

Temporal Relationship Between Psychotic Disorder and Criminal Offense: Review of the Literature and File Review Study

Kris R. Goethals, Valérie A. S. Fabri, Jan K. Buitelaar, and Hjalmar J. C. van Marle

During the past 15 years, a small body of literature has accumulated regarding the temporal relationship between schizophrenia and crime. Many forensic patients have a history of psychiatric care before committing an offense, but such care was often inadequate. Comorbid disorders such as substance abuse and an antisocial personality disorder and/or psychopathy may be responsible for earlier referral of psychotic patients to psychiatric care in connection with the resultant early behavioral problems. In connection with the inadequate care for forensic patients, it is possible that a period of untreated psychosis occurs more often and is of longer duration. The purpose of the present study was to assess these findings. We considered three groups: two groups of forensic patients with a psychotic disorder, with or without a comorbid personality disorder, who have committed a serious violent offense, and a third group of psychotic patients from the general psychiatric population who have not committed a serious violent offense. Retrospective data were collected and the sociodemographic, substance abuse, diagnostic (DSM-IV) and psychiatric history variables were compared. The score on the PCL-SV was taken into account. Psychotic patients detained under the Dutch Entrustment Act (i.e., TBS-detainees) with a comorbid personality disorder began their psychiatric career before committing a violent offense. A long time was found between the first admission and the TBS-offense. Psychopathy and substance abuse influenced these intervals. No difference was found between psychotic TBS-detainees and psychotic patients in general psychiatry with regard to the duration of untreated psychosis. The recognizability of the various groups of psychotic patients in general psychiatry could have a preventive effect if the comorbidity is examined.

Do psychotic patients detained under the Dutch Entrustment Act (TBS) have a prior psychiatric history before they commit their first violent offense? If so, this means that such patients, who present a risk of serious aggressive behavior towards others, could be detected in general psychiatry. In this way, general psychiatry would have a role in preventing psychotic patients from becoming forensic patients. We know from the literature that many forensic patients already have a history of psychiatric care before committing the index offense, but that such care was often inadequate (Timonen et al., 2000; Hodgins & Müller-Isberner, 2004; Hodgins, Müller-

Isberner, & Allaire, 2006). Moreover, comorbid disorders such as substance abuse and an antisocial personality disorder and/or psychopathy may be responsible for earlier referral of psychotic patients for psychiatric care (Hodgins, Tiihonen, & Ross, 2005). Much more often, however, the literature on this temporal relationship fails to subdivide the psychotic patients who have committed a serious offense into those with and without a comorbid personality disorder. In our opinion, an antisocial personality disorder or psychopathy affects the temporal relationship between psychiatric care and the criminal offense due to the presence of a long

K.R. Goethals is a psychiatrist in the psychosis cluster and Manager of patient care in cluster 2 for personality disorders in the Pompe Clinic, Pompe Foundation, Nijmegen, The Netherlands. He also works as a psychiatrist/psychotherapist in a private practice in Hove, Belgium; V.A.S. Fabri is a psychologist and worked, at the time of the study, as a research assistant in the Pompe Clinic, Pompe Foundation, Nijmegen, The Netherlands; J.K. Buitelaar is Professor of Psychiatry and Head of the psychiatry department of the UMC St. Radboud, Nijmegen, and also Head of the University Centre for child and adolescent psychiatry in the Eastern Netherlands; H.J.C. van Marle is Professor of Forensic Psychiatry in both the Faculty of Medicine and Health Sciences and the Faculty of Law of the Erasmus University, Rotterdam. He also works as a forensic psychiatrist/psychotherapist in the forensic outpatient clinic Het Dok in Rotterdam. Correspondence may be addressed to: Kris Goethals, Pompe Foundation, Weg door Jonkerbos 55, 6532 CN Nijmegen, The Netherlands (Email: k.goethals@pompestichting.nl).

history of antisocial behavior (non-violent offenses and substance abuse) and an emotional dysfunction that increases the risk of violence directed at others (Moran & Hodgins, 2004). In this comorbid group, we expect that the offense will precede the psychiatric care. In the case of forensic patients, the temporal relationship between the first psychotic episode and the first admission to a psychiatric institution is also unclear. Psychotic patients in general psychiatry are often not hospitalized until after the first psychotic episode, so that one can speak of the duration of untreated psychosis (DUP). In connection with the lack or avoidance of psychiatric care by forensic patients, it is possible that a DUP occurs more often and lasts longer. In this exploratory study, we will try to find an answer to these questions.

DESCRIPTION OF THE DUTCH TBS-POPULATION

In the Dutch legal system, detention under the Entrustment Act (TBS) is possible if the following criteria are satisfied:

1. There must have been a qualified offense (in general, TBS is limited to offenses for which detention on remand is permitted);
2. There must have been either a mental illness (such as a psychosis) or a defective development of the mental powers (personality disorder, intellectual handicap) at the time of the offense;
3. Due to this disorder, there must be an unacceptable risk of a new offense for which TBS could be imposed.

Four groups of TBS-detainees can be distinguished on the basis of the offense committed and the psychiatric history (Van Emmerik & Diks, 1999): A 'psychiatric' group (19% of all TBS-detainees) is responsible for either homicide or, especially, arson and numerous offenses involving members of the family. Before TBS, these patients, who are often female, have no or only one conviction and have been admitted to a psychiatric hospital on a voluntary basis. These patients often suffer from psychotic disorders and their prognosis generally involves commitment to a psychiatric hospital or a regional institution for protected living (RIBW). This group shows the most similarity with 'ordinary' psychiatric patients and must be considered eligible for

incorporation into the mental healthcare system. This group constitutes the psychotic study population as described below.

In addition, the following three groups can be distinguished:

1. A 'first offender' group (29% of all TBS-detainees) with a history of serious offenses (homicide, sexual offenses), often committed against members of the family; this group has no or only one conviction prior to TBS, there are less serious problems, there is no history of admission to a psychiatric hospital before TBS, and one can speak of a relatively favorable prognosis for an independent return to society, possibly with the exception of the sexual offenders;

2. A 'criminal' group (27% of all TBS-detainees) responsible for many offenses involving bodily injury, sexual offenses and crimes against property, often involving unknown victims; this group has at least two earlier convictions prior to TBS, psychotic disorders are rare, but there is frequent substance abuse and relatively many cluster B personality disorders. The group is most typically characterized as having a 'criminal' identity;

3. A 'mixed' group (25% of all TBS-detainees) responsible for many offenses involving bodily injury and crimes against property, but rarely for homicide. The victims are mostly strangers and a relatively large proportion of the offenders (25%) has already been sentenced previously and was involuntarily committed for psychiatric care before TBS. This group has at least two earlier convictions prior to TBS. Both psychotic disorders and cluster B personality disorders are seen frequently, often in combination with addiction.

DATA FROM THE LITERATURE

Before reporting our own findings, we will examine the literature to see what is known about the temporal relationship between the first psychotic episode, the first psychiatric admission, and the first violent offense. Comorbid disorders such as substance abuse and personality disorders will also be examined in this light, since these may affect the temporal relationship. Finally, the literature regarding DUP will also be reviewed.

The articles were retrieved from www.pubmed.com using the following search terms: (psychosis OR schizophrenia) AND (crime OR violence OR criminality) AND (onset OR timing OR temporal), resulting in 57 articles. Subsequently, other search terms were used:

(sequence OR order OR chronology OR temporal) AND (violence OR crime OR felony) AND (psychosis OR schizophrenia) AND (diagnosis OR admission OR intake), resulting in 38 articles. The total yield was therefore 95 articles. The abstracts were then examined to see whether the articles dealt with the chronological sequence of violence or crime, the first psychotic episode, admission to psychiatric institutions, and the diagnosis of psychosis. Next, the bibliographies in the retrieved articles were examined for other related articles. Only articles published since 1990 were used. This procedure yielded a total of 18 articles (of the 95) that required reading, 11 of which were ultimately found to deal with timing.

First, we will examine the articles on the first psychotic episode, its diagnosis or the first psychiatric admission, and the relationship between this and the time of the first offense; next, we will examine the articles dealing with the timing of the start of the psychosis and its treatment or first psychiatric admission; and finally we will examine two factors that affect or have a relationship with the timing, namely, substance abuse and age. The comorbidity with a personality disorder and/or psychopathy was not properly investigated in this review.

The Time of the First Offense in Relation to the First Psychotic Episode, Diagnosis and the First Admission

A study by Coid, Lewis, and Reveley (1993) examined the relationship between severe psychiatric illness (i.e. schizophrenia, no personality disorders) and criminality by means of a twin study. One of the hypotheses was that the onset of schizophrenia precedes the start of criminal behavior. They found a clear relationship between age at the first psychiatric contact and age at first conviction. In this study, the onset of schizophrenia preceded the start of criminal behavior by an average of one year.

Another study (Taylor & Hodgins, 2003) revealed that a criminal career can begin either before or after the onset of a psychotic disorder, but that violence almost always starts after the onset of the psychosis.

A study by Humphreys, Johnstone, and Macmillan (1994) examined a group of people who were in the first psychotic episode of schizophrenia and had committed an offence during the preceding five years. In half of these patients, the offense was strongly associated with specific psychotic symptoms. For half of the group this was the first offense. In 25% of the schizophrenic patients who had committed an offense, the onset of psychosis had come first, followed by their first offense and then the first admission. Another 25% had first committed an offense, followed by the onset of psychosis and then the first admission. In half of the group, the temporal relationship between these occurrences was unclear.

Munkner, Haastrup, Joergensen, and Kramp (2003b) studied patients' records to determine the temporal relationship between the first recorded violent and non-violent offenses, the first psychiatric admission and the diagnosis of schizophrenia. Most of the criminal offenses had been committed before any contact with psychiatric healthcare. The majority of the violent crimes also took place prior to the first psychiatric admission. Hodgins (1992) found that the criminal behavior of patients with a severe psychiatric disorder often already appeared during adolescence, long before diagnosis of the psychiatric disorder.

In summary, we can conclude that some studies report that the offense precedes the psychotic disorder, while other studies first describe the psychosis and then the offense. The literature is therefore inconsistent regarding the chronology.

The Time between the First Psychotic Episode and its Treatment

The time between the first psychotic episode and the treatment of the psychosis is referred to as the 'duration of untreated psychosis' or DUP. There is no consensus regarding how the DUP should be measured (Malla & Norman, 2002). For example, it is unclear whether the DUP measures the time between the onset of psychotic symptoms associated

with the current episode or that it represents the total time during which the patient has suffered from an untreated psychosis during his lifetime. The second definition would encompass several episodes that had ended spontaneously. There is also lack of clarity regarding the type and severity of the psychotic symptoms that should be used to define the onset of a psychosis, and regarding the criteria that an adequate antipsychotic therapy must fulfill before the DUP can be considered to have ended.

Perkins, Gu, Boteva, and Lieberman (2005) carried out a meta-analysis of the relation between the DUP and the results of treatment. However, the studies of the DUP that were used for this meta-analysis did not all define the beginning and end of the DUP in the same way. Sometimes, the first episode was determined on the basis of information from the patient himself, while in other articles it was defined by the caregivers. The onset of the psychosis was sometimes defined on the basis of the first detectable change, but in other articles by the onset of psychotic symptoms or the onset of positive psychotic symptoms. The start of treatment was also defined in various ways, for example by the first admission, the first use of antipsychotic medication, or only by the first effective therapy. Although 70% of patients with schizophrenia first develop negative symptoms and later positive symptoms, the onset of a psychosis is more often defined by the onset of positive symptoms because these can be determined more reliably than the negative symptoms (Larsen et al., 2001). The effect of a longer DUP on violence and criminal behavior has not yet been properly investigated (Malla & Norman, 2002). The DUP is preceded by a period in which most patients have non-specific, non-psychotic prodromal symptoms. The DUP lasts 1-2 years, on average, and many studies have shown a significant correlation between the DUP and poor results of treatment (Larsen et al., 2001). A shorter duration of the DUP was associated with a better response to antipsychotic therapy as measured by the severity of the overall psychopathology and the functional result. At the start of treatment, the initial DUP was associated with the severity of the negative symptoms but not with the severity of the positive symptoms, general psychopathology or neurocognitive functions.

Effect of Substance Abuse

It has been established that the prevalence of comorbid substance abuse and mental illness is high among mentally ill offenders and that those with comorbid disorders have greater levels of difficulty including offending (Ogloff, Lemphers, & Dwyer, 2004); however, the effect of the timing of the diagnosis of substance abuse and psychotic illness is less clear. Munkner, Haastrup, Joergensen, Andreasen, and Kramp (2003b) also found a relationship between substance abuse and the time between the first psychiatric admission and the diagnosis of schizophrenia. Patients with a diagnosis of substance abuse appeared in the psychiatric care system five months earlier than patients without a diagnosis of substance abuse. The cause of this could be that a more disruptive illness had led to attempts at self-medication, or that substance abuse had led to an earlier recognition of the need for psychiatric help. When the diagnosis of substance abuse was made at the moment of first psychiatric contact, it had no effect on the time between such contact and the diagnosis of schizophrenia. However, when substance abuse was not diagnosed until after the first contact, then it took longer for the diagnosis of schizophrenia to be made. This was true for men and women considered together; when only men were considered, it appeared that those with a diagnosis of substance abuse at the moment of first contact had less chance of being diagnosed with schizophrenia during this first contact.

Relationship with Age

Munkner et al. (2003a) conducted a large-scale study of patients' records in order to determine the impact of criminality on the age at which a person first comes into contact with psychiatric care and on the age at which schizophrenia is diagnosed. They concluded that persons who committed their first offense before coming into contact with psychiatric care were 13 months older, on average, at the time of first contact than persons who committed their first offense after this contact. This also applied to the diagnosis of schizophrenia, which was made at an older age in persons who had committed an offense than in persons who had not committed an offense, regardless of whether the offense was violent

or non-violent and regardless of whether it was committed before the first contact with a psychiatric institution or between that first contact and the diagnosis of schizophrenia.

The commitment of an offense during these intervals was associated with an older age at the time of diagnosis of schizophrenia. Those who were diagnosed at the time of their first psychiatric contact were 11 months older at the moment of diagnosis than those in whom it was more difficult to reach a diagnosis. There was also a difference in the time between the first contact with a psychiatric institution and the diagnosis. The older a person was at the moment of first contact, the more quickly he could be diagnosed. Persons with a police record at the moment of first contact with a psychiatric institution were diagnosed more quickly, while persons who committed an offense between the first contact and the diagnosis had to wait longer for this diagnosis. When the offense was not committed until after the first contact with psychiatric care, criminals remained suspended in the legal system instead of the psychiatric system for a longer period, because of their conviction, so that it took longer to reach a diagnosis. However, the chance of being diagnosed immediately during the first contact was independent of whether or not an offense had been committed.

Munkner, Haastrup, Joergensen, and Kramp (2005) used the results of their earlier study to determine whether there is a relationship between gender, age and substance abuse, on the one hand, and whether persons do or do not commit an offense after their first contact with a psychiatric institution or after the diagnosis of schizophrenia. The results showed that the older a person is at the time of first admission to the psychiatric care system or the first diagnosis, the lower the risk that they will start on a criminal career, provided that they have not committed any crimes before. Persons who are already diagnosed at a young age are affected more by the illness, so that their condition deteriorates more rapidly from a social point of view and they run a greater risk of committing an offense.

Studies into the time of the first offense in relation to the onset of psychosis, diagnosis and first admission have yielded a variety of results. Patients with both a psychotic disorder and a personality disorder have never been properly identified, in these studies, as a separate group that should be dis-

tinguished from psychotic disorders without a comorbid personality disorder. Various definitions of the 'duration of untreated psychosis' or DUP are employed.

The effect of a longer DUP on violence and criminal behavior has not yet been properly investigated. Assuming that psychotic TBS-detainees have an alarming tendency to avoid psychiatric care, the question arises whether the DUP is really longer, or occurs more often, in these patients than in psychotic patients in the mental healthcare system.

Patients with a diagnosis of substance abuse entered the psychiatric care system at an earlier age. Moreover, when the substance abuse was not diagnosed until after the first contact, it took longer before a diagnosis of schizophrenia was reached. In our study, we wish to determine whether the time periods between disorder and offense are affected by the presence of substance abuse. The following relationship with age was seen: patients who committed their first offense after coming into contact with psychiatry were 13 months older, on average, at the time of first contact; this also applied to the diagnosis of schizophrenia.

When the offense was not committed until after the first contact with psychiatric care, the patients remained suspended in the legal system instead of the psychiatric system for a longer period, because of their conviction, so that it took longer to reach a diagnosis. Unfortunately, the effect of these factors on the time of diagnosis cannot be investigated, since this last variable was not scored in our study.

PRESENTATION OF THE QUESTION AND HYPOTHESES

On the basis of the literature, it can be expected that psychotic TBS-detainees without a personality disorder begin a criminal career at an older age, i.e. after the onset of the psychotic disorder. This is in contrast to psychotic TBS-detainees with a personality disorder (Tengström, Hodgins, & Kullgren, 2001). Psychopathy and/or substance abuse are comorbid disorders that lead to a shorter time period between the criminal behavior and the psychotic disorder.

It can be expected that the DUP, which can be measured as the time period between the onset of

psychosis (the first positive symptoms) and the first psychiatric admission, will be longer for psychotic TBS-detainees than for psychotic patients in general psychiatry. It can also be expected that more psychotic TBS-detainees will have a DUP.

As a result, we arrive at the following hypotheses:

1. a) Most of the psychotic TBS-detainees with a personality disorder (group C) commit their first violent offense before their first admission. This is in contrast to psychotic TBS-detainees without a personality disorder;

b) In psychotic patients without a personality disorder, the first psychiatric admission precedes the TBS-offense by a longer time than in the case of psychotic TBS-detainees with a personality disorder;

c) In psychotic TBS-detainees with a personality disorder, psychopathy and/or substance abuse affect the time period between the psychotic disorder and criminal behavior;

2. The 'duration of untreated psychosis' (DUP) is longer in psychotic TBS-detainees than in psychotic patients in general psychiatry;

3. Compared to psychotic patients in general psychiatry, more psychotic TBS-detainees are admitted at the onset of the psychosis.

METHOD

Patients

For this file review study, we created three groups of patients. Group A ($N = 35$) consists of psychotic TBS-detainees without a personality disorder. Group B ($N = 32$) consists of psychotic patients from a general psychiatric hospital without a personality disorder who have not committed an offense. These general psychiatric patients are between 20 and 50 years of age and were recruited from a long-stay ward (minimum duration of admission: 2 years). Group C ($N = 35$), consists of psychotic TBS-detainees with a personality disorder. Group D ($N = 35$) consists of TBS-detainees with a personality disorder only. In view of the focus of this study, no analyses were carried out on Group D. This group is however of importance in the broader context of the dissertation of the first author of this article.

The total number of patients in this study was 102. The forensic patients ($N = 70$) were recruited from three forensic clinics: the Prof. W.P.J. Pompe Foundation in Nijmegen, The Kijvelanden in Poortugaal, and Mental Healthcare Eindhoven and De Kempen in Eindhoven. The control group consisted of psychotic patients from Mental Healthcare Nijmegen. The term 'psychotic patients' is considered to mean patients with an Axis I-psychotic disorder (according to the DSM-IV), such as schizophrenia, schizoaffective disorder, delusional disorder and psychotic disorder NOS. Patients diagnosed with a psychotic disorder due to substance abuse were not included in this study. The 'patients with a personality disorder' included only patients with a cluster B personality disorder (according to the DSM-IV), such as antisocial and/or narcissistic disorders. Table 1 presents the principal Axis I and II diagnoses, subdivided into the various groups. The patients were characterized by the frequent occurrence of substance abuse, so frequent that we can speak of comorbidity together with the psychotic and/or personality disorder. Table 2 shows the diagnoses of substance abuse, subdivided according to the various groups and the type of substance.

All the forensic patients displayed violent behavior, meaning a serious violent offense for which, in the Dutch judicial system, detention under the Entrustment Act (TBS) is imposed and the offender has either a psychiatric disorder or such a degree of cognitive disability that there is a high risk of repetition of the offense. Specific offenses are, for example, (attempted) murder, (attempted) manslaughter, severe battery and injuries with possibly permanent damage, and arson (Table 3). Sexual offenses were not included in this study because the causes of sexual offenses are extremely different for psychotic offenders versus those with a personality disorder.

The forensic patients from the three clinics were selected at random. However, they were all males between the ages of 20 and 50 and had all committed a violent offense. The psychotic patients in control group B were selected on the basis of their last admission being involuntary. Permission for insight into their medical files was requested from the patients from Mental Healthcare Eindhoven and De Kempen. The letter that the attending physician read through with them explained that they would not

Table 1
Principal Diagnoses From Axis I and II, Subdivided into the Various Groups

Axis I diagnosis	group A <i>N</i> = 35		group B <i>N</i> = 32		group C <i>N</i> = 35		Total <i>N</i> = 102	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Schizophrenia	33	94.3	28	87.5	27	77.1	88	86.3
Schizoaffective disorder	1	2.9	0	0.0	0	0.0	1	1.0
Delusional disorder	0	0.0	0	0.0	2	5.7	2	2.0
Other psychotic disorder	1	2.9	4	12.5	6	17.1	11	10.8

Axis II diagnosis	group C <i>N</i> = 35		group D <i>N</i> = 35		Total <i>N</i> = 70	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Antisocial pers. disorder	14	40.0	14	40.0	28	40.0
Narcissistic pers. disorder	5	14.3	5	14.3	10	14.3
Borderline pers. disorder	5	14.3	7	20.0	12	17.1
Personality disorder NOS	11	31.4	9	25.7	20	28.6

Table 2
Diagnoses of Substance Abuse and Dependence, Subdivided According to the Various Groups and Types of Substance

		group A		group B		group C		group D		Total	
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Alcohol	Abuse	1	2.9	3	9.4	4	11.4	8	22.9	16	22.9
	Dependence	2	5.7	3	9.4	3	8.6	10	28.6	18	13.1
Cannabis	Abuse	4	11.4	6	18.8	5	14.3	3	8.6	18	13.1
	Dependence	4	11.4	4	12.5	1	2.9	2	5.7	11	8.0
Hard drugs	Abuse	1	2.9	0	0.0	1	2.9	7	20.0	9	6.6
	Dependence	3	8.6	1	3.1	3	8.6	5	14.3	12	8.6
Various agents	Abuse	0	0.0	0	0.0	0	0.0	2	5.7	2	1.5
	Dependence	5	14.3	1	3.1	5	14.3	6	17.1	17	12.4
Cocaine	Abuse	1	2.9	0	0.0	1	2.9	3	8.6	5	3.6
	Dependence	3	8.6	0	0.0	3	8.6	4	11.4	10	7.3
Amphetamine	Abuse	0	0.0	0	0.0	0	0.0	3	8.6	3	2.2
	Dependence	0	0.0	1	3.1	0	0.0	0	0.0	1	0.7
Hallucinogen	Abuse	0	0.0	0	0.0	0	0.0	1	2.9	1	0.7
	Dependence	0	0.0	0	0.0	0	0.0	1	2.9	1	0.7

group A : psychotic offenders without a personality disorder

group B : non-delinquent psychotic patients without a personality disorder in general psychiatry

group C : psychotic offenders with a personality disorder

group D : non-psychotic offenders with a personality disorder

Table 3
Index Offenses

Type of Offense	%
(attempted) manslaughter	27.0%
offence against property	26.7%
threat	19.0%
severe battery	16.8%
violence, robbery	10.2%
arson	9.5%
(attempted) murder	9.4%
(attempted) blackmail	8.8%
other violent acts	8.2%

have to participate in conversations or investigations, so that there would be no additional burden. It was also explained that their data would be made anonymous, so that they could not be identified as a patient by persons outside of the study. All but three patients gave permission. Because this was a study of patients' files, cooperation on the part of the patient was not necessary.

Table 4 presents some of the sociodemographic characteristics of the study population. It is striking that most of the patients were single and unemployed at the time of the offense or admission. Half of the patients had only completed primary school.

Study Strategy

Existing data were used to compare the four groups. The anamnestic, diagnostic and psychological test data were retrieved from reports to the court and intake reports by means of a retrospective search. In the case of control group B, the medical files were examined, particular attention being given to the previous medical history.

Instruments

To establish the precursors of delinquent behavior, in addition to a list of sociodemographic, (familial) psychiatric and criminological variables that was drawn up on the basis of a study of the current literature in this field, use was made of the following instrument: the historical items of the HCR-20 (Historical, Clinical Risk assessment guide 20), an instrument for assessing the risk of violent

behavior. These historical items are: previous violence, the first violent incident at a young age, unstable relationships, problems in the employment history, problems with substance abuse, mental disorder, psychopathy, problems in childhood, personality disorders, and a previous withdrawal from supervision. Item H-7 of the HCR-20 was scored with the aid of the PCL-SV. The PCL-SV is a Screening Version of the PCL-R which is frequently used for purposes of research.

Procedure

The variables were scored by trainee psychologists who were writing their dissertations while assisting with this study. For variables that were difficult to score, consultation was always possible with the attending psychiatrists who knew the patients well. There was also weekly consultation with a forensic psychiatrist, during which some lists of variables were assessed and amended if necessary.

The study was assessed by the medical ethics committee (Committee for Research on Humans in Nijmegen), which concluded that no declaration of consent from the patients was necessary. In the case of the patients that were recruited from Mental Healthcare Eindhoven and De Kempen, the management decided that a written declaration of consent was necessary. This institution is subject to the regular legislation governing mental healthcare. Consent was obtained from each patient individually.

To measure the inter-rater reliability, 10 randomly selected files per group (total of 40) were scored for a second time. The Kappa-values were

Table 4
Sociodemographic Characteristics of the Study Population

	group A		group B		group C		group D		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Institution										
Pompe Clinic	7	20.0	0	0.0	16	45.7	34	97.1	57	41.6
APZ Nijmegen	0	0.0	32	100.0	0	0.0	0	0.0	32	23.4
GGZE	9	25.7	0	0.0	4	11.4	1	2.9	14	10.2
Kijvelanden	19	54.3	0	0.0	15	42.9	0	0.0	34	24.8
Total	35	100	32	100	35	100	35	100	137	100
Civil status at the time of the offence or hospitalization										
Single	23	65.7	28	87.5	31	88.6	24	68.6	106	77.4
Divorced	7	20.0	3	9.4	3	8.6	3	8.6	16	11.7
Married	3	8.6	1	3.1	1	2.9	4	11.4	9	6.6
Cohabiting	2	5.7	0	0.0	0	0.0	4	11.4	6	4.4
Total	35	100	32	100	35	100	35	100	137	100
Employment status at the time of the offence or hospitalization										
Employed	2	5.7	0	0.0	1	2.9	8	22.9	11	8.0
Studying	0	0.0	2	6.3	1	2.9	1	2.9	4	2.9
Unemployed	33	94.3	30	93.8	33	94.3	26	74.3	122	89.1
Total	35	100	32	100	35	100	35	100	137	100
Domiciliary status at the time of the offence or hospitalization										
Own home	14	40.0	9	28.1	9	25.7	16	45.7	48	35.0
With parents	5	14.3	7	21.9	4	11.4	6	17.1	22	16.1
Shared household	4	11.4	5	15.6	7	20.0	7	20.0	23	16.8
Homeless	7	20.0	7	21.9	11	31.4	6	17.1	31	22.6
Hospitalized	5	14.3	4	12.5	4	11.4	0	0.0	13	9.5
Total	35	100	32	100	35	100	35	100	137	100
Ethnic origin										
Europe	17	48.6	25	78.1	18	51.4	25	71.4	85	62.0
Surinam	8	22.9	0	0.0	8	22.9	1	2.9	17	12.4
Neth. Antilles	2	5.7	2	6.3	0	0.0	1	2.9	5	3.6
North Africa	5	14.3	2	6.3	2	5.7	3	8.6	12	8.8
Turkey	1	2.9	0	0.0	2	5.7	1	2.9	4	2.9
Iran/ Iraq	0	0.0	1	3.1	0	0.0	0	0.0	1	0.7
Indonesia	0	0.0	2	6.3	1	2.9	1	2.9	4	2.9
Other Asian	2	5.7	0	0.0	3	8.6	3	8.6	8	5.8
Other South American	0	0.0	0	0.0	1	2.9	0	0.0	1	0.7
Total	35	100	32	100	35	100	35	100	137	100
Highest educational level completed										
None	1	2.9	1	3.1	3	8.6	3	8.6	8	5.8
Primary school	21	60.0	6	18.8	18	51.4	23	65.7	68	49.6
Lower secondary education	6	17.1	8	25.0	10	28.6	3	8.6	27	19.7
Intermediate second. education	3	8.6	9	28.1	3	8.6	4	11.4	19	13.9
Higher second. Education	3	8.6	6	18.8	1	2.9	2	5.7	12	8.8
College/University	1	2.9	2	6.3	0	0.0	0	0.0	3	2.2
Total	35	100.0	32	100	35	100	35	100	137	100

calculated for the categorical variables and the Interclass Correlation Coefficients (ICC) were calculated for the continuous variables. The inter-rater reliability was generally good to excellent: age at first admission, ICC = .978; first psychotic episode, ICC = .965; date of the TBS-offense, ICC = .843; first conviction (early/late starters), Kappa = .923; H-5 problems with substance abuse, Kappa = .923; H-7 psychopathy, Chi-square = .001.

Missing Data

The variable 'first psychiatric admission' was sometimes missing in the groups 'psychotic TBS-detainees without a personality disorder' (group A) and 'psychotic TBS-detainees with a personality disorder' (group C). The criminological data are usually well documented in forensic psychiatry, but this is much less true for the data on the prior psychiatric history. In order to be sure that this variable was missing for some patients by chance, the patients for whom this variable was present were compared with those for whom this variable was absent. A comparison was made on four socio-demographic variables: current age, marital status, having children or not, ethnicity. There was no significant difference in patients with the present variable 'first psychiatric admission' and those without.

RESULTS

Hypotheses 1a and 1b

Hypothesis 1a: Do most psychotic TBS-detainees with a personality disorder (group C) commit their first violent offense before their first admission? And is this different for psychotic TBS-detainees without a personality disorder?

Hypothesis 1b: Does the first psychiatric admission precede the TBS-offense by a longer period of time in psychotic TBS-detainees without a personality disorder than in psychotic TBS-detainees with a personality disorder?

An ANOVA was carried out with the 'time in years between the first admission and the first violent offense' as the independent variable and the patient groups (A/C) as the between-subject factor. There

was no difference between groups in the time between the first admission and the first violent offense: $F(1, 46) = 0.112, p = .740$. The average time between the first admission and the first violent offense did not differ significantly between groups A and C: $M_A = -2.83, M_B = -3.50$. In general, the first admission preceded the first violent offense.

A chi-square test was also carried out with 'the first violent offense before/after the first admission (before/after the same year)' and 'patient group (A/C)' as variables. This showed that there is no significant relationship between these variables: $\chi^2(2) = 0.651, p = .722$. It should be pointed out in this connection, however, that the expected cell frequency is smaller than 5 in more than 20% of the cells. The numbers are low because some of the data on first admission are lacking for groups A and C. The percentage that committed their first violent offense before their first admission is equally high in groups A and C (Table 5). Table 6 shows the differences between groups A and C in the time intervals.

It can be concluded from this that psychotic TBS-detainees with a personality disorder are also admitted before committing their first offense. The time period between the first admission and the TBS-offense is no different in psychotic TBS-detainees with or without a personality disorder (7 to 9 years).

Hypothesis 1c

Do psychopathy and/or substance abuse affect the time interval between the psychotic disorder and criminal behavior in psychotic TBS-detainees with a personality disorder?

The different time intervals were subjected to ANOVA-tests with a time interval as the independent variable and H 7: psychopathy (HCR-20) or H 5: substance abuse (HCR-20) as the between-subject factor (Tables 7, 8 and 9). Severe psychopathy was found to significantly shorten the time interval between the first violent offense and the first psychotic episode from 4.5 to 1 year. Psychotic TBS-detainees with severe psychopathy are first admitted, on average, 2.5 years before their first psychotic episode, in contrast to psychotic TBS-detainees without psychopathy who are admitted for the first time one-and-a-half years after their first psychotic episode.

Table 5
Temporal Relationship Between the First Violent Offense and the First Admission (groups A and C)

first admission / first violent offence	group A		group C		total	
	%	N	%	N	%	N
before	62.5	15	66.7	16	64.6	31
after	33.3	8	25.0	6	29.2	14
same year	4.2	1	8.3	2	6.3	3

Table 6
Differences Between Groups A and C in the Various Time Intervals

	group A	group C	statistics
period of time between first conviction for a violent offence and onset of psychosis	3.44	2.87	ns
period of time between first conviction for a violent offence and first admission	- 2.83	- 3.50	ns
period of time between onset of psychosis and TBS-offence	8.29	8.34	ns
period of time between first admission and TBS-offence	6.85	8.87	ns
period of time between first conviction and TBS-offence	3.88	4.80	ns
period of time between onset of psychosis and first admission	1.33	- 0.04	ns

ns = Nonsignificant

Serious substance abuse shortens the time interval between the first violent offense and the first psychotic episode from 9.5 years to less than one year in psychotic patients with a personality disorder. In psychotic TBS-detainees without a personality disorder, substance abuse has no effect on the time intervals.

Hypothesis 2

Is the 'duration of untreated psychosis' (DUP) longer in psychotic TBS-detainees than in psychotic patients in general psychiatry?

The average duration of the DUP in groups A, B and C is approximately 2 years (2.34, 2.48 and 2.06

Table 7

Differences Between Groups A and C in the Various Time Intervals: The Influence of Psychopathy

	M none	M slightly	M severe	statistics
period of time between first conviction and onset of psychosis	4.48	- 3.00	1.00	$F(2,27) = 2.742, p = .082, \eta = .17^*$
period of time between first conviction and first admission	- 4.11	- 1.20	- 4.00	ns
period of time between onset of psychosis and TBS-offence	8.84	7.65	0.67	ns
period of time between first admission and TBS-offence	8.18	12.01	3.12	ns
period of time between first conviction and TBS-offence	4.22	8.00	- 1.00	ns
period of time between onset of psychosis and first admission	1.29	- 3.82	- 2.49	$F(2,23) = 6.108, p = .007^{**}, \eta = .37$

*= no post-hoc tests : at least 1 group < 2 patients

**= $p < .01$

ns = Nonsignificant

respectively). Despite the fact that forensic psychotic patients tend to avoid professional healthcare, there is no significant difference between the psychotic TBS-detainees (groups A and C) and psychotic patients in general psychiatry (group B).

Hypothesis 3

Compared to psychotic patients in general psychiatry, are more psychotic TBS-detainees admitted after the first psychotic episode?

Table 10 shows the number of patients with and without a DUP. There was a DUP in 21 of the 24 psychotic TBS-detainees without a personality disorder (group A), indicating that they were not admitted until after the first psychotic episode. Among the psychotic patients in general psychiatry (group B), there are approximately equal numbers of patients with and without a DUP. Among the

psychotic TBS-detainees with a personality disorder (group C), 16 of the 26 had a DUP. There was thus a significant difference between groups A and B and between groups A and C, but not between B and C. It was not possible to score all the patients because data on the first admission are lacking for a number of them.

DISCUSSION

It should be pointed out that a number of hypotheses could not be confirmed, possibly due to the relatively small size of the groups and the lack of some data. It should be possible to test these hypotheses at a later time on larger groups of patients. The absolute time intervals must also be interpreted in the light of the limited numbers of patients.

Table 8
Influence of Substance Abuse on the Various Time Intervals in Group C

	M none	M slightly	M severe	statistics
period of time between first conviction and onset of psychosis	9.50	2.00	0.88	$F(2,27) = 3.599, p = .041^*, \eta = .21$
period of time between first conviction and first admission	- 9.75	- 2.67	- 2.07	ns
period of time between onset of psychosis and TBS-offence	10.15	7.31	8.15	ns
period of time between first admission and TBS-offence	11.95	7.34	8.67	ns
period of time between first conviction and TBS-offence	2.00	4.43	5.94	ns
period of time between onset of psychosis and first admission	0.40	0.25	- 0.25	ns

* $p < .05$

ns = Nonsignificant

Contrary to expectations, psychotic TBS-detainees with a personality disorder are also admitted for the first time before their first conviction for a violent offense (rejection of hypothesis 1a). This means that in this study group, psychotic TBS-detainees with a comorbid personality disorder also begin their psychiatric careers before committing an offense.

The time between the first admission and the TBS-offense is not significantly different for psychotic TBS-detainees with or without a personality disorder. The average duration in years is 6.85 for group A and 8.87 for group C. The late starters (first conviction after the age of 18) are usually found in group A, so that the TBS-offense can be expected to occur later in life. The first offenders are also found more often in this group. In group A we found mainly late starters ($N = 27, 22.9\%$), while in group C there were just as many early starters ($N = 18, 51.4\%$) as

late starters ($N = 17, 48.6\%$). This means that hypothesis 1b can also be rejected.

Severe psychopathy was found to shorten the time between the first conviction and the onset of psychosis. In psychotic TBS-detainees with severe psychopathy (measured with the PCL-SV), the first conviction takes place, on average, one year before the first psychotic episode, compared to about 4.5 years in psychotic TBS-detainees without psychopathy. Psychotic TBS-detainees with severe psychopathy are admitted for the first time 2.5 years before their first psychotic episode, on average, in contrast to psychotic TBS-detainees without psychopathy who are first admitted an average of 1.5 years after the first psychotic episode.

With regard to substance abuse, in group C severe substance abuse shortens the time interval between the first conviction for a violent offense and the first psychotic episode by an average of 8.5 years.

Table 9
Influence of Substance Abuse on the Various Time Intervals in Group A

	M none	M slightly	M severe	statistics
period of time between first conviction and onset of psychosis	3.90	1.56	4.27	ns
period of time between first conviction and first admission	0.86	0.75	4.54	ns
period of time between onset of psychosis and TBS-offence	8.77	6.47	9.06	ns
period of time between first admission and TBS-offence	4.23	3.73	9.21	ns
period of time between first conviction and TBS-offence	2.50	4.56	4.40	ns
period of time between onset of psychosis and first admission	2.22	0.24	1.18	ns

ns = Nonsignificant

Table 10
Presence of a Duration of Untreated Psychosis (DUP) (Admission After the Onset of Psychosis)

group	no DUP	DUP	total
A	3 (12.5%)	21 (87.5 %)	24 (100 %)
B	13 (41.9 %)	18 (58.1 %)	31 (100 %)
C	10 (38.5 %)	16 (61.5 %)	26 (100 %)

ABC $X^2(2) = 6.089, p = .048 *$

AB $X^2(1) = 5.682, p = .017 *$

AC $X^2(1) = 4.372, p = .037 *$

BC ns

* $p < .05$

ns = Nonsignificant

In group A, substance abuse has no effect on the time intervals between the various variables of the psychotic disorder on criminal behavior.

In general, therefore, psychotic TBS-detainees come into contact with the mental healthcare system before committing their first offense. Patients with severe psychopathy are admitted for the first time even before their first psychotic episode. There is an interval of 7-9 years between the first psychiatric admission and the TBS offense. This is a relatively long period of time. Regular psychiatry could therefore play a greater role in prevention if the determinants of future delinquent behavior by psychotic patients could be made clearer.

There was no difference between psychotic TBS-detainees and psychotic patients in general psychiatry with regard to the duration of untreated psychosis (DUP). The average duration is about two years, which corresponds to data in the literature on that subject. On the basis of the fact that psychotic TBS-detainees display an alarming tendency to avoid psychiatric care, it could be expected that the first admission would take place a longer time after the first psychotic episode. Contrary to expectations, this is not the case (rejection of hypothesis 2).

The psychotic TBS-detainees without a personality disorder have a DUP more often than psychotic patients in general psychiatry (hypothesis 3 is thus confirmed for group A). Psychotic TBS-detainees with a personality disorder do not have a DUP more often than regular psychotic patients (hypothesis 3 is rejected for group C). There is a DUP in significantly more patients in group A than in groups B and C. The consequence of a comorbid personality disorder in psychotic TBS-detainees is that more of them are admitted before the first psychotic episode. This may mean that psychotic TBS-detainees without a personality disorder are more difficult to identify due to the absence of residential care.

CONCLUSIONS AND RECOMMENDATIONS

There is considerable similarity between psychotic patients in general psychiatry and psychotic TBS-detainees. In this connection, we would like to emphasize the special circumstances in the Netherlands, where psychotic patients who commit a serious offense are given TBS-status. In

other countries, such delinquent psychotic patients may be treated in general psychiatry. As a result, the international literature on violent psychotic patients cannot be readily extrapolated to the Dutch TBS-situation. It may well be that these psychotic TBS-detainees are a separate subgroup of violent psychotic patients in general.

In any case, the recognizability of the various groups of psychotic patients in general psychiatry could have a preventive effect if the comorbidity is examined. In the first place, we are thinking of the comorbidity of a psychotic disorder with a personality disorder, but comorbidity with psychopathy and substance abuse can also be relevant. As described above,

the latter may affect the time intervals. Other non-psychiatric variables, such as a poor social context and substance abuse, may make the difference, in psychotic patients, between committing a serious offense and not committing one (Swanson et al., 2002). Our results should be compared with the findings in the literature. We also recommend that the hypotheses be tested again in larger groups of patients with fewer missing variables, and that the variable 'date of diagnosis' also be considered.

REFERENCES

- Coid B., Lewis S.W., & Reveley A.M. (1993). A twin study of psychosis and criminality. *British Journal of Psychiatry*, 162, 87-92.
- Hodgins, S. (1992). Mental disorder, intellectual deficiency, and crime. Evidence from a birth cohort. *Archives of General Psychiatry*, 49, 476-483.
- Hodgins, S., & Müller-Isberner, R. (2004). Preventing crime by people with schizophrenic disorders: the role of psychiatric services. *British Journal of Psychiatry*, 185, 245-250.
- Hodgins, S., Tiihonen, J., & Ross, D. (2005). The consequences of conduct disorder for males who develop schizophrenia: Association with criminality, aggressive behaviour, substance use, and psychiatric services. *Schizophrenia Research*, 78, 323-335.
- Hodgins, S., Müller-Isberner, R., & Allaire, J.F. (2006). Attempting to understand the increase in the numbers of forensic beds in Europe: a multi-site study of patients in forensic and general psychiatric services. *International Journal of Forensic Mental Health*, 5, 173-184.
- Humphreys, M., Johnstone, E., & Macmillan, F. (1994). Offending among first episode schizophrenics. *Journal of Forensic Psychiatry*, 5, 51-61.

- Larsen, T.K., Friis, S., Haahr, U., Joa, I., Johannessen, J.O., Melle, I., et al. (2001). Early detection and intervention in first-episode schizophrenia: a critical review. *Acta Psychiatrica Scandinavica*, *103*, 323-334.
- Malla, A.K., & Norman, R.M.G. (2002). Early interventions in schizophrenia and related disorders: advantages and pitfalls. *Current Opinion in Psychiatry*, *15*, 17-23.
- Moran, P., & Hodgins, S. (2004). The correlates of comorbid antisocial personality disorder in schizophrenia. *Schizophrenia Bulletin*, *30*, 791-802.
- Munkner, R., Haastrup, S., Joergensen, T., Andreasen, A.H., & Kramp, P. (2003a). Taking cognizance of mental illness in schizophrenics and its association with crime and substance-related diagnoses. *Acta Psychiatrica Scandinavica*, *107*, 111-117.
- Munkner, R., Haastrup, S., Joergensen, T., & Kramp, P. (2003b). The temporal relationship between schizophrenia and crime. *Social Psychiatry and Psychiatric Epidemiology*, *38*, 347-353.
- Munkner, R., Haastrup, S., Joergensen, T., & Kramp, P. (2005). Incipient offending among schizophrenia patients after first contact to the psychiatric hospital system. *European Psychiatry*, *20*, 321-326.
- Ogloff, J. R. P., Lemphers, A., & Dwyer, C. (2004). Dual Diagnosis in an Australian forensic psychiatric hospital: Prevalence and implications for services, *Behavioral Sciences and the Law*, *22*, 543-562.
- Perkins, D.O., Gu, H., Boteva, K., & Lieberman, J.A. (2005). Relationship between duration of untreated psychosis and outcome in first-episode schizophrenia: a critical review and meta-analysis. *American Journal of Psychiatry*, *162*, 1785-1804.
- Swanson, J.W., Swartz, M.S., Essock, S.M., et al. (2002). The social-environmental context of violent behavior in persons treated for severe mental illness. *American Journal of Public Health*, *92*, 1523-1531.
- Taylor, P.J., & Hodgins, S. (2003). Violence and psychosis: critical timings. *Criminal Behaviour and Mental Health*, *4*, 267-289.
- Tengström, A., Hodgins, S., & Kullgren, G. (2001). Men with schizophrenia who behave violently: the usefulness of an early- versus late-start offender typology. *Schizophrenia Bulletin*, *27*, 205-218.
- Timonen, M., Miettunen, J., Hakko, H., et al. (2000). Psychiatric admissions at different levels of the national health care services and male criminality: the Northern Finland 1966 Birth Cohort Study. *Social Psychiatry and Psychiatric Epidemiology*, *35*, 198-201.
- Van Emmerik, J.L., & Diks, G.J.M. (1999). De terbeschikkingstelling in mate en getal, Deel A: Populatiebeschrijving, een overzicht van 1995 t/m 1997; Deel B: Een overzicht van de kliniepopulaties op 1 januari 1998 [Detention under the Dutch Entrustment Act: Extent and Numbers. Part A: Description of the population, an overview of 1995 through 1997; Part B: An overview of the clinic populations on 1 January 1998]. Draft, Dr. F.S. Meijers Institute, Department of Monitoring and Research, Utrecht.