOLOGICAL FACTORS

Just 20 years ago MacDonald (1976a) devoted a mere 7 pages to biological factors in his textbook, 'Psychiatry and the Criminal'. Contemporary research assumes that virtually all phenomena have at least some neurobiological basis.

Two lines of investigation have been pursued. Genetic studies have attempted to establish whether violent behaviour aggregates in families within particular diagnostic categories. Neuroanatomical and neurophysiological investigations have concentrated on elucidating whether aggression flows from pathological function of particular brain systems, or is actually an inherently normal brain function.

Genetic studies

The notion that violence can be found lurking in chromosomes was provoked by Jacobs' (1965a) assertion that males with 47, XYY aneuploidy were 'hyperaggressive, supermasculine sociopaths'. Subsequent studies, albeit on samples of less than 15 individuals each, have disproved the relationship (Carey 1994; Schiavi et al. 1984).

A recent review concluded that there have been only 3 modern studies that allow for meaningful analyses of violent offenders (Carey 1994). In Mednick et al's Danish adoption sample (1987a) only 1% of 3,691 adoptees were classified as chronic offenders. There were higher correlations for property offences between probands and biological parents, than for violent offences. The Stockholm adoptee sample, however, produced a negative relationship for violent crime (but positive for alcohol abuse) between adoptee and biological father (Cloninger et al. 1982; Virkkunen et al. 1994). Cloninger and Gottesman's (Cloninger & Gottesman 1987) analyses of Danish twins found a high concordance for criminality (0.74 for Monozygous, 0.47 for Dizygous twins), but for crimes against persons the rates were .41 for MZ twins and .20 for DZ twins. In populations of mentally disordered murderers family histories are much more likely to be positive for mental illness

and not for violence (McKnight et al. 1966). Therefore genetic associations are strongest for antisocial behaviour and alcohol abuse, but not for violence.

Neuroanatomical and neurophysiological findings

Animal studies (most commonly on cats) have differentiated between predatory attack and affective (defensive) aggression (Eichelman 1992; Mirsky & Siegel 1994). For both types the final common pathway for the physical expression of aggression is within the hypothalamus and midbrain periaqueductal grey (PAG) which are functionally part of the limbic-hypothalamic-midbrain axis. Affective defence behaviour is generally explosive and is accompanied by a sympathoadrenal response (e.g. piloerection, pupillary dilatation, retraction of ears and arching of the back), analogous to the 'episodic dyscontrol' syndrome described in humans. Predatory aggression occurs without significant arousal and is usually interspecific (i.e. between animals of different species). Both types are modulated by the ventral and dorsal hippocampus, septal area, amygdala and portions of the prefrontal cortex and cingulate gyrus. In addition affective defence involves the central tegmental areas of the midbrain and pons, the locus coeruleus, and nuclei of the trigeminal complex (for vocalisation). Lesions of the septal nuclei in the rat produce increased defensive affective aggression, whereas lesions of the ventromedial nucleus of the hypothalamus produce an increase in offensive affective aggression (Eichelman 1992). It is noteworthy that affective responses can be present in both forms of aggression. Unfortunately it is not yet clear whether this can be extrapolated to human behaviour (Dodge 1993; Eichelman 1992).

The postulate of a localised “aggression centre” in the brain has continued with the quest to identify critical neurotransmitter systems (Eichelman 1992). It is hypothesised that increased noradrenaline and dopamine activity in the CNS in animals correlate with, or trigger affective aggression, but inhibit predatory aggression. Activation of the cholinergic system augments both, whereas activation of the serotonergic system inhibits (Rutter 1985). Depletion of central nervous system (CNS) serotonin (measured by its metabolite 5 hydroxyindole acetate (5HIAA) in cerebrospinal fluid(CSF), or monoamine oxidase (MAO) activity in platelets) has been found in violent offenders, even if they are psychotic (Belfrage, Lidberg, & Orelund 1992; Mulvey & Lidz 1985; Virkkunen et al. 1987a). Dopamine metabolites do not, however, correlate with such behaviour (Rutter 1985). Studies on free-ranging macaques on Morgan Island have confirmed an inverse correlation with cerebrospinal fluid 5 HIAA and escalating aggression as well as loss of impulse control (Higley et al. 1992; Mehlman et al. 1994). This relationship held only for the severe forms of aggression, but not overall rates of aggression, and impulse dyscontrol could not be differentiated from aggression. Generally low CSF 5HIAA levels correlate strongest with poor impulse control (or sensation seeking) rather than violence per se (Roy et al. 1986; Rubin 1987; Virkkunen et al. 1987b; Virkkunen, Horrobin, Jenkins, & Manku 1987a; Virkkunen 1987; Virkkunen et al. 1989a; Virkkunen et al. 1989a).

It is interesting that suicide (especially if violent), depression, anxiety, alcohol dependence, bulimia, Tourettes syndrome and attention deficit disorder in aggressive children demonstrate similar serotonergic profiles (Cohen et al. 1979; Halperin et al. 1994; Jimerson et al. 1997; Klinteberg et al. 1987; Murphy & Pigott 1990).

A similarly robust association has been established with low fasting serum cholesterol levels in psychotic and personality disordered subjects (Mufti, Balon, & Arfken 1998; Santiago & Dalen 1994; Virkkunen & Penttinen 1984). However all were interested only in the occurrence of violent behaviour and not its phenomenology.

Androgens, especially testosterone, are presumed to have two types of actions; permanent (or organisational) effects and temporary (or activational) effects (Rubinow & Schmidt 1996; Rutter 1985). Secretion in utero and early development probably primes animals (including humans) to engage in post-pubertal aggression and sexual behaviour when context-dependent variables are present. This effect has been observed in violent female neuropsychiatric patients, alcoholics, and violent male prisoners (Dabbs et al. 1988; Virkkunen 1987; Virkkunen, Rawlings, Tokola, Poland, Guidotti, Nemeroff, Bissette, Kalogeras, Karonen, & Linnoila 1994). However a recent review concluded that there are many negative studies, including one that concluded that administration of androgens to hypogonadal men did not result in aggressiveness (Rubinow & Schmidt 1996). Anabolic androgens administered in high doses can produce mood changes, often irritability, which in turn can result in aggressive outbursts (Pope & Katz 1994) (Rubinow & Schmidt 1996). Although the association between testosterone and aggression has not really been conclusively demonstrated most of the positive studies, especially those that have focused on the possible relationships between anabolic steroid use and psychiatric symptoms, have not been able to confirm that specific forms of aggression or violent behaviour are facilitated by these hormones. Affective symptoms (such as irritability, anger, anxiety) frequently cannot be differentiated from feelings of aggression and hostility (Pope & Katz 1988; Pope & Katz 1994). Testosterone levels in healthy male adolescents have been strongly correlated to self reports on provoked aggression, and indirectly correlated to

unprovoked aggression via a variable identified as low frustration tolerance (Olweus 1987). However serum testosterone levels did not correlate with variables related to delinquency in adolescents, but were related to sociability and extraversion (including a preference for physical sports and vigorous activity (Mattsson et al. 1980).

According to Elliott (1992a) males are more prone to violence because of the prenatal influence of androgens on the hypothalamic preoptic area, and that aggression diminishes beyond middle age because maturation of the cortices is completed during the 4th decade. This reinforces the impression that aggression is associated strongly with arousal (Brain 1994).

Psychophysiological studies have generally concentrated on differentiating antisocial and criminal individuals by assessing baseline measures of arousal (skin conductance, heart rate and cortical EEG readings) and conditioning responses. There has been speculation that under-arousal may be associated with mild aggression, and over-arousal with emotional aggression (Loeber & Stouthammer-Loeber 1998). This is based on Gray's theory that a Behavioural Inhibition System (BIS) inhibits behaviour in response to punishment, and is mediated within the septo-hippocampal regions of the brain, and a Behavioural Activation System (BAS) which responds to reward. But these authors have conceded that they have not been able to differentiate between aggressive and non-aggressive antisocial subjects.

Cerebral lateralisation

Left-handedness is determined either genetically, or arises from pathological insults to the developing brain, and therefore may serve as a clinical marker for brain dysfunction. A randomly selected group of subjects with Down's syndrome, autism or epilepsy had a rate of non-right-handedness of 36%, which is considerably higher in the general population, and possibly left sided central (brain) lesions (Lewin, Kohen, & Mathew 1993). Androgens in utero possibly assist in determining left hemispheric dominance in males, which raises the likelihood that right hemispheric dominance in males could be associated with lower tendencies for aggression (Andrew 1980; Geschwind & Galaburda 1985; Springer & Deutsch 1993).

DEMOGRAPHIC FACTORS

The Epidemiologic Catchment Area (ECA) study, which was conducted in an unselected sample from 5 open communities concluded that violence was 7 times more prevalent in the young (mostly in the age group 18-29 (7.34%)) as the old, twice as common among males than females (5.29% compared with 2.21%), and 3 times as prevalent among those of the lowest social class than those from the highest social class (Swanson, Holzer, Ganju, & et al. 1990). But it also showed that youth interacts significantly with a past history of violence, loss of employment and alcohol and substance abuse (Catalano et al. 1993; Swanson, Holzer, Ganju, & et al. 1990).

Age

Adolescents between the ages of 13-16 years are responsible for most criminal activity. Violent crimes mostly are committed by young males in the 25-29 age range, which represents 89% of all people arrested for violent crimes (Reiss & Roth 1993). Risk-taking behaviour in high school students is relatively common, and a survey in Cape Town revealed that among boys there was a relationship between alcohol use, cannabis, sexual intercourse, knife-carrying, cigarette smoking, suicide attempts and driving without a seat belt. The girls had a similar interaction of variables except that knife-carrying was insignificant (Flisher et al. 1996a). In the Cambridge longitudinal study the prevalence of offending increased to 17 years, but on average began at 17 years and declined after age 23 years (Farrington 1995e). In South Africa the adult : youth conviction ratio (i.e. under 20 years) has been calculated to be 3.1 :1 (Glanz 1993). However, a Canadian survey of homicide perpetrators in a forensic psychiatry hospital found that the greatest number of

their offences occurred between the ages of 30 and 34 years, with a second peak between 15 and 19 years (McKnight, Mohr, Quinsey, & Erochko 1966).

Age under 50 years coupled with a history of serious criminality has been associated with re-arrest in released forensic psychiatric patients, although in that study most of the subjects were middle aged and had been institutionalised for an average of 14 years (Cocozza & Steadman 1974). In the Copenhagen 25-year retrospective survey of 251 homicide defendants the average age was 29 years, 215 were male, and 36 female (Gottlieb, Gabrielsen, & Kramp 1987).

Gender

Only 15% of serious offences in England and Wales are committed by women, and a very small number are recidivists (Heidensohn 1991). However crimes perpetrated by women is rising, and mirrors the demographics of males, i.e in the 15-18 year low socio-economic groups. In South Africa women account for 10% of all arrests for murder and culpable homicide, 13% for aggravated assault, 16% for simple assault, 8% for robbery and 1% for rape (Glanz 1992d). Males under age 18 commit violent crimes in roughly the same proportion as their numbers in the other age groups. Although male arrest rates decline from age 45, the female arrest rate remains relatively constant throughout the age groups. After age 65 the female arrest rate approaches half that of males, although the overall rate for that age group is extremely low. Male pre-adolescents and adolescents are twice as likely (than females) to engage in physical aggression than verbal aggression (Kashani, Deuser, & Reid 1991). Also, males score higher on sensations seeking and self reported delinquent scales, which are supposed to be reasonable indicators for violence (Perez & Torrubia 1985).

In a study of 100 convicted female prisoners Daniel et al (1988b) found that 29% had committed a violent crime, which was similar to that of 21% of homicide convictions in a prison in Missouri (Cloninger & Guze 1970). The latter study confirmed that female prisoners shared matching demographics to that of male prisoners, and were as likely to attract a diagnosis of sociopathy.

Female psychiatric patients in a community sample were significantly more likely to have been arrested for a violent offence than their male counterparts (Sosowsky 1978). An 18 month survey of admissions to a clinic found that 13.6% of males and 14.7% of females had been violent in the month preceding admission, a non-significant difference (Tardiff et al. 1997). In South Africa the overall offence male:female conviction ratio has been calculated to be 5,8 : 1; for assault to do grievous bodily harm (the offence category which has the highest number of convictions) it is 5,6 : 1, and for murder 11,8 : 1. Female convictions outnumber those for males in the crime category of 'cruelty to, ill treatment and neglect of children' to a ratio of 87 : 67 (Glanz 1993).

Violent Females: Amongst psychiatric samples there are no significant differences between female and male reports of past homicide attempts (Asnis et al. 1994). There have been few studies on violent female offenders. Daniel et al's (1988b) survey of 100 consecutively admitted females to a correctional facility found that 29% had committed a violent crime, 90% were given at least one Axis I diagnosis, and 67% more than one diagnosis. The major diagnoses were alcoholism (26%) antisocial personality disorder (29%), and schizophrenia (7%), calculated as a 6-month and lifetime prevalence.

A survey of 162 remand females that had been referred to the Forensic Psychiatry Unit at Valkenberg Hospital between 1944 and 1984 revealed some interesting trends (Offen 1986). From 1960 the rate of referral of female defendants increased markedly (35 % had been referred in the final 4 years of the study), and the numbers being sent following violent offences increased dramatically (50% of those charged for culpable homicide and homicide were admitted between 1980 and 1984). Almost two thirds (61%) had a previous history of psychiatric illness (mostly the reason for the referral), and 51% of those who had a history of two or more previous admissions to a psychiatric hospital were certified at the end of the assessment period. Only 17.5% who had no previous psychiatric history were so certified. Only 31% were married and 3% were widowed; most were single and lived alone. Of the 162 women 19% had full time jobs, 9% had part time or casual work, and the remainder were unemployed or housewives. Their alleged offences were:

	N	%
Prostitution	6	2.7
Sexual offence	1	0.6
Drugs	12	7.4
Assault	16	9.9
Homicide	16	9.9
Burglaries	7	4.3
Theft	30	18.5
Shoplifting	29	17.9
Falsitas	17	10.5
Arson	3	1.9
Malicious damage	6	3.7
Other	19	11.7

(Offen 1986; p343)

Only 8 (5.0%) were declared as state patients, and 45 (27.8%) were referred to a hospital under civil commitment (that is, 66% were returned for trial). There were racial differences.

68.8% of the homicide charges were against white women, whereas 75% of the assault charges were against the coloured women. Coloured women were more likely to be diagnosed as suffering from a recognised psychiatric disorder (especially schizophrenia), whereas white women were more likely to be seen as having significant psychological problems and to abuse alcohol. Of the 8 eventually declared as state patients 5 were coloured. The author speculates that the racial differences occurred because most of the court officials are white males who were more sympathetically inclined to the white women (with whom they identified) and more likely to label other race groups as 'mad and bad'. But she concedes that coloured defendants were less likely to have legal representation, and therefore were most likely referred because they were obviously bizarre in court.

Clinical studies tend to confirm that female patients are usually admitted to hospitals because of overt violence, although men were more likely to be perceived as possessing potential for violence (Beck, White, & Gage 1991b). A group of 127 female homicide offenders had a 10-fold higher odds ratio of having schizophrenia, a 70-fold greater likelihood of having an antisocial personality disorder, alcohol abuse/dependence with personality disorder, and schizophrenia with alcohol abuse/dependence compared to community controls (Eronen 1995). Likewise a 25-year survey of homicide defendants showed that 44% of the females were psychotic compared to 20% of the males (Gottlieb, Gabrielsen, & Kramp 1987). Women with major mental disorders were 27.45 times more likely to have been convicted for a violent offence, and those with a diagnosis of substance abuse/dependence were 54 times more likely than controls to be convicted for a violent offence (Hodgins 1992). A 10 year survey at St. Elizabeth's Hospital (a forensic institution) showed that 35 out of 105 men, and 10 of 35 women displayed violent behaviour during an admission, a non-significant difference (Karson & Bigelow 1987b).

Data from general psychiatric units have confirmed that about 45% of acute admissions, and about 7% of chronic patients (in a preceding 3 month period) had been violent toward others, and that there were no significant differences between males and females (Palmstierna & Wistedt 1988; Tardiff & Sweillam 1982b). Clinicians generally underestimate in their predictions of violence of female patients. For example, in a 6 month follow up study of patients in a psychiatric emergency department there were more incidents of violence committed by the women (49%) than men (42%), even though the clinicians had predicted that only 22% of the women would be violent (Lidz, Mulvey, & Gardner 1993e). Perhaps women are more likely to be diverted into the mental health system, whereas men are more likely to be arrested (Heidensohn 1991).

Despite these data there is a common assumption that men are inherently more violent than women. Scott (1977a) disputes this, and argues that women are conditioned to believe that they are physically weaker, but actually are as likely to be violent on vulnerable victims such as babies and children. There is evidence that in baby battering, a peculiarly female offence, the same excessive violence is employed that one associates with adult male violence. In Scott's opinion this finding indicates that baby battering represents a 'microcosm of violent crime' and reflects that violence is inherent equally in both genders.

Anthropologists have speculated that male aggression has evolved similarly to that in chimpanzees, a result of successful competition by dominant aggressive alpha males to impregnate submissive females (Wrangham & Peterson 1996). Female dominated primates, such as bonobos, where females band into groups and control male behaviour, engage in

much less intra-species aggression. However these writers do concede that female hyenas hunt in packs with greater ferocity than the males.

Race / ethnicity and socio-economic status:

Heilbrun (1978b) insisted that accumulated evidence indicated that membership in minority groups that are subjected to prejudice increases the risk of violence. According to American statistics blacks constitute 45% of all arrests, and are generally over-represented in the most serious violent crime categories, especially robbery, but also homicide and rape (Reiss & Roth 1993). Although conviction statistics in South Africa were recorded fastidiously under Apartheid, the inequalities in access to legal representation and differing arrest patterns probably skewed data. The general male : female ratios were similar across population groups. Female whites were much less likely to be convicted for a violent crime than white males to a ratio of 25 : 1. However the adult : youth conviction ratio for whites was 7.6 : 1, which was substantially higher than the national average of 3.1 : 1 (Glanz 1993). Convictions of coloured youths for rape is greater than adults to a ratio of 7.1 : 5, which is more than 3 times that of the other race groups. Conviction rates for assault amongst coloureds is 555, blacks 153, Indians 47, and whites 21 per 100 000. Likewise coloureds have conviction rates for attempted murder and murder that are 3 times that of blacks, five times that of Indians, and ten times that of whites. This does seem to convey the impression that a sub-culture of violence exists amongst coloured youth. Many US studies have found that when other variables (such as diagnosis, socio-economic status) are controlled there are non-significant differences between races. Unfortunately most clinicians and law enforcement officials regard black individuals (whether patients or

arrestees) as being inherently more dangerous than their white counterparts (Lagos, Perlmutter, & Saexinger 1977e; Lipsedge 1994).

The influence of socio-economic class (SES) has never quite been eliminated as a determinant, as a low SES could either be a cause or consequence of pathology, and it is well known that most offenders are lower class individuals (Monahan 1992).

Because of the history of apartheid research into race as a contribution to violence remains an exquisitely sensitive issue. The effects of repression and prejudicial arrests cannot yet be controlled for. And most importantly the race classification scheme used by the then authorities was known to be arbitrary and flawed.

Marital status

A 25 year follow up of delinquents showed that at age 32 years convicted men were more likely to be divorced or separated, and to have assaulted their spouse (Farrington 1995e). Those who ceased offending were more likely to have married an unconvicted woman, whereas marriage to a convicted woman was associated with no change in the rate of offending. An enduring marriage appeared to be a protective risk factor. This probably reflects an ability to form reasonably close relationships (Scott 1977a).

Education

Poor education attainment (less than 6 years of formal schooling) has consistently been associated with criminality, but not with violent behaviour (Farrington 1995e; Raine et al.

1996b;Reiss & Roth 1993). Years of education and IQ scores have not significantly differed in a group of violent and non-violent schizophrenics (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c).

Unemployment:

Data extracted from the ECA study indicated that job loss (or lay off) increased the risk for violent behaviour. Individuals who were employed and were not violent at the first interview, but had been laid off by the second were 6 times more likely to be violent than their employed counterparts. This was independent of any psychiatric disorder (and was of greater effect), and was related to being young, and previous violence (Catalano, Dooley, Novaco, Wilson, & Hough 1993). More importantly employed persons who reported recent violent behaviour (but not psychiatric disorder) at first interview were 16 times more likely to be laid off by the second interview.

Convicted delinquents tend to have well-paid but low status jobs and an erratic work history, which seems to be associated with going out in the evenings, 'hanging about' in the streets, and going around in groups that were often involved in group violence and vandalism (Farrington 1995e). Persistent criminality after age 21 years is associated with the interaction of unemployment and alcohol abuse. But the association appears to be strongest for offences that involve financial gain, and not violence. Sometimes an occupational preference for jobs that involve butchering (or work in abattoirs) may betray a sadistic fantasy life that is expressed in dispassionate guilt-free aggression (Scott 1977a).

Homelessness:

Homelessness² has been implicated as a co-factor for criminality, especially amongst mentally ill individuals. A community based area survey of 529 homeless adults in Los Angeles noted that 76% of those who had previously been hospitalised for a psychiatric disorder had been arrested, and that this group was 3 times more likely to have been convicted for a felony compared to the 'well' group (Gelberg, Linn, & Leake 1988). The hospitalisation group was also 3 times more likely to drink alcohol on a daily basis, and at least 41% admitted to the use of illegal drugs in the previous month. Unfortunately the study expressly excluded subjects that exhibited threatening or violent behaviour or were incoherent. Nor were the types of offences recorded, or whether they exhibited more violent behaviour.

According to Martell (1991a) 49.6% of 137 mentally disordered offenders in a forensic facility were classified as homeless at the time of their index offences. The rate of homelessness in this group was 25 times more than that of other mentally ill people, and 50 times more than the general population. Psychotic disorders predominated in both domiciled and homeless groups. Homeless mentally ill were more often charged with violent offences, especially assault (26% compared to 5% of domiciled offenders), which was confirmed by a logistic regression model that indicated that the odds ratio for homelessness and violent offending was 1.77 (i.e. almost twice the risk). The author suggests that homelessness is a situational variable that interacts with the diathesis for

2 'Homelessness' is defined as the need to find makeshift accommodation with uncertainty about remaining in any place for longer than 60 days (Gelberg, Linn, & Leake 1988).

violence created by mental illness, but does concede that homelessness may actually render the mentally ill more vulnerable to arrest.

Socially isolated individuals may be at risk of manifesting interpersonal aggression. Rapists that murder their victims are more likely to have been socially isolated, usually from childhood(Grubin 1997). A previous study at Valkenberg Hospital was not able to ascertain whether subjects were truly homeless, or pursued vagrant lifestyles intermittently because of overcrowding at home (Kaliski & Zabow 1993).

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HISTORICAL FACTORS

Many adult behavioural patterns first manifest during childhood, or are possibly caused by early experiences.

The Cambridge Study on Delinquent Development followed a sample of 410 8-9 year olds over 25 years (Farrington 1995e). They were interviewed at ages 8, 10, 14, 16, 18, 21, 25 and 32 years. They concluded that at age 8-10 years the predictors for future delinquency were antisocial child behaviour (troublesomeness at school, dishonesty and aggressiveness), hyperactivity-impulsivity-attention deficit, low intelligence and poor school performance, family criminality, family poverty (including large family size and poor housing), and poor parental child-rearing behaviour (harsh, erratic discipline, poor supervision, parental conflict and separation from parents). However at each follow up preceding antisocial behaviour became increasingly important as a risk factor. Those who reported that they were bullies at 14 years reported that they were bullies at age 32 years. Aggression and violence were patterns that began early, and persisted. Conversely they identified shy temperament, high intelligence, being first born and a small, stable family characterised by low discord, and social isolation to be protective factors (Reiss & Roth 1993) (Farrington 1995e).

Family circumstances

Convicted delinquents tend to be from poorer, large sized families, and tend to have been physically neglected by their parents (Farrington 1995e). Parents and older siblings were more likely to have had convictions, and the delinquents were more likely to have been subjected to harsh, cruel, or erratic discipline, and to have been exposed to poor parental

supervision and parental conflict. Up to their 10th birthday most future delinquents had experienced broken homes or separations from their parents (such as removal by welfare agencies), and to have had parents who were not interested in their education. Parental brutality, including head blows, corporal punishment, and paternal alcoholism have also been linked to adult aggression (Felthous 1980).

Child Abuse and Neglect

Physical and mental abuse of children has always existed, often with cultural sanction, and as an acceptable fact of routine existence (Oliver 1993b). Since the early 1960's there have been consistent findings that about one third of individuals who are abused or neglected during childhood eventually similarly abuse their own children, and that the effects of sexual and physical abuse do not produce significantly different types of adult abusive behaviour (Silver, Dublin, & Lourie 1969);(Beck-Sander 1995). The definition of physical abuse excludes milder acts of reprimand (slapping, pushing or shoving), but includes repetitive occurrences of assault, and sexual abuse of unwanted or coerced sexual contact while under the age of 16 years. Some have defined physical abuse only when blood was drawn or medical attention was required following episodes of abuse (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c). Neglect refers to a judgement (by the investigator) that the parents failed to provide levels of care found acceptable by the community, usually manifested by a failure to provide adequate food, shelter or medical attention (Luntz & Widom 1994c). Sexual abuse of children is possibly as widespread; at least one-third of women and about half that number of men have had sexual contact with an older person as a child (Sheldrick 1991).

A history of child abuse is relatively common in psychiatric populations. A sample of 169 subjects diagnosed with a major psychiatric disorder revealed that 31.8% reported childhood abuse, and 41% admitted to having behaved violently in the past (Estroff et al. 1994). However those who had been threatened and attacked in childhood were less likely to engage in like behaviours in adulthood. Instead, the authors conclude, they present with mental illness. However, a comparison of violent and non-violent schizophrenics failed to show that child abuse in the former was more prevalent (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c).

For many the impact of the abuse was ultimately minimal, whereas those that do suffer impairments in adulthood may experience variety of mild to serious disorders, but do not commonly exhibit aggressiveness (Farrington 1991;Reiss & Roth 1993).

A comparison of 24 child molesters with 13 violent offenders revealed that 71% of the former, and 46% of the latter had been sexually abused (a non-significant comparison), but 92% of the violent offenders and 39 % of the child molesters had been victims of physical abuse (a significant comparison) (Beck-Sander 1995). However the author did emphasise that the acts of sexual and physical abuse were usually indistinguishable. Childhood sexual abuse per se has generally been associated with emotional disorders (depression, anxiety), disturbed interpersonal relationships, borderline personality disorder, eating disorders, and impaired social functioning, but not especially with adult violent behaviour (Sheldrick 1991).

A group of abused / neglected children that were followed up over 20 years had a greater rate of antisocial personality disorder in adulthood compared to matched controls, but, importantly, 86% of the abused group did not develop the disorder (Luntz & Widom 1994c).

In an influential review Lewis (1992b) noted that animal studies had shown that repeated infliction of pain on animals and people is a powerful generator of aggression. Abusive treatment also has a deleterious effect on expressive skills of children. Unable to speak about their negative experiences and feelings they act out their frustrations, and continue the cycle of abuse onto others. Their inability to experience empathy from others is probably a consequence of a conditioned ability to insulate themselves from their own painful experiences, which over time may become unconscious and not accessible to memory. However she does concede that mice that are genetically aggressive remain so even when growing up in nurturing non-violent environments. This suggests that not all children are predisposed by temperament to respond to abuse with aggressivity. Boys are especially vulnerable (possibly a consequence of the 'XY syndrome'), particularly if they have suffered some previous brain insult, with resulting neuropsychiatric deficit. Such children are more vulnerable to the conditioning effects of repeated abuse, are more likely to be irritable, and to misinterpret cues as being threats. She postulates that testosterone and similar androgens cause delayed development of verbal skills, which contributes to the foregoing predisposition. As she concludes

“..whatever increases impulsivity and irritability engenders hypervigilance and paranoia, diminishes judgement and verbal competence, and curtails the ability to recognise one's own pain and the pain of others, also enhances the tendency toward violence. Abusive, neglectful caretaking does all of these things. In a resilient child, maltreatment (i.e. abuse or neglect) may not engender aggression. In an already vulnerable child with tendencies toward impulsivity,

hypervigilance, expressive difficulties, and dissociation from painful feelings, maltreatment is often sufficient to create a very violent individual. To the extent that testosterone contributes to this constellation of vulnerabilities, persons with the XY Syndrome are at special risk.” (p.389)

Oliver (1993b) has demonstrated that there is often an intergenerational transmission of child abuse, but the actual expression of the abuse varies markedly. For example the intergenerational sequences could be sexual abuse – depression/rejection – violence/criminality – neglect – baby battering. More importantly he found that in adulthood subjects had bland memories of their childhood, whereas official records usually told a more savage story. In other words, self-reports of childhood abuse were generally unreliable.

The impact of witnessing violence by children has uncertain effects, even though there is a widespread assumption that it validates the use of violence in their impressionable minds (Eth 1989; Groves et al. 1993). Unfortunately this has proven difficult to establish because of the profusion of interfering variables (such as abusive parenting, and gang membership).

Therefore most research has concentrated on conduct disorder and its interactions with other disturbances as important harbingers for adult antisocial behaviour.

Conduct Disorder

Conduct disorder is a necessary precursor for the diagnosis of adult antisocial personality disorder, and is one of the most common childhood psychiatric diagnoses, with estimates of its prevalence in the general population ranging up to 12%, with a male/female ratio of

2:1 (Robins & Price 1991). In the Epidemiologic Catchment Areas study conduct disorder was predictive not only for adult personality disorder and alcohol/ substance use disorders, but also schizophrenia, major depressive episode, and somatization disorder in women. Even the anxiety disorders (especially male obsessive compulsive disorder) were almost as strongly associated with conduct disorder as alcohol abuse was (Robins & Price 1991).

A 4 year follow up of 166 adolescents who had undergone treatment in inpatient substance abuse programmes found that the ultimate predictors, in logistic regression models, for adult antisocial personality disorder were early onset of conduct disorder (before 10 years), greater diversity of conduct disorder behaviours, and greater recent use of drugs (Myers, Stewart, & Brown 1998).

An early study that followed up 66 aggressive 15 year olds admitted for psychiatric observation (between 1925 and 1935) over a 3 year period concluded that although two thirds never made adequate adjustment and 20% eventually became psychotic only one had committed a violent crime (Morris, Escoll, & Wexler 1956). A comparison between aggressive psychiatric inpatients, non-aggressive patients and non-psychiatric patients indicated that childhood symptoms of frequent violent outbursts, fighting, inability to get on with others, school suspensions, truancy, frequent temper tantrums, fire setting and killing of animals were associated with adult aggression (Felthous 1980; Justice, Justice, & Kraft 1974).

Preliminary studies have indicated that verbal and physical aggression are significantly associated with measures of conduct disorder, attention deficit disorder, oppositional disorder, anxiety and low serotonergic activity in the central nervous system in groups of

pre-adolescent and adolescent children, (Kashani, Deuser, & Reid 1991); (Halperin, Sharma, Siever, Schwartz, Matier, Wornell, & Newcorn 1994; Kruesi et al. 1992).

Attention deficit and hyperactivity

Authorities are almost unanimous in declaring that ADHD is very difficult to diagnose retrospectively in adults, although there is a growing awareness that adult antisocial activity could be due to unrecognised and unresolved Adult ADHD (Ratey et al. 1992). In Dalteg and Levander's (1998b) 20 year follow up of 75 serious recidivist youthful offenders hyperactivity (and attention deficit disorder) significantly co-varied with general criminality, but not with violent offending. Hyperactive subjects committed almost twice as many crimes as controls. The earlier the onset of hyperactivity, that is, before 6 years, the more crimes eventually committed. However at least half of their biological parents were psychosocially impaired (due to either alcoholism, criminality or psychiatric illness), and only 16% of the parents were deemed to be socially well functioning. Hyperactivity was strongly associated with substance abuse, truancy, defiant behaviour, escaping, psychosomatic back pain, and poor scholastic achievement (also strong risk factors for delinquency).

The course of the disorder and its influence on adult antisocial behaviour remains uncertain. A longitudinal follow up of 104 6-12 year old boys in which 43% had hyperactivity, 32% conduct disorder, and 10% drug abuse at 18 years, had by 25 years changed, in that 4% had hyperactivity, 12% antisocial personality disorder and 19% alcohol and drug abuse (Gittelman et al. 1985; Mannuzza et al. 1989; Mannuzza et al. 1998).

'MENTAL DISORDER'

More than 60 years ago Penrose noticed that countries with large prison populations had small mental hospital populations, and vice versa (quoted in Gunn (1977d)). Mental disorder and crime are generally highly prevalent, and therefore commonly co-occur in both offender and psychiatric populations. Between 25-50% of prison populations suffer from a psychiatric disorder, and about 30% of convicted prisoners could be regarded as psychiatric cases (Gunn 1977d). Therefore the prevailing wisdom until about 10 years ago was that neither was causally linked to the other, despite an oft-quoted German study that had concluded that schizophrenia conferred some risk for violent behaviour (Hafner & Boker 1973). Concern about the possibility that mental illness could be a cause of violence (and not just crime per se) crept onto the research agenda when public anxiety about the deinstitutionalisation of chronic inpatients gained momentum during the 1970's. The prevailing wisdom had always been that property offences tend to be associated with ordinary recidivism, whereas violent offences, sexual offences and drug offences were more strongly related to psychiatric factors (Gunn 1977d). But establishing that causal link had proven to be difficult. As Monahan (1997b) asserted, if mental disorder is a risk factor for the occurrence of violence then the prevalence of violence among the disordered should be higher than the non-disordered population, and mental disorder should be higher among people who commit violent acts. This has been examined by surveys of general community, offender and clinical populations.

Community surveys

In an unselected Swedish birth cohort study of 15117 persons followed from birth to age 30 years, most violent offences were committed by non-psychotic individuals (Hodgins 1992). The Epidemiological Catchment Area survey documented 368 subjects (out of a sample of 10 000) that admitted to having been violent in the preceding year. Of these, 55.5% met criteria for a psychiatric diagnosis, compared to 19.6% of the non-violent respondents, a significant difference (Swanson, Holzer, Ganju, & et al. 1990).

Surveys of offender populations:

Mentally ill individuals are arrested more frequently, and prisons contain more schizophrenics than expected from the frequency of the illness in the population (Tidmarsh 1990). This may be an effect of deinstitutionalisation. Steadman et al (1978c) compared the arrest rates of 2 cohorts of released mental patients; 1 920 released in 1968, and 1 938 released in 1975, and followed them up over 19 months. 6.9% of the former, and 9.4% of the latter were rearrested. However the rates for violent offences were very low, 0.9% and 1.7% respectively. On analysis they concluded that a history of prior arrests, younger age and a diagnosis of substance abuse and personality disorder accounted for the differences between the arrest and control groups.

Surveys of remand populations have indicated that about 26% have a current mental disorder, (of which one third have a serious disorder), and that about one third of sentenced males can be given a psychiatric diagnosis. No distinction between violent and non-violent offenders was made (Birmingham, Mason, & Grubin 1996;Gunn, Madden, &

Swinton 1991). Amongst a remand population that sought psychiatric care 37.9% had been charged with a violent offence, 29.2% were diagnosed as schizophrenic, 9.4% with an affective disorder, 7.6% with personality disorder, and 53.8% had adjustment disorders (Draine, Solomon, & Meyerson 1994). In Taylor and Gunn's remand survey (1984b) 6.1% were diagnosed with schizophrenia, and most were charged with property offences. Mentally ill arrestees were more likely to have been apprehended at the scene of the crime because the combination of psychosis and social incompetence ensured that they were more likely to be apprehended (Robertson 1988).

The majority of property offences committed by the mentally ill are usually pathetic attempts by destitute homeless men to survive, and many attract violent charges from minor assaults, either in resisting arrest or in response to provocation (Coid, quoted in Tidmarsh, 1990). A remand sample in California showed that whereas schizophrenics had an average of 8.4 arrests over a 5 year period, only 14% had histories of violence (Adams, Meloy, & Moritz 1990).

An Australian study estimated that 2% of convicted prisoners were schizophrenic (Herrman et al. 1991). A random screening of 650 inmates in a Canadian prison found lifetime prevalences for schizophrenia to be 6.5% (7 times higher than the general population), bipolar affective disorder 3.4% (6 times higher), atypical bipolar affective disorder 3.2% and major depression 14.8% (Cote & Hodgins 1990). However the major psychiatric disorders rarely existed in pure forms; 55% of schizophrenics, 65% of bipolar affective disorder, 44% of atypical bipolar affective disorder, and 44% of major depression subjects received three or more diagnoses. The most frequently occurring combination of disorders was antisocial personality disorder, alcohol abuse/dependence and drug

abuse/dependence in 19% of the sample. In almost 50% of the schizophrenics the disorder manifested before any of the other comorbid disorders, whereas only one of the 16 bipolar subjects received this diagnosis before the other diagnoses.

In the Copenhagen 25 year retrospective study on homicide 58 out of 251 defendants were given a psychosis diagnosis, which represented 23.1% of those referred for psychiatric assessment (Gottlieb, Gabrielsen, & Kramp 1987). Female psychotics made up 44% of the females, and were mostly diagnosed primarily with depression. The males, who constituted 20% of the males, were schizophrenics. Overall the authors calculated that psychotic homicides occurred in 1.9 psychotics per year per 1 million population, and schizophrenics comprised 0.51 per year per 1 million population. Only one schizophrenic was diagnosed with a co-morbid substance abuse disorder. A 80 year survey of all homicides in Iceland produced only 45 incidents, but 27.7% were diagnosed with a psychotic disorder (over half with schizophrenia, mostly paranoid subtype), 6.3% with mental handicap, and 21.3% with a personality disorder (Petursson & Gudjonsson 1981). Overall 30% attracted no psychiatric diagnosis.

Surveys of clinical populations:

Surveys of criminal and violent activities committed before admission, during hospitalisation, and subsequent to discharge have produced reasonably consistent results.

A random sample of 611 adults that used a public psychiatric service found that 38% had been arrested at least once in their adult lifetimes (Holcomb & Ahr 1988). However, a

naturalistic study that observed police officers interact with arrestees found that police encounters with mentally disordered persons were rare events, in that of a total of 2 122 arrestees only 4% exhibited signs of serious mental disorder, and they were not charged with offences that differed from the general sample (Teplin 1985). Conversely in a sample of 400 adults recruited in the Washington Heights area of New York, those who had had previous contact with psychiatric services were 2-3 times more violent (measured by self-report and arrests), which was, almost totally, accounted for by the level of psychotic symptoms that they were experiencing (Link, Andrews, & Cullen 1992; Link & Stueve 1995).

A 19-month survey of 301 psychiatric patients that had been admitted to a state hospital from a community mental health programme found that 47.2% had been arrested at least once during the 3 ½ years before and 4 ½ years after the introduction of more liberal involuntary commitment procedures in California (Sosowsky 1978). 23.6% had been charged with a violent offence.

Similarly a randomly chosen sample of 400 admissions from 4 psychiatric hospitals revealed that 37.7% had manifested some form of violent behaviour before admission, of which 20% had been physically violent to others or objects, and 11% were vaguely described as having acted violently (Lagos, Perlmutter, & Saexinger 1977e). When data on individuals whose primary diagnosis was either personality disorder or any substance abuse disorder were excluded there was still a rate of at least 18% of pre-admission violence.

Early studies were concerned that discharged psychiatric patients were more likely to commit crimes than the general population. Rappeport and Lassen (1965b) compared two

cohorts of patients discharged in 1947 and 1957 respectively. Essentially they found that hospitalisation did not decrease crime rates (by comparing pre- and post-discharge criminal activity), and that these patients committed offences at roughly the same rate as the general population. There were differences across diagnostic categories. Antisocial personalities committed more crimes following discharge, alcoholics fewer, whereas schizophrenics committed offences at a consistent rate throughout.

Zitrin et al (1976b) compared the arrest records of 867 psychiatric patients for the 2 years before they were admitted to their records for the 2 years following their discharge. Overall 23.3% were arrested at least once (9% for violent offences) before or after. Arrests for violent offences occurred 1 ½ times more frequently during the 2 year period after admission, whereas other offences had similar rates before and after admission.

Hiday ((1992c) followed up 1226 psychiatric patients for 6 months following civil commitment to a psychiatric hospital. For 57.6% the civil commitment was based on perceived dangerousness (defined as violence towards self or others in the form of assault or threat). After 6 months 5.9% were arrested. But a minority, 26.4% of those arrested and 1.55% of the sample, accounted for 50.9% of the arrests. Two were arrested 8 and 9 times each. They were arrested generally for more serious crimes, especially aggravated assault, burglary and theft. None was arrested for murder, rape or arson. But those who had been committed for dangerous behaviour were more likely to be arrested in the following 6 months. However the author did concede that possibly many psychiatric patients are arrested without a history of commitment.

A history of psychiatric hospitalisation in homeless individuals has been associated with criminality and alcohol/substance abuse (Gelberg, Linn, & Leake 1988). Psychiatric inpatients with a history of violence also had a history of between 10 and 20 previous admissions to a psychiatric hospital, compared to non violent patients who had between 5 and 10 previous admissions (Karson & Bigelow 1987b).

When discharged patients commit brutal offences the ensuing public outcry usually results in examination of the long term outcomes of previously violent, but ultimately discharged individuals. The most comprehensive studies of discharged patients were completed in Sweden where detailed population registers are routinely kept. Lindqvist and Allebeck (1990a) followed up 644 discharged schizophrenics over a 10 year period. The crime rate for female patients was about twice that the expected value whereas that of the males was the same as the general male population (including recidivism rates). However the group committed almost 4 times as many violent offences as the general population. A similar investigation of schizophrenics born between 1930 and 1959 in Stockholm identified a small group of patients who were responsible for a disproportionate number of violent offences (Lindqvist & Allebeck 1989). The obvious conclusion was that chronically ill patients tend to end up in those strata of society where criminal behaviour is more prevalent, but that the commission of violent offences was somehow related to the illness itself. Similarly a 5 year follow up of 79 patients discharged into the community following treatment having been found not guilty by reason of insanity (NGRI) found that 32% were re-arrested at least once, and that 72% of these were for crimes of violence against persons (Lamb, Weinberger, & Gross 1988). It should be noted that 80% had been diagnosed with schizophrenia, and 84% had previously committed acts of serious violence against persons (including the index offence), and had been in treatment for a median period of 26 months.

Over a 16 year period from a total of 1020 Lieutenant-Governor's patients³ 48 were found to have re-committed offences (Phillips & Dickie 1991). All were diagnosed with personality disorder, two had a dual diagnosis of schizophrenia and personality disorder, and there was one paranoid schizophrenic. Almost 80% of the repeat offences were violent.

In a Canadian study of pre-trial assessments the mean age of presentation of schizophrenics was 30 years, older than the mean age of presentation of the illness. About 80% had previous admissions, which added to the impression that most schizophrenics become involved in criminal activity after the illness has become firmly established. Similarly 80% of those with major affective disorder (primarily mania) had a mean of 36 years had had previous psychiatric treatment (Kunjukrishnan & Bradford 1988d).

Violent behaviour by inpatients

Whatever the specific wording used in mental health legislation the universal motivation for involuntary hospitalisation is to prevent expected or ongoing violence in a mentally person (Appelbaum 1994). At least 30% of admissions to acute psychiatric admission units are preceded by physical assaultiveness, which are mostly committed by non-psychotic individuals, who settle rapidly and are generally non-violent in hospital 24 hours following admission (Cooper 1988). Beck et al (1991b) noted that in their series of acute admissions that 99 of 1 806 patients were deemed potentially or actually violent, and 51% were actively psychotic in the emergency room. In forensic settings a history of past psychiatric admissions is associated with subsequent violence. In a study of 155 insanity murder

³ Roughly equivalent to state patients in South Africa

acquitees 43% had been previously hospitalised. There was a difference by diagnosis, as 55% schizophrenics and 30% psychopaths had positive histories (Lanzkron 1963).

Many clinical studies have attempted to correlate behaviours that impelled admission to those that are later observed within the hospital. In the 1970's New York State had a statute that provided for the evaluation of dangerousness of defendants that were found unfit to stand trial. Those assessed as being dangerous (pre-trial) were more assaultive in hospital than a control group, although the difference was not statistically significant (Cocozza & Steadman 1978). However, a similar study in a maximum security unit for mentally ill offenders there was no association between the assessment of dangerousness made by a review board and the assessments made by observations by the clinicians in the hospital (Mullen, Dudley, & Craig 1978). A 10-year retrospective study from St. Elizabeth's Hospital indicated that 42% of schizophrenics had become violent (while in hospital) compared to 9% of those with other diagnoses (Karson & Bigelow 1987b). Overall 32% of admissions had been violent, but there were no significant differences in the number of previous admissions, durations of illness or hospitalisations between the violent and non-violent subjects. Subjects with schizophrenia were more likely to belong to the violent group.

Similarly of 5 164 patients in 2 state hospitals in New York 7.8% of males and 7.1% of female inpatients had been violent at least once in the previous 3 months (Tardiff & Sweillam 1982b). Assaultive patients were more likely to have had a primary diagnosis of non-paranoid schizophrenia, psychotic brain syndrome, mental retardation or a non-psychotic diagnosis. Paranoid schizophrenia was significantly not associated with violence in the hospital.

Nevertheless, it does seem that is that the longer the duration of illness, and the greater the number of admissions (and up to a third of violent offending occurs in hospital) the higher the risk the individual ultimately poses (Lindqvist & Allebeck 1989).

A sample from a maximum security unit revealed that only 14% of violent episodes by psychotic patients were not preceded by warning phenomena, but that threatening behaviours such as boisterousness, verbal and physical threats, and attacking objects were predicted by a logistic regression model to be reliable immediate antecedents (Linaker & Busch-Iversen 1995). Conversely a study that investigated factors that contributed to accurate predictions by clinicians (in a short term inpatient unit) were a previous history of violence, diagnoses of schizophrenia, mania or organic conditions, and positive symptoms such as hostile-suspiciousness (McNiel & Binder 1995). Generally they concluded that false positives and false negative predictions were probably due to clinicians failure to take into account the foregoing factors.

Diagnoses or Symptoms?

The overwhelming majority of violent individuals do not have a major psychiatric disorder, but probably have assortments of predisposing characteristics, including personality disorders. Personality disordered individuals that are violent have a stable pattern of aggressivity present from an early age, which is not necessarily associated with specific psychiatric symptoms.

Psychiatric diagnoses have depended on criteria that have varied considerably over the last 50 years. As Karson and Bigelow (1987b) have pointed out many subjects identified as schizophrenics under DSM II would have been excluded from studies that used DSM III. Nevertheless there has been a long-standing debate whether specific disorders, especially schizophrenia, are associated with violence, or whether particular symptoms are important. Often the occurrence of violent behaviour influences the type of diagnosis made, particularly personality disorders, which often use violence as a diagnostic criterion (Krakowski, Volavka, & Brizer 1986a). This may have the consequence that psychotic disorders are missed in the rush to diagnose, for example, antisocial personality disorder. Fulwiler et al (1997c) conclude in their outpatient survey of 64 subjects that the type of mental illness was not important, but rather an early onset of a disorder that had been preceded (by age 15 years) by a history of alcohol or drug abuse. According to Yesavage (1984c) serum levels of thiothixene (a neuroleptic) correlated most convincingly with inpatient aggression in a group of schizophrenics. His conclusions were that inadequate controls of core psychotic symptoms, together with an antecedent history of violence were more important than the diagnosis itself.

In the ECA surveys the 368 subjects (out of total of 10 000) that reported violent behaviour in the preceding year 55.5% met criteria for a psychiatric diagnosis, compared to 19.6% of the non-violent respondents (Swanson, Holzer, Ganju, & et al. 1990). Alcohol or substance abuse was the most prevalent diagnosis (41.64% compared to 4.93%). However their rates of affective disorder and schizophrenia were three times higher than in the non-violent subjects. There was almost a linear relationship between number of co-morbid diagnoses and the risk of violence (from 2.05% for no symptoms to 22.36% for 3 or more symptoms), ie. the more symptoms a person had the more likely that he/she was violent.

In most studies schizophrenia is the diagnosis most strongly associated with violence, followed by those with personality disorder, and organic brain syndrome (Krakowski, Volavka, & Brizer 1986a; McNiel & Binder 1994). In the ECA surveys those diagnosed with schizophrenia (or schizophreniform disorder) represented a substantial risk (8% compared to 2% of general sample), although the authors noted that 92% of schizophrenic subjects had not reported behaving violently in the previous year (Swanson, Holzer, Ganju, & et al. 1990). The combination of schizophrenia with a substance abuse disorder increased that risk by almost 4-fold.

Rappeport and Lassen (1965b) compared arrest rates before and after hospitalisation for cohorts of patients that had been discharged in 1947 and 1957. In the 1947 group alcoholism, schizophrenia and neurosis were associated with roughly equal proportions of arrests pre- and post-hospitalisation. But in the 1957 group 36% of pre-hospitalisation arrests were due to alcoholism, but only for 18% of post-hospitalisation offences, whereas the schizophrenia group remained constant at 20% (pre- and post hospitalisation). Antisocial personalities consistently were arrested much more frequently following discharge than before. Similarly a community study of the arrest records of involuntarily admitted patients found that schizophrenic patients were charged with 75% of the total violent offences, and 80% of all the offences, compared with the non-psychotic patients' rates of 19% and 17% respectively (Sosowsky 1978). Within a remand sample of schizophrenic offenders (n=90) a third were on remand for non-violent offences, of which over a half had a past record of violence (Taylor 1985b). A 5 year retrospective study in Alaska found that 118 schizophrenic individuals had been charged with a violent crime (Phillips, Wolf, & Coons 1988). Comparing these data to known epidemiological data on

the prevalence of the illness (and assuming that at least 50% of schizophrenic offenders are referred for a forensic psychiatry assessment) the authors concluded that the rate of violent offending amongst schizophrenics was no higher than the general population.

Pre-trial forensic assessments of schizophrenics have indicated that schizophrenic offenders tend to have more past convictions; the most common crimes were property offences (26 %), minor crimes such as trespassing (13 %) and assault (13 %). When Schizophrenic (n=155) and major affective disorder (n=46) pre-trial subjects (diagnosed using DSM-II and ICD9 criteria) were compared (Kunjukrishnan & Bradford 1988d) (using a composite score of dangerousness, based on the degree of violence against the person used in the offence, reversibility of damage done, risk assessed by a psychiatrist, lack of guilt or remorse, and a previous history of violence), almost 60% of the major affective disorder group compared to 40% of the schizophrenics were considered to be conditionally dangerous (i.e. that some other factor had to be present for to precipitate the dangerous behaviour), but 10% of the schizophrenics were considered to be unconditionally dangerous (i.e. no precipitants deemed necessary to be present) compared to none in the affective disorder group. The schizophrenic group had previous histories of more violence and had engaged in more serious violence.

In two studies of patients admitted to a short-term inpatient unit (mean length stay was 18 days) schizophrenia, mania and organic psychoses were over-represented among those referred for, and exhibiting assaultiveness or fear-inducing behaviours (independent of age and gender), compared to other diagnostic categories (Binder & McNeil 1988) (McNeil & Binder 1994; Miller, Zadolinsky, & Hafner 1993). However on the Brief Psychiatric Rating Scale (BPRS) assaultiveness was associated with thinking disturbance, hostile-

suspiciousness and agitation-excitement, although the schizophrenic patients were less likely to exhibit high hostile-suspicious scores (which as the authors conceded could have been due to differential treatment of schizophrenics by their staff more active management of these patients). But as Planansky and Johnston (1977b) noted in their survey of schizophrenic admissions paranoid schizophrenia was the most frequent diagnosis made on admission (especially when threats or violence had preceded the admission), and that subsequently the diagnosis was generally changed (in their practice a noisy agitated patient was most likely to attract this diagnosis).

There is a study of a 6 month follow up of patients discharged from a psychiatry emergency department, in which schizophrenia was associated with a lower rate of violence, compared to personality disorders (where the occurrence of violence was often used to make the diagnosis) (Lidz, Mulvey, & Gardner 1993e).

An acute admission unit series revealed that schizophrenic and manic patients were equally likely to have attacked someone in the pre-discharge period (a 2 week period), but schizophrenics were more likely to engage in fear-inducing behaviours, and manics to have attacked someone in the first 24 hours after admission compared to others (Binder & McNeil 1988). The authors did conclude that hospitalisation tends to decrease the likelihood of further violence.

A Northern Finnish 22 year cohort study identified 503 male offenders (from a sample of 5,285 subjects) of whom 23% had a psychiatric diagnosis, and 62% had committed their first crime before the diagnosis had been made (Tiihonen et al. 1997). Of their 165 violent offenders 7% were diagnosed as psychotic. 40% of subjects with schizophrenia and alcohol

abuse were offenders (compared to 11% of those without alcohol problems). The odds ratios (generated by logistic regression modelling) for any criminal offence were 3.1 for schizophrenia, and 6.3 for mood disorders with psychotic features. The corresponding odds ratios for a violent offence were 7.0 for schizophrenia, and 8.8 for mood disorders with psychotic features.

Blackburn (1968) compared paranoid and non-paranoid schizophrenic offenders and concluded that paranoid schizophrenics tend to have more impressive histories of aggression and have higher levels of extraversion. Paranoid schizophrenics tend to commit more serious focussed violence than non-paranoid schizophrenics, supposedly under the impulsion of delusions (Krakowski & Volavka 1989). However in most studies paranoid schizophrenic subjects also tend to have had a more chronic illness. In contrast a comparison between schizophrenics that attended medication clinics and matched medical outpatient controls revealed no differences in histories of antisocial activity (Chuang, Williams, & Dalby 1987).

The Northwick Park study on first admissions for schizophrenia contained 52 out of 253 cases (i.e. 20%) that had impressive histories of violence, excluding verbally abusive or threatening behaviour (Humphreys et al. 1992). In most (85%) the violence was deliberately directed at particular persons, as compared to the remainder that had behaved recklessly. In a heterogeneous outpatient survey in the Bronx schizophrenics were found to have the highest frequency of past homicide attempts (Asnis, Kaplan, van Praag, & Sanderson 1994). A comparison of 42 inpatient schizophrenics to matched non-psychiatric medical patients could find no significant differences with respect to any violent or non-violent criminal activity, but did conclude that schizophrenics were more likely to be victims of

crime (Chuang, Williams, & Dalby 1987). In their review Krakowski et al (1986a) note that many of the factors associated with violence in the general population, such as male sex, youth, history of child abuse, are also present in violent schizophrenics.

In Zitrin et al's survey schizophrenics comprised at least 51% of discharged mentally ill patients that had subsequent convictions for violent offences, which represented only 10% of all their schizophrenic patients. But 75% of their violent schizophrenics also had histories of alcohol abuse, and 20% had histories of both alcohol and drug abuse (Zitrin et al. 1976b). In another analysis of patients discharged from psychiatric hospitals during a 2 year follow-up, schizophrenics accounted for 52 % of all offences, and for almost half of all the violent offences. Although criticised for sampling bias, in that mental hospitals have increasingly admitted patients with criminal records, (and that therefore the history of past convictions is probably a stronger determinant of future criminal activity) (Steadman, Coccozza, & Melick 1978c), there remains the strong impression that there is a group of schizophrenic individuals that is inherently antisocial and violent.

There does seem to be considerable overlap between schizophrenia and personality disorder. Analysis of the psychotics in the Swedish birth cohort study who had been violent revealed two populations; "early starters" whose aggressive behaviour and conduct disorder pre-dated the emergence of psychotic symptoms during development, and "late starters" whose violence occurred after the illness had already declared itself (Hodgins 1992). This is partly borne out by the observation that many schizophrenics, whether antisocial in adulthood or not, have histories of conduct disorder (Chapman et al. 1984).

However, the common denominator seems to be the presence of psychosis. Psychosis predicted 22% of the variance in aggressive behaviour in patients with Alzheimer's disease in a study that could find no other associated clinical variables (Aarsland, Cummings, Yenner, & Miller 1996), and there is good evidence that Misidentification syndromes are also associated (de Pauw & Szulecka 1988).

Monahan (1997b) concluded after reviewing the evidence of the links between mental disorder and violence that active symptoms are probably more important than the presence of an identifiable disorder as a risk factor, even though causal paths are not yet clear.

Psychotic symptoms

As the current literature suggests, psychosis (especially in the context of schizophrenia) is a significant risk factor. Clearly the next step is to establish the links with specific symptoms.

In Planansky and Johnston's (1977b) survey of 205 hospitalised schizophrenics 59 men had made verbal threats or attacked others, always during active phases of their psychosis. But they were unable to specify with confidence whether any particular symptom cluster could be regarded as responsible. Successful treatment of active psychotic symptoms has been linked to marked decrease of aggressive behaviour in inpatients (Krakowski, Volavka, & Brizer 1986a). Most past studies have assumed that severity of overall impairment, conceptual disorganisation, hallucinations, delusions, bizarre behaviour and inappropriate affect contribute equally (Krakowski, Volavka, & Brizer 1986a).

Sometimes aggression is assumed to be merely a manifestation of general agitation. Newly admitted patients who later became assaultive while in hospital scored higher on hostile-suspicious and agitation-excitement measures on the Brief Psychiatric Rating Scale, especially if diagnosed with mania and organic psychoses (McNiel & Binder 1994)

Between 1956 and 1961 Matteawan State Hospital (New York) admitted 155 mentally disordered patients that had been charged with murder. Their demographics resembled that of other homicide perpetrators (especially in being between 21 and 45 years old, 4 times more males, and alcohol abusers), but at least 40% committed their offences as a direct influence of delusions, usually with a persecutory or commanding content (Lanzkron 1963). In the latter it was noted that the psychotic symptoms that motivated the patients' actions had usually been present for a considerable time before the fateful event. Ninety five percent of mentally disordered subjects that had been arrested for pushing victims onto subway tracks had had active psychotic symptoms, especially delusions, hallucinations and thought disorder. In virtually all the content of the delusions were offered as reasons for the behaviour. Only 3 of 14 offenders who had persecutory delusions offered their delusional material to account for their actions (Martell & Dietz 1992).

Command hallucinations have long been presumed to be associated with aggressive acting out behaviour (Lindqvist & Allebeck 1989). However a study of 51 patients who had reported experiencing command hallucinations found that only 39.2% had ever complied with such instructions, and that compliance was related to recognition of the hallucinatory voice, the presence of a hallucination-related delusion, black race and a diagnosis of schizophrenia (Junginger 1990).

Delusions, and the patient's compliance with the content of the delusions, often accompany psychotic acting out behaviour. For example, schizophrenics who had been held in custody because they had attempted to contact the US President, were more likely to be arrested for violent crimes following discharge if they had had a history of compliance with delusions or hallucinations (Shore, Filson, & Rae 1990). Taylor's (1985b) series of remand subjects revealed that delusions were almost always associated with violent offending, whereas auditory hallucinations seemed to be present *pari passu*. This contrasted with Virkkunen's (1974) observations that only 36.5% of violent schizophrenic offenders (in his sample) had committed the violence clearly under the influence of hallucinations or delusions. He had concluded that the quality of the preceding relationship with the victim was of greater importance. In the Icelandic survey about one third of the psychiatrically ill homicide offenders had systematized delusions, and rarely committed homicide for financial gain (Petursson & Gudjonsson 1981).

Persecutory delusions have been strongly associated with well-planned violence (usually congruent with the content of the delusion), and usually target specific people. A disorganised psychosis with fragmentary delusions tends to produce aggressive behaviour that is less focussed, poorly planned and often less severe in its consequences (de Pauw & Szulecka 1988; Kennedy, Kemp, & Dyer 1992; Krakowski, Volavka, & Brizer 1986a; Link & Stueve 1995; Monahan 1995b; Smith 1989; Taylor 1985b; Taylor et al. 1994; Taylor et al. 1998).

A comparison of violent and non-violent schizophrenic offenders in the forensic psychiatry unit at Valkenberg Hospital in Cape Town established that only persecutory

delusions differentiated between the groups. The 49 subjects had been assessed for positive psychotic and affective symptoms (Kaliski 1993).

Hiday (1997d) has proposed that psychotic symptoms override self-control, or produce feelings of personal threat that lead to violence. She adds layers to her model; mentally ill individuals may over time experience tension with others (often due to their bizarre behaviour), or be victims of bullying, which eventually results in defensive violent acts. These often occur in a context of poverty and social disorganisation (which are independent factors for violence), which probably are important in producing co-morbidity with alcohol and substance abuse. The latter are associated with a four-fold increase in risk for violent behaviour in psychotic people. The presence of antisocial personality disorder, especially if entrenched before the onset of the illness, significantly adds to the risk. Whether neurobiological deficits contribute to this model has yet to be demonstrated. Implied in the model is the assumption that psychotic symptoms occur or create real disorganised contexts, which are in turn experienced as being threatening.

Co-morbid mood symptoms have been described in psychotic populations, and possibly contribute to aggressive and angry outbursts (Apter, Plutchik, & van Praag 1993; Miller-Johnson et al. 1998; van Praag). Assaultativeness in psychotic patients in 2 state hospitals was associated with agitation, crying, and expressions of depression (Tardiff & Sweillam 1982b).

Conclusion: What are the relationships between mental disorder and violence?

Although mental illness is neither a necessary or sufficient cause of violent behaviour there is now consensus that for a significant number of individuals a strong association exists.

But how? Mulvey (1994b) has concluded that the relationship between mental illness and violence can be distilled into 6 statements:

1. Mental illness seems to be a risk factor for violence in the community.
2. The size of the association between mental illness and violence while statistically significant, does not appear to be very large.
3. The combination of a serious mental illness and a substance abuse disorder probably significantly increases the risk of involvement in a violent act.
4. The association between mental illness and violence is probably significant even when demographic characteristics are taken into account.
5. Active symptoms are probably more important as a risk factor than is simply the presence of an identifiable disorder.
6. No clear information about the causal paths that produce the association between mental illness and violence is available.

He proposes that violent mentally ill individuals should be compared to violent non-mentally ill individuals in order to test the strength of other variables (assuming that descriptive variables, such as demographics are controlled). Ideally this comparison should be conducted longitudinally, which may also to identify protective factors.

SUICIDE AND VIOLENT BEHAVIOUR

The suicide and homicide rates in most countries vary in parallel. As a group, individuals who kill themselves have committed homicide at a much higher rate than the general population, and conversely individuals who have killed others have a suicide rate several hundred times that of matched controls (Hendin 1986). The Bronx outpatient study confirmed a significant association between suicide ideation and homicide attempts (Asnis, Kaplan, van Praag, & Sanderson 1994). There was also a positive association between multiple suicide attempts and homicide attempts.

Suicide has been shown to be an independent risk factor, but also co-occurs with other risk factors, such as schizophrenia (Allebeck, Varia, & Wistedt 1986). Suicidal patients, whose primary diagnosis may be schizophrenia, personality disorder or major depression, score higher on scales of violence and anxiety (Apter et al. 1990; Yesavage 1983). A comparison of violent and non-violent schizophrenics failed to demonstrate that the former were more likely to have attempted suicide (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c). One study has demonstrated that CSF 5 HIAA in schizophrenics correlated with suicidal behaviour but not violence or aggressive behaviour (Cooper, Kelly, & King 1992). A community sample of psychiatric patients noted that violent patients tended to have a history of suicide attempts, be homeless, younger than 20 years when first referred and to have a history of alcohol and substance abuse (Fulwiler et al. 1997c). Among Taylor's (1985b) remand sample at least 10% of psychotic offenders committed suicide soon after arrest. Their numbers were too low to determine whether this was associated with violent behaviour. However this accorded with the observations by Tardiff and Sweillam (1982b) that assaultive male inpatients were three times, and female patients four times more likely

to have attempted suicide at least once. Suicide is much more common in psychiatric populations, sometimes more than 5 times that of the general community (Zitlin, Hardesty, Burdock, & Drossman 1976b).

Almost half of patients diagnosed with episodic dyscontrol had made suicide gestures, usually in the context of loss of control (Bach-y-Rita et al. 1971). Violent offenders that had committed the index offence impulsively and had a history of suicide attempts had lower levels of CSF 5-HIAA (a metabolite of serotonin) than controls who were similarly impulsive and violent but had negative histories for suicide (Linnoila et al. 1983; Linnoila & Virkkunen 1992). (Virkkunen, De Jong, Bartko, & Linnoila 1989a).

However hospitalised adolescents with affective disorders with histories of suicide ideation or attempts scored low on scales measuring physical recklessness (Clark et al. 1990).

There is a well described phenomenon of homicide followed by suicide. Almost 40 years ago it was noted that 13% of murderers in a forensic facility had attempted suicide after the act (McKnight, Mohr, Quinsey, & Erochko 1966). In a group of 47 homicide offenders in Iceland 5 committed suicide subsequently, of which 4 were considered to have suffered from mental illness (Petursson & Gudjonsson 1981).

Violent suicides occur more often in spring and summer, whereas there are no seasonal differences in rates of violent homicides, which may indicate that the two phenomena are not linked by a common denominator, such as dysregulation of aggressive impulses, although both seem to share similar pathophysiological profiles (Maes et al. 1993).

Nevertheless there are strong associations between suicidality, aggression and impulsivity, not only by the seemingly common link with serotonergic dysregulation, but also in the entity known as borderline personality disorder (Plutchik & van Praag 1989).

SELF-INJURIOUS BEHAVIOUR

Self-injurious behaviour (regardless of type) appears to be associated with assaultive behaviour, but occurs in probably less than 2.5% of an inpatient population (Callias & Carpenter 1994). Eleven percent of an inpatient sample of violent patients also displayed self-injurious behaviour, which was not significantly different from controls (Karson & Bigelow 1987b). Self-injurious behaviours are common behaviours in prisons, and although generally regarded as manipulative in nature, are strongly associated with fighting, outbursts of rage and drug abuse (Winchel & Stanley 1991).

ALCOHOL AND SUBSTANCE ABUSE

Drug or alcohol abuse are the most frequent psychiatric diagnoses (about 66%) made in remand and prison populations, usually comorbid with antisocial personality disorder (where they contribute as criteria for diagnosis), or other major psychiatric disorders (Taylor & Gunn 1984a); (Cote & Hodgins 1990); (Draine, Solomon, & Meyerson 1994) (Brooke et al. 1996).

Hemphill and Fisher (1980) investigated the use of alcohol and drugs in 604 males that had been referred to Valkenberg Hospital, Cape Town, for observation by the courts. Overall 52% were abusers, abusing alcohol alone in 49%, and drugs alone in 19%. In the

abuser group 32% abused alcohol and drugs, 19% drugs only and 49% alcohol only. Only cannabis abuse was documented (n=146), although the authors noted that their subjects tended to abuse LSD, methaqualone and caffeine-containing products as well. However in the sample 55% of all abusers were charged with a violent crime (compared to 41% of the non-abusers). The percentage of violent crime in those who abused alcohol was 69%, in those who abused drugs (ie. cannabis) 28%, in those who abused both 49%, and in non-abusers 41%. Their conclusions were that cannabis abusers were the least likely to commit violent offences, compared even to non-abusers. Drug abuse alone was involved in 1 out of 70 murders, 5 out of 94 violent assaults, and 7 out of 58 sex offences. The rates of abuse among those charged with non-violent offences were not markedly different (the actual data not provided by the authors). Unfortunately the authors did not investigate the role of intoxication during the offences, and whether abuse should be distinguished from intoxication.

In a study comparing violent and non-violent schizophrenic offenders in the forensic psychiatry facility at Valkenberg Hospital in Cape Town no pattern of substance or alcohol abuse distinguished either group from the other (Kaliski & Zabow 1995).

In the ECA surveys substance or alcohol abuse were the most common diagnoses made by respondents that had admitted to violent behaviour in the preceding year (41.64% versus 4.93%), and abuse almost doubled the lifetime risk for violence among those with mental illness (Swanson, Holzer, Ganju, & et al. 1990).

The Swedish cohort study found that 48.7% of male offenders, and 42.9% of women, with a major mental disorder had a co-morbid diagnosis of substance abuse/dependence

(Hodgins 1992). In this survey the men diagnosed with substance abuse/dependence were 15.44 times more likely to have been convicted for a violent offence in a 30 year cohort follow up, whereas for the women the odds ratio was 54.58. Similarly, female homicide offenders had a 48.8-fold higher odds ratio for alcohol abuse/dependence, which in about half of cases is co-morbid with antisocial personality disorder (Cloninger & Guze 1970);(Eronen 1995). Intoxication during the index offence was especially common (44%) among females with histories of abuse, but even 10% of those with negative abuse histories reported intoxication during the offence(Cloninger & Guze 1970). Substance dependency was present in 26% of female offenders, which was co-morbid with alcohol dependency in 59%.

Amongst patients that have been admitted acutely for control of potential or actual violence at least 45% admit to current drug or alcohol use (Beck, White, & Gage 1991b). Violence prior to admission to an acute psychiatric admission unit has been mostly associated with alcohol intoxication in non-psychotic individuals that have been involved in interpersonal conflict (Cooper 1988). Recently admitted psychiatric patients that had been violent in the previous month were more than three times more likely to have abused substances (Tardiff, Marzuk, Leon, Portera, & Weiner 1997). However violent females were more likely to have abused cocaine, whereas males were heroin addicts. There are also reports that hospitalised schizophrenics who abused phencyclidine (PCP) were significantly more likely to be repeatedly assaultive, and to have histories of violent suicide attempts (Convit, Nemes, & Volavka 1988).

An investigation of 64 referrals to a community treatment team, in which 77% had histories of substance or alcohol abuse and 58% of interpersonal violence since the onset

of a major psychiatric illness, found that substance abuse produced an odds ratio of 26.0 when the variable of major mental illness was kept constant, that is, violence was not associated with mental illness unless accompanied by a history of substance abuse (Fulwiler, Grossman, Forbes, & Ruthazer 1997c). In this sample only 7% of the sample with negative histories of substance abuse were more likely to be violent, compared to 73% of those who did abuse substances. But their most robust finding was that patients who had commenced their abuse before age 15 (before the onset of their mental illness) were more likely to become violent after the onset of their mental illness.

Studies on violent schizophrenics have produced varying results. The Stockholm study of violent schizophrenics found that one year following discharge 37% were abusers of alcohol or drugs (Lindqvist & Allebeck 1989). Others have shown that violent schizophrenics were not more likely to abuse alcohol or substances (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c). A history of alcohol or drug abuse in a population of schizophrenics has been correlated with scores on a dangerousness scale, especially if there were co-occurring histories of 'blackouts' (Yesavage 1984c). Unfortunately these investigators were unable to link the abuse directly to violent offending, and did not consider whether their subjects were actually intoxicated during the offences.

Substance abuse co-morbidity in psychotic patients may operate by enhancing their perceptions of threat or hostility from others (Estroff, Zimmer, Lachicotte, & Benoit 1994). Cocaine, in contrast, probably causes aggressivity during withdrawal because of general irritability (Yudofsky, Silver, & Hales 1993).

Alcohol and substance abuse are common in adolescents. A survey of 7 340 Cape high school students revealed that 7.5% had ever smoked cannabis, 10.9% volatile solvents, 1.6% methaqualone-cannabis, and 0.5% injectable drugs (Flisher et al. 1996b). A survey of 74 008 ninth and twelfth graders revealed that 54% of the former and 70% of the latter had used either alcohol or drugs in the previous 12 months (Harrison, Fulkerson, & Beebe 1998). Alcohol was by far the most commonly used, with cannabis a distant second. Amphetamines and other people's prescription drugs were the next most commonly used substances.

Convicted delinquents were found to drink more beer, get drunk more often, and were more likely to say that drink made them violent, and to have been involved in motor vehicle accidents because of intoxication (Farrington 1995e). But by age 32 years, they tended to be less antisocial in behaviour, but still tended to engage in more drunkenness (including binge drinking) and abused more hard drugs (especially heroin and cocaine).

Homicidal ideation has been found to be more frequent in psychiatric outpatients with a primary diagnosis of alcohol and substance abuse (Asnis, Kaplan, van Praag, & Sanderson 1994). One study on impulsive aggression in murderers noted that all 34 of subjects met the diagnostic criteria for alcohol abuse (Linnoila, Virkkunen, Scheinin, Shaner, Rimon, & Goodwin 1983). Alcohol abuse generally presents with other comorbid disorders, especially personality disorders, which confounds attempts to attribute blame to either.

Long-standing alcohol abuse results in lowered CSF 5-HIAA, which in turn probably accounts for the impulsivity, aggression and depression in this group (Roy, Virkkunen, Guthrie, & Linnoila 1986) (Brown & Linnoila 1990). Insufficient research has been

conducted on the cognitive changes during intoxication that interact with situational variables (especially the role of social cues) that culminate in the behaviour (Moss & Tarter 1993).

Problems with the definitions

A methodological problem is that most studies do not use a universally accepted definition of alcoholism. Some question whether it should be regarded as a psychiatric disorder at all, but is rather a habit disorder (Gunn 1977d). The distinctions between 'abuse' and 'dependence' are generally based on degree of severity of symptoms. DSM-IV uses terms such as "larger amounts", "longer periods", "persistent desire", "important activities" but does not offer working definitions of these terms (Harrison, Fulkerson, & Beebe 1998). Dependence is largely based on the criterion that the abuser gives up activities in order to use substances.

But in a survey of 74 008 12th grade students one third of the students that met the criteria for abuse also met those for dependence (Harrison, Fulkerson, & Beebe 1998). Also in this sample of the 6 873 subjects that had reported three or more abuse or dependence criterion items almost 90% that met criteria of dependence for one substance also met criteria of abuse for another substance. In DSM-IV and DSM-III-R diagnoses of abuse and dependence are therefore not mutually exclusive. Therefore most studies have considered abuse and dependence interchangeably.

PERSONALITY FACTORS

Many countries have enacted 'dangerous offender' legislation, which usually exclude mental illness as a consideration (as the insanity defence would apply). These findings generally rely on the presence of specific personality, especially those related to psychopathy (Dinitz & Conrad 1978; Dolan & Doyle 2000).

A currently unresolved issue is whether particular personality types, or specific personality traits contribute significantly. Unfortunately the dependant variable, that is aggression, is often used to define the trait and personality type. This has allowed psychiatrists to use violence as a diagnostic criterion, and then use the diagnosis to label such individuals as dangerous (Dinitz & Conrad 1978); (Dix 1980; Gunn 1977d).

Persistent (and expected) violence forms an integral part of the diagnosis for the personality disorder labelled variously as psychopathy, sociopathy, and latterly antisocial personality disorder (APD) (American Psychiatric Association 1994). But APD is not really synonymous with psychopathy as it relies almost entirely on descriptions of behaviour violations, rather than on a characteristic personality style (Hare, Hart, & Harpur 1991).

Current conceptions of psychopathy rest on the painstaking and vivid descriptions elaborated by Cleckley (1976c). According to him the psychopath appeared to be normal, possessed superficial charm, displayed little anxiety, was unreliable, untruthful and insincere, lacked the capacity for remorse or shame, and engaged in poorly motivated antisocial behaviour. In addition these individuals were deeply narcissistic, were unable to

form affective bonds with others, and generally unable to follow a life plan or anticipate consequences.

The Psychopath Checklist (PCL) developed by Hare relies heavily on these traits, and already has an impressive record in characterising and predicting violent behaviour in a wide range of contexts (Harpur, Hare, & Hakstian 1989; Harris, Rice, & Cormier 1991; Hart, Hare, & Harpur 1991; Nestor et al. 2002; Rutherford, Cacciola, & Alterman 1999).

A great deal of controversy has persisted over the use of psychopathy as a diagnosis. In his meticulous review of its diagnosis and history Blackburn (1988c) demonstrated that the various characteristics that have variously been ascribed to the disorder are commonly found in other personality types as well as disorders. Furthermore, a history of aggressivity, violence, lacks of empathy, superficial affect, conning behaviour etc are predictive in themselves of violence, despite contributing to the diagnosis.

As Blackburn (1988c) opined “.. a disorder defined by past history of socially deviant behaviour is permanently fixed, and cannot provide a point of reference for clinical intervention. Such a concept is little more than a moral judgement masquerading as a clinical diagnosis.” (p.511).

There is therefore strong opinion that psychopathy is really ‘a ragbag containing a wide range of behavioural problems which tend to produce negative emotions and reactions in other people’ (Maden, Swinton, & Gunn 1994). Not surprisingly, prison population

surveys have indicated that offenders with major psychiatric disorders also have high comorbidity with APD, which in turn usually co-exists with alcohol and drug abuse/dependence (Cote & Hodgins 1990). Surveys of female prisoners have confirmed similar presentations, although they present more frequently with histrionic traits (Cloninger & Guze 1970).

However, violent offenders with antisocial personality disorder have been found to have significantly lower levels of CSF metabolites of serotonin compared to paranoid or passive-aggressive personality types (Linnoila, Virkkunen, Scheinin, Shaner, Rimon, & Goodwin 1983). Similarly, those diagnosed with borderline personality disorder are characteristically impulsive, prone to suicidal behaviours and aggressive outbursts, all possibly due to dysregulation of serotonin neurotransmission (Plutchik & van Praag 1989).

In fact, violent outbursts have been described in virtually every personality type (Blackburn et al. 1995; Malmquist 1996). Despite the increasing volume of research into psychopathy there is a continuing interest in linking specific personality traits to recurrent violence.

Scott (1977a) suggested that recurrent aggressive impulses were linked to traits of deceptiveness, jealousy, paranoid ideation, or sado-masochism. Mark and Ervin (1970) had described 4 elements for a 'dyscontrol syndrome': physical assaultiveness, pathological intoxication, impulsive sexual behaviour, and a history of numerous traffic violations. Although more than two thirds of their subjects had had prior voluntary contact with a psychiatrist they were more concerned with understanding the underlying brain dysfunction than constructing a particular personality type (Bach-y-Rita, Lion, Climent, & Ervin 1971). This disorder evolved into the now well-established DSM diagnosis, intermittent explosive

disorder (IED), which was introduced in DSM III in 1980. This disorder is characterised by recurring aggressive and destructive behaviours that are out of proportion to preceding stressors or provocations. The individuals experience these as 'attacks' or 'spells', and afterwards express genuine regret, and may have no, or poor memory for their actions. Although the nosologic status of the disorder remains controversial there are general community studies that indicate that up to 18.9% of recurrently violent individuals may fulfil these criteria, without necessarily attracting a diagnosis of personality disorder (Felthous et al. 1991).

In Quinsey et al's (1975) series of forensic patients (of which 28% had a primary diagnosis of personality disorder and 62% a psychotic disorder), those who were least likely to re-commit violent acts had been originally assessed as being 'overcontrolled assaultive' types (i.e. they inhibit expressions of anger until a severe provocation or series of small provocations provoke a single explosion of rage).

During the past 20 years interest has therefore shifted to personality factors that facilitate loss of control. These include impulsivity and sensation seeking (Moeller et al. 2001; Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a). Individuals constantly attempt to maintain a particular level of arousal. Some have an inherent low arousability, and therefore need high levels of stimulation to maintain an optimal degree of arousability (Farley 1986). Those who seek high arousal tend to be extroverted, risk takers, who can be reckless and delinquent. Conversely, some can use the trait positively to be creative.

Sensation seeking

Sensation seeking is a trait referring to the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks in order to fulfil that need in order to maintain an 'optimal level of arousal (Zuckerman 1984); (Zuckerman 1978). During the development of the Zuckerman Sensation Seeking Scale (ZSSS) 4 factors emerged as constituting the trait:

1. *Thrill and Adventure seeking* (TAS): the seeking of sensations through risky but exciting sports and other activities such as fast driving,
2. *Experience seeking* (ES) : seeking sensation through the mind and senses, and through a non-conformist lifestyle,
3. *Disinhibition* : the seeking of sensation through social stimulation and disinhibition through social drinking, and
4. *Boredom susceptibility*: an aversion to monotonous, invariant situations and restlessness when exposed to such situations (Zuckerman, Kolin, Price, & Zoob 1964; Zuckerman 1984).

The ZSSS contains 10 items from each of the factors, which yields a total maximum score of 40. Internal and retest reliabilities are high; internal reliability has been calculated at .85, and 3-week retest reliability at .94 (Zuckerman et al. 1983). Validity has been established by comparisons to peer evaluations of the trait, variety of sexual experience, use of illegal drugs (including variety of drug use), food preferences, driving habits, engagement in risky sports, aesthetic preferences (e.g. preference for complexity, tolerance of ambiguity, originality, creativity and liberal, permissive and nonconforming attitudes (Zuckerman 1983; Zuckerman 1984; Zuckerman & Link 1968). Sensation seeking appears to lie between

the extraversion and psychotism dimensions of the Eysenck Personality inventory (Zuckerman 1984), and is probably related to venturesomeness (a broad dimension of impulsivity, compared to the narrow impulsivity trait that encompasses 'acting quickly on impulse'). High sensation seekers tend to fantasise about, and try to pursue active sensual lifestyles (Franken & Rowland 1990).

Haapsalo (1990b) has found that non-violent male offenders score higher on the P,N, and L scales (Eysenck's Personality Questionnaire), and overall are more sensation seeking than controls, especially in the disinhibition and experiencing scales. Thrill and Adventure seeking was higher in controls, which possibly indicates that these represent socially acceptable aspects of sensations seeking. There were no significant correlations between the EPQ and SSS scales. Sensation seeking enjoys a considerable overlap with venturesomeness and impulsiveness, both being related to psychotism and extraversion, which are related to diagnoses of psychopathy (Eysenck & Eysenck 1978).

A sample of 349 Spanish students' responses on the SSS was compared to self-reported delinquency behaviours (Perez & Torrubia 1985). Males scored twice as high as females on self reported delinquency behaviours and on scores on the disinhibition subscale of the SSS. Generally the TAS scores were the highest, and the Boredom Susceptibility subscale scores the lowest. Experience seeking and disinhibition correlated significantly with delinquency. The total SSS score correlated significantly with total number of self-reported delinquent behaviours, but correlations with the subscales were weaker. Amongst delinquents and prisoners SSS scores correlate negatively with age (Thorne 1971). High sensation seekers that had been convinced that they had drunk alcohol were more likely to drive recklessly (on a video game) and to take more risks (McMillen, Smith, & Wells-Parker

1989). Low sensation seekers tend to become more cautious when they believe that they have consumed alcohol. Similarly a Spanish study found significant correlations between scores on a self-reported delinquency scale and the Disinhibition and Experience Seeking Subscales in a group of adolescents (Simo & Perez 1991).

Low platelet MAO levels in males have been related to high ZSSS scores, criminal convictions and psychopathy (von Knorring 1984), as well as to high serum levels of androgens in males, and oestradiol in females. Hypogonadal men score lower on total ZSSS and on the disinhibition subscale compared to eugonal men, which is not rectified by the short term administration of androgens (O'Carroll 1984). This seemed to indicate that androgens have a long term effect in enhancing sensation seeking and loss of control in males.

Impulsivity

There have always been people often fail to control temporary compulsions (or 'impulses') that lead to disastrous consequences. The term 'impulse' has usually been used to describe a 'generally unpremeditated welling-up of a drive toward some action that usually has the qualities of hastiness, lack of deliberation, and impetuosity' (Frosch 1977) p.296.

Characteristically impulse dyscontrol and its ensuing act are ego syntonic, pleasurable or satisfying at the moment of expression, and the act directly represents the expression of a fantasised desire, and release of unbearable inner tension. There is often regret or distress afterwards. Poor impulse control has been attributed to an inability to appreciate

consequences, impulsion by stronger primitive drives or a dependence on smaller but immediately available rewards (Ainslie 1975; Lion & Penna 1975).

Impulsiveness (or impulsivity) has been operatively defined as 'a habitual acting on impulse, difficulty in delaying any sort of gratification, and lack of consideration of the consequences of behaviour', which has been correlated with antisocial behaviour (Chapman, Chapman, Numbers, Edell, Carpenter, & Beckfield 1984).

Often the two concepts are used interchangeably. Eysenck (1977c) has decried the lack of rigor in defining the concept of poor impulse control; some regard 'carefree', happy-go-lucky' and 'ready to do things at a moments notice', risk taking, lack of patience, sensation seeking, sociability, and a dislike for solving complex problems as also part of the phenomenon. By using the Eysenck Personality Scale (EPQ) they identified 3 separate factors; 'impulsiveness', 'risk taking', 'liveliness and non-planning'. All seem to be related to his concept of extraversion.

Poor impulse control has also been characterised as being a symptom cluster, which can occur variously as simple aggressive or sexual acts, or as an underlying complex pattern of behaviours (such as evidenced in the impulse control disorders and addictions), and as an integral part of personality structure (such as the borderline personality disorder) manifesting as immaturity with intolerance of tension or anxiety (Frosch 1977).

Much early research concentrated on defining the concept in hyperactive children, and were based on observations on their inability to delay gratification, inhibit motor

movement on request (Walk-the-line-Slowly test), reflect cognitively on tasks (using the Matching Figures Test), or the intensity of their motor activity (Paulsen & Johnson 1980). The correlations between these various measures were minimal, or not significant. Boys tended to have a greater inability to delay gratification, to show greater intensity of motor activity and to stay at particular activities for shorter periods. As children matured these findings diminished (i.e. they became less impulsive), but having low IQ scores retained an association with higher scores of impulsivity, independent of age. Impulsive children make more mistakes in inductive-reasoning tasks (compared to reflective children) because they tend to respond too quickly, and fail to evaluate critically possible options (Kagan, Pearson, & Welch 1966). In adults high impulsive subjects display shorter reactions times and make more errors, because they tend to make rapid decisions without considering consequences (Edman, Schalling, & Levander 1983).

In short, impulsivity has traditionally been regarded as “.. a behavioral trait which in large part relates to emotional and physiologic maturation, and to those ‘ego’ functions which facilitate the individual’s ability to delay action and promote the formation of inhibitory processes (Lion & Penna 1975) p.631.

Virkunen et al (1989a) refined the concept of impulsivity among offenders, and identified it when the victim was unknown to the offender, the had acted without evident provocation, and the motivation for the crime of potential monetary gain had been ruled out. There have also been narrative reports of psychotic violence in which patients have described having had an overwhelming urge to kill. Some removed themselves from society to resist the impulse, while others had exploded in seemingly senseless rages that were said to be out of character (Planansky & Johnson 1977b).

Hence restraint (self-control) and impulsiveness seem to occupy opposite poles of a bipolar spectrum that are probably related to extraversion (Barratt 1990).

An unresolved issue is whether impulsivity can be regarded as a disorder in its own right, or whether it represents an aspect of dyscontrol present in other disorders. For example, impulsivity in bulimic patients appears to indicate severity of illness rather than a separate pathology (Newton, Freeman, & Munro 1993). Impulsivity has been associated with other disorders, such as eating disorders (Fahy & Eisler 1993). A review by Lacey and Evans (1986b) concluded that patients that presented with one form of poor impulse control almost always had multiple problems with impulsivity and compulsive behaviours (which included alcohol and substance abuse or dependence, binge eating, promiscuity, stealing, violence etc).

However it does seem that the combination of high impulsiveness with low anxiety is associated with psychopathy, whereas low impulsiveness and high anxiety manifests in highly controlled behaviour. Low impulsiveness with low anxiety produces well-adjusted individuals who are not highly motivated to succeed. High impulsivity is associated with less efficient psychomotor responses and a high rate of errors, and therefore such individuals often act and speak without thinking, make up their minds quickly, take greater risks, and do not plan ahead (Barratt 1972) (Barratt 1985a)

Occasionally impulsivity during a specific catastrophic situation may be a poor indicator of general impulsiveness. Impulsivity during the commission of a homicide has been

negatively associated with eventual success of parole in 164 male prisoners (Heilbrun, Heilbrun, & Heilbrun 1978b). Therefore it has been important to devise tests that determine a predilection for impulse control, rather than only examining isolated acts.

The development of measurement tools for impulsivity have arisen primarily out of investigations in children and offenders.

Measurement of Impulsivity and Comparisons with Sensation Seeking

Impulsivity was initially tested in children, then adults, with the Matching Familiar Figures Test (MFFT), which required subjects to match a presented picture with subsequent facsimiles that varied in details (Messer 1976). The test measured the time taken to respond, believed to be due to qualities of reflection and analytic thinking. Certainly scores on the MFFT correlated with collateral reports of impulsive behaviour and assessments of attention deficit disorder in adolescents (Oas 1983). Applying these tests to delinquent boys and girls (mean ages of 15 years) he was able to divide the subjects into impulsive and reflective groups. However the groups could not then be differentiated according to their index offences. Unfortunately young age, IQ scores and levels of anxiety were noted to be interfering variables, and children could be taught to respond less rapidly. Delinquents do not generally score higher than controls on all tests for impulsivity, although Israeli delinquents scored twice as high as controls on the MFFT, but could not be differentiated according to scores of aggression (Saunders, Reppucci, & Sarata 1973) (Rotenberg & Nachson 1979).

Barratt (1959); (1965c) developed the Barratt's Impulsiveness Scale (BIS) based on factor analysis using the Taylor Manifest Anxiety Scale, IPAT Anxiety Scale, Guilford-Zimmerman Temperament Survey and the 16 PF Scale. The results separated impulsiveness into traits that corresponded to 'like to take a chance', 'seek adventure', 'act without thinking', and 'avoid work requiring patience and carefulness'. These coalesced into four orthogonal factors: I, speed of cognitive response; II, lack of impulse control; III, adventure seeking- extroversion; IV, risk taking.

Barratt then differentiated between 3 types of impulsiveness;

- *motor impulsiveness* (acting without thinking),
- *cognitive impulsiveness* (rapid decision making), and
- *non-planning impulsiveness* (living for the moment and not planning ahead) (Barratt 1990; Barratt 1991).

The BIS has undergone numerous revisions. The BIS-10 consists of a semantic differential scale, whereas the earlier versions were demanded true/false responses. Scores on the BIS correlate highly with other measures of impulsiveness, particularly Eyesencks Impulsiveness Scale, self reports of impulsive behaviour, and the disinhibition subscale of Zuckerman's Sensation Seeking Scale, but not Kagan's Matching Familiar Figures Test (Barratt 1987; Newton, Freeman, & Munro 1993). The BIS significantly differentiated between antisocial personality disordered subjects and controls, and was associated with trait anger in males (Barratt 1985b). Felons and unwed mothers scored higher than controls on the BIS-10, especially on the non-planning and motor but not cognitive subscales (Royse & Wiehe 1988).

The relationship between sensation seeking, impulsivity and psychopathy appears to be strong. A comparison between psychopathic and non-psychopathic offenders in a maximum secure hospital (which included schizophrenics) produced high correlations between scores on the SSS and Gough's impulsivity scale (Blackburn 1969). The latter scale has not since been used to measure impulsivity. The BIS and Zuckerman's Sensation Seeking Scale did not differentiate between pathological gamblers (an impulse control disorder) and controls. Drug addicts scored higher on both, and alcoholics lower on the ZSSS (Allcock & Grace 1988). Factor analysis of scores of physical recklessness on adolescents (aged between 15 and 18 years old) documented significant correlations between the factor that reflected an interest in weapons and 'death defying' behaviour with scores on the Adventure and Thrill seeking subscale of the ZSSS and the Impulsiveness Questionnaire (Clark, Sommerfeldt, Schwarz, Hedeker, & Watel 1990). These subjects were also more likely to have histories of truancy, assaultiveness and homicidal behaviours.

There are no data that indicate that the BIS-10 is more accurate than its earlier version as a measure of overall impulsivity, or that its subscales possess more than face-validity.

Both the BIS and ZSSS have been used to compare 49 violent and non-violent schizophrenic offenders in the Forensic Psychiatry Unit at Valkenberg Hospital in Cape Town (Kaliski 1993; Kaliski & Zabow 1995). The only significant finding was that the non-violent schizophrenic subjects scored higher on the Thrill and Adventure subscale of the ZSSS.

Other scales that measure impulsivity include the Impulsivity Scale, which is a 15 item 3-point scale that asks about the tendency to engage in impulsive, spur of moment behaviours (Apter, Plutchik, & van Praag 1993g).

The Neurobiological basis of Impulsivity

The frontal lobes, and their connections to the limbic system and thalamus, have been implicated as the anatomical seat of impulsiveness (especially as damage to the orbital cortex characteristically produces behavioural incontinence) (Barratt 1990;Lishman 1998c). The low levels of brain serotonin are presumed to be linked to some form of impulsivity, disinhibition or dyscontrol and not antisocial behaviour per se (Brown & Linnoila 1990).

A low CSF 5 hydroxy-indole acetic acid (5-HIAA) has been associated with impulsive violent behaviour, trait anxiety, depression, suicide risk, and borderline personality disorders (Brown & Linnoila 1990) (Apter, van Praag, Plutchik, Sevy, Korn, & Brown 1990;Apter, Plutchik, & van Praag 1993g;Linnoila, Virkkunen, Scheinin, Shaner, Rimon, & Goodwin 1983;Plutchik & van Praag 1990c;Silverman et al. 1991). A study of 34 pre-trial subjects charged with murder and attempted murder found that impulsive violence in the index offence (defined as having occurred without premeditation) was associated with low CSF 5-HIAA levels, especially amongst those who had committed more than one violent crime (Linnoila, Virkkunen, Scheinin, Shaner, Rimon, & Goodwin 1983). Metabolites of other brain monoamines did not differ between groups. Fenfluramine challenge tests on 24 male substance abusers resulted in significantly higher prolactin and cortisol levels (indicators of low CNS serotonin) in those who had greater scores of self reported aggression and impulsivity, as well as fatigue, depression and boredom (Fishbein,

Lozovsky, & Jaffe 1989). One study has disputed this association in schizophrenia, asserting that low CSF 5 HIAA only relates to suicidal behaviour in this group (Cooper, Kelly, & King 1992).

Alcohol abuse has also been associated with impulsive offending (firesetting) and impulsive aggression, and with low CSF 5-HIAA levels (Linnoila, De Jong, & Virkkunen 1989).

Impulsive aggression, which has been characterised as a form of episodic dyscontrol, manifests as an act which may result from provocation, but occurs without reflection, is more intense than expected from the nature of the provocation, and is often followed by remorse or guilt (Barratt 1990). Its intermittent explosive-like nature has led to comparisons with other epileptiform phenomena. This has been reinforced by the successful use of phenytoin in reducing such aggressive behaviours in a group of prisoners (Barratt 1990; Barratt et al. 1991).

Cortical augmenting on visual and auditory evoked potentials correlates positively with impulsiveness, sensation seeking and extraversion, which conceptually means that the cortex is 'tuned to seek out' increases in stimulus intensity but is unable accurately to time responses appropriately (Barratt et al. 1987).

MENTAL HANDICAP

In the United Kingdom mental handicap hospitals admit forensic patients at three times the rate of other psychiatric hospitals (Gunn 1977d). Low intelligence and poor school achievement have been listed as independent risk factors for delinquency, and that offenders score lower on IQ tests (Farrington 1995e). In Bach-y-Rita et al's (1971) study on episodic dyscontrol 12 of 43 subjects who had been tested were assessed as having subnormal IQs (which was not defined). In Scott's (1977a) study of 218 murder cases low intelligence was rarely found in murderers.

A Swedish birth cohort of intellectually handicapped born in Stockholm in 1953 were followed up 30 years later (Hodgins 1992). The group had been placed in special classes at school and were never admitted to psychiatric wards. Men with mental handicap were 5.45 times more likely to commit a violent offence, whereas women with mental handicap were 24.77 times more likely to be convicted. This occurred in the fact that mental handicap amongst female offenders is rare, probably less than 4% of any sample (Cloninger & Guze 1970).

MEDICAL ILLNESS, ESPECIALLY EPILEPSY

The graphic 19th century case of Nicholas Gage, whose behaviour changed dramatically from that of upright citizen to slovenly amoral individual following a penetrating injury to his frontal lobes provoked interest and speculation into the possible connections between neurological dysfunction and aggression (Lishman 1998c). In Elliott's study (1982c; 1992a)

of 286 recurrently violent subjects 107 had experienced seizures, 119 were diagnosed with minimal brain dysfunction, 51 had had a serious head injury, 13 cerebral tumour, 13 cases of encephalitis, 11 CVA, 6 multiple sclerosis, 3 Alzheimer's disease, 2 of cardiac arrest, 1 of Huntingtons Chorea, hypoglycaemia. Similarly a survey of murderers examined between 1900 and 1979 in Iceland revealed that 36.2% had physical disabilities, such as heart disease, epilepsy, cancer, head injury, bone deformities, deafness, paralysis, and partial blindness (Petursson & Gudjonsson 1981). Fatty acid analysis of 19 offenders indicated that deficiencies in the n6 series seems to contribute to a propensity to violence, although the influence of lifestyle variables (such as alcohol intake) and other dietary variables could not be excluded (Corrigan et al. 1994).

A head injury with loss of consciousness longer than one hour has often been found in the histories of aggressive psychiatric patients (Felthous 1980). But a study on violent schizophrenics failed to show that a past history of head injury was significant (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c).

'Episodic dyscontrol' has been described in those with histories of birth injury, coma-producing illnesses (meningitis, febrile convulsions), serious head injury (involving loss of consciousness), symptomatic seizures, psychosomatic illnesses and abnormal temporal lobe EEG changes without detectable neurological deficits (Bach-y-Rita, Lion, Climent, & Ervin 1971).

Williams (1969), who examined the clinical records of 333 prisoners (a random sample from 1250 referrals over a 20 year period), found that habitually violent prisoners differed from others by their overwhelming rate of EEG abnormalities. Although he tried to

categorise these abnormalities in terms of wave forms and locations, he could only conclude that the anterior temporal and lateral frontal areas were the areas most likely to be involved, and that these were mostly theta (i.e. slow wave) abnormalities.

Therefore, there is a long tradition of worrying whether epilepsy, or just seizure activity, causes aggression. An influential study, by Delgado-Escueta et al (1981b), determined that out of 5400 videotaped seizures from units around the world only 13 cases clearly exhibited ictal violence, of which only 3 were directed against a person. In all the cases the subjects were clearly confused.

Epilepsy is relatively common in prisoners, of the order of at least 7.2 per 1000 (Gunn 1977d). Various explanations exist; epileptics experience a great deal of rejection, which leads to antisocial behaviour, the epilepsy and antisocial behaviour could have common antecedents, such as poverty, abuse (especially with head injury), or antisocial behaviour could result in recklessness, head injuries and ultimately epilepsy.

Most authorities nevertheless do seem to agree that some alterations of behaviour do occur in epileptics, even in the interictal period. They do disagree on the nature, and cause of these 'alterations'. Various, described, and disputed, have been personality changes involving increased concern with religious or philosophical issues, hypergraphia, alterations in sexual behaviour and aggressiveness (Engel, Caldecott-Hazard, & Bandler 1986; Geschwind 1983; Pincus 1980), which have been postulated to be due to seizure activity in the temporal or frontal lobes.

Trimble (1983b) has been moved to state that

“...for some reason, the link between epilepsy and behaviour disorders, especially with regard to changes in personality, has become an area of controversy that sometimes borders on the nonscientific” (p.1334).

Nonetheless speculation has continued unabated. Many workers believed that epilepsy, or some seizure activity were somehow related to episodic dyscontrol (in which otherwise normal individuals display periodic tantrums, anger outbursts and aggression). Mark and Ervin (1970) and Monroe (1989b) hypothesised that episodic violence could be due to intermittent seizure-like discharges in the limbic system, or other subcortical structures. As these discharges emanated from deep structures the conventional EEG would not detect them (unless the activity spread to the cortex). Lewis's (1982e) study on 84 delinquents found correlations between memory impairment, EEG abnormalities, an inability to stop fighting once having started, and repetitious, meaningless automatisms. There were also significant correlations with auditory/visual/tactile hallucinations, thought disorder, and paranoid ideation. Five of the subjects had clearly committed violence during a psychomotor seizure, but had also committed violent acts previously when seizures were not occurring. Of the 18 psychomotor subjects 16 had histories of central nervous system trauma or perinatal difficulties. In 12 cases the CNS trauma (i.e. head injury) definitely preceded the epilepsy, and the authors speculated that their violent behaviour was a reflection of poor impulse control that is characteristic of brain damaged individuals. A further observation was that paranoid ideation and hallucinations were characteristic of this epileptic population and probably contributed to their violence.

Leicester (1982d) reviewed the records of 17 patients (out of 500 consecutive referrals), who were subject to episodic anger outbursts, and concluded that in all, psychological

factors accounted for all the outbursts. Nevertheless the view that episodic aggression is due to subliminal electrical discharges in the limbic system continues to have currency (Fenwick 1989).

Mentally ill individuals have high prevalence of physical illness. A survey conducted at Valkenberg Hospital found that 60% of chronic inpatients had an unrecognised physical disorder (Morris, Ben-Arie, & Zabow 1983). An examination of assaultive patients in 2 state psychiatric hospitals in New York indicated that assaultive patients were significantly more likely to have seizure disorders, if their primary diagnosis was organic psychotic disorder (usually senile, alcoholic or Alzheimers dementia), mental retardation or other non-psychotic disorders (Tardiff & Sweillam 1982b).

Although aggressiveness diminishes with age among those suffering from Alzheimer's disease (average age 75.2 years) 35% exhibit verbal or physical aggression (Aarsland, Cummings, Yenner, & Miller 1996).

In Krakowski et al's (1989c) study of 55 violent and 34 non-violent schizophrenics violent schizophrenics were more likely to have neurological and neuropsychological deficits. The neurological impairments that were most prominent were asteorognosis, graphaesthesia, tandem walk, and walking-associated movements. The high violence group had a selective impairment in visual-spatial functions (as measured mostly in the performance tests of the WAIS-R IQ test). When other variables were held constant in a logistic regression model neurological impairment remained as a significant distinguishing factor between the high violence and non-violent subjects. These neuropsychiatric deficits, which are often quite subtle, probably represent early brain insults (Adams, Meloy, & Moritz 1990).

Electroencephalogram Studies (EEG)

The EEG has been a routine investigation in psychiatry for some time, although standardised and universal terms have not generally been used in reports. Fenton and Standage ((1993c), who reviewed EEG reports for general psychiatric patients that had been done over a 12 month period categorised their findings according to whether they were 'normal', 'anomalous', or 'abnormal'. In their clinical sample 44% had normal, 19% anomalous and 37% abnormal EEGs. The abnormal and anomalous EEGs had a wide variety of wave abnormalities, but most consistently the abnormalities were located in the temporal lobes (although the authors did not specifically record the exact sites of the foci).

A study of 89 schizophrenics failed to differentiate high violent, low violent and non-violent subjects according to EEG abnormalities, in which the wave form, number of abnormal discharges, site of the focus, response to hyperventilation, or amplitude voltage had been measured (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c).

Lewis et al (1982e) investigated the associations between epilepsy, EEG findings and violent behaviour in 74 incarcerated delinquents. They classified the EEG abnormalities into whether they were regional or diffuse. In the former they noted the nature of the waves (i.e. temporal spikes or paroxysmal complexes, theta waves), and in the latter whether paroxysmal slow or sharp waves, theta and delta waves predominated. Eighteen had histories of psychomotor epilepsy and 8 of generalised seizures. There was a significant correlation between the number of psychomotor symptoms and degree of previous violence. However, they were unable to link wave type, or regional loci of the EEG

abnormalities to the behaviours (and reasoned that many interictal EEG's are normal despite compelling evidence that psychomotor seizures had occurred.

CRIMINAL RECORD

As mentioned above significant numbers of convicted prisoners suffer from psychiatric disorders, and likewise significant numbers of psychiatric patients have criminal records.

As Gunn (1977d) has eloquently opined

“...there is an important group of patients, mainly men, whose basic problem is that their disorder, whether it is alcoholism, personality disorder or schizophrenia, leaves them vulnerable, and in need of asylum in the broadest sense. These men constitute the ‘social litter’ of our modern cities, and they move from hospital to prison, to doss house and back again, like a stage army tramping round and round, making a much greater impression than their numbers warrant simply because we have no facilities for them. They usually commit trivial offences, but serious crimes are not unknown from this group” (p.321)

Lanzkron (1963) had shown that 46% of murder insanity acquitees had criminal records before committing the murder (and 43% had previously been hospitalised). Patients who had been arrested following release from state psychiatric hospitals were significantly more likely to have had histories of arrests prior to hospitalisation, and the greater the number of prior arrests the greater the risk for re-arrest, especially for violent offences (Steadman, Cocozza, & Melick 1978c).

Rollin (1973) found that the typical mentally disordered offender (that had been diverted to hospital rather than sent for trial) was between the age of 30-50 years, single, of no fixed

abode and most likely to be suffering from schizophrenia. Most (57%) had committed offences against public order (eg. ripping aerials off cars, walking around naked), and a minority (13%) violent offence.

Nevertheless a study of 89 schizophrenic inpatients indicated that a history of convictions for violent, but not non-violent, offences were significantly related to recurrent assaultiveness (Krakowski, Convit, Jaeger, Lin, & Volavka 1989c). Likewise the White House Case schizophrenic subjects (who had been hospitalised involuntarily following an attempt to contact the US President) were more likely to be arrested for violent crimes after discharge from hospital if they had had a history of prior arrests (Shore, Filson, & Johnson 1988; Shore, Filson, & Rae 1990).

Most schizophrenics are arrested for their first crime only when the illness has become firmly established. In Canada 60% of a remand schizophrenic sample, and 76% of those with major affective disorder did not have previous convictions (Kunjukrishnan & Bradford 1988d). In a 20 year series of schizophrenic violent offenders 23% had a previous criminal record, although less than 10% had records of convictions for violent crimes (Virkkunen 1974).

Samples of violent schizophrenic offenders generally have a nucleus of multiple offenders. Eight of 38 violent schizophrenics in the Stockholm series had committed more than 2 violent offences during the follow up period, and they were responsible for 44% of all the violent acts (Lindqvist & Allebeck 1989).

It has proven more difficult to determine risk in released offenders. In 1969 a cohort of released parolees in California were placed in 6 categories according to their histories of past violence/aggression (Wenk, Robison, & Smith 1972). The 20% that had been assigned to the 'Potentially Aggressive' category recommitted violent crimes at a rate of 3.1 per thousand cases, which did not differ significantly from the 2.8 per thousand that was committed by those who had been assigned to the 'Less Aggressive' categories. Hence they concluded:

"There is little doubt that the known offender in general and the known violent offender in particular are more likely to commit an assaultive act. Still, there has been no successful attempt to identify, within either of the offender groups, a subclass whose members have a greater-than-even chance of engaging again in an assaultive act. The best prediction available today, for even the most refined set of offenders, is that any particular member of that set *will not* become violent" (p.394)

Nevertheless histories of previous convictions and arrests have generally been regarded as important variables in determining risk (Rappeport & Lassen 1965b). The Canadian Violence Risk Assessment Guide relies heavily on eliciting histories of previous convictions (Webster, Harris, & Quinsey 1994). The Legal Dangerousness Scale (LDS) that was used to follow up the Baxstrom cases specifically targeted four aspects of previous criminal activity: presence of a juvenile record, number of previous arrests, presence of convictions for violent crimes and severity of the original (Baxstrom) offence (Cocozza & Steadman 1974). Of the 98 patients followed up, 20 had been re-arrested, of which 17 (85%) were under the age of 50 years and had more serious histories of offending. But only 14% of the general group had actually been assaultive.

HABITUAL VIOLENCE

The adage that past violence predicts future violence has enjoyed widespread currency. All authorities tend to agree with the following points:

- risk assessment is usually conducted on individuals that have already acted violently
 - the greater the number of previous violent acts the more likely that these will recur
- (Monahan 1988;Reiss & Roth 1993;Wenk, Robison, & Smith 1972)

Forty-five percent of patients who were violent during admission to a psychiatric hospital had prior histories of such, compared to 27% of violent patients without a history (Karson & Bigelow 1987b). Of the patients who became violent only one (out of 45) had a previous single episode. In other words virtually all had had multiple episodes before the index episode.

Violent recidivism in a group of paroled juveniles who had a history of habitual violence was found to be three times that of other offenders, even though the overall rate was only 5% (Wenk, Robison, & Smith 1972). A subsidiary finding was that a history of violence correlated significantly with violence in the index offence, even though few of those with histories of violence were actually re-charged with violent offences.

Consequently if 'history of actual violence' were used to identify those at risk then this would be a false alarm in 95% of cases, despite the fact that most of the eventual small number recidivists will be mostly contained in the group.

A 6 month follow up of patients discharged from a psychiatric emergency department indicated that basing predictions solely on a past history of violence produced a sensitivity of 69%, but a specificity of 48%⁴, which was lower than clinical predictions (Lidz, Mulvey, & Gardner 1993e). A similar study that sought to determine the factors that contributed to successful predictions of risk by clinicians concluded that a past history of violence is a major factor, but only in conjunction with other factors such as mania, schizophrenia, and hostile-suspiciousness (McNiel & Binder 1995).

THREATS AND FEELING THREATENED

The significance of issuing threats to commit violence is uncertain, even though this often is the reason for certification for involuntary admission and for seclusion for psychiatric patients, as threats are understood to represent a potential for violence (Beck, White, & Gage 1991b) (Apperson, Mulvey, & Lidz 1993f). Are people who attack physically different from those who threaten verbally? Threats may be linked to homicide ideation, which is strongly associated with homicide attempts (Asnis, Kaplan, van Praag, & Sanderson 1994).

An 18 month follow-up of 169 individuals with a major psychiatric illness documented 75 threats made by 52 subjects (Estroff, Zimmer, Lachicotte, & Benoit 1994). About half were towards specific others, the remainder were vague ideation concerning harm to unidentified others. There were nearly twice as many threats as acts. No diagnosis was

⁴ Sensitivity is the number of true positives divided by the sum of true positives and false negatives; specificity is the number of true negatives divided by the sum of true negatives and false positives.

associated with a higher rate of issuing threats. Those who had acted out violently were more likely to report that people were picking fights with them, talking about them behind their backs, staring at, avoiding or cheating them. Although the authors concluded that perceived threat and hostility from significant others is linked to violence they did not differentiate between psychotic and non-psychotic ideation.

A 6 month follow up of civilly committed patients showed that those who had been committed on the basis of having issued threats were more likely to be arrested for an offence (Hiday 1992c). But in a clinical sample of patients admitted to an acute facility the addition of threats (just before admission) increased the subsequent number of patients identified as being violent by only 7% (Apperson, Mulvey, & Lidz 1993f). In other words, threats co-occur with physical aggression, but are not necessarily linked predictively.

There is a likelihood that chronically hospitalised schizophrenics are more likely to issue threats and not engage in physical aggression, whereas those in the midst of a first breakdown or with recurrent breakdowns (with reasonable functioning in between) tend to issue threats and act out physically (Planansky & Johnson 1977b). However the number of threats issued still outnumbered that of actual assaults by 2:1. In Virkkunen's (1974) series of violent schizophrenic offenders 59.5% had displayed a hostile attitude towards their victim, and 28% had actually threatened the victim with homicide.

ENVIRONMENTAL FACTORS

Behaviour generally occurs within a context. Culture, social change and environmental controls or facilitators either inhibit or encourage aggression (and other impulses), and interact with biological factors (Elliott 1992a).

SITUATIONAL VARIABLES

Antecedent variables combine probably by creating a state of readiness to act if certain situational circumstances occur. Offenders characteristically provide common reasons for their behaviour, which are for material gain, to relieve boredom or for excitement, to deal with provocation (and anger), or loss of control from intoxication (Farrington 1995e). In a seminal study of 212 men diagnosed with a psychotic disorder and charged with an offence Taylor (1985b) noted that determining their motives for offending was often almost impossible to uncover. Even though 9 out of 121 subjects were not actively symptomatic only 20% were considered to have offended in response to psychotic symptoms. If the probable cases were added (in that it was strongly suspected that psychotic symptoms influenced their actions at the time) then at least either hallucinations or delusions had driven 43% of the total sample, including those who had offered superficially rational reasons.

Material gain as a motive was equally likely in psychotic and non-psychotic subjects, but panic, self-defence and immediate retaliation (following provocation) were more likely to be offered by non-psychotic subjects, especially with respect to violent offending.

The Types of Offences

Offenders that specialise in a particular type of offending are rare. In the Cambridge longitudinal study the chronic offenders had each committed at least 5 different offences (out of 10 types altogether) (Farrington 1995e). Violent offender profiles were very similar to that of non-violent offenders, which led to the conclusion that the causes of aggression and violence were essentially the same as the causes of persistent and extreme antisocial, delinquent and criminal behaviour.

The range of offences that pre-trial subjects commit vary considerably. In Kunjukrishnan and Bradford's (1988d) study the most common crimes committed were property offences such as housebreaking, theft and fraud (26%), minor crimes such as public mischief and trespass (13%) and assault (12%). The remainder consisted of murder (4.5%), attempted murder (1%), arson (4.5%), minor sexual crimes (3%), serious sexual crimes (2%), and drug offences (2.5%).

Sexual offenders are sometimes regarded as possessing characteristics apart from other offenders. Sadistic sex offenders have been described as having being pre-occupied with violent sexual fantasies from an early age, which eventually ends up in violent acting out (Grubin 1997). But whether fantasies are specific or merely sensitive indicators of sexual sadism has not been established.

Criminologists and behavioural scientists have explored the notion that offenders differ in their actions when committing different types of crimes, and that these differences reflect

(and correlate with) with the personal characteristics of the offenders. Such attempts at 'profiling' often fail because many 'specialised' offences, such as rape, are carried out by men who commit a wide range of other criminal acts. An analysis of variables associated with 66 cases of rape suggested that use of aggression was common, and similar qualitatively to other forms of violence, namely to achieve control (Canter & Heritage 1989). Further support for this was the observation that sexual crimes often have distinctly criminal components, such as wearing a mask, use of a weapon, robbery and binding of the victim.

Most research into remand populations have the problem that the facts of the offences have yet to be tested in court, and therefore information has to be obtained from a variety of sources (including the subject) in order to establish the nature of the index offence (Draine, Solomon, & Meyerson 1994).

Provocation

Scott (1977a) regarded provocation as 'no more than strong or persistent stimulation', which although is used in the courts as a concession to human frailty, is psychologically a common or even usual element in violent behaviour. He posits the view that a degree of contemplation, preparation and planning, or the use of disproportionate force do not invalidate provocation as an operative factor. Anger, agitation and irritability have not been researched extensively, although schizophrenic and manic patients are known experience these as accompaniments to their acting out (Krakowski, Volavka, & Brizer 1986a).

Immediate reaction to perceived provocation was the commonest reason for offending in both psychotic and non-psychotic remand subjects (Taylor 1985b). In Virkkunen's (1974) series of violent schizophrenic offenders almost 60% had displayed a hostile attitude towards the intended victim.

Intoxication during the Index Offence

Intoxication during an offence usually has to be deduced retrospectively from the circumstances around the index offence. A survey of 47 homicide offenders (assessed between 1900 and 1979) in Iceland concluded that 63.8% had been affected by alcohol at the time of the offence (Petursson & Gudjonsson 1981), and there were no significant differences between those with psychiatric illness and the others. About one fifth of 100 murderers in a forensic psychiatry facility were deemed to have been under the influence of alcohol during the offence, but very few were judged to have actually been intoxicated (McKnight, Mohr, Quinsey, & Erochko 1966). At least 27% of violent offences by 68 schizophrenics in Finland were committed while under the influence of alcohol (Virkkunen 1974).

Among Lanzkron's (1963) series of 155 insanity acquitees 34% had histories of alcohol misuse, but only 12.7% were actually intoxicated at the time of the offence.

The effects of intoxication with other substances have often been equivocal. There are no solid data claiming that cannabis or methaqualone facilitate aggression, although cocaine withdrawal, phencyclidine (PCP) intoxication are commonly blamed for violent outbursts (Convit, Nemes, & Volavka 1988; Eronen, Hakola, & Tiihonen 1996; Gelberg, Linn, &

Leake 1988; Miczek et al. 1994; Reiss & Roth 1993; Scott et al. 1998; Torrey 1994; Yudofsky, Silver, & Hales. 1993).

Nature of the Actions during the Offence

The quality of a perpetrator's actions during the commission of an offence may be reflective of his general and future behavioural tendencies. There has been a long-standing observation that crimes perpetrated against persons are more impulsive than property crimes, but that violent crimes are usually not committed by individuals whose self-control mechanisms are generally impaired. Early studies tried to correlate behaviour exhibited during the index offence to recidivism. Heilbrun et al (1978b) compared the degree of impulsivity that had occurred during a homicide to subsequent parole failure. Actions during the homicide were rated on a 4 point scale; from clearly not planned and a spontaneous act (score=1), to clearly planned and clearly not spontaneous (score=4). The intervening scores were for probably spontaneous (score=2), and probably planned (score=3) (Heilbrun, Knopf, & Bruner 1976). The more impulsive the homicide had been committed the more likely the failure on parole (which included petty violations). But those who re-committed a violent offence were more likely to have committed the index homicide after some premeditation. But where planning or impulsivity was equivocal (scores of 2 or 3) no such relationships were evident. Age at the time of commission of the homicide and impulsivity score were not related. Their conclusions were that violent criminals are generally in good control of themselves, but have acted impulsively in exceptional circumstances. They derived their data from examining prison records. None of the subjects was personally assessed.

Even though an act may appear to be impulsive there may have been planning or some mental preparation beforehand. In a study of 517 outpatients in the Bronx 114 (22%) admitted that they had had homicidal ideation, 8% had had it as a persistent thought in the 7 days prior to the interview, 8% confessed having a homicide plan, and 4% reported a past homicide attempt (Asnis, Kaplan, van Praag, & Sanderson 1994). Only 45% of those who reported a previous homicide attempt described their intent having been associated with a plan. Unfortunately the study did not explore the roles of impulsivity or impulse control, but the authors speculate that paranoid ideation and hostility could probably potentiate impulsive violence in this group.

An unresolved issue is whether the type of offence with other characteristics affects future risk. Without the benefit of empirical evidence Dietz (1985c) has proposed that past and present index offences could be classified into providing first, second and third rank predictors for future violence. First rank offences would include murder with mutilation of the corpse, murder with vampirism, sniper murder of a stranger, two unprovoked assaults on a stranger etc, which confers a probability of recidivism to the order of greater than 50%. Second rank offences include a firearm offence within the previous year, sadistic fantasies and history of any felony etc, which confer a probability of between 10 and 50%. Third rank characteristics include being black, poor, having an absent father, owns child pornography, collects nazi memorabilia etc, which confer a risk less than 10%. The lists he provides are long and without empirical substance.

In Zabow and Cohen's survey (1993d) psychiatrists believed that a charge of murder, rape or attempted rape, and commission of the index offence with a weapon were important for designating a patient as 'dangerous'.

There do not seem to be studies that have assessed whether foreplanning, reflection before acting on the scene or impulsive acting ('on the spur of the moment' without reflection) can be used as risk factors for violent recidivism.

Weapons

The use of weapons almost invariably ensure that any particular assault results in injuries that are more serious than if none had been used (Reiss & Roth 1993). If weapons are not accessible hands and feet tend to be used, which cause less serious injuries. This was found in a sample of 38 violent schizophrenics, who mostly used fists or feet to inflict harm, but tended not to use dangerous weapons (a small minority used a knife) (Lindqvist & Allebeck 1989).

But lethal violence overwhelmingly is accomplished with the use of a weapon. In a study of 1860 homicide victims that had been killed at home in 3 states in the USA 49.8% died of gunshot wounds, a knife (or sharp instrument) was used in 26.4%, 11.7% were bludgeoned, and 6.4% were strangled (Kellermann et al. 1993). When compared to controls gunshot victims were almost twice more likely to have been in a household in which guns were kept.

A similar community sample where 58% had a history of interpersonal violence 22% used a weapon (Fulwiler, Grossman, Forbes, & Ruthazer 1997c). In Lanzkron's (1963) survey of insane murderers 65% had used a gun or a knife, and 12% employed strangulation.

Psychiatric patients tend use hands, knives or blunt objects when they become assaultive, which probably reflects impulsive acting out, and that they use whatever is at hand (Tardiff, Marzuk, Leon, Portera, & Weiner 1997). Of those psychiatric outpatients who admit to past homicide attempts 43% use a knife (Asnis, Kaplan, van Praag, & Sanderson 1994).

Gun control is a contentious political issue. In Heilbrun et al's (1978b) study of parole failure recidivistic violence was related to firearm violations during the parole period. However greater gun availability does not appear to be linked to greater number of violent incidents, rather that gun-inflicted injuries have more serious consequences (Kellermann, Rivara, Rushforth, Banton, Elliott, Francisco, Locci, Prodzinski, Hackman, & Somes 1993). Nevertheless many ordinary people routinely carry weapons, such as a survey in Illinois that found that at least a third of high school students carry lethal weapons to school (Centers for Disease Control. 1991).

Victim,

Offenders and victims generally share similar demographic profiles, although perpetrators tend to be older. Except for aggravated assaults and completed robbery the offender usually knows the victims. The lifetime risk of being a homicide victim is about four times greater for men than women (Reiss & Roth 1993).

Intra-family violence accounts for 18% of homicides in the USA, and women are the most frequent victims of assault, especially if divorced, separated or cohabiting (Reiss & Roth

1993). However women are less likely to report being victims of simple or attempted assault. When men commit violence against their female partners their acts are more likely to result in medical injuries than are women's acts of violence toward their male partners (Jecker 1993). The levels of domestic violence is usually underestimated by a factor of 8 by family physicians, and medical staff tend to downplay its importance on the grounds that domestic violence is somehow a 'personal affair' (Jecker 1993). The USA 3 county study of homicide victims that were killed at home found that 76.7% were killed by a relative or someone known to them. Only 3.6% were killed by a stranger (Kellermann, Rivara, Rushforth, Banton, Elliott, Francisco, Locci, Prodzinski, Hackman, & Somes 1993). The more defenceless the victim the more likely that excessive violence will be used, which may explain why women and the infirm are so frequently targeted (Scott 1977a):

"We forget that most murderers are amateurs and most victims healthy people with a firm hold on life, so that the killer is often horrified at the difficulty of killing and the awful sight and sounds involved, so that he strives in desperation or panic, to end the process quickly." (Scott 1977a) p131

Amongst psychiatric outpatients that admitted to past homicide attempts (4% of 517 subjects) their targets were fathers (18%), brothers (9%), spouse or partner (27%), and strangers (18%); 28% refused to identify their intended victims (Asnis, Kaplan, van Praag, & Sanderson 1994). Similarly in the Chapel Hill study of 169 psychiatric patients more than half of the targets of violence were relatives, 78% were known to the respondent, and more than one third belonged to the patient's social network (including professionals). Among the relatives the most common targets were mothers (28%), then spouses (17%), siblings (13%), children (4.9%) and fathers (3.7%) (Estroff, Zimmer, Lachicotte, & Benoit 1994). Most of the violence (60%) was committed by men and directed onto women. These

findings largely confirmed that of Planansky and Johnston (1977b) who had found that 42% of intended victims of threats were women close to them. However a significant number (20%) expressed an urge to kill unknown persons, and a smaller number were fixated on public figures, such as the Pope.

A 20 year survey of schizophrenic violent offenders revealed similar characteristics; most deeds were against persons who were close to the perpetrator, primarily a spouse (Virkkunen 1974). In almost half the victim was adjudged to have directed at least a partially rejecting attitude towards the offender.

When women were violent they were more likely to attack a relative, usually infants or children, husbands or boyfriends, in equal measures (Lanzkron 1963). However a clinical sample of subjects from a community clinic were more likely to assault non-relatives (Fulwiler, Grossman, Forbes, & Ruthazer 1997c). Unfortunately no details were provided about the circumstances of these incidents. In general, paranoid psychosis results in well planned acts onto specific people, usually family members or spouses, whereas those with disorganised psychoses (including dementia) tend to lash out onto anyone who happens to be in the vicinity (Krakowski, Volavka, & Brizer 1986a). Other studies confirm that in forensic psychiatry populations almost two thirds of homicide victims belong to the nuclear family, and perhaps less than 10% are strangers (Lindqvist & Allebeck 1989; McKnight, Mohr, Quinsey, & Erochko 1966).

Females, psychotic as well as non-psychotic, kill almost exclusively inside their families, most of the victims being their own children. Only non-psychotic wives kill male spouses. Psychotic males kill mostly known or familiar people (in this study only 2 out of 48 victims

were strangers), whereas non-psychotic males kill significant numbers of strangers (39 out of 137) (Gottlieb, Gabrielsen, & Kramp 1987). In a South African 50 year survey of women referred for psychiatric assessment 81% of the homicide victims were close family members, split almost evenly between a husband or children. None killed a stranger (Offen 1986).

Sexual assaults are committed by a person unknown to the victim in about 50% of cases (Canter & Heritage 1989).

Nearly 75% of all violent crimes are committed by lone offenders especially when the victim is known to them (Lindqvist & Allebeck 1989; Tantam 1993).

CONCLUSIONS

Clearly none of the factors in the foregoing discussion cause violence alone. Rather critical combinations of antecedents that probably heighten a readiness to act collide with situational circumstances. Youth, a propensity to be impulsive, sensitivity to perceived threats, a history of aggression or being a victim of violence, social dislocation (such as unemployment and conditions of poor social support), and disinhibition (often facilitated by substance abuse) and psychotic illness seem to be sturdy antecedents.

Forensic psychiatric assessment units seem most likely to encounter violence acts that conform to the model of 'threat/control override' (Link & Stueve 1995).

METHODOLOGICAL ISSUES

Unfortunately methodology is often the first casualty in violence research. This has complicated attempts at comparing results from diverse studies (Reiss & Roth 1993) The most prominent reasons are that there do not seem to be universal standardised definitions of aggression and violence, the actual base rates of the risk factors and violent behaviour are actually quite low (even in the target population), diagnostic classification systems can be problematic, and it is not always possible to ascertain whether the quality of information extracted about a subject is adequate. Other issues include the lack of standardised psychometric instruments for use in this country and the poor resources available to complete studies.

DEFINITIONS OF VIOLENCE AND AGGRESSION

There is a lack of a universally accepted definition for violence, which generally hinders comparisons between studies. Broad definitions tend to be overinclusive and lose specificity, whereas restrictive definitions tend to exclude important cases (Monahan 1995b); (Dix 1980). Many consider violence to be within a spectrum that includes thoughts (or fantasies) of harm to others, verbal threats, and assault (Plutchik & van Praag 1990c);(Monahan 1995b) (Felthous 1980). Similarly aggression is often regarded as being synonymous with violence (Elliott 1992a). Scott (1958) regarded fighting as the exemplar of aggression. Others have concentrated on the range of behaviours that reflect an intent to inflict physical harm (Campbell & Muncer 1994;Lidz, Mulvey, & Gardner 1993e). For example, Lagos et al (1977e) studied retrospectively the records of 400 psychiatric admissions and included in their definition attacks on persons or objects, threats, verbal

attacks, ambiguous violence (which was not defined) and loss of impulse control. Their argument was that there are many less serious acts of violence that nevertheless inspire fear, and that by concentrating solely on extreme forms one is obtaining only a partial answer. Lidz et al's (1993e) prospective study on predicted violence in psychiatric patients specified that violence was deemed to have occurred if the patient had laid hands on another or threatened with a weapon; verbal threats were excluded.

Most current research tend to regard violence as any assaultive behaviour, including imminent threat involving a weapon. Specifically verbal threats or arguments were excluded (Cocozza & Steadman 1974); (Beck, White, & Gage 1991b); (Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a).

It would appear that however seamless the connection between intent for violence and acting out may be, there is a necessary distinction between an impulse that is (at least) partially controlled and that, which is allowed to be expressed. Aggression should therefore be distinguished as being any directed behaviour that may have the goal of harming or injuring another living being (Barratt et al. 1990). Violence is therefore reserved for acts that have resulted, or most likely would have resulted in injury to another person. Hence this study, which focused on criminal behaviour, used the definition that has been used by the National Research Council which adopted as its definition of violence as "behaviours by individuals that intentionally threaten, attempt, or inflict physical harm on others" (Reiss & Roth 1993) p.2.

Definitions of habitual violence have not been operationalized. The 'dangerous offender' has been regarded as a "repetitively violent criminal who has more than once committed or

attempted to commit homicide, forcible rape, robbery, or assault” (Dinitz & Conrad 1978) p.99. This definition includes a pattern of repetitive, compulsive or aggressive behaviour which has not necessarily resulted in conviction.

BASE RATES

Base rates refer to the relative prevalence of particular phenomena in a selected population. As a proportion of all human activity violence is a rare event, even in communities acknowledged to have high rates. Moreover habitually violent individuals are mostly not violent (Reid 1988). Less than 5% of previously violent parolees will re-commit a violent offence (Wenk, Robison, & Smith 1972). This means that 95% will be ‘false positives’, a clearly unacceptable situation. Therefore any ‘high risk’ group will contain a large number of ‘false positives’ (Dix 1980). This is compounded by the reluctance of subjects to report their own behaviour, the unreliability of criminal registries and hospital records, and collateral informants are not always cognisant (Apperson, Mulvey, & Lidz 1993f); (Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a). A solution is to select from a population a group which possesses relatively high base rates. In the Baxstrom series of released criminally insane subjects the low base rate of repeated dangerous behaviour was partly blamed on their middle age and average institutionalisation period of 14 years (Cocozza & Steadman 1974).

Rates also differ over time. An 80 year survey (1900 to 1979) of all homicides in Iceland showed that during the first 40 years of the century only 2 homicides occurred (0.05/ 100 000), and over the following 40 years there were 43 incidents (0.72 /100 000). However in

the last decade of the study (1970-79) the rate was 0.97 /100 000) (Gudjonsson & Petursson 1982).

Determining whether a particular group has a high base rate of activity depends on the method of measurement. Crime statistics distinguish between measures of self-reports of victimization, reports to the police, arrests and convictions, with a resulting broad-based pyramid as the number of convictions are minuscule compared to the estimated number of acts in a community (Reiss & Roth 1993).

Crime statistics in South Africa are known to be unreliable, but Glanz (1992d) has estimated that in 1986 42 cases of murder and attempted murder, 41 of rape, 302 assaults and 126 robberies occurred daily. Analysis of the previous 10 years produced population rates of 50.2 per 100 000 population for murder and attempted murder, 49.5 per 100 000 for rape and attempted rape, 364.5 per 100 000 for aggravated assault, 151.7 per 100 000 for robbery, 652 per 100 000 for housebreaking and 196.3 per 100 000 for motor theft. It widely acknowledged that the current figures are much higher.

The conviction rates for sex and violent offences in South Africa is probably about 256 convictions per 100 000 population aged 7 years and older (Glanz 1993). The rates for crimes reported to the police has been calculated to be 49.5 per 100 000 population for rape and attempted rape, 364,5 per 100 000 for assault (compared to 166 per 100 000 for convictions).

Another problem is that there are low numbers of particular disorders and risk factors, even in index populations. In a 25 year survey of 251 homicide evaluations in Copenhagen

only 58 were psychotic (Gottlieb, Gabrielsen, & Kramp 1987). Tiihonen (1995d) concluded in a recent review that quantitative risk assessment (using odds ratios) has yet to be accomplished that uses an epidemiological approach in which large samples (containing control groups) can be studied for risk factors.

DIAGNOSTIC CATEGORIES

Before DSM III was published in 1980 psychiatric diagnosis was regarded to be an unreliable exercise. It used to be said that three psychiatrists examining the same patient simultaneously would produce three different diagnoses (Martin 1985). Most early studies confirmed this observation, and that the differences between American psychiatrists (who tended more to diagnose schizophrenia) and British psychiatrists (who tended to prefer to diagnose affective psychosis) were particularly marked (Beck et al. 1962; Kramer 1969). There remains a forceful argument that all psychoses exist on a continuum rather than as discrete categories (Crow 1986). Also, during the preceding two decades the anti-psychiatry movement had forcefully argued that psychiatric diagnoses were illusory and had been concocted to label pejoratively those whose behaviours were deemed to be unacceptable (Szasz 1961). Therefore, despite the almost universal acceptance of DSM classifications influential opinion exists that disputes the validity of current diagnostic labels because they are not really based on empirically derived phenomena, but rather on conjectures by influential academics (van Praag 1993).

Even within the DSM classification system analyses have usually concluded that disorders are not always easily differentiated from each other. The impulse control disorders share phenomenologic similarities to mood, anxiety, alcohol and substance abuse disorders, and

all have been shown to have serotonergic dysfunctions (McElroy et al. 1992). Not surprisingly there is an opinion that clinical and statistical assessments should be based more on specific symptoms or discrete behaviours than on global diagnostic categories (Martin 1985).

QUALITY OF ELICITED INFORMATION

A fundamental problem is that most violent acts are not reported. Even when charges are laid convictions often do not result. Therefore most violent acts are not certified events (Wenk, Robison, & Smith 1972).

Antisocial subjects are known to be deceitful and can provide inconsistent information (Brown & Linnoila 1990). Experienced clinicians almost never rely on the 'subject' as a complete source of information. Although multiple interviews with the subject are essential, interviews with other social contacts (family, friends, co-workers, children), witnesses to the index offence, arresting officers, official staff who have worked with the subject (in prison, school, hospital etc) and current and past victims should ideally be contacted (Dietz 1985c). Dietz (1985c) also recommends that the crime scene should be examined, but readily admits that if the examining clinician follows all his advice an evaluation would take too long to complete.

The use of self reports for documentation of violence limits the usefulness of elicited data, even though most studies seem to have relied upon self reports entirely (Beck, White, & Gage 1991b). In the MacArthur Study subjects who were interviewed monthly displayed intolerance to the procedure and a response set developed; either incidents were fabricated,

or under-reported (Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a). Ultimately self reports of violence were actually higher when provided by the subjects than those provided by collateral sources (Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998). Retrospective reporting, either by collateral or self report, often cannot be substantiated. There have been suggestions that face-to-face interviews discourage openness, and that these studies should employ anonymous self-rating scales (Asnis, Kaplan, van Praag, & Sanderson 1994). However Farrington (1995e) confirmed that self reports of antisocial behaviour in delinquents correlated well with official conviction records.

The standard approach now is to collate information from a variety of sources. These include self reports, conviction records and collateral information from family and friends.

SAMPLE SELECTION

Who should be studied? Occasional or exceptional incidents are not easily studied, and are probably not predictable. Repetitively aggressive individuals tax both public health and criminal justice services, and probably have characteristics amenable to intervention (Eichelman 1992).

The courts are selective with respect to whom they refer into psychiatric services (and hence into research surveys), preferring to send violent offenders for assessment and containment (Gunn 1977d). Even if sample selection is confined to the offender population it is not always clear whether arrest or conviction data are more accurate indications of recidivism (Dix 1980).

The great array of variables that need to be considered requires that a large sample be selected. In the Mac Arthur Study it was estimated that a sample of at least 1000 subjects was the minimum number that would allow for meaningful statistical analysis (Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a).

Clinical samples have the additional problem that the group chosen to be the control may actually have similar rates of the studied variable. Thus Apperson et al's (1993f) 6 month follow up of patients admitted to an acute facility found that both control (low risk group) and study groups had engaged in high rates of violence.

INSTRUMENTS FOR MEASUREMENT

Psychological tests have yet to establish characteristic profiles of violence, or of specific patterns of violence, probably because clinicians are unable to tell psychometrists what it is that they wish to be measured (Scott 1977a). There are a variety of psychometric instruments that measure violence. The Past Feelings and Acts of Violence Scale (PFAV) consists of 12 items answered on a 3-point scale of frequency. Subjects are asked about acts of violence against others, the carrying and use of weapons, arrests and loss of temper (Apter, Plutchik, & van Praag 1993g). The Dangerous Behavior Rating Scheme (DBRS) was developed originally by METFORS in Toronto to predict dangerousness in pre-trial patients (Menzies, Webster, & Sepejack 1985b).

All tests suffer from the problem that in the forensic situation subjects may have poor motivation to do well, and are often able to discern what is being asked for in psychological tests (Scott 1977a).

RESOURCES IN SOUTH AFRICA

South Africa is a developing country with limited resources. Planning for research has to take into account the dearth of funds and qualified personnel. Not surprisingly few diagnostic schemes have been validated here, and there are few experienced researchers in the field of violence research.

Therefore this study was regarded as a first step in building research capacity so that important mental health issues, especially those of violence and trauma, can be addressed here.

RATIONALE FOR THIS STUDY

Despite the lack of accurate data it is well known that South Africa has a high prevalence of violent crime. The Forensic Psychiatry Unit at Valkenberg is required routinely to assess criminal defendants' competence and criminal capacity, but also has to perform risk assessments in order to provide expert testimony in court, or to deal with those already being rehabilitated in the forensic psychiatry system.

Although risk assessment instruments have been developed elsewhere their relevance and validity in this country have not been tested. It is not even known whether risk factors that have been found to be important in other countries significantly distinguish the local habitually violent individuals from other offenders.

None of the current risk assessment scales provide weighting of risk factors, especially for a heterogeneous forensic population, which contains various admixtures of mentally ill and antisocial offenders. Most risk assessment schemes give equal importance to significant risk factors, and the weighting usually is applied only for the strength of their presence (for example, 'possibly present' compared to 'definitely present'). It was also not known whether some risk factors could exert huge influences even though their actual base rates are low. This study is hopefully will initiate the development of a risk assessment scheme in which the presence of some risk factors would confer higher scores.

An additional point is that risk assessment is a relatively new procedure, and, despite a profusion of literature on violence generally, many of the schemes and risk factors currently being used in Developed countries still possess only a tentative status. Therefore research has to continue to investigate these factors until a definitive scheme can be produced.

Therefore this study is an attempt to identify the risk factors that can be used in risk assessment evaluations in South Africa. Ultimately it is hoped that a standardised scheme will be developed that can be used in the South African context, and hopefully contribute to those used elsewhere.

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METHOD

All referrals admitted to the Forensic Unit at Valkenberg Hospital under section 79(2) of the Criminal Procedure Act for 30 days pre-trial psychiatric observation, over a 6-month period from November 1991 to April 1992, were considered for entry. Subjects were approached to participate within 3 days of admission, and the gathering of information was conducted throughout the 30 day observation period.

During the admission semi-structured interviews were conducted and the information listed below was elicited. Each was presented in a ward conference attended by 3 psychiatrists, a clinical psychologist, occupational therapist, social workers and nursing staff. Diagnoses were made according to the DSM III-R criteria, and were based on the consensus of the team. Collateral information was obtained by the social workers from subjects' families, and court documentation included the details of the evidence for the case and any criminal record of previous convictions. Nursing staff compiled daily reports on behaviour and symptoms displayed in the ward, and were instructed to note whether the subjects issued threats to commit violence, were aggressive in attitude or posture, or were assaultive.

Informed consent was obtained in which it was emphasised that the study had no relevance to the psychiatric evaluation in progress. Subjects were assured that the findings would not be given to the courts.

The Exclusion criteria were:

- a. an inability to communicate in either English or Afrikaans⁵.
- b. delirium,
- c. an inability, or refusal to provide an account of the index offence
- d. any communication disorder, and
- e. refusal to participate, or lack of capacity to provide informed consent.

The following data were elicited:

DEMOGRAPHICS

The Referring Court was recorded, and the reasons provided in the supporting documentation that were advanced in court to support the application for observation were noted.

- Age, gender, marital status, number of children,
- Birth order in own family
- Whether he/she originated from a rural or urban area
- Occupation at the time of arrest: this was recorded according to whether the subject was unemployed, had been working as a labourer, semi-skilled, skilled, clerical or professional capacity,

⁵ About 15% of admissions to the unit speak Xhosa only. Most Xhosa speaking patients are able to communicate in English or Afrikaans. This criterion was used because of the inability to translate the scales into Xhosa and to find a research assistant who could communicate in the language.

Education was listed both in terms of highest level of education and years of education.

The latter converted the highest level of education into the number of years of education that this represented, and did not necessarily reflect the actual time spent in school. This was to avoid bias against those whose schooling was disrupted during the years of boycotts.

HISTORICAL FACTORS

HISTORY OF CHILD ABUSE

Subjects were asked whether during their childhood they were beaten, assaulted, or sexually abused by adults in the home. The social worker asked the families similarly if the subject had been abused as a child. A positive finding was recorded if either the subject or informants claimed that abuse had occurred.

HISTORY OF CONDUCT DISORDER

Both subjects and informants were asked to list conduct disorder symptoms (as described in DSM-III-R) that had been present during childhood or youth. If the subject met the DSM-III-R (American Psychiatric Association 1987) criteria for conduct disorder the finding was listed as being positive.

PSYCHIATRIC HISTORY

- a. The number of previous admissions to a psychiatric hospital was established, and duration of the subject's disorder, if present, in years was calculated from the year of the first admission to the time of the present study.

- b. If the subject had been previously admitted the diagnoses that had been conferred were noted. If more than one diagnosis had been given all were recorded.

- c. It was noted whether there was any family history of psychiatric disorder. Because it was not possible to access the psychiatric records of family members no attempt was made to establish the diagnoses of affected family members. A positive finding was recorded if a member of the subject's immediate or extended family had ever been admitted to a psychiatric hospital.

Suicide attempts

Subjects were asked to list previous suicide attempts. In a previous study it was found that many could not provide specific details about previous attempts, and therefore ultimately it was recorded whether there was a positive history (Kaliski 1993).

Self-injurious Behaviour

A positive history for self-injurious behaviour was recorded if there was a history that the subject had ever gratuitously cut, burnt or pierced themselves, or any practice in which the integrity of skin was challenged. Excluded from this were tattoos, insertion of rings, or any other body altering practices that seemed to be consistent with a sub-cultural practice.

PATTERN OF VIOLENT BEHAVIOUR IN THE PAST

A history of a previous conviction for a violent offence, a social worker's report that described a pattern of violent behaviour (especially over the previous year), or a self report of frequent episodes of physical violence was used to designate a subjects as having a history of habitual violence.

ALCOHOL AND SUBSTANCE ABUSE

Histories of alcohol and substance abuse and dependence were elicited. Dependence and abuse were conflated into a single category, because of the practical difficulties of frequently distinguishing between the two disorders on history, and because subjects possibly could have dependence on one substance but abuse another.

This information was recorded in 2 sets. First, whether any abuse was present, and secondly a list of the specific substances that were abused was compiled.

PRE-EXISTING MEDICAL DISORDERS

Subjects were asked to list any current medical disorder for which they had sought medical attention or for which they were receiving treatment.

History of head injury

A history of a significant head injury was recorded if there had been loss of consciousness (for longer than 1 hour) followed by hospitalisation (longer than 24 hours), evidence of post-traumatic amnesia, or the consequent development of neurological (including seizures) or cognitive deficits. This was in accordance with standard neuropsychiatric criteria (Lishman 1998c).

CRIMINAL HISTORY

Previous convictions were extracted from the conviction record (the 'SAP69' conviction record form that formed part of the court documentation). Subjects were asked to provide a list of previous convictions, and if there were additional convictions these were added to the list.

Those convictions that had involved physical assaultiveness, or threat to be assaultive (such as robbery), were classified as 'violent convictions'.

For the purposes of analysis these data were classified in two sets:

- a. the presence of any previous convictions, and then of violent convictions
- b. the numbers of all previous convictions, and numbers of violent convictions

SITUATIONAL FACTORS (DETAILS OF THE INDEX OFFENCE)

THE CHARGE

The charge that resulted in the referral was labelled the 'index offence'. If a subject was charged with more than one offence the most serious was recorded as the 'index offence'. This included when the other charges were also violent in nature. For the violent charges the hierarchy of seriousness was as follows: murder; culpable homicide; attempted murder; rape; assault; attempted rape; indecent assault; robbery; malicious damage to property (if there had been intent to injure another); other sex offences (if interpersonal in nature, such as exhibitionism).

The index offence was coded as having been 'violent' or 'non-violent'. A violent index offence was defined as one in which the physical integrity of others was infringed, or threatened.

Subjects were asked to provide a detailed account of the events preceding and during the index offence. These were compared to the allegations that were provided in the court documentation, and also presented to the subjects for comment.

ACCOMPLICES

The presence of accomplices was determined either by self-report or if there were co-accused in the case.

INTOXICATION DURING PERIOD OF OFFENCE

Subjects were asked whether they were intoxicated at the time of the index offence, and to list the substances. Court documents and collateral sources were also used as sources of this information. These data were coded in 2 sets:

the substances that caused the intoxication were listed

whether any intoxication was present was noted.

PROVOCATION BEFORE OFFENCE

During the account of the index offence by the subjects, and from the account alleged in the court documents it was determined whether the subject had acted in reaction to a perceived provocation. The nature of the provocation was classified as follows:

: *none* - no clear provocation elicited

: *verbal* - taunting, teasing, swearing, oral abuse

: *physical* - the patient believed himself to be under actual or imminent physical attack

NATURE OF ACTIONS DURING OFFENCE

The subject's account and that provided in the court documentation were examined to evaluate how precipitously he had acted during the index offence. The nature of the subject's actions were then classified as:

: *Impulsive* - the subject had not planned his actions, and at the time of the offence did not delay his actions for any appreciable period in order to reflect on the situation (i.e. acted on 'the spur of the moment').

: *Premeditated in context* - the subject did not enter the situation of the offence with any evidence of previous planning, but as the events of the index offence unfolded he obviously reflected and formulated a plan of action. This included having left the scene of the offence, following provocation, to fetch a weapon or prepare for his actions (eg. to obtain a stepladder to place against a building where he had chanced upon an enticing opportunity, or to fetch a weapon in an adjoining room during an argument).

: *Foreplanned* - the patient had formulated and implemented a plan of action in advance, or before entering the scene of the offence.

WEAPONS USED

The type of weapon that was carried or used during the commission of the index offence was noted. In addition to naming the type of weapon the presence or absence of a weapon was noted.

VICTIMS

These were classified as:

'stranger': the patient had not previously known or had contact with the victim,

'friend' or acquaintance': a victim previously known but not related to the patient,

'family': whether immediate or extended.

CLINICAL AND DISPOSITIONAL FACTORS

PREVIOUS THREATS TO COMMIT VIOLENCE

Subjects were asked if they had issued threats to harm others, especially in the previous year. The social worker similarly asked family informants whether the subject was known to issue threats to harm others, especially over the previous year.

PSYCHIATRIC DIAGNOSIS

The psychiatric diagnosis was established by consensus of the examining panel (that is, 2 psychiatrists and a clinical psychologist) following a detailed discussion of each subject's history and presentation.

Multiaxial diagnoses were made according to DSM-III-R criteria (American Psychiatric Association 1987). Most of the subjects were from impoverished areas where unemployment is high. Therefore axes IV and V were not coded, as subjects' level of functioning was often too dependent on the general circumstances in their communities.

MENTAL STATE

All members of the examining panel elicited conducted a mental state examination. The primary evaluation was whether the subject was psychotic.

If the patient was assessed as psychotic then the following positive psychotic symptoms were elicited:

- hallucinations, command hallucinations, delusions, delusions of grandeur, delusions of persecution, delusions of control, thought withdrawal or insertion, thought disorder, and ideas of reference.

- Other symptoms were evaluated, primarily depression, and mania. In addition an open list was created to note any other elicited relevant symptoms such as anxiety, somatic complaints, irritability, disinhibition etc.

PSYCHOMETRIC INSTRUMENTS

A research assistant, who was a trained psychometrist, administered Zuckerman's Sensation Seeking Scale, Barratt's Impulsivity Scale, Annet's Handedness Scale. All scales are reproduced in the Appendix.

Subjects were encouraged to ask the research assistant to explain each item, and it was emphasised to them that there were no correct answers, just their own personal preferences.

These scales were translated and back-translated into colloquial Afrikaans by the Human Sciences Research Council, and had been used for a previous study on antisocial schizophrenic offenders (Kaliski 1993).

Zuckerman's Sensation Seeking Scale

Zuckerman's Sensation Seeking Scale (ZSSS) consists of the Thrill and Adventure, Experience Seeking, Disinhibition, and Boredom Susceptibility sub-scales, each with a possible maximum of 10 points (that is, yielding a maximum of 40 points overall on the SSS).

Barratt's Impulsivity Scale

A true-false version of Barrat's Impulsivity Scale (BIS), that yields a possible maximum score of 44 points was used.

Annett's Handedness Scale

This scale consists of a list of activities, and the subject is asked to indicate whether he/she uses either the left, right or both hands to accomplish each activity (Annett 1985).

Mini Mental Examination Test

This is a cognitive screening test which yields a maximum score of 30 points. Scores below 26 are consistent with either a diagnosis of delirium or dementia (Lishman 1998c). The lower the score the more severe the disorder.

MEDICAL FINDINGS

Physical examination

A physical examination was completed on admission. The findings were classified as 'no abnormality', 'neurological deficits', and 'other'. A VDRL (serology for syphilis) test was

conducted routinely on all cases. Other special investigations were done if required to establish a diagnosis, such as brain scans.

Electroencephalogram (EEG)

EEG recordings were made on a Nicolet 16 channel machine. Montages A T R V were used, and readings were taken following hyperventilation and photic stimulation. The EEG's were interpreted by a neurologist, who was blind to clinical and other details about each subject.

The EEG findings were categorised according to location of the abnormality (except for 'abnormal non-specific' in which abnormalities were not confined to any specific region). After discussions with neurologist colleagues, who concurred that previous studies had not used universal methods of classifying EEG findings, the EEG findings were classified primarily according to the site where an abnormality was present. Therefore EEG results were categorised as:

- **normal,**
- **abnormal non-specific, or**
- **site of the abnormality,** which was located by hemisphere (right/left) and lobe (frontal, parietal, temporal, occipital).

BEHAVIOURS OBSERVED IN THE WARD

The staff reported on the subject's behaviour daily. The occurrence of any of 3 categories of behaviour during the 30 day period were recorded:

- *violent behaviour* : actual assault onto fellow patients or staff,
- *aggressive behaviour* : the subject assumed physical poses or postures that were hostile or threatening,
- *threats of violence* : the subject threatened to harm others.

FORENSIC ASSESSMENT

Whether the subject was found to be 'mentally ill' for the purposes of the impending court case was noted. This has juridical significance as it contributes to a court's ultimate finding on competence to stand trial and criminal responsibility.

ANALYSIS OF DATA

The subjects were divided into the following groups :

- a. The Nature of the Charge. Those whose index offence was violent were compared to the others;
- b. The Habitually Violent. Those who fulfilled the criteria for histories of habitual violence were compared to the others

c. Psychotic Disorder. This group was sub-divided into 3 groups; those who were diagnosed with a psychotic disorder even though not currently psychotic; those who were currently psychotic; those diagnosed specifically with schizophrenia. Each was compared to the larger group without the identified disorder.

Comparisons were conducted for the above 3 groups on all of the listed variables.

STATISTICAL ANALYSIS

Prof L Underhill and Dr L Scott of the Department of Biostatistics, University of Cape Town, were consulted.

Initially frequency tables were constructed. Univariate statistical analyses were conducted between the groups for each of the variables under investigation. These specifically were chi square tests (including the use of Fisher's exact test for 2X2 tables when expected frequencies were less than 5) for categorical data, and one way ANOVA tests for continuous data. The Yates correction factor was introduced in chi square calculations to ensure that the groups resembled normative samples. A significance level of $p=0.05$ (one-tailed) was used.

Logistic regression models were constructed in which the nature of the index charge (that is, violent / non-violent), and habitual violence were used as dependent variables. Logistic regression studies the relationship between a dichotomous outcome (dependent) variable and several independent variables; the logistical regression model models the log of the odds as a linear function of the independent variables (Hillis & Woolson 1995). It has been used in a variety of epidemiological studies in which the relationship of a number of

variables on a dichotomous outcome are sought (Cote & Hodgins 1990;Eronen 1995;Fleiss, Williams, & Dubro 1986;Hillis & Woolson 1995;Hosmer & Lemeshow 1989).

Variables that produced significant differences in the univariate analyses were entered into the logistic regression models. This was to generate odds ratios (OR), which are probability ratios (between the occurrence and non-occurrence of the variable). OR's provide a good measure of the relative strength of association between the variables that have been entered into the model.

95% Confidence intervals (CI) for the odds ratios were calculated, and those which included the value of 1 were discarded from the model.

RESULTS

GENERAL DESCRIPTION OF SAMPLE

During the study period 209 referrals were admitted for observation of which 181 satisfied the inclusion criteria. Of the remainder 36 were excluded which resulted in 155 subjects being entered for study. The reasons for exclusion were refusal to grant consent or uncooperativeness during interview (n=16), inadequate collateral information (n=13), patient too psychotic to provide an adequate history (n=4), or subject was mute or provided a sparse account (n=3).

The index offence was violent in 69 (44.5%) subjects, and 96 (61.9%) subjects had histories of habitual violence.

SOURCES OF REFERRAL (MAGISTRATE COURTS)⁶

	n (%)		n (%)		n(%)
ATHLONE	2 (1.3)	ATLANTIS	3 (1.9)	BARKLY-WEST	1 (0.6)
BEAUFORT WEST	2 (1.3)	BELLVILLE	8 (5.2)	BISHOP LAVIS	1 (0.6)
BREDASDORP	2 (1.3)	CARNARVON	1 (0.6)	CERES	3 (1.9)
CITRUSDAL	2 (1.3)	CLANWILLIAM	2 (1.3)	CRADOCK	1 (0.6)
CAPE SUPREME	4 (2.6)	CAPE TOWN	29 (18.7)	GRAHAMSTOWN	1 (0.6)
GARIES	1 (0.6)	GEORGE	3 (1.9)	GOODWOOD	4 (2.6)
GRIEKWES	1 (0.6)	HANOVER	1 (0.6)	HOPETOWN	1 (0.6)
KAKAMAS	1 (0.6)	KEIMOES	1 (0.6)	KIMBERLEY	2 (1.3)
KIRKWOOD	1 (0.6)	KNYSNA	4 (2.6)	KUILSRIVER	5 (3.2)
LAAIPLEK	1 (0.6)	LAMBERTS BAY	1 (0.6)	MITCHELLS PLAIN	2 (1.3)
MALMESBURY	2 (1.3)	MONTAGUE	1 (0.6)	MOREESBURG	1 (0.6)
ODTSHOORN	1 (0.6)	PAARL	5 (3.2)	PAROW	1 (0.6)
PORT ELIZABETH	4 (2.6)	PIKETBERG	1 (0.6)	RIVERSDAL	2 (1.3)
ROBERTSON	1(0.6)	SIMONSTOWN	10 (6.5)	SPRINGBOK	4 (2.6)
STEENBERG	1(0.6)	STELLENBOSCH	1(0.6)	STRAND	6 (3.9)
SWELLENDAM	2(1.3)	UPINGTON	1(0.6)	VREDENBURG	1 (0.6)
VREDENDAL	1(0.6)	WALVIS BAY	1(0.6)	WELLINGTON	1 (0.6)
WILLOWMORE	1(0.6)	WORCESTER	2(1.3)	WYNBERG	13 (8.4)

⁶ Subjects were referred from courts in the Northern, Western and Eastern Cape. There were 79 (50.97%) referrals from courts situated in the Cape Peninsula

REASONS FOR REFERRAL FOR ALL SUBJECTS

	VIOLENT INDEX OFFENCE n=69(%)	HABITUAL VIOLENCE n=96 (%)	TOTAL n =155 (%)
BEHAVIOUR IN COURT WAS DISORDERED	14 (20.3)	28 (29.2)	41 (26.5)
PAST PSYCHIATRIC TREATMENT	13 (18.8)	23 (24.0)	32 (20.6)
BEHAVIOUR AT THE TIME OF THE OFFENCE SEEMED DISORDERED	12 (17.4)	10 (10.4)	15 (9.7)
BEHAVIOUR IN THE COMMUNITY SEEMED DISORDERED	3 (4.3)	6(6.3)	13 (8.4)
SUBJECT CLAIMED AMNESIA FOR ALLEGED OFFENCE	8 (11.6)	7 (7.3)	11 (7.1)
SUBJECT ASKED FOR REFERRAL ⁷	5 (7.2)	6 (6.3)	9 (5.8)
HEAD INJURY IN PAST	2 (2.9)	5 (5.2)	8 (5.2)
COMBINATION OF PAST PSYCHIATRIC TREATMENT & BEHAVIOUR AT THE TIME OF THE OFFENCE	2 (2.9)	2 (2.1)	3 (1.9)
POSSIBLE MENTAL RETARDATION	1 (1.4)	0	3 (1.9)
ALCOHOL / SUBSTANCE ABUSE OR DEPENDENCE	2 (2.9)	2 (2.1)	5 (3.2)
SUICIDAL,	0	2 (2.1)	3 (1.9)
COMBINATION OF BEHAVIOURS IN COURT AND IN THE COMMUNITY	1 (1.4)	2 (2.1)	3 (1.9)
CLAIMED MULTIPLE PERSONALITY	0	0	1 (0.6)
DEPRESSION	0	0	1 (0.6)
POST TRAUMATIC STRESS DISORDER	1 (1.4)	1 (1.0)	1 (0.6)
CLAIMED AUTOMATISM DURING OFFENCE	1 (1.4)	1 (1.0)	1 (0.6)
SEXUAL PROBLEMS	1 (1.4)	0	1 (0.6)
EPILEPSY	1 (1.4)	0	1 (0.6)
SATANISM	1 (1.4)	0	1 (0.6)
NO REASON EVIDENT			

⁷ This includes claims by patient in court that his 'head was not right', he was hearing 'voices', or that he was not in his right senses at the time of the offence etc.

REASONS FOR REFERRAL FOR THE PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION (N=39)	SCHIZOPHRENICS (n=35)	PSYCHOTIC DLAGNOSIS (n=50)
BEHAVIOUR IN COURT	18 (46.2)	13 (37.1)	22 (44.0)
PAST PSYCHIATRIC TREATMENT	11 (28.2)	12 (34.3)	16 (32.0)
BEHAVIOUR AT THE TIME OF THE OFFENCE	5 (12.8)	5 (14.3)	6 (12.0)
BEHAVIOUR IN THE COMMUNITY	2 (5.1)	3 (8.6)	3 (6.0)
COMBINATION OF PAST PSYCHIATRIC TREATMENT & BEHAVIOUR AT THE TIME OF THE OFFENCE	1 (2.6)	1 (2.9)	1 (2.0)
COMBINATION OF BEHAVIOURS IN COURT AND IN THE COMMUNITY	2 (5.1)	1 (2.9)	2 (4.0)

DEMOGRAPHICS OF ALL SUBJECTS

Age The average age was 29.76 years (range= 16-66, sd= 9.31)

Sex N (%)

Male 139 (89.7)

Female 16 (10.3)

Marital status:

Single 111 (71.6)

Married 23 (14.8)

Divorced 19 (12.3)

Widowed 2 (0.01)

No. of children Mean = 0.99 ; range = 1-12

Education n (%)

Illiterate 6 (3.87)

Primary school 80 (51.61)

High school 58 (37.42)

Matric 4 (2.58)

Trade/technical tertiary 3 (1.94)

Years of education Mean = 6.05 years (range= 0 – 15; sd= 2.95)

Occupation n (%)

Unemployed 91 (58.7)

Labourer 31 (20)

Semi-skilled 10 (6.5)

Skilled 15 (9.7)

Clerical 2 (1.3)

Self-employed 2 (1.3)

Professional 4 (2.6)

Origin N (%)

urban 100 (64.5)

rural 55 (35.5)

Birth order

	n (%)
1	40 (25.8)
2	41 (26.5)
3	27 (17.4)
4	14 (9.0)
5	13 (8.4)
6	6 (3.9)
7	10 (6.5)
8	1 (0.6)
9	0 (0)
10	3 (1.9)

DEMOGRAPHICS OF THOSE REFERRED FOLLOWING VIOLENT INDEX OFFENCES

	n (%)	STATISTICAL COMPARISON WITH NON-VIOLENT INDEX OFFENCES
Age	Mean= 28.48 range=16-56 sd= 8.56	F=2.386; p=0.125
Sex		
Male	64 (92.8)	
Female	5 (7.2)	
Marital status:		
Single	51 (73.9)	chi sq= 5.234, df=3, p=0.106 When categories were collapsed into 'single' compared to 'others' : chi sq=0.325; p=0.569
Married	11 (15.9)	
Divorced	5 (7.2)	
Widowed	2 (2.9)	
No. of children	Mean=0.88 (0-4)	F=0.571; p=0.451
Education		
Illiterate	0	
Primary school	36 (52.2)	
High school	30 (43.5)	
Matric	0	
Trade/technical	2 (2.9)	
Tertiary	1 (1.4)	
Years of education	Mean= 6.073 years (sd=2.35; range: 0-15)	F=0.383; p=0.537
Occupation		
Unemployed	35 (50.7)	Unemployment compared to employment: Chi sq = 3.271 ; p= 0.071
Labourer	15 (21.7)	
Semi-skilled	6 (8.7)	
Skilled	9 (13.0)	
Clerical	1 (1.4)	
Self-employed	1 (1.4)	
Professional	2 (2.9)	
Origin		
Urban	47 (68.1)	chi sq=0.704; p= 0.401
Rural	22 (31.9)	
Birth order		
1	17 (24.6)	First born status was not associated with a violent index charge (chi sq=0.089; p=0.766).
2	15 (21.7)	
3	15 (21.7)	
4	7 (10.1)	
5	7 (10.1)	
6	2 (2.9)	
7	4 (5.8)	
8	0	
9	0	
10	2 (2.9)	

DEMOGRAPHICS OF SUBJECTS WITH HISTORIES OF HABITUAL VIOLENCE (N=96)

		STATISTICAL COMPARISON WITH THOSE WITH NO HISTORY OF VIOLENCE
Age	Mean=29.96 range=16-66 sd=8.90	F=0.112; p=0.738
Sex	89 (92.7) 7 (7.3)	chi sq = 2.423; p=0.119
Marital status:		
Single	66 (68.8)	chi sq = 4.136; df= 3; p=0.247
Married	13 (13.5)	
Divorced	15 (15.6)	Single status was also not significant :
Widowed	2 (2.1)	chi sq = 1.032; p=0.309
No. of children	0.96 (0-5)	F=0.119; p=0.730
Education		
Illiterate	3 (3.1)	chi sq = 4.620; df=5; p=0.453
Primary school	53 (55.2)	
High school	35 (36.5)	
Matric	1 (1.0)	
Trade/technical	3 (3.1)	
Tertiary	1 (1.0)	
Years of education	6.24 years (sd=3.19)	F=1.244; p=0.266
Occupation		
Unemployed	64 (66.7)	Unemployment was significant:
Labourer	15 (15.6)	chi sq = 5.589; p= 0.018*
Semi-skilled	5 (5.2)	
Skilled	9 (9.4)	
Clerical	2 (2.1)	
Self-employed	1 (1.0)	
Professional	0	
Origin		
Urban	59 (61.5)	chi sq = 1.040; p=0.308
Rural	37 (38.5)	
Birth order		
1	24 (25.0)	First born status: chi sq = 0.085; p=0.770.
2	26 (27.1)	
3	14 (14.6)	
4	11 (11.5)	
5	9 (9.4)	
6	5 (5.2)	
7	4 (4.2)	
8	0	
9	0	
10	3 (3.1)	

DEMOGRAPHICS OF SUBJECTS DIAGNOSED WITH A PSYCHOTIC DISORDER

	SCHIZOPHRENIC n=35(%)	ALL PSYCHOTIC n=50(%)
Marital status:		
Single	30 (85.7)	38 (76.0)
Married	2 (5.7)	4 (8.0)
Divorced	2 (5.7)	7 (14.0)
Widowed	1 (2.9)	1 (2.0)
No. of children	0.37 (0-3)	0.56 (0-5)
Education		
Illiterate	1 (2.9)	2 (4.0)
Primary school	21 (60.0)	26 (52.0)
High school	11 (31.4)	18 (36.0)
High school	0	0
Matric	0	0
Trade/technical	1 (2.9)	2 (4.0)
Tertiary	1 (2.9)	2 (4.0)
Years of Education	Mean: 6.04 (sd 2.94)	
Occupation		
Unemployed	28 (80.0)	38 (76.0)
Labourer	3 (8.6)	7 (14.0)
Semi-skilled	3 (8.6)	3 (6.0)
Skilled	1 (2.9)	2 (4.0)
Clerical	0	0
Self-employed	0	0
Professional	0	0
Origin		
Urban	19 (54.3)	25 (50.0)
Rural	16 (45.7)	25 (50.0)
Birth order		
1	7 (20.0)	10 (20.0)
2	10 (28.6)	14 (28.0)
3	6 (17.1)	6 (12.0)
4	2 (5.7)	5 (10.0)
5	4 (11.5)	5 (10.0)
6	4 (11.5)	5 (10.0)
7	2 (5.7)	4 (8.0)
8	0	0
9	0	0
10	1 (2.9)	1 (2.0)

The average age of the general psychotic group was 31.64 years old (range = 16-66, sd = 7.39), and did not differ significantly from the general sample ($F=3.049$; $p=0.083$), except

that when the female subjects were excluded they were significantly younger ($F=5.109$; $p=0.025$).

Comparisons with the general sample were not significant for age ($F=3.049$; $p=0.083$), gender ($\chi^2 = 0.430$; $p=0.512$), marital status ($\chi^2 = 2.995$; $df= 3$; $p=0.392$), even if marital status was collapsed into whether married or not ($\chi^2 = 2.732$, $p=0.983$), education level ($\chi^2 = 4.151$; $df=5$; $p=0.528$), and whether was first born ($\chi^2 = 1.299$; $p=0.254$). However more were unemployed ($\chi^2 = 9.103$, $p=0.002$). They had fewer children ($F=5.483$, $p=0.021$). They were more likely to have originated from the rural areas ($F=6.794$, $p=0.009$), but not if psychotic during the current admission ($\chi^2 = 2.534$; $p=0.111$).

There were 35 (22.58%) schizophrenic subjects whose mean age was 32.14 years (range =16-66 , $sd= 7.815$), which did not differ significantly from the others ($F=2.999$, $p=0.085$). They did not differ from the general sample with respect to age ($\chi^2 = 2.999$, $p=0.085$), origin ($\chi^2 = 2.067$, $p=0.151$) or first born status ($\chi^2 = 0.796$, $p=0.372$). Only 2 were married ($\chi^2 = 2.978$, $p=0.084$). They had fewer children ($F=6.981$, $p=0.009$). More were unemployed ($\chi^2 = 8.453$, $p=0.003$).

HISTORICAL FACTORS

HISTORY OF CHILD ABUSE

	n (%)	COMPARISON WITH OTHER
GENERAL SAMPLE	34 (21.9)	
INDEX VIOLENT OFFENCE	17 (24.5)	Chi sq = 0.531; p=0.466
HABITUALLY VIOLENT	23 (24.0)	Chi sq = 0.612; p=0.433
PSYCHOTIC SUBJECTS	6 (12.0)	chi sq=4.255, p=0.039* ⁸
SCHIZOPHRENIC SUBJECTS	5 (14.3)	chi sq=2.409, p=0.152

HISTORY OF CONDUCT DISORDER

	n (%)	COMPARISON WITH OTHERS
GENERAL SAMPLE	65 (41.9)	
INDEX VIOLENT OFFENCE	32 (46.4)	Chi sq = 1.007; p=0.316
HABITUALLY VIOLENT	48 (50.0)	Chi sq = 6.885; p=0.009*
PSYCHOTIC SUBJECTS		
ALL PSYCHOTIC SUBJECTS	14 (28.0)	Chi sq=5.886, p=0.015*
SCHIZOPHRENIC SUBJECTS	11 (31.4)	Chi sq=2.049, p=0.152

Of the 14 psychotic subjects that had positive histories for conduct disorder 11 also were habitually violent. Similarly of the 11 schizophrenic subjects with histories of conduct disorder 10 were also habitually violent. However, psychotic subjects were less likely to have a history of conduct disorder.

⁸ Psychotic subjects were less likely to have histories of child abuse

HISTORY OF PSYCHIATRIC ADMISSIONS

	n (%)	STATISTICAL COMPARISONS
GENERAL SAMPLE	<p>78 (50.3%)</p> <p>The mean number of admissions was 1.82, range: 0-15, sd = 2.85.</p> <p>Within the group of those who had histories of previous admissions:</p> <p>There was an average of 3.60 admissions (sd=3.11; range 1-15)</p>	
INDEX VIOLENT OFFENCE	<p>28 (40.6%).</p> <p>The mean number of previous admissions was 1.6.1 (range = 0-14, sd = 2.85)</p> <p>Within this group those who had previous admissions:</p> <p>Mean = 3.96 (range 1-13; sd= 3.27)</p>	<p>This group was less likely to have been admitted to psychiatric hospitals previously :</p> <p>chi sq = 4.722; p= 0.03*.</p> <p>F= 0.680; p= 0.411</p> <p>Among those with histories of previous admissions there were no significant differences in number of admissions:</p> <p>F=0.586; p=0.446</p>
HABITUALLY VIOLENT	56 (58.3%)	chi sq = 6.528; p=0.01*

	<p>Mean number of admissions was 2.43 (range: 0-15; sd=3.36)</p> <p>Within this group those who had a history of previous admissions: Mean= 4.16 (range 1-14; sd=0.96)</p>	<p>F=12.352; p=0.001*</p> <p>Among those with histories of previous admissions: F=6.864; p=0.011*</p>
PSYCHOTIC SUBJECTS	<p>43 (86.0%).</p> <p>The mean number of admissions was 3.98 (range: 0-15, sd=3.66)</p>	<p>chi sq = 37.58, p=0.000*</p>
VIOLENT INDEX OFFENCE (No. of admissions)	<p>4.05 (3.57; 0-14)</p>	<p>F=0.12; p=0.912</p>
HABITUAL VIOLENCE (No. of admissions)	<p>4.56 (3.90; 0-15)</p>	<p>F=4.86; p=0.032*</p>

DURATION OF PSYCHIATRIC DISORDER

	Mean Years (SD; RANGE)	STATISTICAL COMPARISON
GENERAL SAMPLE	<p>2.70 (4.96; 0-25)</p> <p>Those subjects who had histories of previous admissions: 5.09 (5.91; 0-25)</p>	

INDEX VIOLENT OFFENCE	2.80 (5.65; 0-25)	F=0.04 p=0.83
	Those subjects who had histories of previous admissions: 6.75 (7.24; 0-25)	Comparison within the group that had histories of previous admissions: F=3.52; p=0.06
HABITUALLY VIOLENT	3.61 (5.65; 0-25)	F= 8.96 p=0.003*
	Those subjects who had histories of previous admissions: 6.06 (6.33;0-25)	Comparison within the group that had histories of previous admissions: F=5.618; p=0.02*
PSYCHOTIC SUBJECTS	8.23 (6.06; 0-25)	F=110.99 p=0.000*
VIOLENT INDEX OFFENCE	9.736 (6.84; 0-25)	F=3.80; p=0.057
HABITUAL VIOLENCE	8.69 (5.11; 1-25)	F=4.98; p=0.03*

FAMILY HISTORY OF PSYCHIATRIC DISORDER

	N(% of group)	
GENERAL SAMPLE	30 (19.4)	
INDEX VIOLENT OFFENCE	13 (18.8)	chi sq = 0.021; p= 0.885
HABITUALLY VIOLENT	23 (24.0)	chi sq = 8.956; p=0.057
PSYCHOTIC SUBJECTS	16 (32) ⁹	chi sq=7.56, p=0.006*

⁹ Only 10 (28.6%) of the schizophrenics had a positive family history, which did not differ significantly from the general sample (chi sq= 2.46, p=0.117).

PRIMARY DIAGNOSES MADE DURING PREVIOUS PSYCHIATRIC CONTACTS

	VIOLENT OFFENCE N=32 (%)	INDEX HISTORY OF VIOLENCE N=61 (%)	TOTAL N=88(%)
SCHIZOPHRENIA	19 (59.4)	32 (52.2)	39 (44.3)
SUBSTANCE ABUSE	2 (6.2)	4 (6.6)	8 (9.1)
MAJOR DEPRESSION	3 (9.4)	3 (4.9)	8 (9.1)
TOXIC PSYCHOSIS	2 (6.2)	4 (6.6)	6 (6.8)
BIPOLAR AFFECTIVE DISORDER	0	4 (6.6)	6 (6.8)
ANTISOCIAL PERSONALITY DISORDER	2 (6.2)	3 (4.9)	3 (3.4)
DELIRIUM TREMENS	0	1 (1.6)	2 (2.3)
MILD MENTAL RETARDATION	0	2 (3.2)	2 (2.3)
ALCOHOL AND SUBSTANCE ABUSE	1 (3.1)	2 (3.2)	2 (2.3)
ADJUSTMENT DISORDER	1 (3.1)	1 (1.6)	2 (2.3)
ALCOHOL HALLUCINOSIS	0	0	2 (2.3)
ORGANIC DELUSIONAL DISORDER	0	1 (1.6)	2 (2.3)
CONDUCT DISORDER	0	1 (1.6)	1 (1.1)
BORDERLINE INTELLECT	0	0	1 (1.1)
MALINGERING	0	1 (1.6)	1 (1.1)
DAGGA ABUSE	0	0	1 (1.1)

PRIMARY DIAGNOSES MADE DURING PREVIOUS PSYCHIATRIC CONTACTS :

PSYCHOTIC SUBJECTS

All but 5 (12.8%) subjects had had previous psychiatric contact. The previous diagnoses

were:

PREVIOUS DIAGNOSIS	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
SCHIZOPHRENIA	26 (66.7)	32	26 (74.3)
"TOXIC PSYCHOSIS"	2 (5.1)	3	2 (5.7)
BIPOLAR AFFECTIVE DISORDER	3 (7.7)	6	1 (2.9)
ANTISOCIAL PERSONALITY DISORDER	2 (5.1)	2	2 (5.7)
ORGANIC DELUSIONAL DISORDER	1 (2.6)	1	1 (2.9)
NO DIAGNOSIS/CONTACT	5 (12.8)	6	3 (8.6)

HISTORY OF SUICIDE ATTEMPTS

	N (%)	
GENERAL SAMPLE	38 (24.5)	
INDEX VIOLENT OFFENCE	14 (20.3)	Chi Sq = 1.214; p=0.271
HABITUALLY VIOLENT	24 (25.0)	Chi sq = 0.032; p=0.858
PSYCHOTIC SUBJECTS	<p>Past Suicide Attempts Were Documented In 10 (20.0%) Of Those With A Diagnosis Of Psychotic Disorder, 9 (23.1%) Of Those Currently Psychotic And 6 (17.1%) Of The Schizophrenics.</p> <p>None Significantly Differed From The General Sample</p>	<p>Meaningful statistical analysis not possible as number were too low</p>

SELF MUTILATION

Only 4 (2.6%) subjects admitted to a history of self-mutilation, of which 2 were charged with a violent offence, 2 had a history of violence, and 1 belonged to both latter categories.

Only 1 psychotic subject had a history of self-mutilation. He was a schizophrenic who was psychotic during the observation period.

HISTORY OF VIOLENT BEHAVIOUR OF THE PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
HISTORY OF HABITUAL VIOLENCE	31 (79.5)	39 (78.0)	26 (74.3)
COMPARISON WITH GENERAL SAMPLE	Chi sq= 6.81, p=0.009*	Chi sq = 8.08, p=0.004*	Chi sq = 2.92, p=0.087*
THOSE CHARGED WITH A VIOLENT OFFENCE AND WITH A HISTORY OF HABITUAL VIOLENCE	14 (38.9)	17 (34.0)	15 (42.9)
COMPARISON WITH OTHER SUBJECTS WITH VIOLENT INDEX OFFENCE	Chi sq = 2.94, p=0.079	Chi sq = 2.36, p=0.109	Chi sq = 3.36, p=0.060

Despite the non-significant comparisons within the group charged with a violent index offence it should be noted that 15 of 16 schizophrenics, 17 of 19 diagnosed with a psychotic disorder and 14 of 15 currently psychotic had histories of habitual violence.

Within group comparisons revealed that neither within the psychotic disorder group (chi sq = 2.35, p=0.117) or within those currently psychotic (chi sq = 2.87, p=0.096) was a violent index offence significantly associated with a history of habitual violence. But schizophrenic subjects with histories of habitual violence were more frequently charged with violent index offences (chi sq = 5.85, p=0.018).

A history of habitual violence was significantly more frequent in those diagnosed with a psychotic disorder (chi sq=8.079, p=0.004) and those actively psychotic during the index offence (chi sq = 6.809, p=0.009), but not in the schizophrenia group (chi sq = 2.925, p=0.087).

ALCOHOL AND SUBSTANCE ABUSE/ DEPENDENCE

A history of abuse of any substance was elicited in 120 (77.4%). Alcohol abuse was present in 96 (61.9%), cannabis abuse in 88 (56.8%), and methaqualone in 46 (29.7%). As methaqualone is always abused together with cannabis it was determined that 42 (27.1%) abused cannabis without concomitant methaqualone abuse.

Patterns of abuse in those charged with a violent offence

	VIOLENT INDEX OFFENCE (N=69(%))	HISTORY OF VIOLENCE N=96 (%)	PSYCHOTIC N=39 (%)	TOTAL N=155(%)
HISTORY NOT ELICITED	16 (23.2)	15 (15.6)	10 (25.6)	35 (22.6)
ALCOHOL ONLY	16 (23.2)	16 (16.7)	1 (2.6)	28 (18.1)
ALCOHOL AND CANNABIS	16 (23.2)	21 (21.9)	9 (23.1)	29 (18.7)
ALCOHOL AND ANALGESICS	1 (1.4)	1 (1.0)	0	1 (0.6)
ALCOHOL, CANNABIS AND OTHER	1 (1.4) ¹⁰	2 (2.1) ¹²	2 (5.1)	5 (3.2) ¹⁵
ALCOHOL AND MANDRAX	11 (15.9)	25 (26.0)	6 (15.4)	32 (20.6)
ALCOHOL, MANDRAX AND OTHER	1 (1.4) ¹¹	4 (4.2) ¹³	1 (2.6)	6 (3.9) ¹⁶
CANNABIS ONLY	3 (4.3)	5 (5.2)	3 (7.7)	6 (3.9)
MANDRAX ONLY	2 (2.9)	5 (5.2)	7 (17.9)	9 (5.8)
MANDRAX AND BENZODIAZEPINES	0	0	0	1 (0.6)
BENZODIAZEPINES ONLY	2 (2.9)	2 (2.1) ¹⁴	0	3 (1.8)

STATISTICAL COMPARISONS WITH THE GENERAL SAMPLE

INDEX VIOLENT OFFENCE	Alcohol and/or any Substance Abuse	Chi sq = 0.026; p= 0.871
	Alcohol Abuse	Chi sq = 0.008; p= 0.929
	Cannabis Abuse	Chi sq = 0.373; p = 0.542
	Methaqualone Abuse	Chi sq = 5.251; p = 0.022* ¹⁷

¹⁰ amphetamines

¹¹ cough mixtures

¹² amphetamines (1), volatile substances (1)

¹³ cocaine & cough mixture (1), volatile substances (2), LSD, cocaine & heroin (1)

¹⁴ volatile substances (1), benzodiazepines (1)

¹⁵ amphetamines (3), volatile substances, analgesics,

¹⁶ All had an assortment of volatile substances, LSD, cocaine, heroin, obex, welconal cough mixtures

HABITUALLY VIOLENT	Alcohol and/or any Substance abuse, n=81 (84.38% of all habitually violent subjects)	chi sq = 6.185; p= 0.009**
	Alcohol Abuse	
	Cannabis Abuse	Chi sq = 3.565; p = 0.059
	Methaqualone Abuse	Chi sq = 1.176; p =0.278
		Chi sq = 2.667; p =0.102
PSYCHOTIC SUBJECTS ¹⁸		
Violent index offence	Alcohol and/or any substance abuse	Chi sq = 2.169; p = 0.949
	Alcohol Abuse	Chi Sq = 0.506; p= 0.477
	Cannabis Abuse	Chi sq = 0.178; p = 0.673
	Methaqualone Abuse	Chi sq = 0.069; p = 0.792
Habitually violent	Alcohol and/or any substance abuse	Chi sq = 6.796; p = 0.450
	Alcohol Abuse	Chi sq = 0.303; p = 0.582
	Cannabis Abuse	Chi sq = 2.726; p = 0.127
	Methaqualone Abuse	Chi sq = 0.844; p = 0.297

ALCOHOL AND SUBSTANCE ABUSE PROFILES IN THE SUBGROUPS OF PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
ALCOHOL ONLY	1 (2.6)	2 (4.0)	2 (5.7)
CANNABIS ONLY	3 (7.7)	3 (6.0)	3 (8.6)
METHAQUALONE	7 (17.9)	8 (16.0)	8 (22.9)
ALCOHOL AND CANNABIS	9 (23.1)	14 (28.0)	8 (22.9)

¹⁷ Methaqualone abuse was less likely to be associated with a violent index offence

¹⁸ Alcohol and substance abuse generally was not more frequent in either the general psychotic disorder group (chi sq = 0.014, p=0.905), the currently psychotic (chi sq = 0.281, p=0.597) or the schizophrenia (chi sq = 0.172, p=0.678) groups, compared to the general sample. However the general psychotic group abused cannabis more (chi sq =6.461, p=0.011), although schizophrenic subjects did not differ from the others (chi sq = 1.999, p=0.157).Schizophrenics did abuse alcohol less frequently (chi sq = 6.979, p=0.008).Neither the general psychotic group (chi sq = 0.661, p=0.416) nor the schizophrenics (chi sq = 1.207, p=0.272) abused methaqualone more often.

ALCOHOL AND METHAQUALONE	6 (15.4)	9 (18.0)	6 (17.1)
ALCOHOL AND OTHER	2 (5.1)	2 (4.0)	1 (2.9)
ALCOHOL, METHAQUALONE AND OTHER	1 (2.6)	1 (2.0)	0
NO ABUSE	10 (25.6)	11 (22.0)	7 (20.0)

PRE-EXISTING MEDICAL CONDITIONS

In 61 (39.4%) a history of a pre-existing medical condition was elicited.

Epilepsy	25(16.1)
Hypertension	9 (5.8)
Hearing Impairment	8 (5.2)
Chronic obstructive pulmonary disease	8 (5.2)
Impaired vision	4 (1.9)
Neurosyphilis	3 (1.9)
Syphilis	3 (1.9)
Orchidectomy	2 (1.3)
Diabetes Mellitus	2 (1.3)
Migraine	1 (0.6)
Spina Bifida	1 (0.6)
Ulcerative Colitis	1 (0.6)
Alpoecia	1 (0.6)
Cortical atrophy	1 (0.6)
Mitral incompetence	1 (0.6)
Right hemiplegia	1 (0.6)
Cancer of the lip	1 (0.6)
Peripheral neuropathy	1 (0.6)
Ischaemic Heart Disease	1 (0.6)
Small testes	1 (0.6)

Older subjects were more likely to have medical conditions ($F=4.666$, $p=0.032$), but no differences were found by gender ($\chi^2=0.351$, $p=0.553$), marital status ($\chi^2=0.336$, $p=0.562$), whether employed ($\chi^2=0.014$, $p=0.903$), or place of origin ($\chi^2=3.066$, $p=0.079$).

Pre-Existing Medical Conditions in those charged with a Violent Index Offence

Pre-existing medical conditions were elicited in 23 (33.3%). This did not differ significantly from the general sample ($\chi^2=1.181$; $p=0.277$). In 5 cases 2 medical conditions were present; epilepsy was co-morbid with hearing impairment, chronic obstructive airways disease, right hemiplegia; ischaemic heart disease with blindness; cancer of the lip with hypertension.

Epileptics were not more likely to be charged with a violent offence ($\chi^2=0.003$; $p=0.955$).

Pre- Existing Medical Conditions in the Habitually Violent :

A pre-existing medical condition was offered in 37 (38.54%) which did not differentiate the group from the general sample ($\chi^2=0.024$; $p=0.876$).

Epilepsy had been diagnosed in 17 (17.71%). Of the 11 epileptics charged with a violent offence 10 also had histories of habitual violence.

History of head injury

	n (%)	COMPARISON WITH GENERAL SAMPLE
GENERAL SAMPLE	41 (26.5)	
INDEX VIOLENT OFFENCE	20 (29.0)	chi sq = 0.410; p=0.522
HABITUALLY VIOLENT	26 (27.1).	chi sq = 1.060; p=0.242
PSYCHOTIC SUBJECTS	12 (30.8)	Chi sq = 0.489; p=0.306

CRIMINAL HISTORY

	N (%)	
GENERAL SAMPLE		
- Previous convictions	95 (61.3)	
- Number of prev. convictions	Mean =2.19 (range: 0-14; sd=2.91)	
- Convictions:Violent Offences	45 (29.0)	
- Number of Violent convictions	Mean= 0.63 (range 0-14; sd=1.58).	
INDEX VIOLENT OFFENCE		
- Previous convictions	42 (60.9)	chi sq = 0.009; p=0.923
- Number of prev. convictions	Mean= 2.16 (range = 0-12; sd=2.92)	F=0.011; p=0.916
- Convictions:Violent Offences	30 (43.5)	chi sq = 12.674; p=0.0004**
- Number of Violent convictions	Mean=0.90 (range=0-8; sd=1.45).	F=3.794; p=0.053
HABITUALLY VIOLENT		
- Previous convictions	65 (67.7)	<i>A history of 2 or more violent convictions was used to define this group, and therefore tests of significance were not done.</i>
- Number of prev. convictions	Mean=2.58 (range = 0-14; sd=3.17)	
- Convictions:Violent Offences	44 (45.8)	
- Number of Violent convictions	Mean= 1.0 (range 0-14; sd=1.91).	

Criminal history of Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
History of previous convictions	26 (66.7)	32 (64.0)	25 (71.4)
Comparison with general sample	Chi sq=0.635, p=0.426	Chi sq=0.228, p=0.633	Chi sq=1.959, p=0.162
Number of previous convictions	mean=1.69 (sd=2.63)	mean=1.62 (sd=2.31)	mean=2.06 (sd=2.61)
Comparison with general sample	F=1.508, p=0.221	F=2.829, p=0.095	F=0.089, p=0.765
History of previous violent convictions	15 (38.5)	17 (34.0)	14 (40.0)
Comparison with general sample	Chi sq=2.249, p=0.134	Chi sq=0.884, p=0.347	Chi sq=2.639, p=0.104
Number of violent convictions	mean=0.59 (sd=1.14)	mean=0.52 (sd=1.05)	mean=0.657 (sd=1.21)
Comparison with general sample	F=0.027, p=0.869	F=0.331, p=0.566	F=0.018, p=0.894

SITUATIONAL FACTORS (CIRCUMSTANCES OF THE INDEX OFFENCE)

THE INDEX OFFENCES

THE 'INDEX' OFFENCE	VIOLENT OFFENCE n=69(%)	HISTORY OF VIOLENCE n=96 (%)	ALL CASES n=155 (%)
MURDER	17 (24.6)	11 (11.5)	17 (11.0)
CULPABLE HOMICIDE	1 (1.4)	0	1 (0.6)
ATTEMPTED MURDER	4 (5.8)	3 (3.1)	4 (2.6)
ASSAULT	23 (33.3)	22 (22.9)	23 (14.8)
RAPE	9 (13.0)	5 (5.2)	9 (5.8)
ATTEMPTED RAPE	1 (1.4)	1 (1.0)	1 (0.6)
INDECENT ASSAULT	1 (1.4)	1 (1.0)	2 (1.3)
OTHER SEX OFFENCE	3 (4.3)	2 (2.1)	3 (1.9)
ROBBERY	4 (5.8)	3 (3.1)	4 (2.6)
THEFT	0	14 (14.6)	25 (16.1)
HOUSEBREAKING	0	13 (13.5)	22 (14.2)
ATTEMPTED THEFT	0	0	3 (1.9)
DAMAGE TO PROPERTY	4 (5.8)	9 (9.4)	11 (7.1)
FRAUD	0	1 (1.0)	9 (5.8)
POSSESSION OF A WEAPON	0	4 (4.2)	4 (2.6)
POSSESSION OF CANNABIS	0	4 (4.2)	7 (4.5)
CRIMEN INJURIA	0	1 (1.0)	2 (1.3)
ARSON	0	0	1 (0.6)
BOMB HOAX	0	1 (1.0)	1 (0.6)
SALE OF ALCOHOL	0	1 (1.0)	1 (0.6)
TRESPASSING	0	0	1 (0.6)
POSSESSION OF A BULLET	0	0	1 (0.6)
KIDNAPPING	0	0	2 (1.3)
POSSESSION OF STOLEN PROPERTY	0	0	1 (0.6)

In 69 (44.5%) the index charge was deemed to be violent. Among those found to have histories of habitual violence the index charge was violent in 53 (55.2%), whereas among those eventually declared mentally ill the index charge was violent in 15 (38.5%). Within the

violent index offence group a history of habitual violence was evident in 53 (76.81%) cases.

The combination of a history of violence and violent index offence (n=53) constituted 55.21% of the habitual violence group. The association between violent index offence and history of violence was significant (chi sq=12.003; p=0.0005).

There were 15 (9.7%) sexual offenders, and their index offences were classified as being violent.

Most of the violent index offences were either murder, culpable homicide, attempted murder or assault (65.1%). Of the 11 subjects that were charged with malicious damage to property 4 were adjudged to have acted in consequence of interpersonal factors and were therefore adjudged to be violent.

Index offences of the Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION (N=39(%))	SCHIZOPHRENICS (n=35)	DIAGNOSED WITH A PSYCHOTIC DISORDER (n=50)
MURDER	1 (2.6)	1 (2.9)	1 (2.0)
ASSAULT	7 (17.9)	8 (22.9)	9 (18.0)
ROBBERY	0	0	1 (2.0)
RAPE	2 (5.1)	2 (5.7)	2 (4.0)
INDECENT ASSAULT	1 (2.6)	1 (2.9)	1 (2.0)
THEFT	4 (10.3)	3 (8.6)	5 (10.0)
HOUSEBREAKING	4 (10.3)	4 (11.4)	8 (16.0)
ATTEMPTED THEFT	1 (2.6)	1 (2.9)	1 (2.0)
DAMAGE TO PROPERTY	7 (17.9)	6 (17.1)	9 (18.0)
FRAUD	1 (2.6)	1 (2.9)	1 (2.0)
POSSESSION OF A WEAPON	3 (7.7)	2 (5.7)	3 (6.0)
POSSESSION OF CANNABIS	4 (10.3)	4 (11.4)	5 (10.0)
CRIMEN INJURIA	1 (2.6)	0	1 (2.0)
BOMB HOAX	1 (2.6)	0	1 (2.0)
POSSESSION OF A BULLET	1 (2.6)	1 (2.9)	1 (2.0)
TRESPASSING	1 (2.6)	1 (2.9)	1 (2.0)

Damage to property was almost twice as common in this group than the others, i.e. 17.9% compared to the general sample (7.1%), those with histories of violence (9.4%) and those for whom damage to property was deemed to be a violent offence (5.8%).

A diagnosis of a psychotic disorder was not associated with higher likelihood of having been referred following a violent index offence (chi sq = 1.27, p=0.259). This applied to the schizophrenics (chi sq = 0.026, p=0.871) and those actually psychotic during the index offence (chi sq= 0.779; p=0.377).

ACCOMPLICES

Overall 17 (11.0%) committed the index offence with an accomplice. Accomplices were present in 5 (7.2%) of the violent index offences. This was not significant (chi sq=1.763; p=0.184). Those with a history of violence committed the index offence with accomplices in 12 (12.5%) cases. This was not a significant association (chi sq =0.606; p=0.436).

Accomplices were present in 4 of those diagnosed with a psychotic disorder, 3 with schizophrenia and 2 by those currently psychotic (both of which were for possession of cannabis). Comparisons for the psychotic disorders (chi sq =0.666, p=0.415), and schizophrenics (chi sq =0.266, p=0.435) with the general sample were not significant.

INTOXICATION DURING PERIOD OF OFFENCE

Of the 59 who were intoxicated during the alleged offence 58 had histories of alcohol and substance abuse/dependence (chi sq =23.769 ;p=0.000).

	VIOLENT OFFENCE n=69 (%)	INDEX	HISTORY OF VIOLENCE n=96 (%)	TOTAL n=155 (%)
ANY INTOXICATION	31 (44.9)		39 (40.63)	59 (38.1)
ALCOHOL	23 (33.3)		21 (21.9)	34 (21.9)
CANNABIS	1 (1.4)		6 (6.3)	9 (5.8)
METHAQUALONE (MANDRAX)	0		1 (1.0)	1 (0.6)
ALCOHOL AND CANNABIS	3 (4.3)		7 (7.3)	9 (5.8)
ALCOHOL AND MANDRAX	4 (5.8)		4 (4.2)	5 (3.2)
ALCOHOL AND BENZODIAZEPINE	0		0	1 (0.6)

Comparisons between the Study Groups

INDEX VIOLENT OFFENCE¹⁹

Any intoxication chi sq = 2.485; P=0.115

Alcohol intoxication chi sq = 8.099; P=0.004*

Cannabis intoxication chi sq=1.44; P=0.231

HABITUALLY VIOLENT

Any intoxication chi sq = 0.706; P=0.401

Alcohol intoxication chi sq = 0.345; P=0.556

Cannabis intoxication chi sq = 1.326; P=0.249

-HABITUALLY VIOLENT AND VIOLENT INDEX OFFENCE

Any intoxication chi sq= 3.487; p=0.062

Alcohol intoxication chi sq=10.194; p=0.002*

Cannabis intoxication chi sq= 3.632; p=0.057

Methaqualone intoxication was present in 5 cases, of which 4 had committed a violent offence.

¹⁹ The number intoxicated with methaqualone (n=4) was too low to be entered into statistical analysis.

INTOXICATION DURING THE INDEX OFFENCE: PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION		DIAGNOSIS OF PSYCHOTIC DISORDER		SCHIZOPHRENIA	
	ALL CASES n=39(%)	VIOLENT INDEX OFFENCE n=15 (%)	ALL CASES n= 50(%)	VIOLENT INDEX OFFENCE n=19(%)	ALL CASES n=35 (%)	VIOLENT INDEX OFFENCE n=16 (%)
ANY INTOXICATION	10 (25.6)	3 (20)	15 (30)	4 (21.1)	11 (31.4)	4 (25)
ALCOHOL	3 (7.7)	1 (6.6)	5 (10)	2	4 (11.4)	2 (12.5)
CANNABIS	5 (12.8)	1 (6.6)	5 (10)	0	4 (11.4)	1(6.25)
METHAQUALONE (MANDRAX)	1 (2.6)	1 (6.6)	1 (2)	1	1 (2.9)	0
ALCOHOL AND CANNABIS	1 (2.6)	0	3 (6)	1	1(2.9)	1 (6.25)
ALCOHOL AND MANDRAX	0	0	0	0	1 (2.9)	0
ALCOHOL AND BENZODIAZEPINE	0	0	1 (2)	0	0	0

Those with a diagnosis of a psychotic disorder were less likely to be intoxicated during a violent offence (chi sq= 6.040, p=0.014*).

The subjects who were actively psychotic during observation were not more frequently intoxicated during the index offence (chi sq- 3.549; p=0.059), although were significantly less likely to have been intoxicated with alcohol (chi sq= 9.559;p=0.002*). Neither cannabis (chi sq=0.125; p=0.724) or methaqualone (chi sq = 0.261; p=0.528) intoxication occurred more frequently in this group.

Those currently psychotic were significantly less frequently intoxicated during a violent index offence (chi sq=4.813, p=0.028).

Schizophrenic subjects were not more likely to be intoxicated (chi sq=0.884, p=0.358).

Significantly fewer were intoxicated with alcohol (chi sq =4.378, p=0.036*), but not cannabis (chi sq=0.173, p=0.435) or mandrax (chi sq=0.413, p=0.409). Those charged with violent offences did not differ significantly from the others charged with violent offences (chi sq=3.343, p=0.067).

PROVOCATION BEFORE THE INDEX OFFENCE

Overall 49 (31.6%) of the subjects were exposed to an identifiable provocation before committing the index offence.

	VERBAL n(%)	PHYSICAL n(%)	
GENERAL SAMPLE	32 (20.6)	17 (11.0)	
INDEX VIOLENT OFFENCE	26 (37.7)	15 (21.7)	Both verbal and physical provocation were significantly more likely to have been present (chi sq=46.993; p=0.000*).
HABITUALLY VIOLENT	24 (25.0)	13 (13.5)	The group of habitually violent were more likely to have committed the index offence following either a verbal provocation or physical threat (chi sq = 5.819; p=0.016*).
- AND VIOLENT INDEX OFFENCE (N=53)	21 (39.6)	11(20.8)	The habitually violent group were less likely to have acted following provocation (chi sq = 0.087; p=0.768).

PSYCHOTIC SUBJECTS

		VERBAL	PHYSICAL THREAT	ANY PROVOCATION AS THE COMPARATOR
PSYCHOTIC OBSERVATION	DURING	5 (12.8)	7 (17.9)	
	n=39 (%)			
Violent Index Offence		4 (26.7)	6 (40.0)	Chi sq=0.417, p=0.518
	n=15(%)			
DIAGNOSIS OF A PSYCHOTIC DISORDER		9 (18.0)	6 (17.1)	
	n=50 (%)			
Violent Index Offence		7 (36.8)	6 (31.6)	Chi sq=0.881, p=0.348
	n=19(%)			
SCHIZOPHRENIA		(14.0)	5 (14.3)	
	n=35(%)			
Violent Index Offence		5 (31.3)	5 (31.3)	Chi sq=0.082, p=0.775
	n=16(%)			

NATURE OF ACTIONS DURING OFFENCE

	IMPULSIVE n(%)	PREMEDITATED n(%)	FOREPLANNED n(%)
GENERAL SAMPLE	71 (45.5)	38 (24.5)	46 (29.7)
INDEX VIOLENT OFFENCE	37 (53.6)	22 (31.9)	10 (14.5)
chi sq=14.075; df= 2; p=0.001*	chi sq =3.06;p=0.081	chi sq = 3.65; p=0.056	chi sq=13.74; p=0.0002*
HABITUALLY VIOLENT	50 (52.1)	24 (25.0)	22 (22.9)
chi sq = 6.077; df=2; p=0.048*	chi sq = 4.00; p=0.045*	chi sq = 0.03; p=0.858	chi sq = 5.52; p=0.019*
- AND VIOLENT INDEX OFFENCE ²⁰	chi sq =0.06; p=0.810	chi sq =0.30; p=0.885	chi sq = 0.440; p=0.266

²⁰ These results demonstrate that the habitually violent were no more likely to have acted impulsively, with premeditation or foreplanning than the others charged with a violent offence.

PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION		DIAGNOSIS OF A PSYCHOTIC DISORDER		SCHIZOPHRENIA	
	ALL CASES n=39(%)	VIOLENT INDEX OFFENCE n=15 (%)	ALL CASES n=50(%)	VIOLENT INDEX OFFENCE n=19(%)	ALL CASES n=35 (%)	VIOLENT INDEX OFFENCE n=16 (%)
IMPULSIVE	28 (71.8)	9 (60.0)	35 (70)	13 (68.4)	22 (62.9)	10 (62.5)
PREMEDITATED	4 (10.3)	3 (20.0)	5 (10)	3 (15.8)	5 (14.3)	3 (18.8)
FOREPLANNED	7 (17.9)	3 (20.0)	10 (20)	3 (15.8)	8 (22.8)	3 (18.8)

All groups acted more impulsively during their index offences, but did not display greater foreplanning or premeditation. However no significant differences were evident when compared within the group of violent index offences.

Comparisons between the psychotic subjects and the others

	PSYCHOTIC DURING OBSERVATION				DIAGNOSIS OF A PSYCHOTIC DISORDER				SCHIZOPHRENIA			
	ALL CASES n=39		VIOLENT INDEX OFFENCE n=15		ALL CASES n= 50		VIOLENT INDEX OFFENCE n=19		ALL CASES n=35		VIOLENT INDEX OFFENCE n=16	
	Chi sq	p	Chi sq	p	Chi sq	p	Chi sq	p	Chi sq	p	Chi sq	p
IMPULSIVE	14.18	0.0001*	0.310	0.576	17.40	0.00*	2.310	0.129	5.29	0.021*	0.660	0.417
PREMEDITATED	5.37	0.017*	1.25	0.214	8.40	0.004*	3.13	0.077	2.56	0.120	2.020	0.155
FOREPLANNED	3.43	0.064	0.47	0.493	3.39	0.069	0.04	0.559	1.01	0.315	0.300	0.581

WEAPONS USED

Fifty-two (33.5%) were carrying or used a weapon during the commission of the index offence.

	VIOLENT CHARGE n=69 (%)	HISTORY VIOLENCE n=96 (%)	OF TOTAL n=155(%)
NONE	28 (40.6)	57 (59.4)	103 (66.5)
KNIFE	21 (30.4)	18 (18.8)	26 (16.8)
GUN	5 (7.2)	6 (6.3)	8 (5.2)
AXE	4 (5.8)	3 (3.1)	5 (3.2)
STICK	1 (2.9)	1 (1.0)	1 (0.6)
BOTTLE	3 (4.3)	2 (2.1)	3 (1.9)
CLOTH	1 (1.4)	1 (1.0)	1 (0.6)
RAKE	0	1 (1.0)	1 (0.6)
BELT	1 (1.4)	1 (1.0)	1 (0.6)
BASEBALL BAT	1 (1.4)	1 (1.0)	1 (0.6)
GOLF CLUB	0	1 (1.0)	1 (0.6)
CAN OPENER	1 (1.4)	1 (1.0)	1 (0.6)
ROCK	1 (1.4)	1 (1.0)	1 (0.6)
CHAIN	1 (1.4)	1 (1.0)	1 (0.6)
SPADE	1 (1.4)	1 (1.0)	1 (0.6)

Weapons used in the Violent Index Offences

Use of a weapon was documented in 37 (59.4%), and this differed significantly from the general sample (chi sq=34.37; p=0.000*). The 28 subjects who did not use a weapon inflicted harm with their hands and feet.

Weapons used by the Habitually Violent

A weapon was carried or used during commission of the index offence in 39 (40.63%), which significantly differentiated the habitually violent from the general sample (chi sq =5.865; p=0.015), but they were not more likely to be carrying (or using) a weapon than the others charged with a violent offence (chi sq = 0.543; p=0.461). However, within the group of habitually violent those charged with a violent offence were more likely to be carrying or using a weapon during the index offence (chi sq=19.139; p=0.00001*).

Weapons used by the Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION n=39 (%)		DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)		SCHIZOPHRENIA n=35 (%)	
	ALL OFFENCES	VIOLENT INDEX OFFENCE n=15 (%)	ALL OFFENCES	VIOLENT INDEX OFFENCE n=19 (%)	ALL OFFENCES	VIOLENT INDEX OFFENCE n=16 (%)
KNIFE	6(15.4)	4 (26.7)	6 (12.0)	4 (21.1)	5 (14.3)	4 (25.0)
GUN	2 (5.1)	0	2 (4.0)	0	2 (5.7)	0
AXE	3 (7.7)	2 (13.3)	3 (6.0)	2 (10.5)	3 (8.6)	2 (12.5)
BASEBALL BAT	1 (2.6)	1 (6.7)	1 (2.0)	1 (5.3)	1 (2.9)	1 (6.3)
GOLF CLUB	1 (2.6)	0	1 (2.0)	0	0	0
ROCK	1 (2.6)	1 (6.7)	1 (2.0)	1 (5.3)	0	0
RAKE	0	0	1 (2.0)	0	0	0
CAN OPENER	0	0	1 (2.0)	1 (5.3)	1 (2.9)	1 (6.3)
TOTAL	14 (35.9)	8 (53.3)	18 (36.0)	9 (47.4)	12 (34.3)	8 (50.0)

The use or carrying of weapons during all index offences was not more frequent amongst those currently psychotic (chi sq=0.129, p=0.719), diagnosed with a psychotic disorder (chi sq=0.079, p=0.778) or schizophrenia (chi sq=0.011, p=0.916). Similar lack of significant differences occurred amongst those charged with violent index offences, i.e. currently psychotic (chi sq = 0.169, p=0.681), diagnosed with a psychotic disorder (chi sq=1.209, p=0.271) and schizophrenia (chi sq=0.543, p=0.461).

When comparisons were confined to the group who had a history of habitual violence neither those currently psychotic (chi sq=0.502, p=0.479), diagnosed with a psychotic disorder (chi sq=1.448, p=0.229) or the schizophrenics (chi sq=0.534, p=0.465) were more likely to be carrying weapons.

VICTIMS

	n (%)	STATISTICAL COMPARISONS
GENERAL SAMPLE	Family : 29 (18.7) Friend Or Acquaintance: 48 (31.0) Stranger : 67 (43.2) No Victim : 11 (7.1)	
INDEX VIOLENT OFFENCE ²¹	Family : 23 (33.3) Friend Or Acquaintance: 25 (36.2) Stranger : 21 (30.4)	<p>Family were significantly more likely to be the victims of violent offences, and strangers of non-violent offences (chi sq=19.160; df=2; p=0.0001). In only 6 (8.0%) of non-violent offences was family a victim, whereas in 46 (61.33%) a stranger was a victim of a non-violent offence. Friends and acquaintances were victims of non-violent offences in 23 (30.67%).</p> <p>When the comparison was collapsed into whether the victim was known (or not) to the perpetrator: chi sq =13.791; p=0.0002*.</p>
HABITUALLY VIOLENT	Family : 21 (21.9) Friend Or Acquaintance: 26 (27.1) Stranger : 42 (43.8) No Victim : 7 (7.3) [In 47 (48.0) the victim was known]	<p>Chi sq = 2.609 df= 3 p= 0.456</p> <p>Family was not more likely to be a victim of the index offence (chi sq=1.73, p=0.188), nor was the subject more likely to have known the victim (chi sq=.0521, p=0.819)</p> <p>When only violent index offences were considered: family (chi sq=0.16, p=0.687), and acquaintances (chi sq=0.01, p=0.904) were not more likely to be victims. Nor were the victims more likely to be generally known (chi sq=0.291, p=0.589).</p>

²¹ The 11 victimless offences were withdrawn from the analysis, which left 144 cases in the general sample.

Victims of the Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSED WITH A PSYCHOTIC DISORDER N=50 (%)	SCHIZOPHRENIA n=35 (%)
FAMILY	5 (13.7)	6 (12.0)	5 (14.3)
ACQUAINTANCE/ FRIEND	7 (17.9)	10 (20.0)	7 (20.0)
STRANGER	21 (60.0)	27 (54.0)	17 (48.6)
NO VICTIM	6 (17.1)	7 (14.0)	6 (17.1) 7

Comparisons between the Psychotic Subjects and the Others

	VICTIM KNOWN VS STRANGERS ²²	
PSYCHOTIC DISORDER	chi sq=9.226	P=0.003*
PSYCHOTIC DURING OBSERVATION	Chi sq=7.453	p=0.006*
SCHIZOPHRENIA	Chi sq=4.284	p=0.038*

Victims of psychotic subjects charged with a violent index offence

	PSYCHOTIC DURING OBSERVATION n=15 (%)	DIAGNOSED WITH A PSYCHOTIC DISORDER n=19(%)	SCHIZOPHRENIA n=16 (%)
FAMILY	2 (13.3)	3 (15.8)	3 (18.8)
ACQUAINTANCE/ FRIEND	4 (26.7)	5 (26.3)	4 (25.0)
STRANGER	9 (60.0)	11 (57.9)	9 (56.2)

²² This indicated that the victims of the psychotic subjects were mostly not known

Of the 15 currently psychotic for whom the index offence was violent 1 family member was murdered, 1 family assaulted, 3 friends/acquaintances assaulted, 3 strangers were assaulted, 2 strangers raped, 1 friend/acquaintance indecently assaulted, and the property of 3 strangers maliciously damaged.

When only the violent index offences were considered strangers were again more likely to be the victims of schizophrenics ($\chi^2 = 6.556, p = 0.014$), of those currently psychotic ($\chi^2 = 7.913, p = 0.008$), and of those with any psychotic disorder ($\chi^2 = 9.338, p = 0.002$).

University of Cape Town

CLINICAL AND DISPOSITIONAL FACTORS

PREVIOUS THREATS TO COMMIT VIOLENCE

	N (%)	
GENERAL SAMPLE (N=155)	79 (51.0)	
INDEX VIOLENT OFFENCE (N=69)	48 (69.6)	Chi sq = 17.211; p= 0.00003*
HABITUALLY VIOLENT (N=96)	70 (72.9)	Chi sq = 52.276; p=0.000*

PSYCHOTIC SUBJECTS : PREVIOUS THREATS TO COMMIT VIOLENCE

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS PSYCHOTIC DISORDER n=50 (%)	OF SCHIZOPHRENIA n=35 (%)
HAD ISSUED THREATS	25 (64.1)	32 (64.0)	21 (60.0)
COMPARISON WITH GENERAL SAMPLE	Chi Sq= 3.59, p=0.058	Chi sq = 5.02, p=0.025	Chi sq = 1.48, p=0.224
THOSE WITH HISTORY OF HABITUAL VIOLENCE WHO HAD ISSUED THREATS	24 (61.5)	31 (62.0)	21 (60.0)
COMPARISON WITH THOSE WITH HISTORY OF HABITUAL VIOLENCE	Chi sq = 0.47, p=0.493	Chi sq = 1.44, p=0.231	Chi sq = 1.48, p=0.224

In each group virtually all those who had a history of issuing threats had histories of habitual violence. Analysis was not performed as only 1 patient currently psychotic, 1 diagnosed with a psychotic disorder and no schizophrenic who was described as issuing threats did not have a history of habitual violence.

PARAPHILIA	2 (2.1)	2 (1.3)
PAEDOPHILIA	1 (1.0)	1 (0.6)
PTSD	0	1 (0.6)
DELIRIUM TREMENS	1 (1.0)	1 (0.6)
GENERALIZED ANXIETY DISORDER	0	1 (0.6)
CHILD-PARENT PROBLEM	0	1 (0.6)

An axis 1 diagnosis was conferred on 53 (55.2%), and the habitually violent were not more likely to be given an axis 1 diagnosis (chi sq = 1.815; p=0.178). This finding persisted among those charged with a violent offence (chi sq = 0.139; p=0.709).

Malingering was thought to be likely in 32 (33.3%).

MENTAL ILLNESS²⁴ AND PSYCHOSIS

Ultimately 43 (27.7%) were declared to be mentally ill. Of these 39 (90.7%) were diagnosed with a psychotic disorder. The remaining 4 received a diagnosis of dementia. None was declared mentally ill (that is, legally incompetent) on the basis of mental handicap.

Violent Index Offence and Mental Illness

In this group 16 (23.2%) were declared to be mentally ill, of which a psychotic illness was diagnosed in 15 (93.8%). A finding of mental illness was not significantly more likely in those charged with a violent offence (chi sq = 0.779; p=0.377).

²⁴ A reminder that 'Mental Illness' in this context refers to the finding that was transmitted to the courts, and not to the general finding of the presence of a major psychiatric disorder

The Habitually Violent and Mentally Illness

33 (34.4%) were declared to be mentally ill and psychosis was diagnosed in 31 (93.9%).

Both mental illness (chi sq = 5.805; p=0.016) and psychosis (chi sq = 7.262; p=0.007) were significantly more likely to have been present in this group.

Within this group those who were charged with a violent offence were not more frequently to be declared mentally ill (chi sq = 3.355; p=0.060), or be diagnosed with a psychotic diagnosis (chi sq = 2.937; p=0.079).

Of the 15 psychotic individuals charged with a violent offence, 14 had histories of habitual violence.

AXIS 1 DIAGNOSES OF THE PSYCHOTIC SUBJECTS THAT WERE DECLARED 'MENTALLY ILL'

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)
BIPOLAR AFFECTIVE DISORDER, MANIA	5 (12.8)	10 (20.0)
SCHIZOPHRENIA	29 (74.4)	35 (70.0)
SCHIZOAFFECTIVE DISORDER	5 (12.8)	5 (10.0)

Co-morbidity with other axis 1 disorders was very low (excluding alcohol and substance abuse). One schizophrenic had a co-existing paraphilia. Of the 4 psychotic disorder subjects who were assessed as malingering 2 were schizophrenics.

THE PSYCHOTIC SYMPTOMS ELICITED FROM THE PSYCHOTIC SUBJECTS

	PSYCHOTIC DURING OBSERVATION				
	TOTAL n=39(%)	HABITUALLY VIOLENT n=31(%)	Comparison with non- violent psychoatic subjects P	VIOLENT INDEX OFFENCE n=15	Comparison with psychotic subjects charged with nonviolent offences P
DELUSIONS	35 (89.7)	29 (93.5)	0.180	13 (86.7)	0.502
DELUSIONS OF PERSECUTION	28 (71.8)	24 (77.4)	0.137	10 (66.7)	0.418
DELUSIONS OF CONTROL	6 (15.4)	4 (12.9)	0.357	4 (26.7)	0.139
DELUSIONS OF GRANDEUR	24 (61.5)	18 (58.1)	0.326	7 (46.7)	0.131
DELUSIONS OF REFERENCE	17 (43.6)	14 (45.2)	0.508	8 (53.3)	0.332
HALLUCINATIONS	28 (71.8)	21 (67.7)	0.262	10 (66.7)	0.418
COMMAND HALLUCINATIONS	10 (25.6)	8 (25.8)	0.617	5 (33.3)	0.308
THOUGHT DISORDER	32 (82.1)	25 (80.6)	0.554	13 (86.7)	0.444
THOUGHT WITHDRAWAL/INSERTION	12 (30.8)	9 (29.0)	0.473	8 (53.3)	0.020
MANIA	10 (25.6)	10 (32.3)	0.068	2 (13.3)	0.155

THE PSYCHOTIC SYMPTOMS OF THE SCHIZOPHRENIC SUBJECTS

	TOTAL n=35(%)	HABITUALLY VIOLENT n=26 (%)	P	VIOLENT INDEX OFFENCE n=16(%)	P
DELUSIONS	25 (71.4)	19 (73.1)	0.512	11	0.519
DELUSIONS OF PERSECUTION	20(57.1)	16 (61.5)	0.306	8	0.433
DELUSIONS OF CONTROL	6 (17.1)	4 (15.4)	0.493	4	0.248
DELUSIONS OF GRANDEUR	15 (42.9)	9 (34.6)	0.100	5	0.203
DELUSIONS OF REFERENCE	13 (37.1)	10 (38.5)	0.557	7	0.458
HALLUCINATIONS	21 (60.0)	14 (53.8)	0.194	9	0.678
COMMAND HALLUCINATIONS	8 (22.9)	6 (23.1)	0.670	5	0.248
THOUGHT DISORDER	25 (71.4)	18 (69.2)	0.488	11	0.519
THOUGHT WITHDRAWAL/ INSERTION	12 (34.3)	9 (34.6)	0.639	8	0.072

29 schizophrenics were psychotic during the observation admission.

AXIS 2 DIAGNOSES

A personality disorder was diagnosed in 75 (48.4%), antisocial personality disorder being the most frequently diagnosed. An axis 1 diagnosis was less likely to be made if an axis 2 diagnosis was conferred (chi sq.= 20.912, p=0.000), but there was no relationship between having an axis 2 and axis 3 diagnosis (chi sq.=0.351, p=0.554).

DIAGNOSES OF PERSONALITY DISORDER

	n=75 (%)
ANTISOCIAL PERSONALITY DISORDER	44 (58.7)
DEPENDENT PERSONALITY DISORDER	8 (10.7)
MIXED PERSONALITY DISORDER	8 (10.7)
NARCISSISTIC PERSONALITY DISORDER	7 (9.3)
BORDERLINE PERSONALITY DISORDER	5 (6.7)
HISTRIONIC PERSONALITY DISORDER	2 (2.7)
SCHIZOTYPAL PERSONALITY DISORDER	1 (1.3)

Borderline intellectual functioning was diagnosed in 27 (17.4%), and mild mental retardation in 14 (9.0%).

Axis 2 Diagnoses amongst those charged with a Violent Index Offence

	n(%)
ANTISOCIAL PERSONALITY DISORDER	21 (30.4)
DEPENDENT PERSONALITY DISORDER	5 (7.2)
MIXED PERSONALITY DISORDER	3 (4.3)
NARCISSISTIC PERSONALITY DISORDER	4 (5.8)
BORDERLINE PERSONALITY DISORDER	3 (4.3)

Personality disorder was diagnosed in 36 (52.17%) of this group. A further 14 (20.3%) were assessed to be within borderline intellectual functioning and 7 (10.1%) within mild mental retardation. Borderline intellectual functioning was found together with antisocial personality disorder in 4 subjects and dependent personality disorder in 1 subject. None of the mildly retarded subjects attracted a personality disorder diagnosis.

Antisocial personality disorder was co-morbid with schizophrenia in 5 subjects and paedophilia in 1. Dependent personality disorder was found with 1 case of intermittent explosive disorder and 1 with post traumatic stress disorder. Narcissistic personality disorder was also diagnosed in 1 subject who had a parent-child problem and 1 with bipolar affective disorder. Adjustment disorder was found in 1 subject diagnosed with mixed personality disorder.

Personality disorder was not significantly more likely to be present in those charged with a violent offence ($\chi^2=0.71$; $p=0.398$).

Axis 2 Diagnoses in those with Histories of Habitual Violence

	n=96 (%)
ANTISOCIAL PERSONALITY DISORDER	34 (35.4)
DEPENDENT PERSONALITY DISORDER	5 (5.2)
MIXED PERSONALITY DISORDER	4 (4.2)
NARCISSISTIC PERSONALITY DISORDER	2 (2.1)
BORDERLINE PERSONALITY DISORDER	3 (3.1)
HISTRIONIC PERSONALITY DISORDER	1 (1.0)
SCHIZOTYPAL PERSONALITY DISORDER	0
BORDERLINE INTELLECTUAL FUNCTIONING	20 (20.8)
MILD MENTAL RETARDATION	6 (6.3)

An axis 2 diagnosis was made in 49 (51.04%), but the habitually violent were not more likely to attract an axis 2 diagnosis (chi sq = 1.575; p=0.209). Amongst those charged with a violent offence the habitually violent were not more likely to be given an axis 2 diagnosis (chi sq = 1.156; p=0.282).

Antisocial personality disorder was more likely to be diagnosed in the habitually violent (chi sq = 8.99; p=0.003*).

Axis 2 Diagnoses Amongst the Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
ANTISOCIAL PD	7 (17.9)	9 (18.0)	8 (22.9)
DEPENDENT PD	3 (7.7)	3 (6.0)	0
NARCISSISTIC PD	0	2 (4.0)	0
MIXED PD	1 (2.6)	1 (2.0)	0
TOTAL	11 (28.2)	14 (28.0)	8 (22.9)
BORDERLINE INTELLECTUAL FUNCTIONING	5 (12.8)	8 (16.0)	7 (20.0)
MILD MENTAL RETARDATION	1 (2.6)	2 (4.0)	2 (5.7)

An axis II diagnosis was significantly associated less often with a psychotic diagnosis (chi sq =10.803, p=0.001), current psychosis (chi sq= 7.465, p=0.006) and schizophrenia (chi sq = 10.661, p=0.001).

ZUCKERMAN'S SENSATION SEEKING SCALE (ZSSS)

The mean score on the ZSSS for the general sample was 16.73 (range: 4-28; sd= 5.76).

Mean scores on the sub-scales were:

	MEAN (range; sd)
THRILL & ADVENTURE	5.0 (0-10; 2.47)
EXPERIENCE SEEKING	4.10 (0-10; 2.08)
DISINHIBITION	4.03 (0-9; 2.29)
BOREDOM SUSCEPTIBILITY	3.60 (0-8; 1.63)

Correlations with age were not significant:

ZSSS: $r = -0.008$ ($p = 0.920$);

Experience seeking: $r = 0.061$ ($p = 0.451$);

Thrill and adventure: $r = -0.104$ ($p = 0.196$);

Disinhibition: $r = 0.034$ ($p = 0.676$);

Boredom susceptibility: $r = -0.012$ ($p = 0.887$)

ZSSS Scores Amongst those Charged with a Violent Index Offence

The mean total score was 15.87 (range=4-28; sd=5.71), which was not significant

($F = 2.800$; $p = 0.096$). Subtest scores were:

	Mean; range; sd	Comparison with general sample
THRILL AND ADVENTURE	4.94; 0-10; 2.48	F=0.68; p=0.794
EXPERIENCE SEEKING	3.87; 0-9; 1.92	F=1.490; p=0.224
DISINHIBITION	3.58; 0-8; 2.32	F=4.962; p=0.027*
BOREDOM SUSCEPTIBILITY	3.45; 0-8; 1.59	F=1.069; p=0.303

ZSSS Scores Amongst those with Histories of Habitual Violence

	Score; range; sd	Comparison with general sample
THRILL & ADVENTURE	4.98 (1-10) 2.30	F=0.017 ; p=0.894
EXPERIENCE SEEKING	4.21 (0-10) 2.06	F=0.725 ; p=0.396
DISINHIBITION	4.21 ((0-9) 2.19	F=1.489; p=0.224
BOREDOM SUSCEPTIBILITY	3.77 (1-7); 1.43	F=2.816 ; p=0.095
TOTAL SCORE	17.19 (6-28); 5.18	F=1.678 ; p=0.197

ZSSS Scores of the Psychotic Subjects

	PSYCHOTIC DISORDERS			PSYCHOTIC DURING OBSERVATION			SCHIZOPHRENIA		
	mean (sd)	F	p	mean (sd)	F	p	mean (sd)	F	p
THRILL & ADVENTURE SUBSCALE	5.22 (2.29)	0.586	0.445	5.21 (2.39)	0.359	0.549	5.29 (2.18)	0.606	0.438
EXPERIENCE SEEKING SUBSCALE	4.38 (2.26)	1.373	0.243	4.74 (2.14)	5.181	0.024*	4.37 (2.02)	0.788	0.376
DISINHIBITION SUBSCALE	4.46 (1.95)	2.591	0.109	4.62 (1.79)	3.418	0.066	4.34 (1.76)	0.827	0.365
BOREDOM SUSCEPTIBILITY SUBSCALE	3.58 (1.54)	0.011	0.916	3.85 (1.25)	1.196	0.276	3.91 (1.42)	1.69	0.195
TOTAL SCORES	17.70 (4.57)	2.112	0.148	18.38 (4.42)	4.399	0.038*	18.00 (4.43)	2.220	0.139

BARRATT'S IMPULSIVITY SCALE (BIS)

The mean score for the general sample on the BIS was 24.86 (range : 11-37; sd=4.56).

Correlations with age ($r=0.082$; $p=0.308$), Mini Mental Scores ($r=-0.0128$; $p=0.875$), number of previous admissions ($r=0.129$; $p=0.109$), total convictions ($r=.068$; $p=0.398$) and violent convictions ($r=0.021$ $p=0.796$) were not significantly associated.

BIS Scores Amongst those Charged with a Violent Index Offence

The group's mean score was 24.44 (range = 11-33; sd = 4.80), which did not significantly differ from the general sample ($F=1.104$; $p=0.296$).

BIS Scores Amongst those with Histories of Habitual Violence

The mean scores were 25.45 (range: 11-33; sd = 4.46). This group was more likely to score higher on the BIS than the general sample ($F=4.209$; $p=0.042^*$).

The associations between the ZSSS (and its subscales) and the BIS were correlated:

	BIS r (p)
ZSSS	0.434 (0.000)
EXPERIENCE SEEKING	0.279 (0.000)
BOREDOM SUSCEPTIBILITY	0.234 (0.030)
DISINHIBITION	0.389 (0.000)
THRILL & ADVENTURE	0.248 (0.002)

BIS Scores Amongst the Psychotic Subjects

Mean scores for those diagnosed with any psychotic disorder was 25.08 (sd=4.439, range: 14-33), which did not differ significantly ($F=0.164$, $p=0.686$) from the general sample. Similarly those currently psychotic scored a mean of 25.54 (sd=4.627, range: 14-33) which was not significant ($F=1.138$, $p=0.288$); and the schizophrenics scored a mean of 24.49 (sd=4.674, range: 14-32), which was also not significant ($F=0.310$, $p=0.578$).

MINI MENTAL SCORES

The mean score achieved on the Mini-Mental test was 25.53 (sd=5.23, range=10-30). These scores did not correlate with age ($r=-0.006$ ($p=0.944$))

Mini Mental Scores for those charged with a Violent Index Offence :

Their mean score on the Mini Mental Examination was 25.99 (range=10-30; sd=5.02), which did not differ significantly from the general sample ($F=0.948$; $p=0.332$).

Mini Mental Scores for the Habitually Violent

Their mean score on the Mini Mental was 25.81 (range = 10-30; sd=4.80). Comparison with the general sample was not significant ($F=0.741$; $p=0.391$).

Mini Mental Scores for the Psychotic Subjects

Their Mini Mental scores did not differ from those of the general sample:

	MEAN	sd (range)	F	p
PSYCHOTIC DISORDER n=50	25.86	3.98 (16-30)	0.295	0.588
PSYCHOTIC DURING OBSERVATION n=39	25.62	3.88 (18-30)	0.014	0.906
SCHIZOPHRENIA n=35	25.66	3.92 (18-30)	0.027	0.869

ANNETT'S HANDEDNESS SCALE

Only 5 subjects were left handed and 10 were mixed handed. Within the group of violent index offence subjects left handedness was found in 3 (4.3%) and mixed handedness in 5 (7.2%).

The left-handers: All were male, 2 were psychotic (but 3 had previously been diagnosed with schizophrenia and 1 with bipolar affective disorder), 3 were referred following violent charges (including the 2 psychotic individuals), 4 had previous conviction, (2 for violent offences), 3 had a history of habitual violence (including 1 psychotic subject). One left-hander was epileptic and psychotic, 2 had abnormal EEG's (1 abnormal non-specific, 1 left temporal focus). Child abuse was confirmed in 2 cases, of which 1 also had a history of head injury.

The mixed-handed subjects: All were male, 3 were psychotic, 9 had previous convictions (1 for a violent offence), 7 were regarded as being habitually violent, 3 had abnormal EEG's (2 abnormal non-specific, 1 with a temporal focus), 6 had a history of head injury (child abuse was confirmed in none), 3 were schizophrenic (who all had a history of habitual violence), and 5 were charged with violent offences. Epilepsy was a pre-existing condition in 3 (of which 1 had an abnormal non-specific EEG).

Because of the low frequencies elicited left- and mixed-handedness handedness was not entered as a variable in further analysis

PHYSICAL EXAMINATION

In the general group 14 (9%) had neurological deficits, and 5 (3.2%) had other physical signs. The VDRL result was positive in 13 (8.4%) and 4 of these were confirmed positive in the cerebrospinal fluid.

Physical Examination of those Charged with a Violent Index Offence

The physical examination was normal in 62 (89.9%). Neurological deficits were found in 6 (8.7%). One had a positive serum VDRL, and positive CSF VDRL result.

CT scans were done on 5, and 4 were reported to be abnormal (the remaining 2 scans on non-violent offenders were reported as normal).

Physical Examination of the Habitually Violent

The routine physical examination revealed neurological deficits in 9 (9.4%) and other current physical disorders in 3 (3.1%). The VDRL was positive in 5 (5.2%) and 1 had a positive CSF VDRL.

Physical Examination of the Psychotic Subjects

A physical disorder was evident in 5 (10.0%) of those with a psychotic disorder; 3 had neurological signs, and 2 other medical disorders. All 5 were currently psychotic. Two of the psychotic disorder group had a positive serum VDRL, of which 1 was currently psychotic. No schizophrenic had a positive serum VDRL. None had a positive VDRL finding in cerebro-spinal fluid.

These figures were too low for meaningful statistical analysis.

EEG RESULTS

The EEG was abnormal in 54 (34.8%) cases, of which 15 (27.8%) were diagnosed epileptics. A previous diagnosis of epilepsy was significantly associated with having an abnormal EEG (chi sq.=8.312, p=0.004).

SITE OF ABNORMALITY	VIOLENT INDEX OFFENCE N=69(%)	HISTORY VIOLENCE N=96 (%)	OF TOTAL N=155 (%)
NORMAL	41 (59.4)	66 (68.8)	101 (65.2)
ABNORMAL NON SPECIFIC	17 (24.6)	17 (17.7)	30 (19.4)
RIGHT TEMPORAL	4 (5.8)	7 (7.3)	11 (7.1)
LEFT TEMPORAL	5 (7.2)	5 (5.2)	10 (6.5)
LEFT HEMISPHERE	0	0	1 (0.6)
RIGHT HEMISPHERE	1 (1.4)	1 (1.0)	1 (0.6)
RIGHT OCCIPITAL	1 (1.4)	0	1 (0.6)

EEG Findings in those Charged with a Violent Index Offence

The EEG was abnormal in 28 (40.6%). This did not significantly differentiate between this group and the others whether the sites of abnormality were compared (chi sq = 6.134; df=6; p=0.408), or whether the presence or absence of any abnormality was considered (chi sq= 1.805; p=0.179). Epileptics (charged with a violent offence) were not more likely to have an abnormal EEG (chi sq=2.885; p=0.089).

EEG Findings in the Habitually Violent

The EEG was reported abnormal in 30 (31.2%) which did not differentiate these from the others whether compared by site (chi sq=4.283; df=6 ; p=0.509), or whether any abnormality was present (chi sq.=1.431; p=0.232).

EEG Findings for the Psychotic Subjects

LOCATION OF ABNORMALITY	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS PSYCHOTIC DISORDER n=50 (%)	OF SCHIZOPHRENIA n=35 (%)
ABNORMAL NON-SPECIFIC	3 (7.7)	4 (8.0)	4 (11.4)
LEFT TEMPORAL	4 (10.3)	4 (8.0)	4 (11.4)
RIGHT TEMPORAL	5 (12.8)	5 (5.0)	2 (5.7)
LEFT HEMISPHERE	1 (2.6)	1 (2.0)	1 (2.9)
RIGHT HEMISPHERE	1 (2.6)	1 (2.0)	0
TOTAL	14 (35.9)	15 (30.0)	11 (31.4)

A diagnosis of a psychotic disorder (chi sq =0.761, p=0.383), current psychosis (chi sq = 0.026, p=0.873) or schizophrenia (chi sq= 0.232, p=0.630) was not associated significantly with an abnormal EEG. The numbers were too low to analyse the abnormalities by site.

BEHAVIOURS OBSERVED IN THE WARD DURING THE OBSERVATION PERIOD

Incidents of violent behaviour were committed by 16 (10.3%). Aggressive behaviour was observed in 41 (26.5%), and 23 (14.8%) issued threats to commit violence. Of the 16 who were violent 14 had also displayed aggressive behaviour and 10 had also issued threats to commit violence. Violent, aggressive behaviour and threats were evident in 9; 13 issued threats and were also aggressive; 1 issued threats and was also violent; and 5 were violent and aggressive but did not issue threats. None issued threats only.

Ward Behaviours by those Charged with a Violent Index Offence

Incidents of violent behaviour were observed by 6 (8.7%). Aggressive behaviour was observed in 15 (21.7%), and 13 (18.8%) issued threats to commit violence. However this group was not more likely to behave violently (chi sq=0.360; p=0.549), aggressively (chi sq 1.419; p=0.233), or issue threats (chi sq = 1.566; p=0.211).

All who issued threats were also either violent (n=1), aggressive (n=9) or violent and aggressive (n=3). Similarly only 1 was violent only, and 2 aggressive only. Aggressive and violent behaviour was evident in 1.

Ward Behaviours by the Habitually Violent

Incidents of violent behaviour were committed by 14 (14.6%), which significantly differed from the general sample (chi sq=5.727; p=0.017*). Aggressive behaviour was evident in 28 (29.2%), which was not significant by comparison (chi sq=0.972; p=0.324). Threats to commit violence were issued by 19 (19.8%), which significantly distinguished these from the general sample (chi sq = 5.397; p=0.020*).

Ward Behaviours by the Psychotic Subjects

	PSYCHOTIC DURING OBSERVATION n=39 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=50 (%)	SCHIZOPHRENIA n=35 (%)
ISSUED THREATS n=23	13 (30.0) Chi sq = 14.106, p=0.0001*	15 (30.0) Chi sq = 13.426, p=0.0002*	9 (25.7) Chi sq = 4.23, p=0.040*
AGGRESSIVE BEHAVIOUR n=41	15 (38.5) Chi sq = 3.864, p=0.049*	20 (40.0) Chi sq = 6.964, p=0.008*	11 (31.4) Chi sq = 0.576, p=0.448
VIOLENT BEHAVIOUR n=16	9 (23.1) Chi sq = 0.002*	12 (24.0) Chi sq = 14.916, p=0.0001*	8 (25.7) Chi sq = 7.673, p=0.010*

Subjects with a psychotic disorder made up 65.2% of those who issued threats, 48.9% of those who displayed aggressive behaviour and 75% of those who were violent.

BEHAVIOURS OF HABITUALLY VIOLENT PSYCHOTIC SUBJECTS COMPARED TO OTHER HABITUALLY VIOLENT SUBJECTS

	PSYCHOTIC DURING OBSERVATION n=31 (%)	DIAGNOSIS OF PSYCHOTIC DISORDER n=39 (%)	SCHIZOPHRENIA n=26 (%)
ISSUED THREATS n=19	12 (38.7) Chi sq = 10.322, p=0.002*	13 (30.0) Chi sq = 7.587, p=0.006*	8 (30.7) Chi sq = 2.706, p=0.099
AGGRESSIVE BEHAVIOUR n=28	13 (41.9) Chi sq = 3.613, p=0.057	16(41.0) Chi sq = 4.471, p=0.034	9 (34.6) Chi sq = 5.12, p=0.474
VIOLENT BEHAVIOUR n=16	9 (29.0) Chi sq = 7.763, p=0.008*	12 (30.8) Chi sq = 13.814, p=0.0002*	8 (30.7) Chi sq = 7.499, p=0.010*

Patients with a psychotic disorder constituted 68.4% of the habitually violent who issued threats, 57.1% of those displaying aggressive behaviour, and 75% of those who were violent. All who were violent had histories of habitual violence.

THE FEMALE SUBJECTS

There were 16 (10.3%) female subjects, of which 5 (31.3%) were referred on a violent index offence, and 7 (43.8%) had histories of habitual violence.

The number of female subjects was too low to generate meaningful statistical indices. Their influence on the tests of significance was determined by comparing tests of significance performed with them included in the sample with the same tests performed after removing them from the sample.

However, the following represents the profile of these subjects.

INDEX OFFENCES OF FEMALE SUBJECTS:

	N (%)
FRAUD	4 (25%)
MURDER	3 (18.8)
CRIMEN INJURIA	2 (12.5)
THEFT	2 (12.5)
HOUSEBREAKING	2 (12.5)
CULPABLE HOMICIDE	1 (6.3)
ATTEMPTED MURDER	1 (6.3)
ABDUCTION	1 (6.3)

Admittedly these are small numbers, but nevertheless represent women with a higher rate of violent behaviour than has been reported elsewhere (Kruttschnitt 1994; Reiss & Roth 1993).

Their average age was 36.1 years (range: 19 – 62). Their marital status were: 7 (43.8%) single, 4 (25%) married, 4 (25%) divorced, and 1 (6.3%) was widowed. They had an average of 2.94 children (range 0-12). Nine (56.3%) had a high school, 4 (25%) a primary school education, 2 had had no formal schooling and 1 had some post-matriculation training. Five (31.3%) were first born. All were right handed. At the time of arrest 9 (56.3%) were unemployed, and 11 (68.8%) were living in an urban area.

Historical Factors : The Female Subjects

HISTORY OF CONDUCT DISORDER	n= 4 (25%)
HISTORY OF PSYCHIATRIC ADMISSIONS	n=11 (68.8%)
MEAN NUMBER OF PREVIOUS ADMISSIONS	2.5 (range: 0-15)
MEAN DURATION OF PSYCHIATRIC ILLNESS	2.65 years
FAMILY HISTORY OF PSYCHIATRIC DISORDER	n=6 (37.5%)
HISTORY OF CHILD ABUSE	n= 2 (
HISTORY OF ALCOHOL ABUSE	n=6 (37.5%)
HISTORY OF SUBSTANCE ABUSE	n= 3 (18.8%)
METHAQUALONE ABUSE	n= 2
HISTORY OF HEAD INJURY	n= 3 (18.8%)
EPILEPSY DIAGNOSED	n = 2 (12.5%)
PAST SUICIDE ATTEMPTS	n=5 (31.3%)
HISTORY OF ISSUING THREATS	n=8 (50%)
HISTORY OF PREVIOUS CONVICTIONS	5 (31.3%)
MEAN NUMBER OF CRIMINAL CONVICTIONS	1.55 (range: 0-11)
HISTORY OF VIOLENT CONVICTIONS	1 (6.3) ²⁵

Factors Related to the Index Offence :

INTOXICATION DURING INDEX OFFENCE	n=2 (12.5%)
ACCOMPLICE PRESENT	n=0

²⁵ This subject had a history of 5 previous convictions for violent offences

VICTIM KNOWN TO SUBJECT	n=12 (75%)
RELATIONSHIP TO VICTIM:	
ACQUAINTANCE	n = 8(50.0%)
FAMILY	n= 4 (25%)
STRANGER	n= 4 (25%)
PROVOCATION PRECIPITATED THE OFFENCE	n= 6 (37.5%)
	(verbal = 3, physical threat = 3)
IMPULSIVE ACTIONS DURING THE INDEX OFFENCE	n=8 (50%)
WEAPONS	
ANY WEAPON USED	n=5 (31.3%) ²⁶

PSYCHIATRIC DIAGNOSES : The Female Subjects

PSYCHOTIC DISORDER DIAGNOSED	n=4 (25%)
DECLARED MENTALLY ILL	n = 4 (25%)

An axis 1 diagnosis was conferred on 7 (43.8%), and an axis 2 diagnosis on 11 (68.8%).

The axis 1 diagnoses were:

Bipolar Affective Disorder (n=3),
Schizophrenia (n=1),
Adjustment Disorder (n=1),
Generalized Anxiety Disorder (n=1),
PTSD (n=1).
Malingering (n=5),
Dysthymia (n=2)

The axis 2 diagnoses were:

Dependant Personality Disorder (n=4),
Histrionic Personality Disorder (n=3),
Mixed Personality Disorder (n=2),
Schizotypal Personality Disorder (n=1),
Antisocial Personality Disorder (n=1).

Borderline Intellectual Functioning was found in 2 cases.

²⁶ 3 used knives, 1 a gun and 1 cloth.

Psychotic symptoms : The Female Subjects

	n (%)
HALLUCINATIONS	4 (25%)
DELUSIONS	4 (25%)
DELUSIONS OF GRANDEUR	3 (18.8%)
DELUSIONS OF PERSECUTION	3 (18.8%)
THOUGHT DISORDER	2 (12.5%)
THOUGHT WITHDRAWAL	1 (6.3%)
IDEAS OF REFERENCE	3 (18.8%)
MANIA	3 (18.8%)
DEPRESSION	3 (18.8%)

Their mean score on the MiniMental Test was 27.13.

SENSATION SEEKING AND IMPULSIVITY SCORES: Female Subjects

ZUCKERMAN SENSATION SEEKING SCALE	Mean Scores ²⁷
Total mean score	12.00
Thrill and Adventure subscale	2.81
Experience Seeking subscale	3.88
Boredom Susceptibility subscale	2.94
Disinhibition subscale	2.38
Barratt Impulsivity Scale	24.00

Ward Behaviours: Female Subjects

During the observation period 7 (43.8%) behaved aggressively, 3 (18.8%) issued threats, and 3 (18.8%) were violent.

²⁷ Standard deviations were not calculated because of the low number of subjects

CHANGES IN THE TESTS OF SIGNIFICANCE FOLLOWING THE REMOVAL OF FEMALE SUBJECTS

1. When female subjects were removed from the analysis the previously significant association between being declared mentally ill and habitual violence changed to being not significant (chi sq = 2.51; $p=0.081$).

2. Although psychosis at the time of assessment remained significantly associated with a history of habitual violence, this effect was somewhat reduced (chi sq = 3.49; $p=0.046$).

3. The significant association between habitual violence and high score on Barratt's Impulsivity Scale was strengthened ($F= 5.29$; $p= 0.023$).

There were no other changes of significance.

LOGISTIC REGRESSION MODELS

Variables that were significant by univariate analysis were entered into the models.

Key: OR= odds ratio; SE= standard error; CI= confidence interval; p= significance level

Logistic Regression Models For Violent Index Offences

VARIABLE	B	S.E.(B)	WALD	P	R	EXP(B)	95% CI	OR
PREV. PSYCHIATRIC ADMISSIONS	0.7575	0.2794	7.3497	0.007	0.1585	2.1328	4.88 – 14.59	8.44
VERBAL PROVOCATION BEFORE OFFENCE	0.4715	0.5012	0.8848	0.3469	0.0000	1.6023	1.85 – 13.25	4.96
DISINHIBITION SUBSCALE ON ZSSS	0.2761	0.1130	5.9685	0.0146	0.1365	1.3180	2.99 – 4.66	3.74
PREVIOUS THREATS OF VIOLENCE	-0.2391	0.2864	0.6968	0.4038	0.0000	0.7874	1.25 – 3.85	2.20
VICTIM KNOWN	-0.4908	0.2541	3.7314	0.0534	-0.902	0.6121	1.12 – 3.03	1.84
INTOXICATED WITH ALCOHOL	-0.5035	0.2625	3.6788	0.0551	-0.0888	0.6044	1.09 – 3.06	1.83
PREVIOUS VIOLENT CONVICTIONS	-0.6104	0.2949	4.2848	0.0385	-0.1036	0.5431	0.97 – 3.07	1.72
HISTORY OF HABITUAL VIOLENCE	-0.5332	0.3154	2.8575	0.0909	-0.0634	0.5867	0.96 – 3.34	1.78
USE OF WEAPON	-0.8491	0.2922	8.4425	0.003	-0.1739	0.4278	0.86 – 2.72	1.53
ANY PROVOCATION BEFORE OFFENCE	-0.9810	0.3155	9.6670	0.0019	-0.1897	0.3749	0.78 – 2.70	1.45

*Logistic Regression Models For Habitually Violent Subjects That Were Charged
With Violent Offences*

VARIABLE	B	S.E.(B)	WALD	P	R	EXP(B)	95% CI	OR
PROVOCATION BEFORE THE OFFENCE	1.3917	.5453	6.5136	.010	.1849	4.0215	19.16 – 162.43	55.78
PREV. PSYCHIATRIC ADMISSIONS	.7891	.3682	4.5921	.032	.1401	2.2014	4.39 - 18.59	9.04
DISINHIBITION SUBSCALE ON ZSSS	.1962	.1504	1.7021	.192	.0000	1.2168	2.51 - 4.53	3.38
VICTIM KNOWN	-.3044	.3362	.8199	.365	.0000	.7375	1.08 - 4.04	2.09
VERBAL PROVOCATION BEFORE OFFENCE	-.4851	.6453	.5651	.452	.0000	.6156	0.52 - 6.56	1.85
PREVIOUS THREATS OF VIOLENCE	-.5688	.3904	2.1223	.1452	-.0304	.5662	1.31 - 2.15	1.76
PREVIOUS VIOLENT CONVICTIONS	-.8089	.3396	5.6716	.017	-.1668	.4454	0.80 - 3.04	1.56
INTOXICATED WITH ALCOHOL	-.9555	.3808	6.2943	.012	-.1803	.3846	0.69 - 3.12	1.47
USE OF WEAPON	-.9767	.3597	7.3746	.006	-.2018	.3766	0.72 - 2.95	1.46

Logistic Regression Models For Habitually Violent Subjects

VARIABLE	B	S.E.(B)	Wald	p	R	Exp(B)	95% CI	OR
DECLARED MENTALLY ILL	0.8831	0.5779	2.3355	0.127	0.04	2.4184	3.62 – 34.85	11.23
VIOLENT BEHAVIOUR DURING THE ADMISSION	0.5945	0.5654	1.1056	0.293	0.00	1.8122	2.02 – 18.55	6.12
PREVIOUS PSYCHIATRIC ADMISSIONS	-0.0149	0.3497	0.0018	0.9659	0.00	0.9852	1.35 – 5.32	2.68
BIS SCORE	-0.0636	0.0504	1.5914	0.2071	0.00	0.9384	2.32 – 2.82	2.56
ANY PROVOCATION BEFORE OFFENCE	-0.1244	0.3489	0.1271	0.7215	0.00	0.8831	1.22 – 4.79	2.42
USE OF WEAPON	-0.131	0.2975	0.1938	0.6598	0.00	0.8772	1.34 – 4.31	2.40
NO. OF PREVIOUS PSYCHIATRIC ADMISSIONS	-0.1091	0.1985	0.3020	0.5826	0.00	0.8966	1.66 – 3.62	2.45
UNEMPLOYED	-0.1833	.2416	0.5756	0.4480	0.00	0.8325	1.43 – 3.69	2.30
PSYCHOTIC DURING ASSESSMENT	-0.2779	0.6275	0.1961	0.6579	0.00	0.7574	0.62 – 7.30	2.13
ISSUED THREATS DURING ADMISSION	-0.2332	0.4547	0.2681	0.6080	0.00	0.7920	0.95 – 5.38	2.21
ALCOHOL / SUBSTANCE ABUSE	-0.5787	0.2875	4.0527	0.0441	-0.0998	0.5606	0.99 – 2.08	1.75
HISTORY OF CONDUCT DISORDER	-0.7217	0.2669	7.3095	0.0069	-0.1606	0.4859	0.96 – 2.74	1.63
HISTORY OF ISSUING THREATS	-1.3509	0.2758	25.989	0.00	-0.3268	0.2590	0.75 – 2.22	1.30

DISCUSSION

CHARACTERISTICS OF THE SUBJECTS

The profile of these subjects resembled those of remand prisoners that are generally referred for psychiatric pre-trial assessment. In all but one case the courts believed that a potential psychiatric disorder was present, even though ultimately only 43 (27.7%) was declared mentally ill. The most common reasons for referral were that either the accused appeared disordered in court (26.5%), had a psychiatric history (20.6%), or had exhibited strange behaviour at the time of the offence (9.7%). Less common were reasons based on reports of strange behaviour in the community (8.4%), on a complaint of amnesia for the offence (7.1%), or that the accused believed that he (or she) was just 'not right in the head'(5.8%). Although statistical comparisons were not made (as there were too many categories) those charged with a violent offence were more often referred because of concern about their behaviour at the time of the offence caused (17.4% compared to 9.7% of the general sample). However, 46.2% of the psychotic subjects were referred because of disordered behaviour in court, which is almost twice that of the others, and because of a history of psychiatric treatment. This probably indicates that psychotic defendants arouse the courts' concern about their competence to stand trial, rather than their behaviour at the time of the offence. No psychotic subject had claimed to have had amnesia, or any of the other reasons that were not related to disordered behaviour either in the community, at the time of the offence or in court.

As has been documented in another study at Valkenberg Hospital the local courts tend to refer defendants for insubstantial causes (Kaliski, Borchers, & Williams 1997;Williams,

Borcherds, & Kaliski 1997). Consequently most pre-trial assessments are conducted on defendants that resemble the general remand population, although conversely it is also now accepted that remand populations contain a high proportion of psychiatrically ill individuals (Brooke, Taylor, Gunn, & Maden 1996). A recent screening study in the UK found that almost 7% had a psychotic disorder, 17.4% alcohol dependence and 15.7% drug dependence (Shaw et al. 1999). Only 10% had been charged with violent offences.

In this study 44.5% of the sample was referred following a violent index offence, which is not representative of general offender populations (which comprise overwhelmingly of property offences). The demographics of this sample, that is, 89.7% male, 71.6% single, 58.7% unemployed and with just under 7 years of education corresponds reasonably with descriptions of violent offender populations described in North America and Europe (Dietz 1985c; Dix 1980; Reiss & Roth 1993).

Crime statistics for South Africa are not readily available. For 1990 the SA Police reported the following rates of reported crimes (as per 100 000 population): 65.2 for rape, 410.9 for assault, 37.5 for murder, 161.4 for robbery, 263 for malicious damage to property, 14.6 for arson, and 2390.50 all property offences (including housebreaking, all types of theft, fraud, driving while under the influence etc). The total rate of reported crime therefore was 3343.1 per 1 000 000 population, and that for violent crime 953.5 per 1 000 000. Using these statistics violent offences constitute about 28.5% of all reported crime. The study sample consisted of almost twice this proportion of violent offences, which possibly confirms the assumption that forensic psychiatric services assess offender and patient populations that have higher base rates of violence than other services (Munk-Jorgensen 1999; Steinart 2001; Torrey 1995; Walsh et al. 2001). Undeniably the South African crime

rates are considerably higher than those reported in the USA and Europe, especially for violent crimes that are up to 3 times the rates than that in Europe and about twice that of the USA, which means that forensic psychiatric services are receiving referrals from a pool of offenders that already have a relatively high base rate of violent activity(Glanz 1992d).

Although there were referrals from areas that were very far from Cape Town (such as Springbok and Knysna, which are between 600 – 800 km away) 50.97% actually derived from courts in the Cape Peninsula.

The study sample therefore consisted of criminal defendants who, although referred for suspected psychiatric disorders, were overwhelmingly not mentally ill, and had a relatively high base rate of violent offending.

The following sections discuss the strength of associations between previously identified risk factors for violent offending and habitual violence in this pre-trial group.

THE STATIC FACTORS

Static risk factors can be regarded as the matrix within which the dynamic risk factors combine to yield violence.

DEMOGRAPHIC VARIABLES

Age

The average of the sample was 29.76 years. The youngest subject was 16 and the oldest 66 years old, but the majority were between 20 and 38 years old. This was similar to that described in other offender populations (Reiss & Roth 1993). Those who committed violent offences had a mean age of 28.48 (range 16-56 years), and the mean age of those who were habitually violent was 29.96 (range 16-66 years old). Their standard deviations were similar to that of the general sample, and no statistically significant differences were evident between those who had a violent index offence, or who were habitually violent, from the general sample. Recidivistic criminal behaviour is associated most strongly with age younger than 50 years, and more especially with age under 35 years (Durbin, Pasewark, & Albers 1977; Reiss & Roth 1993). As the age profile of violent offending overlaps almost perfectly within this general offender category youth alone cannot be used as a significant risk factor.

There are studies that contend that violent offending is preceded by some years of non-violent offending, and have found that arrestees on violent charges are older than non-violent arrestees (Farrington 1990; Farrington 1995e; Reiss & Roth 1993). If this were true,

then at the least those identified as being habitually violent should be an older group. This was not borne out in this study.

The most likely explanation is that the onset of habitual violence is during youth, such that when these individuals present to mental health facilities they already have impressive entrenched patterns of violent behaviour, which in turn is already an integral part of their general criminality. As indicated below habitual violence is associated with a history of conduct disorder ($\chi^2 = 6.89$; $p=0.009$), which surely reinforces this assumption.

Gender / Sex

There were only 16 (10.3%) female subjects, of which 5 (31.3%) were referred on a violent charge, and 7 (43.8%) had histories of habitual violence. Despite their low numbers these women had higher rates of violent behaviour than the general population. Although studies appear overwhelmingly to confirm that females are less involved in aggressive and assaultative behaviour, few have determined whether the risk factors that are associated with violence in men operate similarly in women. There are analyses of violent and non-violent female offenders that have concluded that their defining characteristics are actually very similar to their male counterparts (Coontz, Lidz, & Mulvey 1994; Frodi, Macaulay, & Thome 1977; Heidensohn 1991; Offen 1986; Pajer 1998; Robertson 1990). Accordingly the female subjects were retained, and because of their low numbers (which prevented meaningful statistical comparisons with the male subjects), their effect on the strength of the risk factors was measured indirectly by computing the tests of significance, initially with them, and then without them in the sample. Obviously subtle influences would be missed (because of their low numbers), but it was assumed that significant differences would point to a powerful effect.

When female subjects were removed the initial significant association between habitual violence and being declared mentally ill ($\chi^2=2.51$; $p=0.016$) became non-significant ($\chi^2 = 2.51$; $p=0.081$), and its strength of significance with psychosis waned ($\chi^2 = 3.49$; $p=0.046$, compared to $\chi^2=7.26$; $p=0.007$).

This appears to confirm an increasingly consistent observation that women with major mental disorders (including mental retardation) are vastly disproportionately more aggressive and violent than women in the general population (Daniel, Harris, & Husain 1981; Rappeport & Lassen 1966). Female prison populations have very high rates of schizophrenia, depression, substance abuse and antisocial personality disorders (Daniel et al. 1988b). Epidemiological surveys in Denmark have placed this relative risk at about 8 (Hodgins et al. 1996c), whereas a Finnish study determined that female homicide offenders had a 10-fold higher odds ratio for having either schizophrenia or a personality disorder (Eronen 1995). The latter also revealed that co-morbid alcohol abuse/dependence increased the odds ratio by a factor of 48.8, not dissimilar to that of males.

Mental disorder, therefore, is an important cause of disinhibition of aggression in women, which probably also reinforces the notion that women are inherently as aggressive (but probably socialised to have a greater degree of control over their impulses).

Conversely the already significant association between a high score on the BIS and habitual violence was further strengthened following the removal of the female subjects ($F=5.29$; $p= 0.023$, which with females was $F=4.21$; $p=0.042$). Half the females were adjudged to have acted impulsively during the index offence, and almost 40% had reacted to either verbal provocation or physical threat. And 75% of their victims were known to them.

There are no studies comparing female and male offender impulsivity, but this seems to indicate that violent females are possibly slightly less impulsive, and more likely to have acted in retaliation.

An unanswered issue is whether official crime statistics actually reflect the true nature of aggression in women. It is a commonplace finding that 1 woman for every 7-9 men is arrested for a violent crime (Kruttschnitt 1994;Reiss & Roth 1993). Arrest data seem also to indicate that females, at most, commit about 25% of violent crimes (especially common assault). However, these same sources concede that less than half of violent crimes are ever reported to the police, and that female victims are more likely to report than male counterparts (Kruttschnitt 1994). Furthermore, male victims of female violence are probably ashamed to report the crimes.

Scott (1977a) was adamant that female violence was mostly inflicted on children, which largely accounted for the ongoing epidemic of child abuse. Children are unlikely to report such assaults, and are less likely to retaliate as a stronger man might. Therefore, low female aggressivity against other adults may be more a matter of inhibition against performance, rather than a lack of capacity. What this means, as Frodi et al (1977f) concluded in their extensive review, is that low overt aggression in women is most likely due socialising influences (girls are taught to avoid physical aggression and to fear retaliation, whereas boys are encouraged to assert themselves physically), and not to an inherent neurobiological mechanism. The former is a gender issue (how women acquire their identities), and the latter a sex-related behaviour (due to genetic imperatives). As discussed earlier in the review of literature no convincing evidence exists that any neurobiological system that is unique to

males (such as greater androgen secretion) is a significant cause of aggression (Rubinow & Schmidt 1996).

Birth Order, Education level, Marital status, Number of children

Just over half (52.3%) were either first or second born in their families, although there were high numbers of 3rd (17.4%), 4th (9.0%), 5th (8.4%) and 7th (6.5%) born, and 3 were 10th born. Only 14.8% were married, and they had an average of 0.99 children (although the range was up to 12 children). Most had either a primary (51.6%) or high school (37.4%) education, which represented about a mean of just over 6 years of education. The schizophrenic subjects had fewer children ($F=5.48$; $p=0.021$), a common occurrence in those with this disorder, and unlikely to be associated with their criminality.

None of the above meaningfully differentiated violent offending from general offending. As in virtually all other studies on offender populations, the subjects derived from poor, under-educated backgrounds, and very few had been able to sustain long-term relationships (including having children)²⁸. These are therefore risk factors that are possibly associated with general criminality, and not specifically with violence.

Employment

Most of the sample was either unemployed (58.7%), or worked in menial jobs, such as manual labour (20%) and semi-skilled work (6.5%). The habitually violent were more likely to be unemployed ($\chi^2=5.59$; $p=0.018$). Unfortunately, it was not possible to determine

²⁸ Many subjects had not actually married or were living with the partners with whom they had had the children. This was not anticipated before the study and therefore was not coded for.

whether this was cause or effect. Presumably recurrently violent individuals cannot sustain employment (especially if their conflicts occur at work), and conversely unemployment may be a source of frustration (due to loss of income and status). American research has suggested that official unemployment data may hide actual involvement in gang activities or organised crime (Reiss & Roth 1993). This was not explored in this study, although it is well known that gang activity in the Cape is common, and most of the respondents were cagey about revealing their gang affiliations, which is the reason that this variable was not explored.

The psychotic subjects were more likely than the others to be unemployed (chi sq =9.10; p=0.002). This applied strongly to the schizophrenic subjects (chi sq= 8.43;p=0.003). Major mental illness is a known important cause of poor social functioning. Therefore many are idle and impoverished, and often abuse alcohol and substances, which almost inevitably leads to conflict with others (Gunn 1974; Swanson et al. 2000; Swartz.M.S. et al. 1998). Not surprisingly many experience periods of homelessness, which compounds the risk (Gelberg, Linn, & Leake 1988; Martell 1991a; Martell & Dietz 1992). Homelessness, which has emerged as an important independent risk factor, was not included in this study. All the subjects provided home addresses of families, and, anecdotally, many reported that they spent periods of vagrancy interspersed with sojourns at home. Homelessness therefore proved difficult to define and quantify, but should be explored in future research.

Effective risk management therefore should involve vocational rehabilitation, which not only concentrates on improving work capacity but also on developing life and interpersonal skills (Kaliski 1997).

Area of Origin

Almost two thirds (64.5%) were from an urban area. This may reflect the relative inaccessibility of the forensic service to rural areas. If this were true then the referrals from the rural areas ought to have involved more serious offences, and included more habitually violent subjects. Rural districts were more likely to refer psychotic subjects ($F=6.79$; $p=0.021$), but there were no differences with respect to the other parameters.

Although it is well known that rates of violence differ markedly between areas (especially within cities) there does not seem to be research into violence in rural areas in South Africa. These findings do seem to suggest that criminal defendants in the rural areas commit violent acts as often as their counterparts in the cities.

SUMMARY

Although the demographic profile of the sample closely resembled that previously described for general criminality, only unemployment was strongly associated with violent behaviour. Gender did not seem to influence the results, except that when the female subjects were removed from the analyses the association between habitual violence and psychosis, and being declared mentally ill was weakened. Conversely removal of the female subjects strengthened the association between impulsivity and habitual violence.

HISTORICAL FACTORS

CHILD ABUSE

A history of child abuse was elicited from 21.9% of the subjects, and did not differentiate the habitually violent, or those charged with violent offences from the others. The psychotic subjects were less likely to have histories of child abuse ($\chi^2=4.55$; $p=0.039$). Ostensibly, child abuse would seem to be an unimportant risk factor in this population.

Unfortunately, various considerations, which if controlled, could have altered this result. There was no procedure to check the validity of the information, especially as it depended on retrospective recollections. Although a decision was made to pool the reports from the subjects and collateral sources there is a possibility that there was general under-reporting. This was most prominent amongst the psychotic subjects, where possibly greater guilt or shame by collateral informants (for being responsible for the subject's illness) may have occurred.

Child abuse is poorly defined, and probably also includes neglect, which is also difficult to define (especially for research purposes) in an impoverished population. Luntz and Widom (1994c) defined neglect as reflecting

“a judgement that the parents' deficiencies in child care were beyond those found acceptable by community and professional standards at the time. These represented

extreme failure to provide adequate food, clothing, shelter and/or medical attention to children” p.674.

For many in South Africa, who may have grown up in informal settlements or apartheid-decreed complexes, child neglect could have been caused by poverty and social disruption, and not wilful dereliction of parenting. This study could not determine how to measure these meaningfully.

CONDUCT DISORDER

Conduct disorder was evident in 41.9%, and although not related to a violent index offence, was significantly associated with habitual violence (chi sq=6.885; p=0.009). Psychotic subjects were less likely to have histories of conduct disorder (chi sq=5.88; p=0.015).

The finding that the psychotic subjects were less likely to have a history of conduct disorder contrasts with the overwhelming finding that 11 of the 14 psychotic subjects, and 10 of the 11 schizophrenic subjects with histories of conduct disorder were also habitually violent. There is an increasing recognition that violent psychotics, especially those with schizophrenia, have a bimodal distribution of onset of the behaviour (Hodgins 1992; Hodgins, Mednick, Brennan, Schulsinger, & Engberg 1996c). Certainly, in this population, habitual violence in psychotic individuals most likely has its roots in youthful antisocial behaviour. The psychosis possibly acts as an additional disinhibitory factor, especially if aggravated by psychotic symptoms.

As noted before there were no age differences between the habitually violent and other subjects. Although it proved difficult to establish retrospectively precisely the ages of onset of the conduct disorder, it seemed reasonably clear that the onset of habitual violence occurs during adolescence, and that the behaviour is already entrenched when they are referred to forensic psychiatric units. Conduct disorder has, in recent years, been characterised as a symptom complex that is a manifestation of other disorders, such as attention deficit hyperactivity disorder (ADHD) and mood disorders (primarily unrecognised mania) (Bach-y-Rita, Lion, Climent, & Ervin 1971; Leheup & Pearce 1993; Mannuzza, Gittelman-Klein, Konig, & Giampino 1989; Myers, Stewart, & Brown 1998; Renouf, Kovacs, & Mukerji 1997; Robins & Price 1991; Satterfield & Schell 1997; Storm-Mathisen & Vaglum 1994).

It is not simply that there is a connection between childhood aggressivity and adult violence. The early study by Morris et al (1956), which followed 90 aggressive children (under 15 years old) over a 20 year period, documented a variety of psychopathologies in their subjects, yet only one eventually had committed a violent crime. Conversely an evaluation of 103 children at an outpatient clinic in the Bronx concluded that assaultiveness in latency age children was not related to general antisocial behaviour (such as lying, stealing etc), but to an absence of mood and anxiety symptoms, and parental assaultiveness.

However, what is clear from many sources is that general versatility of antisocial behaviour, especially if it involves violence (such as fighting with weapons, sexual offending, arson), and substance /alcohol abuse, combined with an early age of onset carries a strong risk of adult antisocial behaviour (Mannuzza, Gittelman-Klein, Konig, & Giampino 1989; Myers, Stewart, & Brown 1998; Rasanen et al. 1998; Storm-Mathisen & Vaglum 1994). These are

surely related to psychopathy, which increasingly has been established as one of the strongest risk factors for violence in adolescence (Dolan & Doyle 2000; Mailloux, Forth, & Kroner 1997; Rutherford, Cacciola, & Alterman 1999; Zuckerman 1978).

The weakness of this finding is that it could not be established retrospectively whether subjects had symptoms of ADHD, or precisely when the onset of symptoms (especially substance abuse and aggressivity) was. However, pending more detailed investigations in this population, logic dictates that conduct disorder should be regarded as an umbrella of risks, and that future risk management strategies need to home in on juveniles more, especially in those who at risk for developing a psychotic illness.

HISTORY OF PSYCHIATRIC ADMISSIONS

Just over half (50.3%) had had previous admissions to psychiatric facilities with an average of 1.82 admissions (and a maximum of 15 admissions). Overall, this translated to duration of illness of 2.7 years (with a maximum of 25 years) before arrest. When only those with positive psychiatric histories were scrutinised, their average duration of illness was 5.09 years, with an average of 3.6 previous admissions. Almost 24% of the subjects were referred for observation because of prior psychiatric history, which means that the court was unaware that a further quarter also had psychiatric histories. All the psychotic subjects were referred either because of a past psychiatric history (33%), or because their behaviour in court or in the community provoked concern about their mental state.

Schizophrenia, overwhelmingly, was the diagnosis conferred on subjects during their previous admissions. Substance abuse and mood disorders were the next most frequent diagnoses. The stability, or reliability, of the previous diagnoses was questionable, as only 74% of those previously diagnosed with schizophrenia were actually so diagnosed during the observation, and conversely those who had previously been diagnosed with 'toxic psychosis', bipolar affective disorder, antisocial personality disorder, and organic delusional disorder were now diagnosed with schizophrenia. Only 5 subjects with no previous psychiatric history were psychotic during the assessment, of which 3 were eventually diagnosed with schizophrenia.

A positive family history of psychiatric disorder was significant only for the psychotic subjects. This finding is obviously related more to the nature of the illness than criminal behaviour, despite the intriguing genetic relationship that has been established between schizophrenic probands and criminal behaviour in parents or offspring (Hodgins, Mednick, Brennan, Schulsinger, & Engberg 1996c; Mednick, Gabrielli, & Hutchings 1984; Mednick, Gabrielli, & Hutchings 1987a; Moffitt, Mednick, & Gabrielli 1989).

Although 40.6% of those with violent index offences had had previous psychiatric admissions (with an average of 1.61), this group was less likely to have histories of psychiatric admissions ($\chi^2 = 4.72$; $p = 0.03$). Their average duration of illness was 2.80 years. However, those subjects with positive psychiatric histories, and charged with violent offences, had a mean of 3.96 admissions, and had been ill for an average of 6.75 years, which did not differ significantly from the others. Just over 20% had been referred because of previous psychiatric admissions.

A history of previous admissions to psychiatric hospitals was evident in 58.3% of the habitually violent group (with an average of 2.43 admissions), which was a significantly positive association ($\chi^2 = 6.52$; $p = 0.01$). The habitually violent also had been admitted more often ($F = 12.35$; $p = 0.001$). Those who were habitually violent and had histories of psychiatric admissions had an average of 4.16 admissions ($F = 6.86$; $p = 0.011$), and mean duration of illness of 6.06 years ($F = 5.62$; $p = 0.02$). Again, it is noteworthy that only 26% of these subjects were referred by the courts because of their psychiatric histories.

Not surprisingly 86% of the psychotic subjects, with an average of 3.98 admissions, had a significant history of having previously been admitted ($\chi^2 = 37.58$; $p = 0.000$). This does mean that for 14% ($n = 7$) the forensic evaluation was their first contact with psychiatric facilities, of which only 2 had committed a violent offence. On average they had been ill for a mean of 8.23 years ($F = 110.09$; $p = 0.000$). The habitually violent psychotic subjects had a mean of 4.56 admissions ($F = 4.86$; $p = 0.03$), and had been ill for an average of 8.69 years ($F = 4.98$; $p = 0.03$), which differed significantly from the other psychotic subjects. Although those psychotic subjects charged with violent index offences had had an average of 4.05 admissions and duration of illness of 9.73 years they did not differ from the other psychotic subjects.

In contrast with other studies, such as that conducted in Camberwell, violent psychotic individuals usually have impressive histories of at least 4-years of illness and recurrent admissions (Wessely, Castle, & Douglas 1994). It is rare for a violent psychotic person to present to forensic facilities before having had past contact with psychiatric services. This implies that risk management should, as a priority, concentrate on those patients who are hospital recidivists.

Neither a history of suicide attempts or self-mutilation was an important risk factor. In the general sample 24.5% had previously attempted suicide, but only 2.6% (n=4) admitted to the practice of self mutilation. The latter was therefore disregarded as a useful factor because its prevalence was too low.

Attempted suicide was relatively common, even among the habitually violent, i.e. 25%. There are no data on the prevalence of attempted suicides in the general population of South Africa. It can, nevertheless, be assumed that the rate in the community is considerably less than 25%. In other words, an offender population that has a high rate of previous psychiatric admissions probably also has a high rate of attempted suicide, which may be a sign of mood disorder as well as another example of manipulative behaviour that is often described in this group (Gunn 1974;Gunn, Madden, & Swinton 1991;Gunn & Taylor 1995c).

Perhaps the previously described relationship between suicidality and violence is actually mediated via depressed mood, anxiety and general propensity for impulsivity, as proposed by Apter et al (1993g; 1990c). In fact a recent Italian study of 134 depressed outpatients concluded that measures of aggression did not correlate with suicidality, which was actually most strongly associated with feelings of resentment and guilt (Castrogiovanni, Pieraccini, & Di Muro 1998). Nevertheless, there is some consensus that suicidality and violent behaviour are somehow linked via decreased serotonergic neurotransmission in the brain (Cohen, Llorente, & Eisdorfer 1998;Mann 1998;Roy & Linnoila 1988;Spittle, Bragan, & James 1976;Virkkunen, De Jong, Bartko, & Linnoila 1989a;Williams, Davidson, & Montgomery 1980).

The following conclusions appear to be inescapable:

- a. There have been no surveys of psychiatric disorder in criminal defendants in South Africa, but it is unlikely that an investigation of any remand sample would reveal that 50% had previously been admitted to psychiatric hospitals. However, there is convincing evidence from other countries that remand prisoners suffer high rates of psychiatric illness, with prevalence rates that range from 30-50% (Brooke, Taylor, Gunn, & Maden 1996;Gunn 1977d;Purchase, Kennedy, & McCallum 1996;Robertson et al. 1994;Shaw, Creed, Price, Huxley, & Tomenson 1999;Swank & Winer 1976). The number of subjects referred on the grounds of a past psychiatric contact was actually about half the actual rate, and was consistently about 20% of the habitually violent, and violent index offence groups, except that this was a consideration in one third of the psychotic subjects. Obviously defendants do not routinely reveal their psychiatric histories in court, and when the courts decide to refer on these grounds neither the nature of the index offence nor the defendant's propensity for violence are taken into consideration.

Almost two thirds (61.3%) of subjects had a criminal history, with a mean of 2.19 past convictions. Most of the subjects have circulated repeatedly between prisons and psychiatric hospitals, which fits the usual profile of forensic psychiatry patients (Grounds, Snowden, & Taylor 1995;Gunn 1977d;Gunn 2000;Gunn & Robertson 1976;Gunn & Taylor 1995c). Therefore, it is reasonable to assume that the findings from this study group can be generalised, at the least, to those individuals whom psychiatrists are asked to assess for the courts. Possibly these findings could be

extended to all remand prisoners, to a degree, considering the consistent findings (in other countries) of their high prevalence of psychiatric disorder.

- b. Habitual violence is related to a history of psychiatric admissions, a higher number of admissions and longer duration of illness. It was not possible to establish whether the violence predated, or appeared after the onset of the disorder, as these data were collected retrospectively. They could not be classified as early or late starters of antisocial behaviour (Hodgins 1992). However, psychotic subjects were less likely to have histories of conduct disorder, which seems to suggest that the onset of their criminality and mental illness probably occurred during early adulthood, and are related.

At the time of this contact those with psychiatric histories had had an average of just 4 admissions, over a 6 year period, but more telling is that the psychotic subjects had an average of 4.5 admissions, but over a period of nearly 9 years²⁹. A closer analysis of the psychotic subjects revealed that the habitually violent had been ill for an average of 9.22 years (that for the non-violent subjects' was 4.37 years), a significant difference ($F=4.43$; $p=0.042$), and had had an average of 4.5 previous admissions ($F=4.86$; $p=0.032$). Only 5 subjects had never had previous contact with psychiatric services.

A striking finding was that 64% of the psychotic subjects (and 71.4% of the schizophrenics) had histories of criminal convictions. Moreover, 38.5% of the psychotic subjects, and 40% of the schizophrenics, had convictions for violent offences. These figures are somewhat higher than those reported for general

²⁹ It may seem superficially that psychotic subjects are admitted less frequently over a longer period. More likely the psychotic subjects are admitted for much longer periods, and are followed up more closely in the community.

psychotic populations, which have found that although more than 40% have arrest records, a small minority have convictions for violent offences (Holcomb & Ahr 1988; Sosowsky 1978).

Certainly this sample represents a group of antisocial mentally ill offenders that have circulated considerably through both the general psychiatric and criminal justice systems before referral to the forensic psychiatric service.

In short, a long psychiatric history (with a duration of illness of more than 6-8 years) combined with a criminal record is an important risk factor.

ALCOHOL AND SUBSTANCE ABUSE

Only 3.2 % of the subjects were referred because of concerns that their alcohol or substance abuse had impacted on their mental state. Nevertheless, abuse of any substance was elicited in 77.4%, of which alcohol abuse was present in 61.9%, cannabis abuse in 56.8%, and methaqualone in 29.7%. Cannabis was abused without methaqualone in 27.1%. Only 46 (29.7%) abused only one substance, the rest abused mixtures. It was therefore difficult to determine whether the substance itself, its combination with other substances, or whether abuse per se (regardless of which substance in particular was abused) was the most important factor.

The overall prevalence of substance and alcohol abuse in this sample agrees closely to the general range of between 60-80% rates found in other clinical, remand and prison surveys (Brooke, Taylor, Gunn, & Maden 1996; Cote & Hodgins 1990; Durbin, Pasewark, & Albers

1977;Eronen 1995;Gelberg, Linn, & Leake 1988;Nicol et al. 1973;Reiss & Roth 1993;Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998;Yesavage & Zarcone 1983;Zhang, Wiczorek, & Welte 1997). Unlike in other countries Western Cape offenders abuse predominantly alcohol, cannabis and methaqualone, and not stimulants or narcotics. Cocaine abuse in its various forms, in particular, has been associated strongly with violent behaviour (Rutherford, Cacciola, & Alterman 1999;Yudofsky, Silver, & Hales 1993).

The most robust finding was that abuse of any substance was very strongly associated with habitual violence ($\chi^2=6.19$; $p=0.009$), but that none of the substances alone was important, other than that methaqualone abuse was less likely to be associated with a violent index offence. This lack of specific associations persisted even when the analysis considered the psychotic subjects.

These data do seem to agree with other major findings. In the ECA study alcoholism alone was not strongly associated with violence as 75% of alcoholics were not violent (Swanson, Holzer, Ganju, & et al. 1990). They calculated that substance abuse generally was associated with the highest rates of violence, and that when such abuse was added to major psychiatric disorder (especially a psychotic disorder) the risk increased almost by a factor of 20. Similarly in the MacArthur follow-up of discharged psychiatric patients the 1-year prevalence of violence in non-substance abusers with a major psychiatric disorder was 17.9%, 31.1% for those with a substance abuse diagnosis, but 43% for those diagnosed with substance abuse and some other psychiatric disorder (i.e. personality disorder) (Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998).

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Further analysis of the data revealed that any abuse was significantly associated with having either an axis 1 ($\chi^2=7.57$; $p=0.005$) or axis 2 diagnosis ($\chi^2=6.23$; $p=0.01$)³⁰.

Similarly, abusers scored higher on the ZSS ($F=14.8$; $p=0.0001$), including the subscales of thrill and adventure ($F=5.63$; $p=0.02$), experience seeking ($F=4.79$; $p=0.03$), disinhibition ($F=17.21$; $p=0.00$), but not boredom susceptibility. Differences on the BIS were not significant. Abusers also had more previous criminal convictions ($F=7.45$; $p=0.007$), especially for violent offences ($F=4.34$; $p=0.039$), but did not differ in number of previous admissions or duration of illness.

The concluding impression is that substance and alcohol abuse probably in themselves are not causes of violent offending, but are markers of habitual violence, or amplify an already extant predisposition to be violent.

PRE-EXISTING MEDICAL CONDITIONS

A pre-existing medical condition was elicited in 39.4%, and epilepsy in 16.1%. Only one subject (0.06%) had been referred because of his epilepsy. Twelve of the 25 epileptics (48%) had histories of head injury, which was significantly more frequent than in the other subjects ($\chi^2=7.11$; $p=0.01$), but did not differ from the other epileptics in terms of psychiatric admissions, diagnosis of a psychotic illness, or criminal record.

It was not possible to determine whether medical illness, including epilepsy, occurred at a rate much higher than that found in the general offender population. Nevertheless, these

³⁰ Alcohol and substance abuse disorders were not included as axis 1 disorders, as they were considered separately to facilitate statistical analysis

findings did not assist in differentiating those who have committed a violent index offence, or are habitually violent from the others. The high rate of physical disability probably reflects on the degree of impoverishment that accompanies the average offender in South Africa, and not on the quality of his, or her behaviour.

Head Injury

In the general sample 26.5% provided a history of head injury, in contrast to the 5.2% that had actually volunteered a history of head injury in court to motivate for psychiatric observation. There is an impressive literature linking head injury, especially damage to the fronto-temporal regions (with special reference to the frontal orbital cortex), with poor impulse control and aggressivity (Grafman, Schwab, & Warden 1996; Lishman 1998c; Max et al. 1998).

The rate of head injury in this group is probably 10 times that found in the general population, and obviously the validity of this information has to be questioned. Subjects and collateral sources were asked whether there was a history of at least one hour of unconsciousness following a head injury with hospitalisation. Unfortunately for most hospital records could not be traced (as the injury had occurred many years previously, or they had been admitted to a regional hospital that was far from Cape Town).

Considering the high rate of alcohol abuse in this population it is possible that many of the reported head injuries may have been sustained during drunken brawls, and although obviously injured the individual actually may have appeared to be unconscious because of

the prevailing state of intoxication, and not because a serious head injury had occurred. But as noted above there was a significant association between a diagnosis of epilepsy and a history of head injury. This implies that many must have been suffering the consequences of significant head injuries.

With the information that was elicited it was not possible to use a history of head injury to differentiate between the habitually violent, or those charged with violent index offences from the others. As Lishman (1998c) has noted, the effects of head injuries are so diverse, ranging from a subtle coarsening of social manners to repetitive outbursts of rage, that in this sample head injury alone cannot be used as a risk factor.

In conclusion:

- a. If these data are valid then they are cause of great concern, as they may indicate that a great many offenders in South Africa have suffered a head injury in the past. Frontal lobe damage can cause poor social judgement and impulsivity, which are often important ingredients that contribute to general criminality. As Raine et al (1996b) have demonstrated, early neuromotor damage (usually due to perinatal injury) combined with a poor psychosocial environments produces a risk of 2.5 times of adult criminality, and also of violence. This may be the situation in South Africa, where head injury combined with impoverished environments likewise results in increased risk of criminality.
- b. The consequences of head injury in offenders in South Africa are worthy of further study. In particular, more attention will have to be given to the types of head injuries, Glasgow Coma Scale scores, the length of the post-traumatic amnesia, and

post-injury adjustment. Unfortunately these aspects were beyond the scope of this study.

CRIMINAL HISTORY

Almost two thirds (61.3%) had a criminal record (with an average of 2.19 convictions), and 29% had been previously convicted for a violent offence, at an average of 0.63 convictions. Similarly 60.9% of those referred following a violent index offence had a criminal record, with an average of 2.16 convictions, of which 43.5% had previous convictions for violent offences, a significant difference from the others (chi sq 12.67; $p=0.0004$). They also had a significantly higher mean of 0.90 violent convictions ($F=3.79$; $p=0.037$) if the female subjects were removed from the analysis. Despite the strong association between violent index offence and past violent convictions some caution should be exercised. Just less than 40% of these did not have any criminal record, and nearly 58% had never been convicted of a violent offence.

This obviously means that although one could correctly assume that an offender with a previous violent conviction presents a risk of violence, one would also have to concede that the absence of a violent conviction is not helpful. The problem is compounded when one realises that almost 60% of those charged with a violent offence could not have been previously correctly identified, if one used only the criminal record as a guide.

Fully 67.7% of the habitually violent had criminal records, and 45.8% had convictions for violent offences (with an average of 1 previous conviction). This also means that 54.2% of

the habitually violent were so classified because of self-reports or collateral information from families despite having no convictions for violent offences.

The mentally disordered subjects had similar conviction rates as the others. However, 71.4% of the schizophrenic subjects had a criminal record, which although slightly higher than the rest was not significantly so.

In other words, a criminal record does not help identify more than half of those who are habitually violent, and that even the habitually violent commit a great number of non-violent offences. Most workers have noted that convictions form the pinnacle of a pyramid of crime, which stands on a very wide base of actual crime, which lies under increasingly smaller wedges of reports to the police, actual arrests, and penultimately indictments (Chaiken, Chaiken, & Rhodes 1994d; Reiss & Roth 1993). Despite some reports that mentally ill individuals do seem to be arrested more frequently than other groups the conviction records of psychotic subjects did not distinguish them from the others.

SUMMARY

A history of child abuse did not assist in differentiating between the groups. The possible reasons were that it proved difficult to delineate from child neglect and other consequences of impoverishment, and that retrospectively memories for abuse could be unreliable.

A history of conduct disorder was strongly associated with habitual violence, which implies that the onset of habitual violence occurs during childhood or adolescence, or that conduct

disorder leads to habitual violence. This also supports the view that habitual violence has its origins in general antisocial behaviour. Even the psychotic subjects that were identified as being habitually violent overwhelmingly had histories of conduct disorder, which probably means that conduct disorder has similar significance in this group.

A history of previous psychiatric admissions, and longer duration of mental disorder, was more evident in the habitually violent, but less so in those referred for a violent index offence. Habitually violent psychotic subjects likewise had more previous admissions and longer duration of illness than the other psychotic subjects.

No specific pattern of alcohol or substance abuse seemed to be important, but the existence of any substance or alcohol abuse was associated with habitual violence. This was taken to indicate that substance abuse was a manifestation of an underlying personality characteristic, and not a factor that operated independently.

Although the general sample had a high rate of pre-existing medical conditions, including epilepsy and histories of head injury, these were not significant as differentiators.

A criminal record, especially of convictions for violent offences, was linked strongly to a violent index offence. But more than half of the habitually violent did not have past convictions for violent offences, and 70% of those referred for a violent index offence similarly did not have past violent convictions.

THE DYNAMIC FACTORS

SITUATIONAL FACTORS

Antecedent factors conspire to produce violence when significant circumstances are present. This section discusses the situational factors that contributed to the emergence of a violent index offence, and to the behaviour of the habitually violent.

THE INDEX OFFENCE

The subjects had been referred following a wide diversity of offences. Murder (11.0%), assault (14.8%), theft (16.1%), housebreaking (14.2%), and damage to property (7.1%) were the most common offences. Sex offences constituted 9.6% of the offences.

It may seem contentious to polarise the offences into either violent or non-violent groups, especially as much research has concentrated on particular types of offences, especially the various sex offences. However, even those who confined their investigations into risk assessment for sex offenders have always conceded that these offenders usually have committed a variety of other offences, including violent offences (Canter & Heritage 1989; Grubin 1997). Conversely, as Chaiken et al concluded (1994d) from their own research and after reviewing other surveys, 'violent predators' (who are incarcerated for robbery, assault, murder and drug dealing) are just as likely to have an arrest history of rape as those actually serving time for rape. Neurobiological findings have also generally

considered violence to be a generic behaviour that is released when usual controls are inadequate or overwhelmed (Pietrini et al. 2000; Volavka 1995).

In 69 (44.5%) of the general group the index charge was violent. A history of habitual violence was evident in 53 (76.81%) of those charged with a violent index offence. Conversely, the index charge was violent in 53 (55.2%) of the habitually violent. Among those eventually declared mentally ill the index charge was violent in 15 (38.5%). The association between violent index offence and habitual violence was highly significant ($\chi^2=12.003$; $p=0.0005$). Therefore, the old adage that previous violence predicts future violence appears superficially to hold true. Certain caveats need to be expressed. Sixteen (23.2%) of those charged with a violent offence did not have histories of habitual violence, which means that they would have been incorrectly labelled as habitually violent if only the index offence was considered. Most authorities that have reflected on the prediction of dangerousness have assumed that the best one could achieve is to predict 75% of true positive cases (Apperson, Mulvey, & Lidz 1993f; Cocozza & Steadman 1978; Gunn & Taylor 1995c; Megargee 1981; Monahan 1995b; Mossman 2000). Similarly 43 (44.8%) of the habitually violent were referred following a non-violent index offence, which means that if one just focussed on the violence of the index offence one would miss more than half of the habitually violent offenders, who had been referred following less serious offences.

ACCOMPLICES

Only 11% of the subjects committed the index offence with others. Violent index offences were committed with accomplices in 7.2%, and 12.5% of the habitually violent were accompanied by others. None of these produced significant results.

These data do suggest that almost 90% of defendants that are referred for psychiatric assessment are lone offenders. Two reasons are possible; firstly, most crime is committed by lone individuals, and secondly, the courts are less likely to refer a defendant who is one of many for assessment (as the circumstances of the crime seem more understandable when more than two offend in concert). This study, however, did not elicit whether subjects were members of any local gang, because many gangsters tend to deny their affiliations. Future research will have to explore whether gang membership contributes significantly to habitual violence (or, rather, whether the habitually violent are drawn to gang membership).

INTOXICATION DURING THE PERIOD OF THE INDEX OFFENCE

Intoxication with any substance during the index offence was elicited in 38.1% in the general sample, in 44.9% of those referred following a violent index offence, and in 40.6% of the habitually violent. Being intoxicated in general (by any substance) was not linked to either a violent index offence, or a history of habitual violence.

The psychotic subjects were less likely to be intoxicated during a violent index offence ($\chi^2=4.81$; $p=0.028$). This latter finding appears to contradict the now well-known robust relationship between substance abuse, psychiatric disorder and violence (Scott, Johnson, Menezes, Thornicraft, Marshall, Bindman, Bebbington, & Kuipers 1998; Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998; Swanson, Holzer, Ganju, & et al. 1990). However most studies have investigated self-reported violent behaviour and not violent offending, and on closer analysis did not always distinguish between personality, mood and psychotic disorders. Substance abuse is relatively common among

psychotic individuals, but may not be as important as psychotic symptoms as causal factors for violent offending.

Intoxication with Alcohol

Alcohol was an intoxicant in 31.5% of all cases (either alone or in combination with other substances). Similarly it was an intoxicant in 43.4% of the violent index offences, and 34.4% of the habitually violent were intoxicated with alcohol during commission of the index offence. Therefore, despite the greater variety of substances that were listed in their histories of abuse the subjects had predominantly used alcohol as an intoxicant just before the index offence, and rarely had been intoxicated with cannabis and methaqualone (that is, almost 4 times less frequently).

Alcohol intoxication was significantly associated with a violent index offence (chi sq.=8.09; $p=0.004$). The habitually violent were not more likely to have been intoxicated with alcohol during their index offences, except when committing a violent offence (chi sq.=10.19; $p=0.002$).

Alcohol intoxication during the offence and a history of alcohol abuse were very strongly intertwined (chi sq.=23.59; $p=0.000$). Only 9.8% of those intoxicated during the index offence, and 20% of those charged with a violent offence, had no history of alcohol abuse. But 52 of the 96 (ie. 54.2%) who had histories of alcohol abuse (and 17 out of 43 (39.5%) of these who were charged with a violent index offences) were not intoxicated during the index offence. In other words, almost half of those with histories of alcohol abuse were

not intoxicated at the time of the index offence, but almost all of those who were intoxicated had histories of alcohol abuse.

As noted previously, alcohol abuse is related to habitual violence, probably as an indicator of an underlying predisposition towards aggressive dyscontrol. Two inter-related phenomena probably account for this. Firstly, a genetically determined characterological temperament (such as Cloninger's 'male-limited' alcoholics) predisposes to alcohol abuse and impulsivity (with periodic dyscontrol). Secondly, long-term abuse either exacerbates or causes a baseline low state of brain serotonergic activity, so that intoxication serves as a serotonin challenge, and thereby triggers aggressive dyscontrol. Obviously many alcohol abusers do not need to be intoxicated to behave violently, which probably means that both their abuse and violence are caused by other factors (even though they may actually interact).

Interestingly, psychotic subjects were less likely to be intoxicated with alcohol when committing any offence (chi sq.=9.56; $p=0.002$), or even a violent offence (chi sq.=6.04; $p=0.014$). This occurred despite the fact that the psychotic subjects were not different from the others with respect to having histories of alcohol abuse. A possible explanation is that psychotic symptoms provoke violence more strongly than intoxication, probably by enhancing perceptions of threat rather than by facilitating disinhibition (Link & Stueve 1995).

Intoxication with Cannabis

Only 5.8% of the subjects were intoxicated solely with cannabis, of which one subject had committed a violent index offence, and 6.3% of the habitually violent were intoxicated with

cannabis during the index offence. When combined with either methaqualone or alcohol, cannabis intoxication occurred in 15.4% of the subjects.

Cannabis intoxication did not differentiate a violent index offence or habitual violence from the others. There was perhaps a trend that habitually violent subjects seemed to be less likely to be intoxicated with cannabis if they had committed a violent index offence (chi sq.=3.63; p=0.057).

Cannabis intoxication does not seem to be a significant contributor to offending behaviour, and certainly not clearly to violent offences. This may support an oft expressed view that cannabis reduces aggression, and that criminal behaviour occurs as a result of poor judgement and not disinhibition (Ashton 2001; Moss & Tarter 1993). The relationship between cannabis and aggression requires further investigation. For psychotic individuals cannabis (and other substances) may interfere with medication compliance and therefore indirectly cause relapses, which in turn result in symptom-motivated violence (Swartz.M.S., Swanson, Hiday, Borum, Wagner, & Burns 1998). There are authorities, though that insist that cannabis causes psychosis, which then can lead to disinhibited aggressiveness, presumably via delusions or manic symptoms (Abel 1977; Goff et al. 1991). It is generally accepted that psychotic individuals, especially those suffering from schizophrenia generally do abuse cannabis regularly.

Intoxication with Methaqualone (Mandrax)

Unfortunately, too few subjects were intoxicated with methaqualone for meaningful analysis. Of the 5 that had been intoxicated with methaqualone, 4 committed violent index

offences. To date one study on methaqualone intoxication seems to have been published, and it merely documented that an appreciable number of victims of trauma (in a Cape Town hospital) tested positive for methaqualone (Peden et al. 2000). As it is a barbiturate its effects essentially are somnolence, some impulsiveness and poor judgement. Therefore intoxication usually leads to self-inflicted injuries (including vehicular fatalities) and not violence (Wetli 1983). In South Africa, unlike as in other countries where methaqualone is abused as an ingested pill, methaqualone is smoked as a powder mixed with cannabis. It is well known that differing qualities of street methaqualone are sold, and the quality depends on the amount of pure methaqualone present in the pill. The cheaper versions are known to contain contaminants, such as benzodiazepines, talc powder or any other white powdery material³¹. Observed effects following methaqualone use could be due to the unique combinations of cannabis and the drug, or additionally to the active contaminants. Therefore, there are methodological difficulties in investigating this substance, even though its abuse is widespread in the Cape. To date there are no studies that have investigated the influence of methaqualone intoxication on offending behaviour.

PROVOCATION

For 31.6% a provocation preceded the commission of the index offence, of which 20.6% reported having experienced a verbal provocation, and 11% believed that they were under physical threat. Violent index offences were preceded by a verbal provocation in 37.7%, and by a physical threat in 21.7%. Some form of provocation was present in 59.4% in the violent offences, a highly significant association ($\chi^2=46.99$; $p=0.000$). Similarly, 38.5% of the habitually violent subjects reported having experienced a provocation, in which 25%

³¹ This information was obtained from unpublished research conducted by Dr G McCarthy in the Department of Pharmacology, UCT.

was verbal and 13.5% a physical threat, also a significant association ($\chi^2 = 5.819$; $p=0.016$). But the habitually violent group was not more likely to have committed a violent offence following a provocation compared to the others that had committed a violent index offence.

Despite their low numbers 40% of psychotic subjects had responded to provocation before committing a violent offence. Unlike the others, the psychotic subjects seemed to be as likely to report having experienced verbal or physical provocation, instead of twice as likely to have had verbal provocation as the other violent offenders. These findings should be coupled to the significant associations between delusions of persecution, a history of issuing threats and violence (Linaker & Busch-Iversen 1995; Taylor 1985b). Psychotic individuals may feel under constant threat, probably because of the content of their delusions as well as a cognitive inability to understand social cues properly. They are therefore more likely to interpret innocuous events (such as simple physical gestures) as ominous harbingers.

In all scenarios, whether general commission of any offence, or of a violent offence, subjects responded to verbal provocation almost twice as often as to a perception of being under physical threat. Also it is worth noting that 40.6% of the violent index offences were not preceded by provocation. These latter offences were possibly committed by predatory-like behaviour, which included many of the sexual and robbery offences.

Despite the strength of association between provocation and violence this study could not establish whether the subjects' reports of provocation were not merely post facto excuses. This does not mean that the provocations did not occur, but rather that the individual

primed himself beforehand to respond catastrophically to certain cues. In the Western Cape it is well known that certain specific verbal taunts will almost always elicit a violent response in others, and in fact, if one does not respond aggressively to such taunts one's standing amongst peers diminishes.

This does indicate that future research (which would have to be qualitative) and risk management interventions could concentrate on the cultural meanings of known triggers for aggression. The specific natures of the various types of provocation were not recorded here, which did result in a loss of potentially rich clinical material.

NATURE OF ACTIONS

Essentially these results assessed the degree of reflection that subjects exercised before committing the offence. Their actions generally were impulsive in 45%, premeditated in 24.5% and had been foreplanned in 29.7%. Violent offences were foreplanned in only 14.5% ($\chi^2=13.74; p=0.00002$), and were mostly impulsive (53.6%). Although more than half of the violent offences were committed impulsively this did not differ from the other offences. This means that most offences are committed impulsively, in which a previously primed individual acts without reflection, because certain 'optimal' opportunities or circumstances have occurred.

The habitually violent and psychotic individuals were much more likely to have acted impulsively generally, but again, not more so when committing a violent offence. Of the habitually violent 52.1% had acted impulsively ($\chi^2=4.99; p=0.045$), and only 22.9% had planned ahead ($\chi^2=5.52; p=0.019$). Also 71.8% of the psychotic group (including

62.9% of those suffering from schizophrenia) had been impulsive, which confirmed that psychotic individuals were very likely to commit any offence on the 'spur of the moment' ($\chi^2=14.18$; $p=0.0001$).

Impulsive behaviour during an offence probably enjoys a complicated relationship to violence. Only the habitually violent scored significantly higher on the BIS ($F=4.21$; $p=0.04$), which does indicate that although most offences are impulsive violent recidivism is more likely to occur in individuals with the personality traits of 'acting precipitously and without planning'. This begins to confirm to the increasing acceptance that a high degree of psychopathy (as measured by the Psychopath Checklist) incorporates these aspects of risk (Barratt 1990; Blackburn 1969; Blackburn 1986; Hare & McPherson 1984).

WEAPONS

A weapon was used or carried in 33.5% of all the offences, and in 59.4% of the violent offences. There was a highly significant association between commission of a violent index offence and use of a weapon ($\chi^2=34.37$; $p=0.000$), and those with histories of habitual violence were also more likely to use or carry a weapon during the commission of the index offence ($\chi^2= 5.87$; $p=0.015$). Amongst the habitually violent those who committed a violent offence the use of a weapon was also more frequent ($\chi^2=19.14$; $p=0.00001$).

The psychotic subjects were not more likely to carry or use a weapon.

Carrying of a weapon indicates that the individual anticipated having to use force to achieve an end. The use or carrying of a weapon was very strongly associated with a history of issuing threats ($\chi^2=12.76$; $p=0.000$), having responded following a

provocation ($\chi^2=46.12$; $p=0.000$), but not with the quality of actions during the offence ($\chi^2=4.45$; $p=0.11$), or higher scores on the BIS ($F=0.07$; $p=0.79$).

Of the 52 subjects that carried or used a weapon 11 committed non-violent offences, that is 21.2% of the offences that involved a weapon were non-violent. These latter weapons included guns ($n=5$), knives ($n=3$), axe ($n=1$), rake ($n=1$) and a golf club ($n=1$), which generally could be used to intimidate potential victims.

The most common weapon was a knife (30.4% of the violent offences), which is known is commonly carried for protection by people that anticipate criminal violence (Centers for Disease Control, 1991; Kellermann, Rivara, Rushforth, Banton, Elliott, Francisco, Locci, Prodzinski, Hackman, & Somes 1993).

Many of the other weapons were actually objects that just happened to be available at the time, and their use possibly indicated that the subject acted after some reflection (as he would have had to take some time to recognise and plan to use the object).

An appreciable number (40.6%) used their hands or feet instead of weapons, which supports the notion that most violence, although not unexpected in particular individuals, is mostly an unplanned act.

VICTIMS

Overall strangers (43.2%) were the most common victims. But 49.7% of the victims were known to the perpetrator; either as family (18.7%), or as friends/acquaintances (31.0%). In only 8.0% of the non-violent offences was family the victim. Violent index offences were most likely to have been committed on victims known to the perpetrator (chi sq=13.79; p=0.0002). The habitually violent did not have specific preferences, and the pattern of their victims resembled the others with respect to both the violent and non-violent offences. This latter finding probably indicates that habitually violent individuals engage in general criminal activity (and are unselective about the victims of their non-violent crimes), but conform to the usual pattern of assaulting those known to them. They display criminal versatility.

The psychotic subjects, including the schizophrenic subjects (chi sq=4.28; p=0.038), were more likely to commit offences against strangers (chi sq=9.22; p=0.003). This association was as strong for the violent offences (chi sq=9.34; p=0.002). Previous research has overwhelmingly concluded that most victims of psychotic violence are well known to the perpetrator, and family members (especially those who set limits, such as a parent) are most at risk (Carmen, Rieker, & Mills 1984; Chuang, Williams, & Dalby 1987; Virkkunen 1974). Yet there are documentations of random violence by psychotic (usually homeless) individuals (Martell 1991a; Martell & Dietz 1992; Ritchie, Dick, & Lingham 1994).

There are a few possible explanations for these contrary findings.

a. The psychotic offenders in this group were mostly homeless, or had few social supports, which could have meant that familiar or close people were not present as targets. As discussed above it was not possible to ascertain properly whether the subjects actually lived mostly with their families, or wandered about. Certainly, there is compelling evidence that strong supportive social networks decrease the occurrence of violent behaviour in mentally ill individuals (Estroff, Zimmer, Lachicotte, & Benoit 1994; Estroff & Zimmer 1994).

b. Families are often reluctant to report violence committed by a psychotic member.

Usually a combination of shame (that others will find out) and a fear of further retribution deter them. Often self-reports of violence (by the perpetrator) are more accurate than the information provided by close family members (Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998; Steadman, Monahan, Appelbaum, Grisso, Mulvey, Roth, Robbins, & Klassen 1994a; Swartz, M.S., Swanson, Hiday, Borum, Wagner, & Burns 1998).

The police are usually reluctant to lay charges against mentally ill individuals when they assault family members. Their reasons are that they believe they will be admitted to a psychiatric hospital regardless, and therefore refusal to allow families to lay charges saves them bureaucratic trouble. Most psychiatric practitioners have had this experience.

SUMMARY

There was a highly significant relationship between a violent index offence and a history of habitual violence. Nevertheless, 24% of those referred following a violent index offence had negative histories for violence, and almost 45% of the habitually violent were referred following non-violent offences.

Only alcohol intoxication was associated with violent offending. Habitually violent subjects were more likely to be intoxicated with alcohol when committing a violent offence.

Psychotic subjects were less likely to be intoxicated.

Provocation, whether verbal or physical, was a very important immediate precursor to violent offending for all the groups. Most of the offences were committed impulsively (or without planning). The use of a weapon (usually a knife) was characteristic of the violent offences, and the habitually violent carried a weapon more frequently (even when committing non-violent offences). Family members and friends (or acquaintances) were most likely to be the victims of the violent crimes. The psychotic subjects were violent more frequently against strangers.

CLINICAL AND DISPOSITIONAL FACTORS

A HISTORY OF ISSUING THREATS

In the general sample 51% had a history of issuing threats to commit violence. Of those who committed a violent index offence 69.6% ($\chi^2=17.21$; $p=0.00003$), and 72.9% ($\chi^2=52.23$; $p=0.000$) of the habitually violent were known to issue threats to commit violence. Similarly a psychotic disorder was significantly associated with a history of issuing threats ($\chi^2=5.02$; $p=0.025$), as 64% of the psychotic subjects had histories of threats.

The most salient observation is the relatively common occurrence of threats issued by all, and especially the strong relationship of threats to violent behaviour. There has long been anecdotal caveats concerning the gravity of threats, especially if homicidal (De Leon 1961; MacDonald 1963; MacDonald 1967), but few recent studies have systematically investigated their significance as precursors to violence. To date most research has focussed on whether psychiatric inpatients are threatening before lashing out while in the ward, with conflicting results (Apperson, Mulvey, & Lidz 1993f; Cooper 1988; Lidz, Mulvey, & Gardner 1993e; Linaker & Busch-Iversen 1995).

Unfortunately this study was unable to capture the qualitative nature of the threats. As MacDonald (1967) suggested the clinician has to differentiate between so-called idle threats from the expression of well elaborated plans. He nevertheless conceded that the former can lead to aggression, and the former is not always a reliable guide. In short, such individuals usually express threats far more often than with manifest physical aggression.

Nevertheless, threats do represent an important phenomenological dimension of aggression. They are either manifestations of ongoing, recurrent impulses of anger, or defensive outbursts by individuals that believe themselves to be under threat. Or both. Psychotic individuals, who especially may suffer from delusions of persecution, may experience these constantly, and their eventual violent behaviour may be a result of control override (Link, Andrews, & Cullen 1992). In fact, a history of issuing threats did occur more frequently in those who suffered from delusions of persecution ($\chi^2=3.90$; $p=0.038$).

PSYCHIATRIC DIAGNOSIS

Apart from alcohol and substance abuse, which were considered separately, 52.3% were given an axis 1 diagnosis, and 48.4% were considered to be personality disordered. These figures are considerably higher than those present in the general community, probably as these individuals were referred because the Courts had believed them to have psychiatric illnesses. As expected in forensic populations malingering was uncovered in 31.6%, which is consistent with findings in other units (Resnick 1993; Resnick 1999).

Axis 1 Diagnoses

The most common axis 1 diagnoses were schizophrenia (22.6%), bipolar affective disorder (6.5%), conduct disorder (5.2%), schizoaffective disorder (3.2%) and adjustment disorder (3.2%). Schizophrenia was diagnosed about 3 times more frequently as the next most common disorder, bipolar affective disorder, which is also more than 20 times its prevalence in the general community. This preponderance could be because the subjects were not selected randomly, but rather had originally been selected (by the courts), based

on the potential that they were psychiatrically ill. Nevertheless, it could reasonably have been expected that more of a larger range of disorders would have been present, as schizophrenia is not the only disorder that impairs competence to stand trial, or criminal capacity. Therefore, these data may be a compelling indication that in offender populations that may have psychiatric illness, schizophrenia would be the most prominent disorder.

In fact, substance and alcohol abuse were the most prevalent axis 1 disorder (as discussed above), and were present in nearly 80% of the subjects, which was almost 4 times the rate of schizophrenia. The association between having an axis 1 disorder and substance/alcohol abuse was highly significant ($\chi^2 = 7.57$; $p = 0.005$). This is consistent with current evidence that individuals with major psychiatric illness commonly abuse substances, the so-called 'double diagnosis'. However, it must be noted that an axis 1 diagnosis alone (without substance/alcohol abuse) did not distinguish the violent index offences, or the habitually violent from the others. Similarly, schizophrenia was not associated significantly with a violent index offence ($\chi^2 = 0.026$; $p = 0.51$), nor with habitual violence ($\chi^2 = 2.93$; $p = 0.063$).

But, psychosis (as a general state) was significantly associated with habitual violence ($\chi^2 = 7.26$; $p = 0.007$), and those who were declared mentally ill (that is, were not competent to stand trial) were also more likely to be habitually violent ($\chi^2 = 5.81$; $p = 0.016$). And of the 15 psychotic individuals charged with a violent index offence, 14 had histories of habitual violence.

These data confirm the growing evidence that mental disorder (which refers predominantly to psychotic illness) is a risk factor, especially if there is co-occurring substance abuse (Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998; Swanson,

Holzer, Ganju, & et al. 1990; Swartz, M.S., Swanson, Hiday, Borum, Wagner, & Burns 1998).

It is therefore helpful to explore the possible associations with the individual psychotic symptoms with violence.

Psychotic Symptoms

When specific psychotic symptoms were considered the only significant comparison found was that among those who were psychotic during the assessment thought withdrawal/insertion was more likely to be present in those who had committed a violent index offence. None of the other symptoms differentiated between the groups. Why thought withdrawal/insertion (which are delusions) should have been the only significant association in this group cannot be easily explained, especially as the literature has documented that virtually every possible type of psychotic symptom can be relevant.

It was not possible to confirm the association between delusions (as an all inclusive category), especially delusions of persecution, and violent offending that other influential studies have documented (Taylor 1985b; Taylor, Garety, Buchanan, Reed, Wessely, Ray, Dunn, & Grubin 1994; Taylor & Gunn 1984b). Even so, Taylor (1985b) has concluded that although delusions may have played a part in violent offending, that “(t)he most likely reason for serious violence within the psychotic group, however, was probably the psychosis itself” (p.496).

This general view is reinforced by other studies that have linked poor compliance with medication and substance abuse with violent behaviour, presumably because the interaction between these factors contribute greatly to relapse, which in turn increases the risk of violence (Lindqvist & Allebeck 1989; Soyka 2000; Swartz.M.S., Swanson, Hiday, Borum, Wagner, & Burns 1998; Torrey 1994).

In this study the motivations for offending were not recorded, and therefore it is possible that in many individual cases particular psychotic symptoms directed behaviour during the index offence. For example, it is well known that some psychotic individuals do indeed act on their delusions and/or command hallucinations (Humphreys, Johnstone, & MacMillan 1994; Junginger 1990; Junginger, Parks-Levy, & McGuire 1998; Shore, Filson, & Rae 1990), but obviously not enough do, which would result in an overall measures of significance. This latter point has been emphasised by Mulvey in his review (1994b) when he stated, firstly, that mental illness constituted a relative risk, but not absolute risk for violence³², and, secondly, that although the literature has demonstrated an association there is, as yet, no indication what the actual causal links between mental disorder and violence are.

Psychosis is probably, then, an important indicator of personal disorganisation.

Consequently, the psychotic individual experiences an awful inability to interpret many social cues, and cannot cope with perceived stresses in the environment. Most writers have emphasised that psychotic violence occurs in a context of excitement, panic, fear, fright, anger, or some other intense affective state (Kennedy 1992; Kennedy, Kemp, & Dyer 1992; Planansky & Johnson 1977b; Taylor 1985b; Taylor, Garety, Buchanan, Reed, Wessely,

³² That is, the numbers that actually are violent are too small to be important within the greater group of patients, but that within the group of violent individuals mental illness confers significant risk

Ray, Dunn, & Grubin 1994; Taylor & Gunn 1984b). Additionally, alcohol and substance abuse may add to the disorganisation either by causing greater disinhibition, or by aggravating their already impaired reality testing capacities.

Axis 2 Diagnoses

A personality disorder was diagnosed in 48.4%, of which antisocial personality disorder (58.7%) was by far the most prevalent, followed by dependent personality disorder (10.7%), mixed personality disorder (10.7%), narcissistic personality disorder (9.3%), and borderline personality disorder (6.7%). The prevalence of personality disorder, especially antisocial personality disorder, is obviously much higher than that present in the general community. There do not seem to be reliable surveys on the prevalence of personality disorders amongst offender populations. A patent reason may be that a pattern of criminality, including violent behaviour, is an important criterion for the category of antisocial personality disorder in the DSM classification system (American Psychiatric Association 1987).

In this population, a diagnosis of personality disorder did not significantly differentiate between the nature of the offences, or between the habitually violent and others, despite their high prevalence in the sample generally. Not surprisingly a diagnosis of antisocial personality disorder was more likely to be diagnosed in the habitually violent ($\chi^2=8.99$; $p=0.003$), because a pattern of violence was used as a diagnostic criterion (and probably was related to a wide range of other antisocial behaviours). The numbers of the other types of personality disorder were too low for further meaningful analysis.

This study did not use a structured interview schedule to diagnose personality disorders because there have been no investigations into the validity of such schedules in a deprived South African population. However the clinicians did use the criteria in DSM-III-R, and by consensus attempted to eliminate cultural bias. This, in truth, could not have been entirely possible, as offender populations here suffer double prejudice; firstly as they are predominantly members of a socio-politically disadvantaged group, and secondly as offenders whose criminal record influenced the conferment of diagnosis. DSM-IV specifically cautions on the use of antisocial personality disorder in sub-cultures in which antisocial behaviour may actually be adaptive (American Psychiatric Association 1994).

Nevertheless, there is a strong indication that a diagnosis of personality disorder in this population, although consonant with criminality generally (which by definition contributes to the diagnosis), is not helpful for characterising the violent individuals.

Borderline Intellectual Functioning and Mild Mental Retardation

Borderline intellectual functioning was diagnosed in 17.4%, and mild mental retardation in 9.0% in the general group. Amongst those charged with a violent index offence 20.3% had borderline intellectual functioning, and 10.1% mild mental retardation. Similarly, 20.8% of the habitually violent had borderline intellectual functioning, and 6.3% mild mental retardation.

The most prominent aspect of the above findings is that just over a quarter of the subjects were assessed as being below average intelligence. There are no reliable data on the numbers of low intellect offenders in South Africa. Surveys in the UK and USA have

tended to produce vastly varying figures, from as high as 60% to as low as 2.5% of offender populations (d'Orban et al. 1994). Low intelligence (and poor scholastic achievement) were listed as poor risk factors in the Cambridge longitudinal study of delinquents (Farrington 1991; Farrington 1995e). Nevertheless, the risk was for general criminality and not necessarily for violence.

The high percentages of low intelligence in the general sample could have been due to a combination of poor motivation by subjects during testing (a common problem in the forensic setting), poor education, a greater propensity to be caught, or obvious inability to understand court procedure.

Interestingly only 1.9% of the subjects were originally referred by the courts because of a concern about mental retardation. This does seem to confirm other observations that defendants generally in this country do not understand court procedure, either from lack of education or low cognitive functioning (Kaliski, Borchers, & Williams 1997).

ZUCKERMAN'S SENSATION SEEKING SCALE (ZSSS)

Considering that a maximum score of 40 is possible on the ZSSS the general sample's average score of 16.73 (sd=5.76; range 4-28) probably demonstrates that they were not generally high sensation seekers. The scores on the subtests were reasonably consistent, between an average of 3.6 for boredom susceptibility, and 5.0 for thrill and adventure. The non-significant correlations with age indicate that this effect was constant throughout the age groups and therefore could not be attributed to youthfulness, or ageing.

Those who were psychotic during the assessment scored higher on the ZSSS ($F=4.39$; $p=0.038$), and on the experience seeking subscale ($F=5.18$; $p=0.024$). There is the possibility that psychosis engenders sensation seeking by infusing the individual with feelings of grandiosity and invincibility. In a previous study, however, schizophrenics produced scores similar to those in this general sample, and only the thrill and adventure sub test differentiated significantly between the habitually violent and the others (Kaliski & Zabow 1995).

The Disinhibition subscale was the only scale that distinguished between those charged with violence index offences. Neither the ZSSS, nor any of its subscales, differentiated between the habitually violent and the rest. This implies that sensation seeking, and its correlates of novelty seeking, risk taking and low harm avoidance, are normal personality traits that are dispersed throughout the population (in varying degrees), and which do not necessarily contribute significantly to violent behaviour. In fact, these characteristics, even though probably genetically determined, have been associated with reckless antisocial behaviour only via the disinhibiting effects of alcohol (Cloninger & Gottesman 1987; Cloninger, Svrakic, & Przybeck 1993).

BARRATT'S IMPULSIVITY SCALE (BIS)

The mean score on the BIS for all the subjects was 24.86 (with almost two thirds scoring between 20 and 30), which was just more than half the possible maximum of 44 points.

Subjects that committed violent index offences, and psychotic subjects, did not score higher on the BIS.

The habitually violent subjects' mean score was 25.45, which was significantly higher than the others ($F=4.21$; $p=0.042$). When female subjects were removed from the analysis the significance strengthened ($F=5.29$; $p=0.023$). High BIS scores were not associated with having acted impulsively during the index offence ($F=0.19$; $p=0.66$), even though 71 (45.8%) were adjudged to have acted impulsively during the index offence (regardless of whether it was violent). Therefore the BIS helps with identifying a subset of impulsively aggressive individuals, who tend also to commit most of their offences impulsively.

This conforms, partly, to the findings of the Finnish studies that have concluded that impulsive aggression is due to neurobiological deficits in serotonin neurotransmission (Linnoila, Virkkunen, Scheinin, Shaner, Rimon, & Goodwin 1983; Virkkunen, De Jong, Bartko, & Linnoila 1989a; Virkkunen, Rawlings, Tokola, Poland, Guidotti, Nemeroff, Bissette, Kalogeras, Karonen, & Linnoila 1994). In most of these studies there was a strong association between alcohol abuse and impulsive aggression, which was not evident here ($F=0.524$; $p=0.47$). This lack of association persisted even when abuse of any substance was considered ($F=1.97$; $p=0.162$). The most probably explanation is that in this population alcohol and substance abuse were so common that the impulsivity trait was probably superceded (or submerged) by their overwhelmingly disinhibiting effects.

Impulsivity and violence are used as criteria for diagnosis of many personality disorders, and therefore could not be used as independent variables for comparisons on the BIS.

Despite the seemingly solid finding that habitual violence is associated with higher scores on the BIS it should be noted that the mean score for the habitually violent was 25.45 (with almost two thirds scoring between 21 and 29), which in real terms indicates that their actual degree of impulsivity is not very high. The scores on the BIS correlated highly with scores on the ZSSS, especially the subscale of Disinhibition, and the composite score.

Impulsivity (as a trait) is probably important only when it interacts with other variables.

It can be concluded that although almost half of offences are committed on the 'spur of the moment' (ie. impulsively) the proclivity to be impulsive seems to reside in the habitually violent only.

MINI-MENTAL TEST

The MiniMental Test is used routinely to screen for cognitive deficits, especially for signs of cortical dementia. Despite the fact that 2.6% were diagnosed with dementia, which by definition had to have been mild in degree (in order for the subjects to have participated) the average score on the MiniMental Test was 25.53, which would seem to indicate that that almost two thirds scored between 20 and 30. The most probable explanation lies in the fact that the average number of years of schooling in the general sample was less than 7 years, which is known to invalidate results (Spreeen & Strauss 1998). This effect was surely compounded by the relatively high percentage of subjects that were assessed as being of borderline intellectual functioning or mildly mentally retarded.

Furthermore, the MiniMental Test scores failed to differentiate between any of the groups.

The inescapable conclusion is that this scale has little value in our forensic psychiatric assessments, and does not assist in differentiating between violent and non-violent individuals. It remains useful as a general cognitive screen to aid diagnosis.

ANNET'S HANDEDNESS SCALE

Sinistrality was evident in only 5 (3.3%) subjects, despite the expected prevalence of about 10% (that is found in the general population. Mixed handedness was found in 6.6%. It is tempting to speculate that left handedness is rare in offender populations, and that right hemisphere dominance is protective against criminality and violence. These low numbers preclude meaningful analysis. However, this does anecdotally indicate that sinistrality may be associated with violence, because 3 of the 5 lefthanders were habitually violent (4 had previous convictions), and similarly 7 of the 10 mixed handed subjects had histories of habitual violence (and 9 had previous convictions). There are some studies that claim psychopathy is strongly associated with mixed handedness, seemingly supported by the high proportion of mixed handed subjects with histories of habitual violence (Mayer & Kosson 2000). This would seem to contradict the theory that left handed people are less likely to be violent, because of the purported lesser influence of testosterone in utero (Andrew 1980). Why they should be less likely to commit offences generally remains mysterious.

BEHAVIOURS OBSERVED IN THE WARD DURING THE OBSERVATION PERIOD

Although the primary purpose of admitting court referred defendants for 30 days is to allow for a thorough psychiatric assessment there has always been an implicit (and now explicit via Section 286A of the Criminal Procedure Act) requirement to observe for

aggressive behaviour during the period of hospitalisation. As discussed in the literature review there is not always a direct correlation between behaviour observed (or anticipated) in the community and that occurring after admission to hospital.

Overt violence was observed in 10.3% of the subjects, which included 8.7% of those charged with violent offences, and 14.6% of the habitually violent. It could be argued that these represent a high base rate of violence, despite the low percentages (because the subjects knew they were being observed and assessed). However, violent behaviour during the observation period was more likely to be exhibited by the habitually violent ($\chi^2 = 5.73$; $p=0.017$). Psychosis was a significant co-factor, as 75% of the violent group had a psychotic diagnosis.

The conclusion must be that violent behaviour that occurs during the forensic 30-day admission is a good indicator of habitual violence that emanates from psychosis. Future studies should attempt to differentiate between single and multiple episodes as predictors. To date most research on hospital violence has been on civil involuntary commitment cases, and not pre-trial offenders (Beck, White, & Gage 1991b; Binder & McNeil 1988; Slobogin 1994; Tardiff, Marzuk, Leon, Portera, & Weiner 1997; Torrey 1994).

The staff adjudged 26.5% of the subjects as adopting aggressive behaviours. This was mostly based on the staffs' subjective interpretation of the subjects' body postures and speech patterns. Although 21.7% of those charged with a violent index offence were so adjudged they were not significantly different from the others. Likewise, 29.2% of the habitually violent were assessed as having been aggressive in attitude, which again was not a significant difference. The most obvious explanation is that staff generally fear forensic

patients and are quick to interpret many behaviours as being aggressive. A diagnosis of a psychotic disorder was again significant, in that 57.1% of the habitually violent who were assessed as being aggressive were also psychotic. Another possibility may have been that staff are aware of the charges pending against each, and may intuitively be so influenced, although the lack of differentiation between the violent and non-violent subjects would seem to deny this. Many assessment scales rely on staff observations, and seem to presume that staff are able to maintain objectivity (Palmstierna & Wistedt 1989). It would seem that this variable cannot be relied upon because staff interpretations of aggressive behaviours tend to be too subjective.

The incidence of issuing threats to commit violence was greater than that of actual violence (that is, 14.8% compared to 10.3%), but was almost half that of the staff's assessments of aggressive behaviour.

Nevertheless, 23 of the 28 (82.1%) that issued threats belonged to the habitually violent group. Therefore issuing of threats significantly differentiated the habitually violent ($\chi^2=5.39$; $p=0.02$), but not those charged with violent index offences. A psychotic disorder was diagnosed in 65.2% of those who issued threats. Again, there appears to be a relationship between psychosis, issuing of threats and habitual violence.

Of the 16 subjects that were violent, 14 had been adjudged to be aggressive by the staff and 10 had also issued threats. If a subject was violent during observation then the likelihood of threats and aggressive behaviour was also very high. But unfortunately not all of those who issued threats, or were adjudged to have been aggressive actually exhibited violent behaviour. That is, 4 of the 23 who issued threats (17.4%), and 13 of 41 (31.7%) who were

aggressive did not have histories of violence. Even on the basis of these small numbers it is obvious that if one relied solely on issuing of threats, or on observations of aggressive behaviour, then one would falsely classify either 17.4% or 31.7% as being habitually violent. If the person was overtly violent during the admission then classifying the subject as being habitually violent would have yielded a false positive rate of 2/16, that is 12.5%.

Despite the low numbers generated in this study these figures are roughly similar to the false positive rates calculated by many authorities when discussing the problems of clinical prediction, even when particularly powerful variables used) (Monahan 1997b; Mossman 2000).

PHYSICAL EXAMINATION

The physical examination, despite the high prevalence of physical disorders in the histories of the subjects, revealed few physical signs of significant disorders. In all only 12.2% had signs, and 9% had neurological signs. These numbers were too small for statistical analysis, which probably indicates that neurological deficits, even though important in individual cases (for example, frontal lobe damage), do not generally contribute significantly to either producing violent offences, or to predisposing towards habitual violence.

It could be argued that when neurological deficits are present in an offender group that they are disproportionately represented in the habitually violent. This is based on the finding that 9 of the 14 who had neurological deficits were also habitually violent, of which 3 were also psychotic. This is consistent with the literature that has confirmed strong associations between neurological deficits, psychosis and violent behaviour. Presumably neurological deficits aggravate the cognitive impairment that psychosis already inflicts on

susceptible individuals (Brennan & Raine 1997; Elliott 1982c; Krakowski, Convit, Jaeger, Lin, & Volavka 1989c; Lewis et al. 1986)

As the numbers were too small the actual neurological deficits were not recorded, but these were mostly present in those diagnosed with dementia and organic personality disorders. Hence, the physical findings were mostly helpful in making the primary diagnosis, and not in differentiating between the various groups.

EEG FINDINGS

The EEG was abnormal in 34.8%, which was high even considering that only 27.8% of these were known epileptics. These data are similar to that found in some other studies on offender populations, although in most studies epilepsy and neurological deficits were exclusionary criteria (Mednick et al. 1981; Volavka 1987; Williams 1969).

EEG abnormalities did not help characterise violent index offences or habitual violence from the others. Admittedly this study did not, as in other studies, investigate whether types of wave abnormalities were important, but rather concentrated on the location of the abnormalities. Nevertheless most of the abnormal findings were characterised as being 'abnormal non-specific', and relatively few derived from specific cortical areas.

Possibly the assertion by some authorities that recordings should be taken from deep structures (especially the basal ganglia, limbic system and orbital lobes of the frontal cortex) should be heeded. Fenwick has described a series of cases in which subcortical subliminal electrical spikes were attributed to catastrophic violent behaviour. Unfortunately his

observations remain anecdotal, and do not explain how recurring spikes (as they were evident long after in the laboratory) could account for singular events.

Certainly, the routine EEG, as used here, contributed little to the identification of violent offenders.

SUMMARY

A history of issuing threats to commit violence was highly associated with a violent index offence, habitual violence and psychosis. Although having an axis 1 diagnosis (excluding alcohol or substance abuse) was not significant psychosis and being declared mentally ill (that is, incompetent to stand trial or not being criminally responsible) was strongly related to habitual violence. However, except for thought withdrawal/insertion, no specific psychotic symptom alone accounted for this.

Only the disinhibition subscale of the ZSSS had a positive association (with a violent index offence). It was therefore deduced that sensation seeking mostly does not contribute to violence in this population. High BIS scores, however, did identify the habitually violent, and this was strengthened when the females were removed from the analysis.

In the ward overt violent behaviour and the issuing of threats to commit violence, which were strongly associated with psychosis were good indicators of habitual violence.

However, relatively few were actually violent, which meant that most of the habitually violent were not violent during the observation admission. Of little value were the scores on the MiniMental Test, Annet's Handedness Scale, results of the physical examination, and EEG findings.

SYNTHESIS

The variables that produced significantly statistical differences on the univariate analyses were entered into logistic regression models. Consequently, their importance relative to each other was determined.

Of the ten variables entered into the model where violent index offence was the dependant variable only 6 could be regarded as possessing validity, as the remaining four (previous violent convictions (OR: 1.72; CI: 0.97 – 3.07), a history of habitual violence (OR: 1.78; CI: 0.96 – 3.34), use of a weapon (OR: 1.53; CI: 0.86 – 2.72) and the presence of any provocation beforehand (OR:1.45; CI: 0.78 – 2.70)) had confidence intervals that included 1.

Offenders with histories of previous psychiatric admissions were 8.4 times (CI: 4.88-14.59) more likely to be charged with a violent offence. This was, by far, the strongest variable, although having experienced verbal provocation beforehand (OR: 4.96; CI: 1.85-13.25), scoring high on the Disinhibition subscale of the ZSSS (OR: 3.74; CI: 2.99-4.66), and a history of issuing threats (OR: 2.20; CI: 1.25 – 3.85) were also clearly very important. In comparison knowing the victim (OR: 1.84; CI: 1.12 – 3.03) and being intoxicated with alcohol (OR: 1.83; CI: 1.09 – 3.06) during the offence contributed modestly to their behaviour.

In short, violent offences seemed more likely to have been committed by offenders who had had previous admissions to psychiatric hospitals, had a tendency to become disinhibited, had previously announced their intentions by means of threats and had responded strongly to verbal provocation. Intoxication and knowing the victim were of lesser importance. This does suggest that the violent offenders were in a state of readiness beforehand. The association of threats and provocation, may be due to a mindset in which the individual has probably recurrently been experiencing impulses to act defensively against perceived threats. This probably occurs in a context of decreased controls. Intoxication contributes by increasing disinhibition and lessening of controls.

It could also be argued that it is easier to lose control onto a known victim, not only because the victim is the most readily available, but also because the perpetrator already knows that the chances of subduing the victim are rather good. Surprisingly a history of habitual violence, previous convictions for violent offences, and use of a weapon were not as important as factors that directly contributed to the commission of the violent offences. This latter finding could possibly be explained by the high base rate of these factors in the sample generally, which probably diluted their specificity.

The habitually violent subjects were 11.23 times (CI: 3.62 – 34.85) more likely to be declared mentally ill. Violent behaviour during the observation admission (OR: 6.12; CI: 2.02 – 18.55) also strongly contributed to the model. These contributed substantially more than the other factors of previous psychiatric admissions (OR: 2.68; CI: 1.35-5.32), number of previous psychiatric admissions (OR: 2.45; CI: 1.66 – 3.62), a high score on the BIS (OR: 2.56; CI: 2.32 – 2.82), having been provoked before the offence (OR: 2.42; CI: 1.22 – 4.79), the use of a weapon (OR: 2.40; CI: 1.34 – 4.31), and unemployment (OR: 2.30; CI:

1.43 – 3.69). The factors of presence of psychosis (OR: 2.13; CI: 0.62 – 7.30), threats to commit violence during the observation admission (OR: 2.21; CI: 0.95 – 5.38), a history of conduct disorder (OR: 1.63; CI: 0.96 – 2.74), alcohol or substance abuse (OR: 1.71; CI: 0.97 – 3.02) and a history of issuing threats (OR: 1.30; CI: 0.75 – 2.22) had confidence intervals that included 1.

The habitually violent subjects that were charged with a violent offence were 55.78 times more likely (CI: 19.16 – 162.43) to have responded to any provocation, and 9.04 times more likely (CI: 4.39 – 18.59) to have a history of previous psychiatric admissions. They were also likely to have scored higher on the Disinhibition subscale of the ZSSS (OR: 3.38; CI: 2.51 – 4.53), and to have acted on a victim known to them (OR: 2.09; CI: 1.08 – 4.04). A history of issuing threats to commit violence did not contribute as strongly to the model (OR: 1.76; CI: 1.31 – 2.15), which is in contrast to the very strong significance level that was found on univariate analysis. Past convictions for violent offences (OR: 1.56; CI: 0.80 – 3.04), verbal provocation before the offence (OR: 1.85; CI: 0.52 – 6.56), intoxication with alcohol during the index offence (OR: 1.47; CI: 0.69 – 3.12), use of a weapon (OR: 1.46; CI: 0.72 – 2.95) had confidence values that included 1.

Although it is true that these subjects were not randomly selected from a population of offenders, they were referred by the Courts because of concerns for their mental state and not because of concerns for their physical aggression (as this is not a criterion for referral under sections 77-79 of the Criminal Procedure Act). Nevertheless less than a third of the subjects were actually declared mentally ill.

It is therefore of some importance that habitual violence was so strongly linked to being declared mentally ill, and that having a history of psychiatric admissions overwhelmingly was more likely in those charged with violent offences. This is consistent with the now increasingly accepted finding that mental disorder is a significant risk factor for violent behaviour (Gottlieb, Gabrielsen, & Kramp 1987; Hiday 1997d; Hodgins 1992; Steadman, Mulvey, Monahan, Robbins, Appelbaum, Grisso, Roth, & Silver 1998; Tiihonen, Eronen, & Hakola 1993; Tuninger et al. 2001).

The habitually violent although strongly at risk to be declared mentally ill, were also likely to have been known to the mental health system (that is, they were likely to have a history of previous psychiatric admissions), and were overtly violent during the observation admission. They were more impulsive, more easily responsive to provocation and readily used a weapon. Unemployment probably added to the risk by increasing their frustration (via deprivation). When the habitually violent who had been charged with a violent offence were considered (which combined the contexts of a pattern of violence with the situational variables of an actual violent act) response to provocation far exceeded the other variables (that is, almost 6 times more). Again, this was combined with a history of previous psychiatric admissions, a tendency to become disinhibited and inflicting the violence on a known victim.

It is worth re-emphasising that the designation of being 'mentally ill' in this context carries the juridical assumption that the individual is not competent to stand trial, or was not criminally responsible at the time of committing the offence. This assessment for the most part implies that cognitive and volitional deficits (due to any psychiatric disorder) are more important than any specific symptoms or diagnoses.

A history of previous psychiatric admissions has many possible implications. Commonly when known psychiatric patients are aggressive they are not charged with an offence, but are committed civilly into the general psychiatric wards. Involuntary admission under sections 9 and 12 of the Mental Health Act presume that the person is a danger to others (or self) because of ongoing mental illness. Conversely, mentally ill individuals whose behaviours are not problematic are not generally admitted. Many of these patients seem eventually to believe that they may act out violently with impunity, but ultimately either they commit an offence that is too serious to be ignored, or their families tire of repeatedly applying for committal. A history of many previous admissions is therefore a potent indicator of a history of a pattern of difficult behaviour. An added dimension is that chronic mental illness that requires frequent admissions is very likely also an indication of impaired cognition or poor impulse control.

Although psychosis, a history of conduct disorder, alcohol or substance abuse and threats to commit violence did not seem to contribute greatly to the model their presence as significant variables reinforces the impression that a predisposition to misinterpret social cues, to being disinhibited and impulsive probably have an onset during their youth, and that by the time they present to forensic psychiatric services the interlocking of violent behaviour and psychiatric interventions has been long entrenched. Most of these subjects correspond to the early-onset antisocial psychotic subjects described by Hodgins et al (1996c).

These findings suggest that habitually violent individuals are more or less in a perpetual state of readiness to act violently. They are impulsive, have a tendency to become

disinhibited, and are probably constantly frustrated. Their exquisite sensitivity to provocation, their proclivity to issue threats, and the need to carry or use a weapon suggests that they experience (or perhaps misinterpret) social cues as being threatening. Therefore the hypothesis that habitually violent individuals act out because of threat overriding controls seems to be valid in this population (Hiday 1997d; Link & Stueve 1995).

There remains the vexing fact that the associations between mental illness, psychiatric admissions and violent crime have only recently gained currency. Perhaps the answer lies in Marzuk's (1996d) speculations that in the past violent mentally ill individuals were institutionalised for long periods, and that deinstitutionalisation has thrust them back into the community, and consequently into the criminal justice system. Also, researchers have long worried about stigmatising those with psychiatric disorder and have probably steered clear of trying to prove the link.

IMPLICATIONS FOR RISK MANAGEMENT STRATEGIES

Identifying important risk factors helps to guide future intervention strategies. Clinical risk management has been described as “..nothing more than the development of treatment strategies to reduce the severity and frequency of identified risks” (Snowden 1997). Mental Health services ought to have structured approaches for reducing the risks in vulnerable clients. Forensic psychiatric facilities have the added responsibility of identifying offenders at risk, and then advising the courts on appropriate measures for their management and containment.

Although risk management implicitly is intended for those with histories of violence there exists the possibility that psychiatric interventions could also manage the factors that are contextually linked to violent crimes.

In this population, it was clear that clinical factors (mental illness and psychiatric admissions) were by far the most important variables demanding attention. Contextual factors, such as alcohol intoxication, provocation, and knowing the victim contributed modestly.

The following strategies could therefore be considered in this population:

A. ESTABLISH SPECIAL UNITS FOR CONTAINMENT AND REHABILITATION

Identify those who are often admitted to psychiatric hospitals, are violent (or aggressive) during admissions, and who may have been declared mentally ill during previous forensic contacts.

Lengthy hospitalisation has been identified as the most effective risk management strategy for recurrently aggressive patients (Steinart 2001). Long periods of incarceration are likewise effective, because the offender is removed from the community, and not because the violent behaviour is necessarily reduced.

There is currently a commitment to limit institutional care and maintain individuals in the community. In addition, sentencing and parole practices have become more liberal. Consequently a need has arisen for the establishment of facilities in South Africa that specialise in the containment and management of difficult psychiatric patients, who are admitted often for aggressive behaviour and psychosis. In the UK a network of designated 'Special Hospitals' were created, which are dedicated to the management of difficult patients (who do not necessarily have to be suffering from a psychotic illness), and to the process of determining how to rehabilitate and re-integrate these patients into their communities (Taylor, Leese, Williams, Butwell, Daly, & Larkin 1998).

B. MANAGEMENT OF DISINHIBITED, IMPULSIVE AND DYSREGULATED BEHAVIOUR

Therapeutic measures should target dispositional factors such as impulsivity and disinhibition. Their behavioural markers (from the above findings) include a history of conduct disorder, and tendencies to respond precipitously to provocation and to issue threats to commit violence.

This surely indicates that children and adolescents that exhibit patterns of dysregulated behaviour are worthy of specialised attention, especially if they are also conduct disordered. More research into the management of conduct disorder (especially when recurrent serious aggression is involved) should be encouraged.

C. COMMUNITY PROGRAMMES

Two seemingly incompatible imperatives exist. The community at large needs to be protected from potentially aggressive offenders, and the latter ought to be reintegrated as productive members of the same community. Although control of clinical and dispositional factors take priority, overall functioning has to be addressed.

Vocational rehabilitation and maintenance of employment have increasingly become an integral part of forensic psychiatric programmes (Kaliski 1997). Productive work not only provides remuneration, but enhances self esteem, decreases boredom and reduces opportunities for alcohol and substance abuse.

Individuals who carry weapons and habitually issue threats to others should be identified, and referred to appropriate agencies. Perhaps this could be accomplished by passing legislation that makes these activities illegal.

In effect risk monitoring of offenders in the community needs to be instituted as a structured activity. This would involve training community mental health professionals in evaluating the changes in risk that identified offenders represent at particular points in time as well over periods. Intervention when risks increase could be more timeously applied.

D. TREATMENT OF ALCOHOL AND SUBSTANCE ABUSE

Despite the relatively modest contribution that alcohol abuse and intoxication made to the logistic regression models they were nevertheless significant variables. It is arguable whether offenders ought to have separate alcohol and substance abuse rehabilitation programmes, or whether they can satisfactorily be accommodated in general programmes.

Most forensic risk management programmes include alcohol and substance abuse rehabilitation as an integral part of their programmes (Kaliski 1997).

LIMITATIONS OF THE STUDY

1. SAMPLE SELECTION

All subjects were 'pre-selected' by the courts on the basis that there was some concern that they had a psychiatric disorder. Clearly, a minority of criminal defendants does arouse this concern, and therefore it must be conceded that this group probably was not representative of the general offender population. However, as noted in the review section psychiatric morbidity is relatively high in remand and prison populations. In addition, the demographic profiles and characteristics of these subjects were similar to those described in other offender populations. Their characteristics do not differ significantly from those found in other local studies of remand referrals (Hemphill & Fisher 1980; Kaliski, Borchers, & Williams 1997).

At the least, therefore, these subjects do represent the population of offenders that are likely to be assessed by a forensic psychiatry service. Future studies should attempt to investigate non-referred remand and convicted populations. However, there are ethical obstacles, including consent and confidentiality issues, which would first have to be resolved (Monahan et al. 1993).

Ideally, the number of subjects should have been much higher. This would have yielded more sturdy results because the base rates of both violence and many risk factors are actually quite low. Factors such as self-injurious behaviour may actually have a strong association with violent behaviour, but do not register as such unless the sample size exceeds a certain threshold number. In addition logistic regression models require that the

sample size should be much greater than the number of variables entered (perhaps as high as 10 times) (Fleiss, Williams, & Dubro 1986; Hosmer & Lemeshow 1989). In this study the number of variables entered into the logistic regression models were restricted only to those that were found to be significant from the univariate analyses. If the sample size had been much larger (that is, more than 2 000 subjects) more of the variables could have been entered in varying combinations in order to test the viability of other models.

It is important, therefore, that future studies aim to investigate a great array of risk factors in an unselected, and very large, offender population.

2. USE OF STANDARDIZED INSTRUMENTS AND TRANSCULTURAL ISSUES

Studies are increasingly using standardised instruments for diagnosing psychiatric disorders, identifying and classifying violent behaviour and underlying personality traits. These findings would have had greater credibility if all of the diagnoses had been established by use of a well-known standardised structured interview schedule. To date no such interview schedule or other psychometric scales have been developed and standardised for use in South Africa. Even instruments such as the Wechsler Adult Intelligence Scale (WAIS), which has been validated for use in South Africa had been abandoned as a tool in the forensic psychiatry unit. The reasons for this were that uneducated rural people consistently scored lower. The anecdotal experience in the unit was that many state patients that had been found to be moderately mentally retarded because of their scores on the WAIS were actually assessed over time as not being mentally retarded, as their functioning in the rehabilitation programme was obviously inconsistent with that assessment.

A related but separate issue is that race and cultural issues were not addressed. At the time these data were collected, South Africa was just emerging from Apartheid, and race classification in the health services was proving to be a contentious issue. For example, the label 'coloured' has generally been used in this country to indicate that the person derives from mixed race heritage. This is actually not so, as this label has included people of Malay, Khoi and even Indian extraction, and does not really take into account their various language and religious affiliations.

A consequence of Apartheid is that most mental health professionals, especially the psychiatrists and psychologists, tend to be white and derive from relatively privileged backgrounds. Despite their good intentions there is always the possibility that those who assessed the subjects did not fully understand some important cultural nuances during the interviews, or unconsciously allowed racial stereotyping to influence them (Fernando, Ndegwa, & Wilson 1998).

Therefore these findings have to be tempered by a realisation that in future instruments need to be developed that have 'equivalence'. This means that they must have linguistic equivalence (the extent to which content and grammar have similar connotative and denotative meaning across cultures), conceptual equivalence (similarities in the meaning of the concepts used), scale equivalence (ie, that the scales are culturally relevant) and norm-equivalence (that normative standards developed for one culture are not indiscriminately applied to other cultures) (Fernando, Ndegwa, & Wilson 1998).

3. RELIABILITY OF THE INFORMATION

The quality of information elicited during a forensic assessment is known to be difficult to verify. Defendants usually have obvious motives for lying, avoiding the truth or malingering, and it is not always easy to detect whether they are in fact using these strategies (Daniel & Resnick 1987; Diamond 1994; Resnick 1993). Although self-reports of violence in non-forensic subjects tend to yield rates much higher than those elicited from other collateral sources it can be assumed in forensic populations that multiple sources have to be used for verification.

This study attempted to overcome this difficulty by using family members, court records and criminal records as collateral sources together with the information obtained from the subjects themselves. Nevertheless, there remains the possibility that family members may not have had good enough knowledge about the subjects, and that the other sources only provided superficial and obvious data. Many could have had significant histories of violent behaviour that had never resulted in a conviction or had come to the notice of close family members. Likewise, behaviours that are associated with a modicum of shame, such as self-injurious behaviour or attempted suicide, could have been hidden. This could have resulted in an unknown number of false negatives. To date no study seems to have overcome these strictures. A possible solution may be to conduct this sort of study longitudinally and hope that consistency of information emerges over time.

4. DISTINCTIONS BETWEEN TYPES OF VIOLENCE

Although this study assumed that all violent behaviour has a common neurobiological substrate, there remains the enduring impression that qualitative differences between the

various types of violence do exist. For example, sexual aggression obviously differs qualitatively from the lashings out of a dementing person. Unfortunately, it was not possible to differentiate between these various types of aggression phenomenologically. Future investigations in this unit should attempt to differentiate between sexual offenders and other violent offenders (although it is well known that both types engage in a variety of other violent behaviours). Because recent studies are increasingly separating sexual violence from other forms future investigations will have to compare whether there are indeed important differences between the various manifestations (Grubin 1997; Hendricks et al. 1988; Mirsky & Siegel 1994).

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CONCLUSIONS

Violent offences were more likely to have been committed by subjects who had had previous admissions to psychiatric hospitals, had a tendency to become disinhibited, had previously announced their intentions by means of threats, and had responded strongly to verbal provocation just before the offence. Intoxication and knowing the victim were of lesser importance.

The habitually violent subjects were much more likely to be declared mentally ill, and to have been violent during the observation admission. The other significant factors, which included a history of previous psychiatric admissions, the number of previous psychiatric admissions, a higher score on the BIS, having been provoked before the offence, having used or carried a weapon, and unemployment made more modest contributions. The other significant factors, namely the presence of psychosis, having issued threats to commit violence during the observation admission, a history of conduct disorder, a history of alcohol or substance abuse and a history of issuing threats were not considered to contribute greatly to the model as their confidence intervals for the odds ratios included 1.

The habitually violent subjects that were charged with a violent offence were 55.78 times more likely to have responded to any provocation, and 9.04 times more likely to have a history of previous psychiatric admissions. They were also likely to have scored higher on the Disinhibition subscale of the ZSSS, and to have acted on a victim known to them. A history of issuing threats to commit violence did not contribute as strongly, which is in

contrast to the very strong significance level that was found on univariate analysis. Past convictions for violent offences, verbal provocation before the offence, intoxication with alcohol during the index offence, use of a weapon had confidence values that included 1.

This implies that risk assessment tools and risk management strategies need to be developed in South Africa that give weighting and specific attention to individuals that are recurrently admitted to psychiatric hospitals, especially if they have been violent during previous hospitalisations. It is envisaged that a risk assessment tool will now be developed in which significant risk factors will be scored according to the odds ratios they achieved in logistic regression models. This should be regarded as a tentative initial step in creating strategies to prevent or control violent crime in this country.

APPENDIX

ZUCKERMAN'S SENSATION SEEKING SCALE

Instructions: Each of the items below contains two choices, A and B. Please indicate which of the choices most describes your likes or dislikes, or the way you feel. In some cases you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases you may find items in which you do not like either choice. In such cases indicate the one you dislike the least.

It is important that you respond to all the items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give an honest appraisal of yourself.

1. A. I like "wild" uninhibited parties
B. I prefer quiet parties with good conversation
2. A. There are some movies I enjoy seeing a second or even a third time
B. I can't stand watching a movie that I've seen before
3. A. I often wish I could be a mountain climber
B. I can't understand people who risk their necks climbing mountains
4. A. I dislike all body smells
B. I like some of the earthy body smells
5. A. I get bored seeing the same old faces
B. I like the comfortable familiarity of everyday friends
6. A. I like to explore a strange city or section of town by myself, even if it means getting lost
B. I prefer a guide when I am in a place I don't know well
7. A. I dislike people who do or say things just to shock or upset others
B. When you can predict almost everything a person will do and say he or she must be a bore
8. A. I usually don't enjoy a movie where I can predict what will happen in advance
B. I don't mind watching a movie where I can predict what will happen in advance

9. A. I have tried cannabis or would like to
B. I would never smoke cannabis
10. A. I would not like to try any drug which might produce strange and dangerous effects on me
B. I would like to try some of the new drugs that produce hallucinations
11. A. A sensible person avoids activities that are dangerous
B. I sometimes like to do things that are a little scary
12. A. I dislike 'jollers'
B. I enjoy the company of real 'jollers'³³
13. A. I find that drugs make me feel uncomfortable
B. I often like to get high on cannabis / alcohol
14. A. I like to try new foods that I have never tasted before
B. I usually eat food with which I am familiar, so as to avoid disappointment and unpleasantness
15. A. I enjoy looking at other people's photographs ('snaps')
B. Looking at other people's snaps bores me a lot
16. A. I would like to water-ski
B. I would not like to water-ski
17. A. I would like to try surfing
B. I would not like to try surfing

³³ 'Joller' is the South African equivalent of the 'swinger' that is used in the original ZSSS

18. A. I would like to take off on a trip with no pre-planned route or timetable
B. When I go on a trip I like to plan my route and time-table fairly carefully
19. A. I prefer "down-to-earth" people for friends
B. I would like to make friends amongst way out group such as artists, musicians etc.
20. A. I would not like to learn to fly an aeroplane
B. I would like to learn to fly an aeroplane.
21. A. I prefer the surface of the water to the depths
B. I would like to go scuba diving
22. A. I would like to meet some people who are homosexual
B. I stay away from anyone I suspect of being "queer"
23. A. I would like to try parachute jumping
B. I would never want to try jumping out of a plane with or without a parachute
24. A. I prefer friends who are excitingly unpredictable
B. I prefer friends who are reliable and predictable
25. A. I am not interested in doing things just for kicks
B. I like new and exciting experiences even if they are frightening, unusual or illegal
26. A. I prefer looking at pictures that are easy to make out and in which the colours and shapes do not clash
B. I often like looking at pictures where the colours clash and it is difficult to make t out clearly
27. A. I enjoy spending time in the familiar surroundings of home

- B. I get very restless if I have to stay around home for any length of time
28. A. I would like to dive off the high board
B. I don't like the feeling I get standing on the high board (or I would not go near it)
29. A. I like to go out with members of the opposite sex who are physically exciting
B. I like to go out with members of the opposite sex who are good company and understand me
30. A. Heavy drinking usually ruins a party because some people get loud and difficult
B. Keeping the drinks full is the key to a good party
31. A. The worst behaviour is to be rude
B. The worst behaviour is to be a bore
32. A. A person should have much sexual experience before marriage
B. It is better if two married persons begin their sexual experiences with each other
33. A. Even if I were rich I would not like to mix with some of the "wild" people in the "jet set"
B. I could see myself having a good time around the world with the "jet set"
34. A. I like people who are clever and funny even if they do sometimes insult others
B. I dislike people who have fun by hurting the feelings of others
35. A. There is altogether too much sex in movies
B. I enjoy watching many of the sexy scenes in movies

36. A. I feel best after taking a couple of drinks
B. Something is wrong with people who need liquor to feel good
37. A. People should dress according to standards of taste neatness, and style
B. People should dress as they wish even if they look strange
38. A. Sailing long distances in small sailing boats is foolish
B. I would like to sail a long distance in a small but sea-worthy boat
39. A. I have no patience with dull or boring people
B. I find something interesting in almost every person I talk with
40. A. Jumping from a high mountain on a hang-glider is a good way to end up in hospital
B. I think I would enjoy the sensations of gliding down fast from a high mountain on a hang-glider
-

ZSSS - Afrikaans

Aanwysings. Elk van die items hieronder bevat twee keuses A en B. Dui asseblief die keuse aan wat die meeste met jou voorkeure of alkeure ooreenstem of u gevoelens die beste beslyf. U mag dalk in sommige gevalle items vind waar albei keuses u voorkeure of gevoelens beskryf. Kies asseblief die een wat u voorkeure of gevoelens beste beskryf. U mag dalk ook items vind waar u nie van enige keuse hou nie. Dui dan die een aan wat u die minste pla.

Dit is belangrik dat u by al die items net een keuse, A of B, moet maak. Ons stel net in u voorkeure of gevoelens belang, nie hoe ander daarvoor voel of 'n mens behoort te voel nie. Daar is nie regte of verkeerde antwoorde soos in ander toetse nie. Wees reguit en gee 'n eerlike opinie van jouself.

1. A. Ek hou van wilde partytjies waar mense maak soos hulle wil
B. Ek hou meer van rustige partytjies waar jy lekker kan gesels
2. A. Daar is party films wat ek twee of drie keer wil sien
B. Ek kan nie verdra om 'n film te sien wat ek al gesien het nie
3. A. Ek wens dikwels dat ek 'n bergklimmer kan wees

- B Ek kan nie mense verstaan wat hulle lewens waag om berg te klim nie
4. A Ek haat alle liggaamlike reuke
- B Ek hou van sommige aardse liggaamlike reuke
5. A Dit verveel my om dieselfde ou gesigte elke dag te sien
- B Ek hou van die rustige samesyn met my ware vriende
6. A Ek hou daarvan om alleen in 'n vreemde stad of deel van 'n dorp rond te loop, al verdwaaal ek
- B Ek wil liever 'n gids hê as ek in 'n vreemde plek is.
7. A Ek hou nie van mense wat dinge sê of doen net om ander mense te skok of om te krap nie
- B As jy omtrent alles weet wat iemand gaan doen of sê, dan moct daardie iemand vervelig wees
8. A Gewoonlik hou ek nie van 'n film as ek weet wat gaan gebeur nie
- B Ek gee nie om om te kyk na 'n film as ek weet wat gaan gebeur nie
9. A Ek het al dagga gerook, of ek wil dit graag doen
- B Ek sal nooit dagga rook nie
10. A Ek sal nie graag enige dwelms gebruik wat 'n snaakse of gevaarlike effek op my kan hê nie
- B Ek sal graag van daardie nuwe dwelms probeer wat wilde drome veroorsaak
11. A 'n Verstandige persoon vermy aktiwiteite wat gevaarlik is.
- B Somtyds hou ek daarvan om dinge te doen wat 'n mens skrikkerig maak

12. A Ek hou nie van jollers nie
B Ek hou van die geselskap van regte jollers
13. A Enige dweims laat my ongemaklik voel
B Ek hou dikwels daarvan om van dagga of drank dronk te word
14. A Ek hou daarvan om nuwe kosse te eet wat ek nog nooit vantevore geproe het nie
B Ek eet gewoonlik kos wat ek ken om teleurstelling en onaangenaamheid te voorkom
15. A Ek geniet dit om na ander mense se foto's te kyk
B Dit is vervelig om na ander mense se foto's te kyk
16. A Ek sal graag wil waterski
B Ek sal nie graag wil waterski nie
17. A Ek sal graag wil branderplank ry
B Ek sal nie graag wil branderplank ry nie
18. A Ek sal graag wil reis sonder om my oor roetes of tydtafels te bekommer
B As ek op reis gaan hou ek daarvan om die roete en tydtafel goed te beplan
19. A Ek verkies doodgewone mense as my vriende
B Ek sou graag vriende wil maak met ongewone mense soos kunstenaars, musikante ens.
20. A Ek wil nie leer hoe om 'n vliegtuig te bestuur nie
B Ek sal graag wil leer hoe om 'n vliegtuig te bestuur

21. A Ek verkies die oppervlakte van die water bo die diepte
B Ek sou graag wil skubaduik
22. A Ek wil graag homoseksuele mense ontmoet
B Ek bly weg van enigiemand wat na 'n 'moffie' lyk
23. A Ek sal graag wil valskennspring
B Ek sal nooit, met of sonder 'n valskerm, uit 'n vliegtuig wil spring nie
24. A Ek hou van vriende wat opwindend onvoorspelbaar is
B Ek verkies vriende wat betroubaar en voorspelbaar is
25. A Ek stel nie daatin belang om dinge te doen net vir die opwinding daarvan nie
B Ek hou daarvan om nuwe en opwindende dinge te doen, al is dit skrikwekkend, ongewoon, of onwettig
26. A Ek verkies om na prente te kyk wat 'n mens maklik kan verstaan en waarin die kleure en vorms nie bots nie
B Ek hou dikwels daarvan om na prente te kyk waar die kleure bots en dit moeilik is om alles te verstaan
27. A Ek geniet dit om in die bekende omgewing van my huis te wees
B Ek raak baie rusteloos as ek vir 'n lang tyd by die huis moet bly
28. A Ek sal graag van die hoë duikplank wil duik
B Ek hou nie van die gevoel wat ek kry as ek op die hoë duikplank staan nie

29. A Ek hou daarvan om uit te gaan met meisies/ouens wat liggaamlik aantreklik is
B Ek hou daarvan om uit te gaan met meisies/ouens wat goeie geselskap is en my verstaan
30. A Suipery bederf panytyjies omdat sommige mense raserig en moeilik raak
B 'n Partyjie is lekker as die glasies altyd vol bly
31. A Die slegste gedrag is om ongepoets te wees
B Die slegste gedrag is om vervelig te wees
32. A Dit is belangrik dat 'n mens baie seksuele ondervinding voor die huwelik moet hê
B Dit is beter as 'n man en vrou hul seksuele verhouding met mekaar begin
33. A Al was ek ryk, sou ek nie graag met sommige van die wilde mense in
die 'jet set' wil meng nie
B Ek verbeel my dit sal lekker wees om deur die wereld te reis met die 'jet set'
34. A Ek hou van mans wat slim en sneaks is, al maak hul soms ander seer
B Ek hou nie van mans wat lekker kry as hulle ander se gevoelens seermaak nie
35. A Daar is veels te veel seks in films
B Ek hou daarvan om na baie van die sekstonele in films te kyk
36. A Ek voel die lekkerste as ek 'n paar drankies in
B Daar is iets verkeerd met mans wat drank nodig het om lekker te voel
37. A Mense behoort so aan te trek dat almal tevrede is met hul kleredrag
B Mense moet kan aantrek soos hul wil, al lyk hul

38. A Dit is verspot om lang afstande in klein seilbote te vaar
 B Ek sou daarvan hou om 'n lang afstand in 'n klein maar betroubare seilboot te vaar
39. A Bot of vervelige mense maak my ongeduldig
 B Ek vind iets interessants in die meeste mense met wie ek praat
40. A Spring van 'n hoë berg af op 'n hangsweeftuig as jy in die hospitaal wil beland
 B Ek dink ek sal daarvan hou om vinnig van 'n hoë berg op 'n hangsweeftuig af te

ZSSS SCORING:

1 A (D)	11 B (T)	21 B (T)	31 B (B)
2 B (B)	12 B (D)	22 A (E)	32 A (D)
3 A (T)	13 B (D)	23 A (T)	33 B (D)
4 B (E)	14 A (E)	24 A (B)	34 A (B)
5 A (B)	15 B (B)	25 B (B)	35 B (D)
6 A (E)	16 A (T)	26 B (E)	36 A (D)
7 B (B)	17 A (T)	27 B (B)	37 B (E)
8 A (B)	18 A (E)	28 A (T)	38 B (T)
9 A (E)	19 B (E)	29 A (D)	39 A (B)
10 B (E)	20 B (T)	30 B (D)	40 B (T)

BARRATT'S IMPULSIVITY SCALE

Answer the following "true" or "false":

- 1 My friends think I am happy-go-lucky
- 2 I like being where there is something going on all the time
- 3 I like work that has lots of excitement
- 4 I change my plans often
- 5 I like to take a chance just for the excitement
- 6 My interests tend to change quickly
- 7 I like to do things on the spur of the moment
- 8 I consider myself always to be careful
- 9 I scan newspapers rather than read them carefully
- 10 I let myself go at parties
- 11 I don't like changes
- 12 As a youngster I enjoyed taking part in reckless stunts
- 13 I like work requiring patience and carefulness
- 14 I like a great deal of variety in my work
- 15 I often make people laugh
- 16 I like new situations
- 17 I don't like to work with slow people
- 18 I like to solve complicated problems
- 19 I easily become impatient with people
- 20 I usually have a ready answer
- 21 I don't like to wait for traffic lights to change
- 22 I usually think carefully before I do most things
- 23 I like work in which I must change often from one task to another
- 24 I like mathematics
- 25 I make up my mind quickly
- 26 I frequently forget things
- 27 I don't like having my plans changed
- 28 I make up my mind easily
- 29 I usually notice the furniture arrangements in a strange house
- 30 I (would) like to play chess
- 31 I have more trouble being able to concentrate than other people
- 32 When I see a train I wish I were on it
- 33 I like detailed work
- 34 I like to work on crossword puzzles
- 35 I spend most of my free time outdoors
- 36 I frequently feel "on top of the world"
- 37 I am always on time for social events
- 38 I like work where there is competition
- 39 I answer questions quickly
- 40 When watching games I often yell along with the others

- 41 I remember the names of people I meet
 - 42 I keep a diary
 - 43 In the morning I usually get out of bed full of energy
 - 44 I like people who are always on time
-

BIS - Afrikaans

Beantwoord die volgende.. "Waar" of "onwaar"..

- 1 My vriende dink ek is onverskillig
- 2 Ek hou daarvan om te wees waar daar altyd iets aan &e gang is
- 3 Ek hou van werk met baie opwinding
- 4 Ek verander dikwels my planne
- 5 Ek hou daarvan om net vir die opwinding kans te waag
- 6 My belangstellings verander die hele tyd
- 7 Ek hou daarvan om dinge te doen sonder om te dink
- 8 Ek is iemand wat altyd versigtig is
- 9 Ek lees koerante vinnig sonder om stadig na alles te kyk
- 10 Ek laat waai by partytjies
- 11 Ek hou nie van veranderings nie
- 12 Toe ek klein was, het ek daarvan gehou om gevaarlike toertjies te doen
- 13 Ek hou van werk waar ek geduldig en versigtig moet wees
- 14 Ek hou van baie verskeidenheid in my werk
- 15 Ek laat dikwels mense lag
- 16 Ek hou van nuwe situasies
- 17 Ek hou nie daarvan om met stadige mense te werk nie
- 18 Ek hou daarvan om moeilike probleme op te los
- 19 Ek raak maklik ongeduldig met mense
- 20 Ek het gewoonlik altyd 'n antwoord reg
- 21 Ek hou nie daarvan om te wag vir die verkeersligte om te verander nie
- 22 Ek dink gewoonlik goed voordat ek die meeste dinge doen
- 23 Ek hou van werk waar ek dikwels van een taak na die ander moet gaan
- 24 Ek hou van wiskunde
- 25 Ek besluit vinnig oor iets
- 26 Ek vergeet goed dikwels
- 27 Ek hou nie daarvan dat my planne verander word nie
- 28 Ek besluit maklik oor iets
- 29 Ek kan gewoonlik die manier waarop meubels in 'n vreemde huis staan,
- 30 Ek sou graag skaak wou speel
- 31 Ek sukkel meer as ander mense om te konsentreer

- 32 As ek 'n trein sien, wens ek ek was daarop
 33 Ek hou van werk met allerhande kleinighede
 34 Ek hou daarvan om blokkiesraaisels te doen
 35 Ek bring the meeste van my vrye tyd in the buitelug deur
 36 Ek voel dikwels asof die hele wereld myne is
 37 Ek is altyd betyds vir sulke goed soos partytjies
 38 Ek hou daarvan om te werk waar daar kompetisie is
 39 Ek beantwoord vrae vinnig
 40 As ek sport kyk, skreeu ek dikwels saam met die ander
 41 Ek onthou die name van mense wat ek ontmoet
 42 Ek hou 'n dagboek aan
 43 Ek is gewoonlik vol lewe as ek in die oggend opstaan
 44 Ek hou van mense wat altyd betyds is

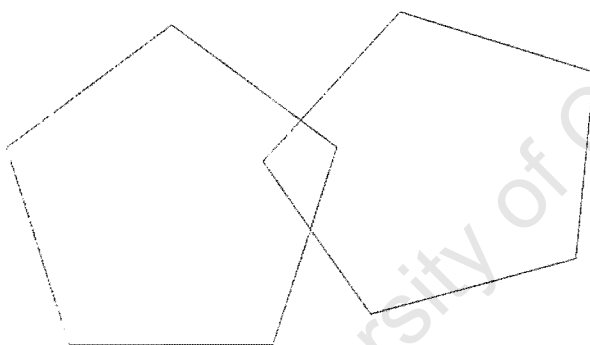
BARRATT'S IMPULSIVITY SCALE SCORE SHEET

1. T	12. T	23. T	34. F
2. T	13. F	24. F	35. T
3. T	14. T	25. T	36. T
4. T	15. T	26. T	37. F
5. T	16. T	27. F	38. T
6. T	17. T	28. T	39. T
7. T	18. F	29. F	40. T
8. F	19. T	30. F	41. T
9. T	20. T	31. T	42. F
10. T	21. T	32. T	43. T
11. F	22. F	33. F	44. T

MINI-MENTAL STATE EXAMINATION

	SCORE
1. What is the Year?	
Season?	1
Month?	1
Day?	1
Date?	1
2. Where are we Country?	1
Province	1
Town/City	1
Hospital	1
Ward	1
3. Name 3 objects, taking one second to say each. Then ask the subject all three after you have said them. Give one point for each correct answer. Repeat the answers until the patient learns all three (maximum of 6 trials).	3
4. Serial sevens. Subtract 7 from 100. Then subtract 7 from that number. Give one point for each correct answer. Stop after five answers. ALTERNATE: spell WORLD backwards (HERFS for Afrikaans)	5
5. Ask for the names of the three objects learned above. Give one point for each correct answer.	3

6. Point to a pencil and a watch. Have the subject name them as you point
7. Have the subject follow a three-stage command: "Take this paper in your right hand. Fold the paper in half. Put the paper on the floor" 3
8. Have the subject repeat "No ifs, and or buts" ("Nog vis, nog vlees, nog voeel" for Afrikaans). 1
9. Have the subject read and obey the following: "CLOSE YOUR EYES" (write it in large letters) 1
10. Have the subject write a sentence of his or her choice. (The sentence should contain a subject and an object, and should make sense. Ignore spelling errors) 1



11. Have the subject copy the design printed above. Give one point if all sides and angles are preserved and if the intersecting sides form a diamond shape. 1

ANNETT'S HANDEDNESS INVENTORY

INDICATE HAND PREFERENCE	ALWAYS LEFT	USUALLY LEFT	NO PREFERENCE	USUALLY RIGHT	ALWAYS RIGHT
1. TO WRITE A LETTER LEGIBLY					
2. TO THROW A BALL TO HIT A TARGET					
3. TO PLAY A GAME REQUIRING A RACQUET, BAT ETC					
4. AT TOP OF BROOM TO SWEEP DUST FROM FLOOR					
5. AT TOP OF SHOVEL TO MOVE SAND					
6. TO HOLD MATCH WHEN STRIKING IT					
7. TO HOLD SCISSORS TO CUT PAPER					
8. TO HOLD THREAD TO GUIDE THROUGH THE EYE OF A NEEDLE					
9. TO DEAL PLAYING CARDS					
10. TO HAMMER A NAIL INTO WOOD					
11. TO HOLD A TOOTHBRUSH WHILE CLEANING TEETH					
12. TO UNSCREW THE LID OF A JAR					

Scoring: Two (2) points are assigned to "always" responses, one point to "usually", and none to "no preference". Scoring left preferences as negative and right as positive gives a range of scores from -24 (for the most left handed) to +24 (the most right handed). Those scoring above +9 are right handed, below -9 left handed, and those with scores between -8 and +8 are mixed-handed.

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