

**NETWORK EFFECTS ON TREATMENT RESULTS IN A CLOSED
FORENSIC PSYCHIATRIC SETTING**

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**NETWORK EFFECTS ON TREATMENT RESULTS IN A CLOSED
FORENSIC PSYCHIATRIC SETTING**

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Voor Ellen, Tijn en Bram

'The result of sociometric development has been that the investigation of the smallest social aggregates has become more interesting than that of the large ones'

- Jacob. L. Moreno (1934)

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Chapter 1

Introduction



1.1 Introduction

The ‘terbeschikkingstelling’ (TBS) is a court-ordered treatment measure in the Dutch penal system that can be imposed on any perpetrator who is deemed at risk to reoffend after committing an offence with a minimal custodial sentence of four years. TBS patients cannot be held fully responsible for their crimes because they were suffering from a mental illness at the time they committed their offence. As psychiatric patients, they are usually treated in a forensic psychiatric hospital, with the aim of reducing their risk to society. The duration of TBS is not predetermined, but depends on reducing the patients’ risk of reoffending during the treatment process. For as long as the patient is deemed still dangerous, TBS may be prolonged every two years. After a certain time or after reaching a certain level of progress in treatment, patients may be allowed to go on temporary leave. If patients show no progress in their psychological treatment for lengthy periods and are placed in long-term care, temporary leave under supervision may be admitted for humanitarian reasons. When sufficient reduction in risk behavior is established, patients are permitted to leave the forensic hospital for short periods to begin with, superintended by a guard or therapist. After evaluation and continued good results, the duration of leaves and freedom of movement in the resocialization process may be extended. TBS normally ends only when the risk of reoffending has been reduced to an acceptable level.

On 23 June 2004, a forensic psychiatric patient ordered to undergo TBS failed to come back from unsupervised leave. Instead, he abducted a 13-year-old girl and, as became apparent following his re-arrest, seriously threatened and abused her. The situation caused a great wave of unrest in the Netherlands. Parliament called the Minister of Justice to account for the mistakes made in allocating permitted leave for this patient. Under pressure, the minister tightened routine procedures for forensic patients’ leave. Nevertheless, on 7 June 2005, another forensic patient on short leave escaped from his supervisor and shortly afterwards, murdered an elderly man. The Minister of Justice was again called to account in an emergency debate. Demands for his resignation were rejected only because the vote of no confidence found insufficient support. These incidents led to a proposal by two members of parliament, Wolfsen and Weekers who stressed the importance of investigating why the TBS measure in its present form was not working to protect society against reoffending forensic psychiatric patients.¹ A proper investigation would provide crucial information to improve the TBS system. Parliament approved the resolution and established the Visser Committee, a temporary research committee named after its chair, VVD Second Chamber member Arno Visser.

Besides instigating several procedural changes, such as policy adjustments for providing leave and stricter monitoring of patients released from a closed facility, the

¹ Second Chamber, session 2004-2005, 29 452, nr. 25

committee recommended conducting scientific research into the effectiveness of TBS treatment to obtain insight into factors that establish the risk of reoffending (Final TBS research report, 2006). The Ministry of Justice Research Center was instructed to develop a research program based on an inventory of research needs in the forensic field, within the latitude of the committee's recommendations. The result was a three-year program studying the TBS measure along two lines: 1) the effectiveness of specific treatment interventions during the treatment process, and 2) underlying (risk) factors of recidivism. Now, in 2011, most of the studies begun in the past two years are still ongoing; others will begin next year.

This dissertation presents research into social relationships of forensic psychiatric in-patients in association with their risk-related behavior. It is independent of the three-year research program but takes place in the same general domain.

That social inter-relatedness affects all kinds of behavior and wellbeing has been long recognized, since the work of Durkheim (1858-1917) and Simmel (1858-1918). The association between social interaction and delinquent behavior is also assumed in prominent criminological theories. For instance, social control theory argues that criminal acts result from a lack of social integration, and deficient bonds to other individuals and social institutions (see Hirschi, 1969). In contrast, differential association theory (Sutherland & Cressey, 1955; Warr, 2002) posits that delinquent behavior is learned from interactions with other delinquents. Research into delinquent behavior has confirmed the importance of social relations to delinquent behavior (see Haynie, 2001, 2002) and mental and physical health (see Kawachi & Berkman, 2001; see Halpern, 2005 for a review). Despite the well-known literature and related empirical findings, surprisingly little research has been done into the social interaction of forensic psychiatric patients. Almost everyone in this group of delinquents commits very serious offences, and they do so because of their severe psychopathology. The largest population of forensic patients has the psychopathology known as personality disorder (80%, de Beurs & Barendregt, 2008), a relational disorder characterized by disturbances in relations with the self, others, and the environment (American Psychiatric Association (APA), 1994, 2000). In most cases, these patients receive psychological treatment in a forensic psychiatric hospital. The dominant aim is to prevent them from reoffending by reducing their risk-related behavior.

Because of the importance of social relations for the behavior and mental health of individuals, and the relational nature of the psychopathology of the most prominent group of forensic patients, behavioral change due to treatment is assumed to be closely related to changes in the social interaction of these patients. Insight into the association between social relationships and risk-related behavior can contribute additional insights into factors causing risk of reoffending. Conducting more of this type of research was one of the Visser Committee's important recommendations. Research into the social

relations of this population is also interesting sociologically because of the special context of the closed facility, where forensic psychiatric patients are incarcerated or hospitalized involuntarily. Living together in small groups, patients find their fellow patients difficult to avoid. They must depend on each other to achieve either social or material goals.

This research began by studying the social interaction among forensic patients forced to live in small closed groups. In particular, it investigated the association, cross-sectional and over time, between social relation networks and the risk-related behavior of forensic psychiatric in-patients with personality disorders.²

1.2 Background

1.2.1 The social environment of closed institutions

Sociological interest in closed institutions began with the pioneering research *The Prison Community* (Clemmer, 1940). Clemmer studied how the prison environment influenced and shaped the attitudes and behavior of prisoners. He employed the analytical concept of 'assimilation', which refers to a person's learning 'enough of the culture of a social unit into which he is placed to make him characteristic of it'. He also coined the term 'prisonization' that described the process of 'taking on in greater or lesser degree the folkways, mores, customs and general culture of the prison'. Prominent experiences such as accepting a subordinate role, learning the ways and means of the institution, and adapting to new habits in daily existence made the inmate part of a 'prison community'. The pre-incarceration personality of a prisoner, the type, and extent of relationships, associations with other inmates not of the inmate's choosing, and acceptance of the creeds and codes of the prison subculture proved to be factors that could accelerate or delay the prisonization process.

Sykes (1958) examined the impact of the prison environment from another perspective, one that emphasized that the psychological pain of inmates was rooted in the extremely depriving and frustrating nature of the prisoners' captive situation. According to Sykes, this pain contributed to a new set of functional but deviant norms and values that could later be exported to society upon release. Along with Clemmer, Sykes stressed the importance of social relations in dealing with the institutional environment. He felt that the most realistic mode of surviving the pains of imprisonment (deprivation of liberty, autonomy, goods and services, heterosexual relationships and loss of security) was through the pattern of social interaction between inmates. The interactions ranged between the two extremes of 'collectivistic' and 'individualistic' orientation. Sykes & Messenger (1960) considered a more collectivist orientation that provided greater inmate solidarity and reduced the pain of

² For reasons that shall be explained later in this introduction, this research focused specifically on the group of patients with personality disorders.

imprisonment. However, this contrasted with the code that inmates do not interfere with one another.

How prisoners try to cope with prisonization and psychological pain also seems important for the rehabilitative potential of inmates. Those who internalize prison customs and rules have a greater chance to reoffend than those who keep relating to the customs and rules of society (Irwin & Cressey, 1962). Recent literature has acknowledged the importance of social relations for inmates in closed institutions in order to 1) combat dehumanization and the degrading environment, 2) define norms and roles so that expectations are clear, and 3) minimize the risk of assault (Sijuwade, 2007). Social behavior is probably important for the inmate's chances of successful rehabilitation.

Although the above citations apply to the prison environment and not specifically forensic psychiatric hospitals, it may be assumed that the same mechanisms play a role in psychiatric facilities, albeit to a lesser extent. This corresponds with research by Sykes & Messenger (1960) and others (e.g., Irwin & Cressey, 1962), who incorporated the institutional structure as a factor to explain the prisonization process. Prisonization is presumably less at issue in treatment-oriented institutions than in custody/disciplinarian-oriented institutions. However, in forensic psychiatric hospitals, the focus on custody or discipline is more important than in average treatment-oriented institutions, because of the nature of the committed offences, the patients' disorders, and their risk to reoffend. In line with propositions on the importance of social relationships to individual (criminal) behavior and wellbeing, it may therefore be assumed that social relations are indeed important for the functioning of forensic psychiatric patients.

Social network analysis

Social network analysis (SNA) is a specialized way to investigate social relations and networks; for overviews see Wasserman & Faust (1994), Scott (2000), and Carrington, Scott & Wasserman (2005). Networks are patterns of relationships between actors in a group. Often such relationships are regarded as binary ('on/off') in that for each pair of actors they distinguish only between the existence and non-existence of a relational tie. The actors are usually individuals but can also be organizations or countries.

Network relationships can be diverse, such as friendship, cooperation, and trade. In sociology, social relations are often studied at a general and aggregated level. Network analysis, in contrast, is aimed at the microstructure of social relationships and it distinguishes between 'complete networks' and 'ego networks'. Complete networks contain a predetermined group of actors, for instance, a unit of colleagues in a company or a class of schoolchildren, and include the entire pattern of relationships within the group network. The study of ego networks takes only the relationships of the central actor (the 'respondent') with others into account. This dissertation deals with the study of complete networks.

Graphical representations are often helpful to visualize network patterns. Actors are represented by dots, also called nodes. The lines between nodes represent the social connections between actors. Relations can be directed (represented by an arrow) in cases where the direction of the relationship between the two actors is considered to be meaningful, or undirected (represented by dotted lines or a double-headed arrow), in which case an existing relationship is always assumed to be reciprocal, or the direction has no meaning. Networks can be described in terms of characteristics of the network as a whole, or as positional characteristics of actors in the network. It is also possible to consider the presence of subgroups in the network.

A basic feature of the network as a whole is cohesion, which indicates the degree of interconnectedness of actors in the network. A basic cohesion measure is the mean number of relationships per actor in the network. Subgroups can be distinguished by defining groups of actors who are socially highly related and less related to those outside their subgroup. Positional characteristics describe the degree to which actors occupy a central position within the network. A first measure for centrality is the number of connections an actor has with other actors, called the degree of the actor. Directed networks distinguish the number of incoming and outgoing interactions, (depending on the meaning of the relation) where incoming relations can often be interpreted as a measure of the popularity of an actor and outgoing relations as a measure of activity. Positional network characteristics can be used to investigate whether relational facets of actors are associated with other characteristics, such as their behavior. The next section explains how the present research applied SNA.

Networks, relationships, and measures in this study

The present research investigated the social relationships of forensic psychiatric patients of various units in a Dutch forensic hospital. In-patients are, in social network terms, the actors. The total number of relationships between patients living on the same unit are considered complete networks. Because of the pioneering nature of this research into the social relationships of forensic psychiatric patients, it was important to include a set of relationships that covered all aspects of their social interaction as well as possible.

According to the exchange approach, social networks can be defined as ‘a set of persons with whom specific types of support are exchanged’ (Fischer, Jackson, Stueve, Gerson, Jones & Baldassare, 1977; Wellman, 1981) or ‘relationships that are to some degree important to the individual that is part of the network’ (Kahn & Antonucci, 1980). The important overarching relations according to this approach are companionship, emotional aid, and instrumental aid (McCallister & Fischer, 1978; Wellman & Wortley, 1990).

The present study included social relationships related to this approach. First, it noted the frequency of association between patients, distinguishing positive (friendship and

friendly relationships) and negative relationships (unfriendly and hostile) for general insight into the nature of this association. This research also included social support and trust relations, both more profound relations associated with emotional aid, in line with the exchange approach. The instrumental aid of the exchange approach was included by assessing instrumental relationships between patients, drawing a distinction between material and relational instrumental use. These social relations largely cover the basic interpersonal exchanges between patients. However, because patients in a closed setting are strongly dependent on their group mates for almost all domains of (social) life, issues of hierarchy and status are more prominent here than in regular settings. The effects of a patient's low status in the group can seldom be compensated by contacts outside the closed setting and so seriously restrict behavioral opportunities. On the other hand, high status patients have more behavioral and control opportunities, for instance, using intimidation to retain high status. Status competition and defense mechanisms of low status patients are to be expected, especially in the most prominent group of forensic patients, those with personality disorders, for whom the manifestations of their disorders are often expressed in distortions in authority and equality-based relationships (Haslam, Reichert & Fiske, 2002). Therefore, this research also included hierarchy and influence relations.

The various social interactions, namely positive/negative, instrumental, trust, social support, influence and hierarchical relations, were investigated in five units of a forensic psychiatric hospital. The social relations of patients on a unit are considered closed networks. Sociotherapists working on a unit were made responsible for assessing the relationships. Networks were assessed for every type of relationship, based on a consensus method to combine the various observations of sociotherapists. The network relations were used to describe and analyze the social relations of the patients.

The primary objective of this research was to investigate the association between social relations and the disorders and risk-related functioning of forensic in-patients. Before explaining this association further, the risk-related functioning of these patients requires some introduction.

1.2.2 Risk-related functioning in patients

The dominant aim of TBS is to protect society against mentally ill offenders. This is why recidivism by these patients is important in research into outcomes of the measure (see Van Emmerik 1981, 1984, 1985, 1989; Leuw, 1995, 1999; Canton, 2004; Wartna, Harbachi & Knaap, 2005; Bregman & Wartna, 2010; Keune & Van Binsbergen, 2010). Although past studies have provided valuable insights into the extent to which patients reoffend, such aspects as the type and severity of reoffences cannot be related to therapy results or treatment outcomes. One of the main reasons is uncertainty about what occurred between

the time a patient received treatment and the time he or she reoffended. Fortunately, the number of patients that reoffend, and thus for whom this can be studied, is limited. In the period 2004–2006, 268 patients were unconditionally released from forensic psychiatric hospitals. Within a two-year period about 21% of the group came in contact with the justice system again, and less than 5% reoffended with a very serious crime (Bregman & Wartna, 2010).

To gain more insight into actual treatment-caused progression, recent research focused on the extent to which specific therapeutic aims are met, such as a decrease in certain psychiatric symptoms (e.g., Greeven & De Ruiter, 2004; Caldwell, McCormick, Umstead & Van Rybroek, 2007). This is why the need for evidence-based treatment has become more prominent in forensic psychiatry. Knowing which specific interventions (e.g. therapies) work best, for whom and under what circumstances requires an 'evidence base' for specific interventions and treatment programs, obtained through scientific research (de Beurs & Barendregt, 2008). Although progress has been made in identifying factors for successful treatment, research into interventions is still in its infancy and the usefulness of this kind of research to address questions regarding the effectiveness of TBS as a whole, including non-therapeutic influences such as the social environment of the patient unit, is still limited.

A problem for general research into the effectiveness of TBS is that recidivism in most cases can only be determined much later than the time the treatment was actually provided. Another restriction is that only registered recidivism is taken into account, and not the unnoticed reoffences, or offences by persons who have not had the TBS measure imposed. Rather than actual recidivism, the *risk* of recidivism during the course of treatment is a better variable to study. In the past, evaluation of this risk consisted mainly of clinical assessments by the hospital professionals. These assessments proved, however, to be unreliable, and now structured methods of risk assessment are increasingly used (Lammers, 2007; De Vogel, 2005; Philipse, 2005). These instruments consider criminogenic factors that are assumed to remain stable as well as risk factors that are assumed to be changeable over time. The criminogenic factors assumed to be changeable could be especially useful measures of treatment success and thus decreased risk of reoffending.

To establish decreased risk-related behavior, patients are treated mainly by cognitive-behavioral therapy and skills training. The cognitive-behavioral approach assumes that cognitive, emotive, and behavioral patterns of individuals are inter-related and constitute interdependent aspects of a person's adjustment. The problems of the most prominent forensic patient group, those with personality disorders, are manifested in the individual's personality, which can be split into the character and temperament aspects of personality. An individual's character affects a person's beliefs, view of the world, the future, and the self (Sperry, 1999). Temperament refers to the innate, genetic, and constitutional influences

of personality; impulsivity and aggression are important elements of temperament (Costello, 1996). Temperament plays an important role in the ability of an individual to regulate behavior. Treatment of personality disorders requires the adjustment of both character and temperament aspects of personality. Both clinical experience (Freeman & Davidson, 1997) and research (Linehan, 1993) suggest that adjustments to the patients' temperament must initiate the ultimate change in individuals' character. However, many patients with personality disorders lack the basic skills (Stanley, Bundy & Beberman, 2001) for overcoming problems in regulating their temperament, often leading to stress or even violent behavior. Treatment is thus initially directed at learning the requisite personal and relational skills, and secondly at initiating changes to the temperament and character aspects of personality to reduce the risk of a patient reoffending. Monitored risk-related behavior in the present research focused on factors related to cognitive-behavioral domains as well as personality disorder domains.

1.2.3 Association between networks and behavior

As mentioned earlier, social inter-relatedness affects all kinds of behavior, as well as mental and physical wellbeing. The importance of social relations on delinquent behavior has also been acknowledged.

Interacting individuals may influence each other's behavior and choose interaction partners based on their behavioral characteristics (cf. Steglich, Snijders & Pearson, 2010). Social relations may thus be changed based on characteristics of individuals in the network (selection); but also individual characteristics, like the risk-related behavior of patients, may be changed based on characteristics of those an individual is related to (influence). This study investigated diverse social interactions among forensic psychiatric patients in association with risk-related behavior. The assumption is that detailed information about patients' maintained relationships will contribute insights into their therapeutical process and treatment progression, and potentially add possibilities for monitoring and intervening in patients' risk behavior. Because relational patterns are relatively objective and as such observable through SNA, this leads to potentially more reliable monitoring of the treatment status and changes in behavior during the treatment process.

The study began by investigating the contemporaneous association between the networks/social relationships and risk-related behavior. Second, the association was investigated in a longitudinal design that distinguished between the selection and influence processes in the association. Section 1.4 sketches an outline of the research.

1.3 Procedure

Data for the studies described in this dissertation were collected in one of the largest forensic psychiatric centers in the Netherlands for the treatment of TBS-imposed patients.

The research population consists of patients with personality disorders staying on units for the treatment of their psychopathology. Patients with personality disorders mainly receive psychotherapy and cognitive-behavioral therapy, while patients with psychotic disorder are treated mainly with medication. Possible effects of psychological treatment on the behavior of psychotic patients are hard to separate from the influence of medication. Investigating the inter-relatedness of social relations and behavior is highly interesting in the group of patients with personality disorders because these disorders are of relational nature, and since these patients reoffend relatively often, even after forensic psychiatric treatment.

Initially, a pilot study of two measurements was conducted on two patient units for treatment of patients with personality disorders. The pilot study developed and tested a method for collecting relational data, based on SNA. All sociotherapists working on the units assessed the social relationships of the patients on their unit. Data were not collected directly from patients because they may be intrinsically motivated to provide incomplete or false information thus placing the validity and reliability of their responses into doubt. With all sociotherapists evaluating the relationships of all patients, the same network of relations was observed multiple times. This made it possible to check on the reliability of observations and minimized possible bias in within-group comparisons, which might have occurred if patients had evaluated their own relationships.

For the development of the measure for the patients' risk-related functioning, their sociotherapeutic mentors and the treatment coordinator of the patient unit (psychologist or psychiatrist) completed a questionnaire during the pilot. The questions were based on assumed changeable criminogenic factors. The respondents' comments and suggestions were used to develop the questionnaire for the subsequent research.

After the pilot study, data on networks/relations and patient behavior were collected three times at six-monthly intervals on all five treatment units for patients with personality disorders in the same forensic psychiatric center in which the pilot study had been carried out. Relational data were collected by the methods developed in the pilot study, taking each patient unit as a closed network. Every sociotherapist on these units filled in a digital questionnaire provided on a computer. Based on the overlap in relations perceived by sociotherapists, a consensus network was constructed for every kind of relation and this was used in the subsequent analyses. Behavioral data were collected using hard-copy questionnaires, in parallel with the information about the social relationships. Patient records were the source of information on patients' psychiatric and personality disorders, as well as personal details such as age, duration of stay in the facility, duration of TBS, and IQ. The disorders listed in axis I and axis II of DSM-IV classification (American Psychiatric Association, 1994, 2000), as diagnosed by psychologists/psychiatrists of the facility, were used to determine the psychopathology of the patients.

1.4 Description of the studies in the dissertation

This section presents a description of the studies included in this dissertation. All the studies are presented in the form of independent research articles. To avoid repetition in later chapters, however, previously mentioned background information has been deleted.

Chapters 3, 5, and 6 investigate the associations between social relationships of forensic patients and their psychological and behavioral characteristics. The studies described in Chapters 2 and 4 are preparations for the other chapters. They provide information about the methods used to measure social relations (Chapter 2) and behavioral aspects (Chapter 4) of forensic patients.

Specifically, **Chapter 2** describes a pilot study aimed to investigate the possibility of reliably mapping social relations of forensic psychiatric patients with social network analysis. It involved two distinct groups of patients (a unit of sex offenders and a unit of patients with borderline personality disorder), and mapped diverse social relationships, including influence, positive/negative and instrumental relationships. This established to a satisfactory degree the capability to distinguish differences in social relations on the individual and the group level.

Chapter 3 studies the association between patients' social relations and their personality disorders. Personality disorders are defined as relational disorders. Psychological diagnosis of forensic patients is generally done on the individual level even though the behavior expressed through psychopathology is dependent on the relational contexts of the individuals. Several social relationship types are related to the ten personality disorders of clusters A, B, and C in DSM-IV (American Psychiatric Association, 1994, 2000). Expectations, based on the relational diagnostic criteria of these disorders, about the social interactions between patients were formulated and tested, throwing more light onto the relational character of the disorders.

This chapter also introduces the research population studied in the following chapters, consisting of patients from five units for the treatment of personality disorders. The chapter provides an overview of the psychiatric and personality disorders on the distinct patient units, and includes personal details (average age, average length of stay in the facility, and average IQ) of patients on the various units.

Chapter 4 describes the development of a measure of patients' risk-related behavior, based on the data collected during the pilot study. This measure uses the dynamic risk factors of the risk assessment instrument commonly used in practice, the HKT-30 (Work group risk assessment forensic psychiatry, 2002). The chapter examines the psychometric qualities of the developed scales, inter-rater reliability, and the factor structure of the risk behavior. In addition, it presents the developments in patients' risk-related behavior for patients involved in all three measurements. This serves as background knowledge for the

studies described in the next two chapters. Within these studies the risk-related behavioral domains, distinguished by principal component analysis, were used as separate and complementary measures for the risk-related functioning of patients.

Chapter 5 specifically examines the associations between patients' social interaction and risk-related functioning. This study associated several kinds of social relations in a cross-sectional design, with risk behavior related to cognition, temperament, and skills.

Chapter 6 describes the interdependent co-evolution of social relationships and risk-related behavior of forensic psychiatric in-patients over a period of 18 months. Compared to the cross-sectional study, it considered a richer set of network parameters. The longitudinal design facilitated better insight into the nature of the association between social interaction and risk-related behavior. Stochastic actor-based models were used to analyze developments in patients' social relations and behavior in mutual dependence, which enabled one to distinguish between selection effects (where an individual chooses interaction partner based on their personal characteristics) and influence effects (changes in personal behavior due to the characteristics of an individual's interaction partners).

Finally, **Chapter 7** presents a summary of the conducted research and draws conclusions based on outcomes of the various studies.

Chapter 2

Applying social network analysis in a forensic psychiatric center¹

¹ This chapter has previously been published in slightly revised form: Horst, R. P. van der & Spreen, M. (2010). De toepassing van sociale netwerkanalyse in een forensisch psychiatrisch centrum. *Panopticon, tijdschrift voor strafrecht, criminologie en forensisch welzijnswerk*, 31, 26-41.

2.1 Introduction

The extent to which individual behavior is influenced by social surroundings has become an important focus in research into criminal behavior (e.g., Haynie, 2001, 2002). Social surroundings seem to affect the mental and physical health of individuals (e.g., Kawachi & Berkman, 2001, see Halpern, 2005 for an overview). Several criminological theories underline the importance of social relations in the explanation of criminal behavior; social control theory assumes that criminal acts are the result of a lack of social integration and a lack of bonds with other individuals (see Hirschi, 1969), while differential association theory (Sutherland & Cressey, 1955; Warr, 2002) assumes that delinquent behavior is learned from others who exhibit similar delinquent behavior.

Since the work of Durkheim (1858-1917), it has been generally accepted that social integration affects behavior and the psychosocial wellbeing of individuals. Thus, it is remarkable today how limited and seemingly inconsistent knowledge is with regard to the role of social relations of persons staying in forensic facilities. Lindquist (2000) indicates that close social interaction between female inmates leads to extra tension and fear. Brunt & Hansson (2002), on the other hand, show that an increase in social interaction and emotional relationships has a positive effect on the mental condition of a group of individuals with severe psychiatric disorders.

In forensic psychiatry, the importance of social relationships is mainly expressed in the items of risk assessment tools, such as the HKT-30 (Workgroup risk assessment forensic psychiatry, 2002) and the HCR-20 (Webster, Douglas, Eaves & Hart, 1997). These measurements were developed to predict the chance a patient will reoffend. Examples of relational facets in these instruments are 'social and relational skills', 'social support and network', 'instability of relationships', and 'minimal availability of personal support'. The items must be interpreted as a summary of the influence of the personal network on patients' risk-related behavior.

The detailed description of the influence of the personal network on patients' risk for recidivism has recently obtained increased attention. Spreen, Pomp & Vermeulen (2006) developed the forensic social network analysis (FSNA) method for research into forensic psychiatric patients as well as for practical application in police investigations. With FSNA, the researcher can provide a detailed picture of the personal network of a forensic patient during the period he committed the offence as well as for the current situation. This network information and a comparison of the networks in both situations can be used to assess a patient's present risk for society, as is illustrated by Pomp's (2008) detailed description of network processes in the case of a sex offender.

However, knowledge about the role of social relations between patients living in an intramural setting is still underdeveloped in forensic psychiatric network research. Clearly, detailed information about maintained relationships between patients can contribute

insight into the therapeutical process and the progress of their treatment. Psychotherapist Moreno developed the sociogram for his research into the relationship between social structures and psychological wellbeing. He explains, "The science of group organization attacks the problem not from the outer structure of the group, the group surface, but from the inner structure. Sociometric explorations reveal the hidden structures that give a group its form: the alliances, the subgroups, the hidden beliefs, the forbidden agendas, the ideological agreements, the 'stars' of the show" (Moreno, 1934).

On a closed unit, for example, a network may have one patient in the role of leader playing a prominent part in influencing other patients. If this patient had a strongly negative attitude towards treatment, his attitude would probably affect the treatment of patients over whom he has influence. On the other hand, if the leader had a positive attitude to treatment, his attitude could promote cooperative behavior in line with treatment objectives. In other words, the internal network structure of a patient unit may have a great impact on the behavior of patients and eventually also on the ultimate effectiveness of treatment. This has to be investigated.

This chapter describes the results of an exploratory network study in the Netherlands conducted at the forensic psychiatric center (FPC) Dr. S. Van Mesdag. This facility treats TBS offenders who have committed serious crimes but who cannot be held fully responsible for the offence because of the severe psychiatric disorder they suffered at the time they committed the offence. With the aim to protect society because of the significant chance of recidivism, such offenders are incarcerated indefinitely for treatment in a forensic psychiatric hospital.

The current study describes social relationships maintained by patients on two units in FPC Dr. S. Van Mesdag. The first unit is a treatment unit for patients with borderline personality disorder. The second unit is a treatment unit for patients who in addition to having personality disorders have all committed sexual offences.

Since little is known about the internal network structures of forensic treatment units, this study is explorative. The aim is to map the mutual social relationships on the two units, and investigate ways in which network analyses can add value to daily routine treatment practices. The study considers differences on both the individual unit level and on the group level (between units).

2.2 Method

2.2.1 Research population

The first unit houses 11 male patients, mainly diagnosed with borderline personality disorder (BPD). Patients with BPD are characterized by such behaviors as instability of mood and relationships, impulsivity, black-white thinking, bad temper and (threatening)

suicide. The mean age during the measurement period was 39 years; six patients had a European and five a non-European background. The mean duration of incarceration was 51 months.

The second unit houses 13 sex offenders (SO) with widely diverse personality disorders. The mean age was 41 years during the measurement; all were Dutch nationals. Nine of the 13 patients were diagnosed with pedophilia. The mean duration of incarceration was 54 months.

2.2.2 Data collection

All the sociotherapists working on the units (10 on the BPD unit and 12 on the SO unit) were questioned for the collection of relational information on patients. Since these members of forensic psychiatric staff work entirely on the units, they have the most detailed knowledge of the social interactions between the patients in residence. To obtain an as complete and varied a picture as possible of the social relations on the unit, all the sociotherapists independently evaluated the questionnaire. Basing their views on their daily observations, they were asked to assess diverse social relationships between all pairs of patients. Each sociotherapist answered the questionnaire in a private room during working hours, in the presence of a researcher. While assessing, the therapists explained their answers verbally. This extra information added qualitative description to the results and is thus cited at times to illustrate this chapter. Each therapist took on average 90 minutes to fill in the questionnaire. The measurements were completed in a period of two weeks per unit. The response rate was 100% for both measurements.

2.2.3 The questionnaire

For each pair of patients on the unit, sociotherapists were requested to assess:

1. whether the relation of one patient to another led to changes in thinking and/or behavior of the second patient (Influence)
2. whether the nature of the relation between pairs of patients could be described as friendship, friendly, neutral, unpleasant or hostile (Positive/negative relationship)
3. whether a patient used a relationship with another patient to his own advantage for material things (e.g., cigarettes, drugs, money) and/or for the relation itself (e.g., for protection, prestige, sexual favors) (Instrumental relationship).

In addition, sociotherapists were asked to report the hierarchy (pecking order) of patients in the group. The top patients (undisputed leader of the unit) were given the lowest number (1), while the patients with the lowest rank (scapegoat/lowest status) were number 11 on the BPD unit and 13 on the SO unit.

2.2.4 The analysis

Standard concepts of social network analysis were used to analyze the internal networks on the units (for a general introduction, see Wasserman & Faust, 1994). First, therapists provided their views of the network by assessing the relations between all patient pairs on the unit, per type of relationship. Then the individual responses were summarized in an aggregated 'consensus network', determined according to a minimal overlap of 25%, that is, a connection was assumed to exist if at least 25% of the sociotherapists had reported it. This relatively low boundary value was based on the assumption that therapists possess complementary knowledge. If a therapist did not report a relationship, this may be interpreted as lack of information and thus may not be a convincing sign of the absence of the relationship. If, for instance, four therapists observed patient A exerting influence on patient B, and six other therapists did not, the overlap is 40% and this pair will thus be included in the consensus network. The variables 'positive/negative relation' were given a higher consensus threshold, namely 50% or higher. This is because the type of relation between patient pairs was always indicated for these variables. The therapists were asked to rate the relationship on a scale, meaning that they had to fill in the answer category that best corresponded with the nature of the relationship they had observed. To guarantee better reliability, the percentage required for consensus for these relationships was higher.

Using the Ucinet network program (Borgatti, Everett & Freeman, 2002), the following network measures for centrality were calculated for the diverse relations:

- '*degree centrality*': the number of direct relations a patient has with another patient:
 - '*in-degree centrality*' (*idc*): the number of patients directing relations towards the patient (incoming ties)
 - '*out-degree centrality*' (*odc*): the number of patients to whom a patient directs relations (outgoing ties)
- The '*closeness centrality*' (*cc*): a measure indicating the extent to which a patient is directly or indirectly connected with all other patients
- The '*betweenness centrality*' (*bc*): a measure that indicates to what extent a patient has an intermediary position between patients not directly connected with one another.

The '*mean degree*' (*Mdc*) of the network is a global indicator for the extent to which a certain type of relation is present in the patient group. This measure is valuable for comparing the overall extent to which social relations are maintained on the diverse groups.

The hierarchical positions of patients was obtained by asking the sociotherapists to rank the patients in vertical order on the unit. Their orderings were processed into a network showing the hierarchical differences between all patient couples. Every higher position of a patient in relation to another patient was defined as a (hierarchical) relation. The cumulative assessment of the hierarchical ordering of patients was acquired by

adding up the relational networks. Patients were grouped according to their hierarchical characteristics by the statistical technique of block modeling that groups individuals with similar relational characteristics together. The results are presented as visualized networks in Section 2.3. BLOCKS was used for the analysis (for the manual, see Snijders & Nowicki, 2007), a program for stochastic block modeling (for more information about block modeling and BLOCKS, see Nowicki & Snijders, 1997; Nowicki & Snijders, 2001).

Block modeling distinguished three groups of patients on the BPD unit and four groups on the SO unit with similar hierarchical relational characteristics.

To study the extent to which each relation ‘follows’ the direction of the hierarchical order, the degree of hierarchy conformity (*hierc*) was calculated by subtracting the number of relations going against the hierarchical order from the number of relations that follow the order, and dividing the difference by the total number of relations in either direction. This obtained a score of between -1 to 1, which presents the extent to which a relation respectively does or does not follow the hierarchical structure.

To establish the degree of correspondence between two distinct relations, the Jaccard coefficient (Jaccard, 1901; Batagelj & Bren, 1993) was calculated using the Ucinet program (Borgatti, Everett & Freeman, 2002). This coefficient is defined by the number of pairs tied to both kinds of relations, divided by the number of pairs tied by at least one of them. As the value of this coefficient increases from 0 to 1, it indicates a stronger correspondence between the two relations.

2.3 Results

The consensus networks are analyzed per patient unit and per type of relation (influence, positive/negative association and instrumental relation). Appendix 1 presents a complete report of the network measures per type relation. The next subsections briefly mention a few measures to illustrate the results. The *Netdraw* program (Borgatti, 2002) was used to visualize the networks presented in this section. In these visualizations, patients are presented according to their position in the pecking order (number 1 at the top) and those in comparable positions at roughly the same height. In the description of the association between types of relations (paragraph 2.3.4), besides earlier described sorts of relations also results of the relationships ‘trust’ and ‘social support’ will be presented.

2.3.1 Influence relations

Figures 2.1 and 2.2 present consensus networks for the influence relation for both BPD and SO units. Visualizing the exertion of influence provides a first insight into the hierarchical ordering on the unit.

Both units appear to have almost the same number of influence relations (BPD

patients, $Mdc = 2.55$; SO patients, $Mdc = 2.23$). Evidently only a few patients on both units are responsible for exerting influence, namely those with a relatively high position in the pecking order. In almost all cases influence is directed to patients with an equal or lower hierarchical position ($hierc = 1$ for the BPD unit/0.94 for the SO unit).

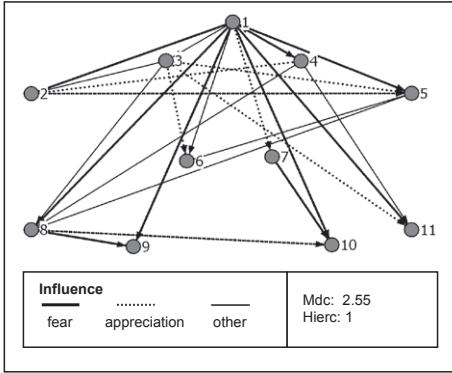


Figure 2.1. Influence relations on the BPD unit

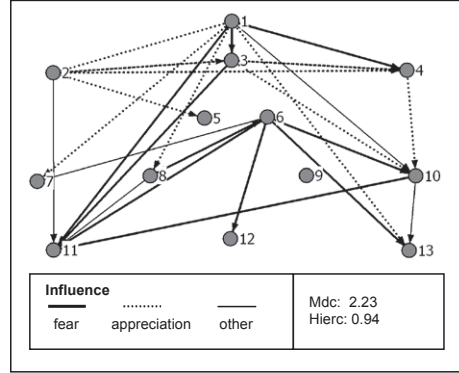


Figure 2.2. Influence relations on the SO unit

Patient 1 of the BPD unit, the undisputed leader according to the therapists, appears to have direct influence on all ten other patients residing on the unit ($odc = 10$). His influence seems due mainly to the other patients' fear of him ($odc = 7$). Patient 4 is typified by the therapists as the informal leader of the unit. He is characterized as 'cunning', and 'not clearly present on the unit', but according to his network position he is very influential. Although he influences 'only' four patients directly, his actual influence (through his impact on patient 1) is greater because of indirect relationships ($cc = 0.62$).

Patient 3 also seems influential ($odc = 5$). This patient has been living on the unit for some considerable time, and knows the ropes well. His indirect influence, however, stretches less far than patient 4's influence ($cc = 0.32$). Patient 8 is most influenced by most other patients ($idc = 6$). He demands attention and behaves annoyingly, which is why he is generally regarded as a difficult person whom the others wish to influence.

On the SO unit, patients 1 and 6 are primarily responsible for exerting influence on other patients. Patient 1, the undisputed leader, is characterized as 'charming' and 'socially skilled'. He exerts influence on eight other patients ($odc = 8$), for four patients his influence is based on appreciation and for three others it is based on fear. Patient 6 has a somewhat lower hierarchical position but still exerts direct influence on six other patients ($odc = 6$), based mainly on fear. This patient is typified by the therapists as a 'father figure for the weaker patients on the unit'. His influence appears to be limited to this weaker group. For patients 2 ($odc = 3$) and 4 ($odc = 4$), the essence of their influence appears to be mutual

appreciation. Despite the smaller *number* of direct influence relations, it seems that the range of influence through their indirect relations is larger ($cc = 0.24-0.27$) than the indirect influence of patient 6 ($cc = 0.14$). Patients 11 ($idc = 6$) and 10 ($idc = 4$) are influenced by the most other patients. Patient 11 is described by the therapists as ‘nervous, anxious and retarded’, which is why he is sensitive to the influence of others. Patient 10 is ‘socially vulnerable’ who compensates by being verbally aggressive. He tries (without success) to connect with patients belonging to the highest group in the hierarchy, whom he respects deeply.

2.3.2 Positive/negative relations

Figures 2.3 and 2.4 present the friendships and friendly (positive) relations and the unpleasant and hostile (negative) relations between patients on the BPD and SO units.

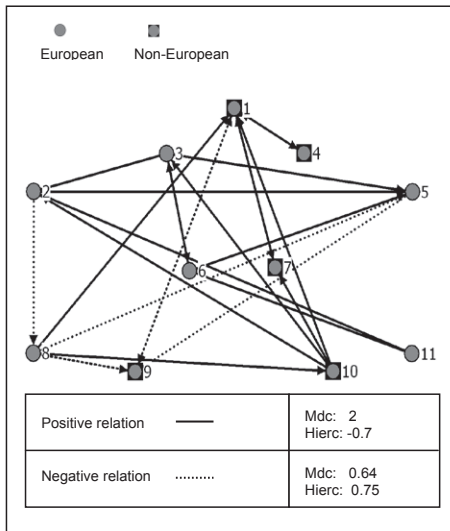


Figure 2.3. Positive/ negative associations on the BPD unit

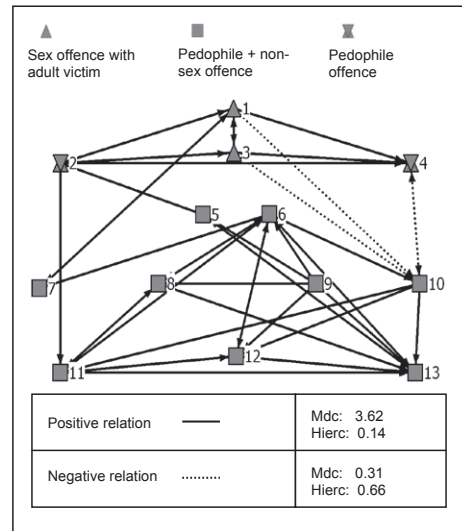


Figure 2.4. Positive/ negative associations on the SO unit

It seems that patients on the BPD unit maintain fewer positive relationships than patients on the SO unit (difference, $Mdc = 1.6$). When distinguishing between friendly and friendship relations, however, it appears that BPD patients maintain more friendship relations than sex offenders (difference, $Mdc = 0.32$). Friendship relations on both units seem to be maintained primarily between patients with similar hierarchical positions. Positive relations on the BPD unit are directed mainly in the opposite direction of the unit hierarchy ($hierc = -0.7$), which implies that patients lower in the hierarchy have more

positive relations directed towards patients higher in the hierarchy than the other way around. Despite hierarchical differences, positive relations on the SO unit are maintained unidirectionally ($hierc = 0.14$). Negative association (unpleasant and hostile relations) is more prominent on the BPD unit than on the SO unit (difference, $Mdc = 0.33$), especially hostile relations ($Mdc = 0.54$). On the SO unit, negative relations are restricted to a few unpleasant relations. On both units, negative relations are in line with the hierarchical order ($hierc$ BPD = 0.75, $hierc$ sexual delinquents = 0.66), implying that patients higher in the hierarchical order maintain more unpleasant and hostile relations towards patients lower down in the order.

On the BPD unit, two subgroups maintain mutual positive relations.² The first subgroup contains patients 1, 4, 7, 8, and 10, and the second subgroup contains patients 2, 3, 5, and 6. Patient 11 is 'an autistic person with little backbone who communicates with difficulty', which is mainly why he is isolated from both subgroups. Patient number 9 is not a member of a subgroup because he 'actively looks for strife' and is generally seen as 'a very unpleasant person to deal with'.

The first subgroup consists of patients of similar ethnical background, except for patient 8. This subgroup is hierarchically diverse. Patients 1, 4, and 7 belong to a group called 'The Brothers' by patient 1. Patient 7 is verbally aggressive to compensate for 'his lack of intelligence'. Despite their non-European background, patients 8 and 10 do not belong to The Brothers. Patient 10 tries 'too hard' to impress other patients and thus maintains many friendly relationships with others ($odc = 5$).

The second subgroup that shows mutual positive interaction are the Dutch patients who share a significant institutional history in that they have been imprisoned (on the unit) for a long time. Patient 2 is verbally skilled and self-confident. Patient 5 is typified by the therapists as 'the unit entrepreneur' who is known to 'make a fool of others'. Patient 6 occupies a somewhat lower hierarchical position, mainly due to his psychotic problems and tendency to 'play the victim'.

On the SO unit, mutual positive relationships are restricted mainly to the subgroups, and in contrast to the BPD unit, these are not in line or opposite to the hierarchy. The upper subgroup contains patients 1, 2, 3, and 4, the lower subgroup of patients 5, 6, 8, 9, 10, 11, 12, and 13. It is striking that patients in the lower group all seem to be pedophiles. Patients in the upper group committed sex offences on adult victims or they committed other non-sex crimes³ besides a sex crime involving minors. According to the therapists, those

² Subgroups are hard to distinguish in the network figure, because the patients are ordered according to hierarchical position. Positive relations are differently grouped than the hierarchical subdivision.

³ This indicates antisocial behavior in a general sense, where patients are not necessarily regarded as (core) pedophiles. The sexual offence involving minors is then seen more as an opportunistic crime rather than because of victim preference.

in the upper group have 'greater ego strength' compared to the lower group, and usually have mutually friendly relationships; patients 3 and 4 appear to be friends. Patient 7 is not really committed to any other patients and therefore does not belong to a subgroup.

2.3.3 Instrumental relations

Especially in an environment with more restrictions and dependencies than usual, relationships are often used instrumentally in the pursuit of personal goals. Therefore, it makes sense to investigate this. Figures 2.5 and 2.6 visualize the instrumental relations on both units.

A similar frequency of instrumental relations was observed on the BPD unit ($Mdc = 2.3$) and the SO unit ($Mdc = 2.7$). However, closer inspection of the *nature* of instrumental relations identified prominent differences between the units. On the BPD unit, instrumental relations are mainly used to gain access to material goods. In contrast, sexual delinquents seem to use each other instrumentally mainly for relational purposes (protection, status, entertainment). While on the BPD unit instrumental relations seem to follow the hierarchical order ($hierc = 0.42$), the instrumental relations of the sexual delinquents appeared not to be hierarchically ordered ($hierc = -0.18$), but mainly reciprocal.

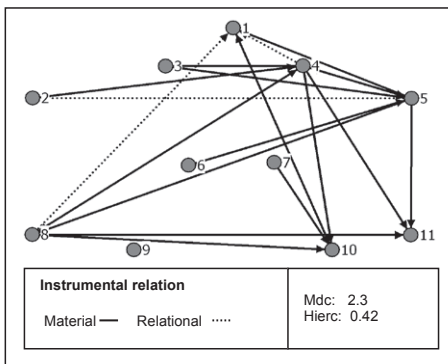


Figure 2.5. Instrumental relations on the BPD unit

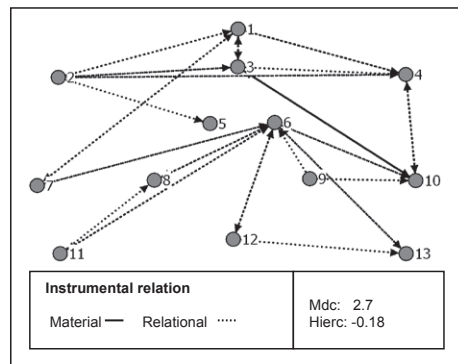


Figure 2.6. Instrumental relations on the SO unit

On the BPD unit, patient 4 ($odc = 7$), patient 5 ($odc = 7$), and patient 8 ($odc = 4$) occupy central roles in the instrumental use of other patients. Patient 4 is associated with drug use. Patient 5 is the entrepreneur of the unit. His wares include goods from the facility shop, which he sells at a profit, and he trades goods saved on the unit (e.g. coffee and sugar). Patient 8 is the most instrumentally used patient ($idc = 4$). Patient 8 ($bc = 0.21$), patient 4 ($bc = 0.25$), and patient 5 ($bc = 0.20$) connect the web of patients who instrumentally use each other. Patient 9 who lives in isolation on the unit maintains no instrumental relations with others. The person used most for relational purposes is patient 1 ($idc = 3$), namely by

patient 8, 4, and 10. Due to patient 1’s hierarchical position, he can provide power, status, and protection.

Instrumental use by sex offenders is mainly directed towards patients in a patient’s own subgroup. The upper subgroup has mutual instrumental relationships in the main. In the lower subgroup, patient 6 occupies a central position as almost everyone else in this subgroup maintains a mutual instrumental relationship with him (*odc* = 6; *idc* = 7).

2.3.4 Association between diverse relations

To obtain a good representation of the relational patterns in the two patient populations, the associations between the several types of relations are also investigated. Tables 2.1 and 2.2 provide insight into the associations, expressed in Jaccard coefficients per pair of relations. The Jaccard coefficients are presented on the upper right side of the diagonal. Below the diagonal for every pair of relations, the number of relations that correspond with each other is displayed on the upper left, the number of vertically mentioned relations that do not correspond with the horizontally mentioned relations are displayed on the lower left, the number of horizontally mentioned relation that do not correspond with the vertically mentioned relation are displayed on the upper right and, finally, the total number of horizontal and vertical possibilities for relations in the network are displayed on the lower right.

		Influence		Positive		Negative		Social support		Trust		Instrumental relation	
Jaccard coefficient (SD)													
Influence				0.28 (0.01)		0.13 (0.07)		0.39 (0.00)		0.14 (0.16)		0.26 (0.08)	
Positive	Relational associations	11	17			0.00 (1.00)		0.42 (0.00)		0.55 (0.00)		0.27 (0.02)	
		11	71										
Negative	Relational associations	4	24	0	22			0.00 (1.00)		0.00 (1.00)		0.03 (0.77)	
		3	79	7	81								
Social support	Relational associations	12	16	11	11	0	7			0.35 (0.00)		0.18 (0.12)	
		3	79	4	84	15	88						
Trust	Relational associations	5	23	12	10	0	7	7	8			0.19 (0.04)	
		7	75	0	88	12	91	5	90				
Instrum. relation	Relational associations	11	17	10	12	1	6	6	9	6	6		
		14	68	15	73	24	79	19	76	19	79		

Table 2.1. The association between types of relations expressed in Jaccard coefficients based on relational associations on the BPD unit.

The Jaccard coefficient of 0.28 for the pairing of positive relations and influence, for instance, was calculated by dividing the 11 mutual relations in the networks by the 39 relations of both networks accumulated (11+11+17). So, both types of relations share 11 of the total 39 relations. Of these relations, 11 are positive but no influence relation and 17 influence but no positive relation. As the value of the Jaccard index increases, the association between the two sorts of relations grows stronger.

On the BPD unit, positive, trust and social support relations appear strongly related. Almost all trust and social support relations are also positive relationships. About half of all positive relations appear to be a trust and social support relation. Half of the trust and social support relations seem to be mutually associated.

A relatively strong association was found between influence and social support relations. Three quarters of the social support relations appear to be related to the influence relations. Less than half of the influence relations coincide with social support. Relations that associate with each other to a somewhat lesser degree are positive, influence and instrumental relationships.

		Influence		Positive		Negative		Social support		Trust		Instrumental relation	
Jaccard coefficient (SD)													
Influence				0.41 (0.00)		0.10 (0.03)		0.49 (0.00)		0.11 (0.18)		0.44 (0.00)	
Positive	Relational associations	22	7			0.00 (1.00)		0.52 (0.00)		0.23 (0.00)		0.51 (0.00)	
		25	102										
Negative	Relational associations	3	26	0	47			0.00 (1.00)		0.00 (1.00)		0.08 (0.09)	
		1	126	4	105								
Social support	Relational associations	19	10	26	21	0	4			0.11 (0.17)		0.48 (0.00)	
		10	117	3	106	29	123						
Trust	Relational associations	4	25	11	36	0	4	4	25			0.26 (0.00)	
		8	119	1	108	12	140	8	119				
Instrum. relation	Relational associations	20	9	28	19	3	1	21	8	10	2		
		16	111	8	101	33	119	15	112	26	118		

Table 2.2. The association between types of relations expressed in Jaccard coefficients based on relational associations on the SO unit.

On the SO unit, strongest associations of relations seem to be in positive, instrumental and influence relationships. Almost all social support relations in the network are also positive relations. Approximately half of the positive relationships are also social support relations. Three quarters of the instrumental relations also appear to be positive relations; the other way round, this appears to be somewhat more than half. Social support, instrumental and influence relations mutually coincide for about three quarters. Only the number of instrumental relations that coincide with influence relations is somewhat lower.

With regard to the association between positive relations and influence, three quarters of the influence relations coincide with relations in the positive relation network but this drops to half for positive relations related to influence. A substantially weaker association for this group was found between positive and trust relations. Almost all trust relations coincided with positive relations. The other way around this was less the case.

Differences in associations between the units

On the BPD unit, positive, social support and trust relations are most strongly associated. On the SO unit, besides the association of positive and social support relations, additional mutual associations were found with influence and instrumental use. Where associations between positive relations, social support and trust (as on the BPD unit) can be interpreted as authentic 'healthy' social interaction, the remarkably strong association of these relations with instrumental relations (as on the SO unit) is deviational. The sex offenders share more types of relations with each other. Instead of interpreting this multiplicity of relationships positively, we interpret the high association rather as superficiality in interpersonal association.

In both groups, social support and influence relations are strongly associated. Providing social support could thus play a role in shaping the patients' hierarchy. In the group of sexual delinquents the existence of social support relations is more prominent than influence relations. This may indicate that an additional function of social support may be to signal hierarchical differences in a conflict-avoiding way.

2.3.5 Overall view

The results show that patients on the SO unit maintain positive relationships in general, while patients on the BPD unit maintain, besides more friendship, more hostile relations. Such extremes in relational behavior are congruent with BPD pathology, demonstrating on the one hand impulsivity, black-and-white thinking and bad temper, and on the other hand abandonment anxiety and low self-esteem. Generally speaking, sex offenders imprisoned in this FPC (especially pedophiles) are observed to avoid conflict, behavior reflected by their superficially friendly relations and the total absence of hostility.

Two subgroups were identified in the populations of both units. On the SO unit, the

split appeared to coincide with the division in the patients' hierarchical order, separating patients with adult victims from the pedophiles. This result indicates that the hierarchical order on the unit is probably based (partly) on characteristics of the offence committed. While it is common knowledge that sex offenders are less respected in a forensic setting than other groups of delinquents, this research provides novel insight into the hierarchical sub-ordering within a group of sex offenders.

Two subgroups were distinguished on the BPD unit, in positive association, based on shared ethnical background. This association appears to be based on ethnic homophily rather than hierarchy. The first subgroup consists almost only of patients with a non-European background, while the other group consisted of Dutch patients who shared a long institutional history. The group of non-European patients contains patients ranked both high and low in the hierarchy. Hierarchical differences in homogeneous ethnic groups are also identified in U.S. prisons, where patients often group together according to ethnicity. Hierarchical distinctions in these groups appear to play an important role in the development of these networks (Buentello, Fong & Vogel, 1991).

2.4 Discussion

Research into the role of social relationships on treatment units in a forensic psychiatric hospital is still at an early stage of development. The detailed illustrative social network analysis of the social relations on two patient units, described in this chapter, was an initial approach to explore the potential value of the method for treatment practice and to serve as background for the remainder of this research.

The most important finding is that social network analysis makes it possible to map relational differences on both group and individual levels. Collecting relational information on patients from the therapists' observations proved to be a very useful method. The sensitivity of the social network analyses to differences on both group and individual level implicitly proves its usability.

Besides the methodological and substantive findings, using observer data added important extra value to the therapeutic process. The sociotherapists indicated that filling in the network questionnaire helped them to enhance their professionalism. Firstly, the questions activated a process of awareness that motivated the sociotherapists to examine an individual patient's social relations more conscientiously. As a result, the sociotherapists seemed better able to perceive patient behavior in the relational context. Whereas patients' behavior used to be seen as a personal feature, because of their increased awareness of social context, the therapists could now view the behavior more in the light of relational influences. The sociotherapist's expanded view can be seen as contributing added value to the daily handling and assessment of patients on the unit.

Later, when the resulting images of the network relations were reported to the unit's staff, the sociotherapists and treatment coordinators (psychologists/psychiatrists) seemed to recognize the images and valued the detailed, clarifying information they provided on the relational associations between patients. This more detailed view of patients' relation networks may indeed offer possibilities for better and more targeted interventions in treatment.

To illustrate this, here are two interventions based on relational information gathered on the BPD unit. One of the results of the BPD network analysis was new insight into the high degree of (indirect) influence exerted by the informal leader, which had not previously been noticed by the therapists in daily practice. Influence does not necessarily have to be negative, but this patient was suspected of using his influence to procure drugs. After a urine check, suspicions of his drug use were indeed confirmed. Network information further provided insight into the instrumental relationships he maintained with two patients who were vulnerable to the influence of others. Close observation showed that the leader used one of these patients to provide drugs, which the subordinate acquired from a patient on another unit. To restrict the informal leader's influence and provide more developmental space for those patients under his powerful influence, the leader was transferred to a unit of patients with greater ego strength and less susceptibility to the influence of others.

Another patient on the BPD unit was also transferred around the same time because of the dangerous situation created by his hostile relations with hierarchically highly positioned patients belonging to both subgroups on the unit. Some sociotherapists had already noticed this patient's hostile attitude, but understanding the relational context, which clarified the prominence of his problems with significant persons in both subgroups, made the problems for this individual's safety more explicit.

Of course, an intervention does not necessarily mean transferring a patient. For example, in a situation where patients maintain less hostile or unpleasant relationships, activities directed at constructive cooperation could be deployed (e.g., making trouble-makers the secretary and chairman of group meetings, to let them practice consulting each other).

However, the prerequisite for efficient application of network interventions in the treatment process is to gain good insight into the networks of relevant relationships for the entire unit. Social network analysis appears imminently useful for this purpose.

Chapter 3

Relational patterns and networks of forensic in-patients with distinct personality disorders



3.1 Introduction

Since the work of Durkheim (1858-1917) and Simmel (1958-1918) it has been generally accepted that individual wellbeing and behavior is affected by the social environment. The degree to which individual behavior (see Haynie, 2001, 2002), as well as both mental and physical health (see Kawachi & Berkman, 2001; see Halpern, 2005 for a review) are affected by the social environment has become an important topic in research into criminal behavior in recent decades. Despite the common acknowledgement of the importance of social relations for behavior in a broad set of contexts and domains of life, research into the relationships of incarcerated persons still is rare.

More insight into social relations and the influence of social interactions on individual behavior would be interesting and especially useful in the case of forensic psychiatric in-patients because their therapeutic treatment is focused on establishing positive change in pathology-related interpersonal behavior. Most forensic psychiatric patients suffer from a personality disorder (80% of Dutch forensic patients, de Beurs & Barendregt, 2008). It is widely accepted that personality disorders manifest largely as disruptions to interpersonal life with characteristic patterns of interpersonal disturbance, as illustrated by the definition of personality disorder (PD): *a chronic disturbance in one's relation with the self, others and the environment that results in distress or failure to fulfill social roles and obligations* (American Psychiatric Association, 1994, 2000). Interpersonal aspects figure prominently in the clinical descriptions of many PDs although the expression of the PD-specific problems can vary, as indicated by the clinical criteria listed in DSM-IV (APA, 1994, 2000): paranoid personalities for instance 'suspect that others are exploiting, harming or deceiving them', while dependent personalities 'go to excessive lengths to obtain nurturance and support from others'. Antisocial personalities 'lack remorse, as indicated by having hurt, mistreated or stolen from others', while obsessive-compulsive personalities are 'over conscientious, scrupulous, and inflexible about matters of morality, ethics or values', all of which have relational implications.

According to the dominant, cognitive-behavioral treatment approach for forensic in-patients with PDs, the 'manner of thinking' determines patients' feelings and behavioral response. Thoughts or core beliefs, also called 'schemes', represent the content of hypothetical structures in the mind. Individuals process information consistently with their beliefs, and develop corresponding behavioral strategies. Each personality disorder has its own set of core beliefs and behavioral strategies (Beck, Freeman & Associates, 1990). Despite the interpersonal content of behavioral strategy (Pretzer & Beck, 1996), PDs are rarely framed in interpersonal terms but rather in terms of biological origin, developmental problems, or intrapersonal deficits.

The main tradition of systematically investigating the interpersonal aspects of PDs is based on the interpersonal circumplex that has rich clinical (Benjamin, 1993), theoretical (Kiesler, 1986; Leary, 1957) and empirical (Wiggins, 1982) foundations. The interpersonal circumplex tradition presents PDs as blends of interpersonal characteristics, which is why this approach provides better insight into inter-relatedness and thereby the differences and similarities of distinct PDs. The five-factor model (FFM), better known as the 'Big Five', containing five interpersonal characteristics (neuroticism, extraversion, agreeableness, conscientiousness, and openness) seems to be a complementary model of personality that provides a larger framework for orienting and interpreting the circumplex model (McCrea & Costa, 1989). Many published studies have related the Big Five to PD (see for a review Widiger & Costa, 2002) and recently quite a number of additional studies have expanded on this research, providing further support for understanding PDs in terms of FFM dimensions and facets (Mullins-Sweatt & Widiger, 2006; Clark, 2007; Widiger & Trull, 2007). However, an important limitation of the circumplex model (that the FFM does not deal with either) is the neglect of information on actual relational patterns of personality disordered individuals. Insight into actual relational patterns may give more specific insight into behavior as a result of psychopathology. For example, Clifton, Turkheimer & Oltmanns (2009) studied how the network characteristics of military recruits ($N = 809$) were associated with both self and peer-reported PD traits. Consistent with DSM-IV descriptors, they found measures of centrality and degree connectivity to be positively associated with narcissistic and histrionic PDs, and negatively associated with avoidant, schizoid, and schizotypal PDs. This confirmed the relational character of PD traits.

For forensic in-patients with these disorders, monitoring manifestations of relational behavior can be a useful indication of the extent to which pathological behavior still exists in a patient. It may provide an additional handhold for therapeutic intervention.

The aim of this chapter is to contribute insight into the actual relational patterns of in-patients suffering from PDs, using social network analysis to study various interpersonal relations (contact frequency, positive/negative association, instrumental relations, and influence relations) among forensic psychiatric in-patients in a maximum security forensic hospital. The locus of research consisted of five units for the therapeutic treatment of patients who had committed serious crimes and suffered from PDs. The patients were grouped homogeneously in units according to general crime or personality features, namely 1) sex offenders, 2) narcissistic PD, 3) substance use disorder, 4) pervasive developmental disorder, and 5) borderline personality disorder. First, expectations about the social relationships within and between these units were formulated and these led to hypotheses about actual relational patterns for PDs, which were then tested by exponential random graph modeling (Robins, Snijders, Wang, Handcock & Pattison, 2007).

3.2 Arguments and expectations

This section begins with a discussion of the particular social relations considered in the study. The distinct PDs are introduced, including diagnostic characteristics as well as their relatedness to FFM factors. Next, hypotheses for the association between social relations and PDs are presented and finally, the hypotheses are investigated and tested.

3.2.1 Choice of relations

Social networks are defined as relational interpersonal structures within which specific types of support are exchanged (Fischer, Jackson, Stueve, Gerson, Jones & Baldassare, 1977; Wellman, 1981), including relationships that to some degree are important to the individual belonging to the network (Kahn & Antonucci, 1980). According to this exchange approach to social networks, the important overarching relations are companionship, emotional aid, and instrumental aid (McCallister & Fischer, 1978; Wellman & Wortley, 1990). This study included similar social relationships, namely, contact frequency, negative relations (hostile and unpleasant relations) vs. positive relations (friendship and friendly relations), and instrumental relations (distinguishing between material and relational motives). These social relations cover the basis of interpersonal exchanges between patients. However, in a closed institution, where patients have limited freedom to choose with whom they will interact, patients' hierarchy and influence, in combination with mutual dependency are important complements to the basic array of exchange relations. Aberrations in authority and equality-based relationships seem to be especially present in individuals with PD symptomatology (Haslam, Reichert & Fiske, 2002). Therefore influence relations were also included in the research. Using the diagnostic criteria of DSM-IV, hypotheses about these social relations were formulated and tested for the distinct PDs.

3.2.2 Personality disorders and the five-factor model

For diagnostic purposes, forensic psychiatric centers in the Netherlands mainly use the classification system the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994, 2000) that organizes disorders in distinct categories. This research mainly considers the psychiatric disorders categorized as PDs (axis II¹), grouped in DSM-IV into three clusters of ten prototypical descriptions (see Figure 3.1). Cluster A is characterized by odd and eccentric behavior and consists of the paranoid, schizoid, and schizotypal PDs.

¹ In DSM-IV each psychiatric diagnosis is organized into five levels (axis) related to different aspects of a disorder or disability. PDs are defined as axis II disorders.

Cluster B is characterized by dramatic, emotional and erratic behavior and includes antisocial, borderline, histrionic, and narcissistic PDs. Cluster C, finally, is characterized by anxious or fearful behavior, and includes avoidant, dependent, and obsessive-compulsive PDs. Besides the clearly formulated PDs, DSM-IV contains a category for behavioral patterns that do not match any of the ten disorders, but nevertheless exhibit characteristics of a PD. This category is labeled PD ‘not otherwise specified’ (NOS).

Cluster A <i>(odd, eccentric disorder)</i>	Cluster B <i>(dramatic, erratic disorder)</i>	Cluster C <i>(anxious, fearful disorder)</i>
Paranoid Schizoid Schizotypal	Antisocial Borderline Histrionic Narcissistic	Avoidant Dependent Obsessive-compulsive

Figure 3.1. Personality disorders grouped in clusters A, B & C (DSM-IV, APA, 1994, 2000).

Clinicians determine whether the symptoms of a patient are sufficiently close to a particular diagnostic category to warrant the corresponding diagnosis. This categorical way of diagnosis has demonstrated both clinical utility (Casey, Birbeck, McDonagh, Horgan, Dowrick, Dalgard, Lethinen, Ayuso-Mateos, Dunn, Page, Wilkinson, Wilkinson & Vasquez-Barquero (2004)) and predictive validity (Skodol, Buckley & Charles, 1983; Gunderson, Frank, Ronningstam, Wachter, Lynch & Wolf, 1989; Smith, Koenigsberg, Yeomans, Clarkin & Selzer, 1995; Histroke, Langstrom, Ottosson & Grann, 2003). However, several researchers have found weaknesses, such as excessive co-morbidity² and poor convergent and discriminant validity, to argue for the reconceptualisation of PD diagnoses with a dimensional model (Clark, 2007; Krueger, 2005; Markon, Krueger & Watson, 2005; Widiger & Trull, 2007). From the dimensional perspective, PDs can be considered an extreme trait level of a normal personality dimension, or as a dysfunction associated with general personality traits (Wiggins & Pincus, 1989). One of the predominant candidates for a dimensional model of PD is the FFM, which allows a comprehensive, adequate and accurate description of distinct PDs (Widiger & Costa, 2002; Saulsman & Page, 2004; O’Connor, 2005). This study used the FFM to provide insight into the inter-relatedness of interpersonal characteristics of distinct PDs.

The FFM consists of the following broadly formulated domains of general personality function: neuroticism versus emotional stability, extraversion versus introversion, openness versus closedness, agreeableness versus antagonism, and conscientiousness. Each factor comprises a cluster of more specifically formulated traits, called facets (see Appendix 2).

² Co-morbidity is the presence of additional conditions with the initially diagnosed illness.

DSM-IV PD symptomatology is readily understood as a system of maladaptive variants of FFM domains and facets (O'Connor, 2002, 2005; Samuel & Widiger, 2009; Saulsman & Page, 2004; Widiger & Costa, 2002). A meta-study by Samuel & Widiger (2009) included 16 independent studies into the relationship between PDs and the FFM factors and facets in adult populations. Table 3.1 presents the associations between PDs and four related FFM factors with the weighted effect sizes interpretable as correlation coefficients. These results provide general insight into the characteristics, differences and similarities and ultimately the inter-relatedness of distinct PDs. Additional insight into the most prominent associations between PDs and FFM facets (not presented in Table 3.1) are described in the text.³ These insights were used to formulate hypotheses on the social relations and various PDs in the research population.

Personality disorders related to neuroticism

The paranoid, schizotypal, borderline, avoidant and dependent PDs seem to be strongly and positively related to neuroticism, especially to the facets 'experience of negative emotions', 'emotionally reactivity', and 'vulnerability to stress'. Due to these characteristics, people with these personalities have a greater tendency than others to interpret ordinary situations as threatening. Antisocial and narcissistic PDs seem positively related only to the neuroticism facets of 'hostility' and 'impulsiveness'.

PD	Neuroticism	Extraversion	Agreeableness	Conscientiousness
Paranoid	.40	-.21	-.34	-.11
Schizoid	.22	-.46	-.16	-.10
Schizotypal	.38	-.28	-.17	-.14
Antisocial	.18	.04	-.36	-.33
Borderline	.54	-.12	-.24	-.29
Histrionic	.10	.33	-.11	-.11
Narcissistic	.11	.09	-.37	-.10
Avoidant	.52	-.49	-.07	-.16
Dependent	.44	-.15	.08	-.20
Obs. compulsive	.18	-.12	-.05	.24

Table 3.1. Weighted effect size estimates of correlations for ten DSM-IV PDs and four of the FFM relationships (Samuel & Widiger, 2009). Openness is excluded because it lacks relevance to PDs.

³ For relatedness of personality disorders and facets of FFM factors, see Samuel & Widiger (2009).

Personality disorders related to extraversion

The histrionic PD is the only disorder characterized by 'extraversion'. Individuals with this disorder seek stimulation in the company of others. In contrast, PDs in cluster A and the avoidant PD in cluster C are associated with 'introversion'. Whereas schizoid and avoidant PDs show relatively strong overall associations with introversion, paranoid and schizotypal PDs relate especially negatively to the introversion-related facets of 'warmth', 'gregariousness', and 'positive emotions'. The antisocial PD is characterized only by the extraversion-related facet of 'excitement seeking'. Borderline PD is negatively associated with the facet of 'positive emotions' and the dependent PD negatively with 'assertiveness'.

Personality disorders related to agreeableness

Paranoid, antisocial, borderline, and narcissistic PDs are all characterized by 'antagonism', the opposite of the FFM factor 'agreeableness'. Such personalities are suspicious of others, rather than compassionate and cooperative. Paranoid, antisocial, borderline and narcissistic PDs are negatively related to the facets of 'agreeableness': 'trust', 'straightforwardness', 'altruism', and 'compliance'. Narcissistic PD is strongly characterized by 'lack of modesty'. Schizoid, schizotypal and avoidant PDs relate negatively only to the facet of 'trust'. The dependent PD is the only disorder positively related to a facet of this domain, namely, 'modesty'.

Personality disorders related to conscientiousness

Antisocial, borderline and dependent PDs are negatively associated with 'conscientiousness'. In contrast, obsessive-compulsive PD is overall positively related to this factor, which embodies avoidance of trouble and being regarded by others as reliable. Antisocial and borderline PDs show negative associations with the facets of 'competence', 'dutifulness', 'self-discipline', and 'deliberation'. Avoidant and dependent PDs both relate negatively to the facets of 'competence' and 'self-discipline'.

3.2.3 Relational implications of interpersonal behavior of patients with distinct personality disorders

This section discusses the interpersonal relations included in this research (contact frequency, positive vs. negative relations, instrumental relations and influence relations) in association with the PD symptomatology derived from the diagnostic criteria listed in DSM-IV (APA, 1994, 2000). The associations between PDs and FFM personality traits as discussed above were used to formulate hypotheses about the relatedness of these disorders with social relationships. The hypotheses are summarized in Table 3.2.

Personality disorders and contact frequency

Contact frequency is the most generally defined type of relation in this research. It describes the frequency of contact between individuals without referring specifically to the content of interaction. The degree to which a patient associates with others depends mainly on the patients' extraversion and neuroticism. The histrionic PD is extravert and 'uncomfortable in a situation in which he or she is not the center of attention.'⁴ It is thus assumed that patients with histrionic PDs associate more with other patients (H1). PDs characterized by both introversion and neuroticism are paranoid, schizoid, schizotypal, borderline and avoidant PDs. Paranoid PD is associated with 'solitariness and avoidance of close confiding relationships', while schizoid PDs 'neither desire nor enjoy close relationships', and schizotypal PD is characterized by a 'lack of close friends or confidants other than first degree relatives'. Meanwhile, the avoidant PD 'avoids activities that involve interpersonal contact'. Therefore it is hypothesized that paranoid (H2), schizoid (H3), schizotypal (H4) and avoidant (H5) PDs associate less frequently with other patients. Neuroticism in the dependent PD finds its origin in 'a lack of self-confidence in own judgment or abilities' resulting in 'an excessive need to be taken care of by others'. It is hypothesized that those suffering from dependent PD therefore maintain more interaction with other patients (H6). The neuroticism of borderline PD is 'a pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation'. Since this does not relate per se to the frequency of interaction, no association with contact frequency with other patients is expected.

Personality disorders and positive vs. negative relations

Positive or negative interactions by patients are mainly related to agreeableness and traits such as hostility and warmth. A patient with paranoid PD 'perceives attacks on his character or reputation that are not apparent to others and is quick to react angrily or to counterattack'. Antisocial PD is characterized by 'irritability and aggressiveness, as indicated by repeated physical fights or assaults'. Borderline PD is characterized by displays of 'inappropriate, intense anger or difficulties controlling anger' and the patient with narcissistic PD shows 'arrogant, haughty behavior or attitudes and is unwilling to recognize or identify with feelings and needs of others'. Thus it is hypothesized that the paranoid (H7), antisocial (H8), borderline (H9), and narcissistic (H10) PDs will show more negative relations with other patients.

Avoidant PD is characterized by a positive association with modesty. Individuals with this disorder are 'sensitive to criticism, disapproval, or rejection', resulting in friendly contact and conflict avoidance. It is hypothesized that individuals with avoidant PDs maintain

⁴ This and other quotes used in this Section are (parts of) criteria of PDs as described in DSM-IV (APA, 1994, 2000).

more positive relations with others (H11). Patients with dependent PD have 'difficulty expressing disagreement with others because of fear of loss of support or approval', likely resulting in more positive relations towards others (H12).

Personality disorders and instrumental relations

Instrumental relations are mainly related to agreeableness and conscientiousness. The patient with paranoid PD 'suspects, with insufficient basis, that others are exploiting, harming or deceiving him or her'. With their suspicion of maltreatment by others, it is hypothesized that the chance they will be instrumentally used by others is smaller (H13). The antisocial PD is characterized by 'deceitfulness, as indicated by repeated lying or conning others for personal profit or pleasure'. The patient with narcissistic PD is 'interpersonally exploitative, taking advantage of others to achieve his or her own ends'. Individuals with antisocial (H14) and narcissistic (H15) PDs are therefore expected to make more instrumental use of others. The diagnostic criteria of borderline PD do not give grounds for formulating expectations about instrumental interaction with others.

The dependent PD is negatively related to conscientiousness, mainly caused by lack of competence and self-discipline. Combined with neurotic characteristics, this results in 'a great need of others to assume responsibility for most areas of their life'. This is why they 'go to excessive length to obtain nurturance and support from others, to the point of volunteering to do things that are unpleasant'. On the one hand, the person with dependent PD will maintain more instrumental relations with others (H16), to fulfill their need for the help of others. On the other hand, they will sooner be used instrumentally by others because of their vulnerability (H17).

The obsessive-compulsive personality is 'over conscientious, scrupulous, and inflexible about matters of morality, ethics, or values'. Because of this rigidity in their own moral standards and their polarized beliefs and actions, this group of individuals will maintain fewer instrumental relations with others (H18) and will probably be less used instrumentally by others (H19) because of their sensitivity to interpersonal misuse.

Personality disorders and influence relations

Influence relations are not specifically related to overall FFM domains, but some relations can be proposed for various facets. Suggestibility to influence is expected to be related to vulnerability, compliance, competence, self-discipline and deliberation. The exertion of influence is more related to the characteristics of hostility and impulsiveness, and to self-discipline.

Individuals with paranoid PD are characterized by 'suspicion' of others and their preoccupation with 'unjustified doubts about the trustworthiness of friends and associates'. It is expected that patients with this disorder will be less influenced by others

(H20). The antisocial PD is characterized by 'impulsivity, irritableness and aggressiveness', and 'deceitfulness' towards others. Therefore it is expected that individuals with antisocial PD will exert more (negative) influence and thus maintain more influence relationships with others (H21). Lack of self-discipline and deliberation combined with high trust in others makes patients with histrionic PD 'suggestible, and easily influenced by others or circumstances'. More incoming influence relations are expected for individuals with histrionic PD (H22).

Hypotheses	
Contact frequency	
	More outgoing contact frequency of patients with histrionic PD (H1)
	Less outgoing contact frequency of patients with paranoid (H2), schizoid (H3), schizotypal (H4) and avoidant (H5) PDs
	More outgoing contact frequency of patients with dependent PD (H6)
Positive vs. negative relations	
	More outgoing negative relations of patients with paranoid (H7), antisocial (H8), borderline (H9), and narcissistic (H10) PDs
	More outgoing positive relationships of patients with avoidant (H11) and dependent (H12) PDs
Instrumental relations	
	Less incoming instrumental relations for patients with paranoid (H13) and obsessive-compulsive (H19) PDs
	More outgoing instrumental relations of patients with antisocial (H14), narcissistic (H15) and dependent (H16) PDs
	More incoming instrumental relations for patients with dependent PDs (H17)
	Less outgoing instrumental relations of patients with obsessive-compulsive PDs (H18)
Influence relations	
	Less incoming influence relations for patients with paranoid (H20), avoidant (H24) and obsessive-compulsive (H26) PDs
	More outgoing influence relations of patients with antisocial (H21) and narcissistic (H23) PDs
	More incoming influence relations for patients with histrionic (H22) and dependent (H25) PDs

Table 3.2. Overview of hypotheses for the associations between social relations (contact frequency, positive vs. negative, instrumental, and influence relations) and personality disorders (paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, and obsessive-compulsive).

The narcissistic personality shows 'arrogant, haughty behavior or attitudes' and 'believes that he or she is special and unique and can only be understood by, or should associate with, other special or high status people'. The narcissistic patient will therefore maintain more influence relationships towards others (H23). Individuals with avoidant PD are 'unwilling to become involved with people, unless certain of being liked' and 'avoid social activities that involve significant interpersonal contact because of fear of criticism, disapproval, or rejection'. They probably try to avoid the influence of others and will thus have less incoming influence relations (H24). Dependent PD is characterized by 'lack of self-confidence in judgment or abilities' and 'difficulty in making everyday decisions without an excessive advice and reassurance from others', which makes these individuals more vulnerable to the influence of others. It is hypothesized that individuals with dependent PD will have more incoming influence relations (H25). People with obsessive-compulsive PD are 'inflexible about matters of morality, ethics, or values', which makes it likely that these individuals have fewer incoming influence relations (H26).

Table 3.2 gives an overview of hypotheses. To avoid misunderstanding, the directional nature of the interpersonal relation is reflected by the explicit distinction made in Table 3.2 between incoming and outgoing relations of various kinds (for contact frequency this difference is less explicit, because more often than in other kinds of relations, this is a mutual or reciprocal interaction).

3.3 Method

This section starts with an introduction to the research site and population, continues by describing the dominant characteristics of the patients on the five units including the comorbidity between personality and psychiatric disorders, and it closes by introducing the analytical methods.

3.3.1 Research site

The research was conducted at FPC Dr. S. Van Mesdag, which provides residential treatment for some 200 patients imposed with the TBS measure. TBS patients have committed serious crimes for which they cannot be held fully responsible, because of their severe psychopathology, which can be roughly distinguished into PDs and psychotic disorders. The two groups of patients reside in distinct units in the hospital, each housing on average 12 patients. In-patients are supervised by eight to 12 sociotherapists working in two shifts a day, with some three therapists on duty per shift. From 8.45 am to 8.30 pm, patients are kept out of their own rooms and can stay in the public areas of the unit, passing the time with fellow patients and therapists, fulfilling therapy-related obligations or taking the opportunity to join in activities elsewhere in the FPC. Meals, coffee and tea breaks are communal events and patients may play games and watch television together.

3.3.2 Study population

For this research, data was collected on all five treatment units for patients with PDs. The units contain patients with homogeneous crime or personality features: 1) sex offenders (SO), 2) narcissistic PD (NPD), 3) substance use disorders (SUD), 4) pervasive developmental disorders (PDD), and 5) borderline PD (BPD). This categorization is not strictly maintained in practice as two or more clinical PDs can often co-exist in one patient. Widiger, Frances, Pincus, Davis & First (1991) reported that over 80% of individuals with PDs fulfilled the criteria for more than one PD. Of these disorders, antisocial PD is most prominent in the forensic psychiatric population.

The Psychopathy Checklist-Revised (PCL-R) (Hare, 1991, 2003) was used to distinguish between psychopathic traits of patients and characteristics strongly related to antisocial features. This diagnostic tool for assessment of psychopathy, contains 20 items. Assessment was based on patient file data and a semi-structured interview. It is scored on a three-point scale with the value of 0 assigned if the item does not apply to the patient, 1 if it applies somewhat, and 2 if it applies fully. Early factor analysis used a two-factor model, but this was later adjusted to a four-factor model of psychopathy in the PCL-R. The four factors are 1) arrogant deceitful interpersonal style (characterized by lying, manipulation, superficial charm and egocentrism), 2) deficient affective experience (characterized by lack of remorse, lack of empathy and failure to accept responsibility for own actions), 3) impulsive irresponsible behavioral style (characterized by impulsivity, irresponsibility, parasitic lifestyle and proneness to boredom), and 4) antisocial lifestyle (characterized by early behavioral problems, delinquency and criminal versatility).

Besides the co-occurrence (also called co-morbidity) of PDs, the co-occurrence of PDs and psychiatric axis I disorders is the rule rather than the exception, especially in the clinical population (McGlashan, Grilo, Skodol, Gunderson, Shea, Morey et al., 2000). The most prominent axis I disorders of the study population are related to sexually deviant behavior, substance use, and pervasive developmental disorders.

The next sections discuss the populations of the units, their characteristics (for an overview, see Table 3.3) and expectations for their social interactions. This is followed by a discussion on the co-occurrence of PDs and psychiatric axis I disorders in the research population.

Sex offenders unit

Sex offenders are a diverse group, difficult to categorize into clear subgroups. Groth & Birnbaum (1979) made significant distinctions according to the rapist's motives, such as 'power', 'anger', and 'sadistic rapists' (Groth & Birnbaum, 1979), later completed by Knight & Prentky (1987) with 'exploitative rapists'. With respect to sexually delinquent behavior, more compulsive and neurotic behavior is found in this group in comparison to non-

sexual offenders (Van Marle, Putten & Ridder 1995). Abel, Rouleau & Cunningham-Rathner (1986) distinguish between sex offenders with antisocial features and sex offenders with paraphilia-related disorders (e.g. pedophilia, exhibitionism and voyeurism). The latter group is primarily characterized by obsessive-compulsive sexual acts, inhibition, passive aggressiveness, and harm avoidance, in contrast to the group of antisocial sexual delinquents, who display more impulsivity and directly aggressive behavior.

The patients on the SO unit had all committed sexual offences, such as rape, child molestation, or incest. Most belong to the group with paraphilia-related disorders. The average age is 45 years (SD 10, range 26–61 years), average duration of incarceration is 34 months (SD 15, range 16–59 months), and average IQ is 92 (SD 14, range 75–117). Diagnosed disorders in this group include PD not otherwise specified (NOS) (6), antisocial PD (4), and narcissistic PD (2). The diagnosed personality traits are antisocial (6), narcissistic (5), avoidant (4), dependent (4), obsessive-compulsive (1), paranoid (1), and borderline (1). The diagnosed psychiatric axis I disorders are pedophilia, non-exclusive type (11), (former) abuse of alcohol (4), and pervasive developmental disorder (1).

Regarding psychopathy, sex offenders show less 'impulsive and irresponsible behavioral style' compared to patients on the other units ($t = -2.8, p = 0.01$). This is in line with the expectations of the group of paraphilia-disordered patients, who are expected to be less impulsive, more rational and harm-avoidant, and are more skilled in getting people to do things (often necessary to persuade the victims of their crimes). Accordingly, they are expected to maintain more positive instrumental relationships with others.

Narcissistic personality disorder unit

Narcissistic PD is defined as 'a pervasive pattern of grandiosity, need for admiration, and lack of empathy' (APA, 1994, 2000). The narcissist is described as turning inward for gratification rather than depending on others, and as excessively preoccupied with issues of personal adequacy, power and prestige. These patients believe they deserve special attention and considerable privileges, as they consider themselves more accomplished and important than others. In relationships, they show arrogant, haughty behavior and tend to have little empathy for others or their needs. They may be prone to exploitative behavior if this furthers their causes.

This unit contains 12 patients, primarily convicted for violent non-sexual offences such as assault, manslaughter, and murder. The average age is 33 years (SD 5, range 25–42 years), average duration of incarceration is 40 months (SD 31, range 11–111 months) and average IQ is 106 (SD 12, range 86–123). The diagnosed disorders are antisocial PD (8), narcissistic PD (4), borderline PD (4) and PD NOS (1). Diagnosed personality traits are narcissistic (7), paranoid (4), antisocial (3) and obsessive-compulsive (1).

Psychiatric axis I diagnoses are (former) soft drugs abuse (7), (former) alcohol abuse (4), hard drugs abuse (3), and pedophilia, non-exclusive type (1).

Regarding psychopathy, scores for 'arrogant and deceitful interpersonal style' ($t = 4.1, p = 0.01$) and 'impulsive and irresponsible behavioral lifestyle' ($t = 3.5, p = 0.02$) were higher compared to patients on the other units. Because of their arrogant, haughty behavior and urge to associate with special or high status people, this group is expected to have a stronger hierarchical order.

Substance use disorder unit

Substance abuse axis I disorder is defined as 'a maladaptive pattern of substance use leading to clinically significant impairment or distress', resulting in 'a failure to fulfill major role obligations at work, school, or home' through recurrent use in situations where it is physically hazardous (e.g., driving an automobile). Recurrent drug abusers have legal problems (e.g., arrests for substance-related disordered conduct), or continue substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (APA, 1994, 2000). Motives for drug abuse as well as the severity of the problems can be very diverse. Impairment in social functioning is a central feature. Several studies indicate that for people with severe mental illness, co-occurring substance disorder is associated with increased family problems and disruption in familial living arrangements (Blankertz & Cnaan, 1994; Dixon, McNary & Lehman, 1995). Substance abuse is often facilitated and reinforced by drug use among peers. Patients report 'socializing' is a primary motivation for their drug use (Warner, Taylor, Wright, Sloat, Springett, Arnold & Weinberg, 1994). A study by Carey, Carey & Simons (2003) into psychiatric patients with substance use disorder reported greater subjective feelings of distress in current and former abusers compared to those who had never abused drugs. Drug abusers were found to have good instrumental role functioning, probably as a result of learning to cope with their chaotic lifestyle and the necessity to deal with social conflicts.

This unit contains 12 patients, primarily with problems of (former) drug use. The average age is 38 years ($SD 6$, range 29–48 years), average duration of incarceration is 28 months ($SD 11$, range 15–47 months), and average IQ is 95 ($SD 16$, range 74–116). The diagnosed disorders are PD NOS (5), antisocial PD (3), borderline PD (3), and pervasive developmental disorder (1). Diagnosed personality traits are antisocial (8), borderline (4), and narcissistic (3). Diagnosed psychiatric axis I disorders are (former) abuse of hard drugs (10), soft drugs (9), and alcohol (9).

Considering psychopathy, these patients have a lower score on 'arrogant and deceitful interpersonal style' ($t = 3.9, p = 0.01$) and a higher score on 'antisocial lifestyle' ($t = 2.9, p = 0.01$) compared to patients on the other units.

This group is expected to maintain more positive relations, but at the same time more relations of an instrumental nature.

Pervasive developmental disorder unit

Pervasive developmental axis I disorder (PDD) is a spectrum of psychological conditions characterized by widespread abnormal social interaction and communication, as well as severely restricted interests and highly repetitive behavior (APA, 1994, 2000). The most commonly diagnosed disorders in this group are pervasive developmental disorder not otherwise specified (PDD-NOS), Asperger's syndrome, and autistic disorder. This sequence shows an increase in distorted functioning. Individuals with these disorders show severe and pervasive impairment in the development of reciprocal social interaction or verbal and non-verbal communication skills. Stereotyped behavior, interests, and activities are characteristic for these disorders. The degree of problems can vary from failure to develop appropriate peer relationships and share enjoyment, interests, or achievements with other people, to marked impairment in the ability to initiate or sustain a conversation with others and total lack of development of spoken language (APA, 1994, 2000).

The unit contains 12 patients, who are mainly diagnosed with PDDs. The average age is 40 years (SD 13, range 25–68 years), average duration of incarceration is 51 months (SD 35, range 14–137 months), and average IQ is 100 (SD 10, range 82–118). The diagnosed disorders are PDD NOS (5), and narcissistic PD (1). Diagnosed personality traits are antisocial (4), borderline (3), avoidant (3), narcissistic (2), histrionic (1) and schizoid (1). Diagnosed psychiatric axis I disorders are pervasive developmental disorder (11) and (former) alcohol (5), hard drugs (2), and soft drugs abuse (1).

This group shows no specific distinguishing characteristics of psychopathy. Because of their lack of basic communication skills, these patients are expected to associate less with others and because of their greater sensitivity for righteous treatment by others, to have more negative relationships.

Borderline personality disorder unit

Borderline PD is defined as a 'pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity' (APA, 1994, 2000).

Emotional instability results in dramatic and abrupt shifts in mood, impulsivity, poor self-image and tumultuous interpersonal relationships. People with borderline are prone to unpredictable outbursts of anger, which sometimes manifests in self-injurious behavior. They are highly sensitive to rejection, and fear of abandonment may result in frantic efforts to avoid being left alone, including suicide threats and attempts (Oldham, 2004).

Population characteristics						
	SO unit (N = 12)	NPD unit (N = 12)	SUD unit (N = 12)	PDD unit (N = 12)	BPD unit (N = 11)	
Age (years)	45 (SD 10, range 26-61)	33 (SD 5, range 25-42)	38 (SD 6, range 29-48)	40 (SD 13, range 25-68)	40 (SD 13, range 25-68)	
Stay facility (months)	34 (SD 15, range 16-59)	40 (SD 31, range 11-111)	28 (SD 11, range 15-47)	51 (SD 35, range 14-137)	20 (SD 12, range 0-39)	
IQ	92 (SD 14, range 75-117)	106 (SD 12, range 86-123)	95 (SD 16, range 74-116)	100 (SD 10, range 82-118)	95 (SD 15, range 75-119)	
	PD/trait	PD/trait	PD/trait	PD/trait	PD/trait	Total
PAR	0/1	0/4	0/0	0/0	3/2	3/7
SCHIZ	1/0	0/0	0/0	0/1	0/0	1/1
SCHIZTYP	0/0	0/0	0/0	0/0	0/0	0/0
ANTI	4/6	8/3	3/8	0/4	4/4	19/25
BOR	0/1	4/0	3/4	0/3	4/4	11/12
HIS	0/0	0/0	0/0	0/1	0/0	0/1
NAR	2/5	4/7	0/3	1/2	0/3	7/20
AVOID	0/4	0/0	0/0	0/3	0/0	0/7
DEP	0/4	0/0	0/0	0/0	0/1	0/5
OBS	0/1	0/1	0/0	0/0	0/0	0/2
PD-NOS	6	1	5	5	3	20
	Axis I	Axis I	Axis I	Axis I	Axis I	Total
SEX	11	1	0	0	0	12
ALCOHOL	4	4	9	5	5	27
SOFT DRUGS	0	7	9	1	6	23
HARD DRUGS	0	3	10	2	3	18
PERV	1	0	1	11	0	13

Table 3.3. Population characteristics per patient unit; age, duration of stay in the facility, IQ, personality disorders and traits (axis II) and psychiatric disorders (axis I). PAR = paranoid, SCHIZ = schizoid, SCHIZTYP = schizotypal, ANTI = antisocial, BOR = borderline, HIS = histrionic, NAR = narcissistic, AVOID = avoidant, DEP = dependent, OBS = obsessive-compulsive, PD-NOS = personality disorder not otherwise specified, SEX = sexual deviance, ALCOHOL = alcohol abuse, SOFT DRUGS = soft drugs abuse, HARD DRUGS = hard drugs abuse, PERV = pervasive developmental disorder (N = 59).

This unit contains 11 patients with mainly borderline and antisocial PDs. The average age is 38 years (SD 11, range 26–55 years), average duration of incarceration is 20 months (SD 12, range 0–39 months), and average IQ is 95 (SD 15, range 75–119). Diagnosed PDs are borderline (4), antisocial (4), paranoid (3), NOS (3) and narcissistic (2). The diagnosed personality traits are antisocial (4), borderline (4), narcissistic (3), paranoid (2) and dependent (1). Psychiatric axis I diagnoses are (former) soft drugs (6), alcohol (5) and hard drug abuse (3).

This group also showed no specific characteristics of psychopathy. Because of their impulsivity and proneness to unpredictable outbursts of anger, more negative relations are expected. On the other hand, because of fear of rejection, maintaining relationships is very important to these patients and thus more frequent association is expected.

Table 3.3 presents an overview of the study population characteristics.

Co-occurrence of axis II personality disorders and axis I psychiatric disorders

Table 3.4 presents information about the co-occurrence of the personality (axis II) and psychiatric (axis I) disorders of the study population. Co-occurrence is expressed in Jaccard coefficients, which are displayed above the diagonal. Below the diagonal, for every pair of disorders, there is a 2x2 table with the following contents: upper left, number of patients with both disorders; lower left, number of patients with the row disorder but without the column disorder; upper right, number of patients with the column disorder but without the row disorder; lower right, number of patients without either of the two disorders. The Jaccard coefficient is calculated by dividing the total of simultaneously present disorders (intersection of disorders) by the total number of disordered persons (union of disorders). The larger the Jaccard coefficient, the stronger the correspondence between the disorders.

Antisocial and narcissistic PDs show the largest correspondence (0.44). Narcissistic PD corresponds highly with the paranoid PD (0.29). Borderline PD shows high inter-relatedness with antisocial PD (0.37). PD-NOS corresponds relatively strongly with antisocial (0.26) and borderline PDs (0.25).

In the co-occurrence between PDs and psychiatric disorders we see large correspondences between antisocial PD and alcohol (0.40) as well as drug (0.38) abuse. Borderline and narcissistic PDs also show high inter-relatedness with alcohol (0.27, 0.24) and drug (0.31, 0.28) abuse. Paranoid PD is associated only with drug abuse (0.21). Antisocial, avoidant and PD-NOS correspond with sexual deviance. Besides, there was a strong correspondence between psychiatric disorders of both kinds of substance abuse, namely alcohol and drug abuse (0.39).

	Jaccard index											SEX	ALC	DRUG	PERV
	PAR	SCHIZ/ TYP	ANTI	BOR	HIS	NAR	AVOID	DEP	OBS	PD-NOS	SEX	ALC	DRUG	PERV	
Personality disorder	PAR	0	0.00	0.17	0.15	0.00	0.29	0.00	0.00	0.15	0.08	0.06	0.21	0.00	
	SCHIZ/TYP	1	12	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.04	0.00	0.00	
	ANTI	8	3	0	0.37	0.04	0.44	0.13	0.09	0.26	0.26	0.40	0.38	0.12	
	BOR	35	54	43	44	0.09	0.20	0.11	0.08	0.25	0.09	0.27	0.31	0.14	
	HIS	4	7	0	17	26	0.10	0.17	0.11	0.09	0.12	0.03	0.07	0.06	
	NAR	16	31	20	21	3	18	0.08	0.10	0.23	0.22	0.24	0.28	0.11	
	AVOID	4	15	4	5	2	47	0.08	0.23	0.15	0.25	0.19	0.06	0.15	
	DEP	9	2	0	1	22	21	0.08	0.00	0.13	0.24	0.10	0.03	0.00	
	OBS	20	40	29	30	7	72	0.08	0.00	0.05	0.20	0.07	0.00	0.00	
	PD-NOS	0	11	1	0	6	37	0.08	0.23	0.05	0.20	0.07	0.00	0.00	
Psych. disorder	PAR	10	21	9	11	4	53	7	30	8	14	7	39	0.20	
	SCHIZ/TYP	0	11	0	1	4	39	2	18	1	3	3	26	0.25	
	ANTI	6	17	6	7	2	49	4	26	5	10	3	35	0.24	
	BOR	1	10	0	1	3	40	0	20	1	3	3	26	0.10	
	HIS	2	14	3	4	0	46	3	23	2	7	0	32	0.07	
	NAR	4	7	1	0	13	30	8	12	2	2	9	20	0.25	
	AVOID	16	31	19	21	7	63	12	40	18	24	11	49	0.18	
	DEP	2	9	0	1	12	31	3	17	2	2	8	21	0.18	
	OBS	13	26	15	16	3	58	12	35	13	19	7	44	0.11	
	PD-NOS	4	7	1	0	20	23	10	10	1	3	11	18	0.00	
Psych. disorder	PAR	23	38	25	27	7	70	17	47	26	31	16	56	0.08	
	SCHIZ/TYP	7	4	0	1	19	24	11	9	2	2	12	17	0.08	
	ANTI	19	37	26	27	7	69	15	46	24	30	14	55	0.08	
	BOR	0	11	0	1	6	37	4	16	1	3	4	25	0.08	
	HIS	13	24	13	14	7	56	9	33	12	17	9	42	0.08	
	NAR	2	9	0	1	12	31	3	17	2	2	8	21	0.08	
	AVOID	13	26	15	16	3	58	12	35	13	19	7	44	0.08	
	DEP	4	7	1	0	20	23	10	10	1	3	11	18	0.08	
	OBS	23	38	25	27	7	70	17	47	26	31	16	56	0.08	
	PD-NOS	7	4	0	1	19	24	11	9	2	2	12	17	0.08	

Table 3.4. Similarity between personality disorders and traits (axis I) and psychiatric disorders (axis II) expressed in a Jaccard coefficient (the upper half of the diagonal). For explanation of the lower diagonal see end of Section 3.3.2. PAR = paranoid, SCHIZ/TYP = schizoid/schizotypal, ANTI = antisocial, BOR = borderline, HIS = histrionic, NAR = narcissistic, AVOID = avoidant, DEP = dependent, OBS = obsessive-compulsive, PD-NOS = personality disorder not otherwise specified, SEX = sexual deviance, ALCOHOL = alcohol abuse disorder, DRUGS = drug abuse disorder, PERV = pervasive developmental disorder (N = 59).

3.3.3 Design

Data on social relations and psychiatric disorders were collected of patients from all five treatment units. Each unit was considered a closed network. All sociotherapists working on the units were asked to assess a broad spectrum of social relations – including contact frequency, positive relations, negative relations, influence, instrumental use, and hierarchy – between patients on their unit, using a digital questionnaire specifically designed for this purpose. Each unit was given a laptop that contained the questionnaire applicable to the specific patients and therapeutic group of the unit. In this questionnaire all sociotherapists working on the unit were requested to evaluate all possible dyadic relations between patients for each kind of relation. The social relations were defined as follows:

- 1) Contact frequency: frequency of interaction with another patient
- 2) Positive relations: friendly and friendship relations with another patient
- 3) Negative relations: unpleasant and hostile relations with another patient
- 4) Instrumental relation: the use of a relation to one's own advantage for 1) material things (e.g. cigarettes, drugs, money) and/or 2) the relation itself (e.g., protection, prestige, sexual favors)
- 5) Influence: relations that lead to changes in thinking and/or behavior of another patient, 1) out of fear or 2) out of respect and appreciation for the patient exerting influence.

Besides, the sociotherapists were asked to rank the hierarchy of the patients in the group. Hierarchy was defined as the rank order or gradual descent from 'leader' to 'scapegoat'. The highest patient in the hierarchy received rank no. 1 and the lowest the number equal to the total of patients on the unit. Ties were allowed in this ranking.

All 40 sociotherapists involved filled in the questionnaire. Ten valued the relations on the SO unit, eight on the NPD unit, seven on the SUD unit, seven on the PDD unit, and eight on the BPD unit.

Diagnostic information in patient files was the source of data collected on the psychiatric disorders. The most recent axis I and II diagnoses of the DSM-IV classificatory system were used to determine the personality symptomatology or other psychiatric problems for each patient. The diagnoses on file are based on observation reports by the Ministry of Justice or on psychological evaluations by psychologists or psychiatrists working in the FPC. The reported psychiatric axis I and II diagnoses were included in the study. Strict confidentiality was maintained.

3.3.4 Analysis

The study employed two analytic approaches. First came a descriptive comparison of the units with respect to the social interactions and included an investigation of relational expectations based on the diagnostic traits of the groups, as formulated in Section 3.3.2. The results contributed background knowledge to the second approach, which involved testing the hypotheses derived in Section 3.2.3.

Social relation variables

The research methods utilized here are in the general domain of social network analysis (for introductions to social network analysis see Wasserman & Faust, 1994 and Carrington, Scott & Wasserman, 2005). All sociotherapists working in any given patient group were involved as respondents because presumably, although individuals may have had an incomplete view of the relations between patients, their views would complement each other and jointly give a good picture of the network. The responses were combined in a 'consensus network'.

As a general rule, each instrumental, influence or hierarchical tie (coded as a dichotomous variable) was rated as existing between one patient and another if at least 25% of the therapists (with a minimum of three) reported this type of tie. A different consensus rule was applied to assess the contact frequency and the 'positive/negative' relations. These were rated on a five-point scale ranging from little to much contact frequency and from 'friendship' to 'hostility'. Contact frequency was measured by the category labels 'regular association' and 'frequent association'. Positive relations were identified by responses on the positive side of the scale for the category labels 'friendship' and 'friendliness'. Negative relations were identified by responses on the negative side of the scale for the category labels 'unpleasant' and 'hostile'. Therapists answered these questions for all patient dyads (pairs). As opposed to the binary scale used to rate the other types of relations, in practice the five-point scale gives the therapist a lower threshold to rate one patient's positive or negative relationship to another patient. Contact frequency, and positive and negative ties were considered present in a dyad if at least 50% of the therapists reported one of the category labels listed above. The consensus networks resulting from dichotomization of cumulated individual networks were used for network analysis.

Disorder variables

For the analysis of the disorders of patients, all diagnoses of the DSM-IV axes I and II were considered, based on the patient files as described above. The personality disorder diagnoses were distinguished into the ten categorized DSM-IV PDs as well as PD-NOS. A further distinction was made in the extent to which the criteria for a disorder were met, fully or partly or to a lesser degree. If the criteria were met only partly or to a lesser degree, the disorder was diagnosed as a 'personality trait' derived from the original PD. A complete diagnosis of a PD was given the value 2, an incomplete diagnosis of personality traits was scored 1 and absence of PD and characteristics of the disorder was scored as 0.

Statistical model for association between social relations and personality disorder

Personality disorder variables are defined at the level of individuals whereas social relations are defined at the level of pairs of individuals, the 'dyadic level' that is concerned with inter-individual ties. This raises two methodological issues for the study of associations between

PDs and social relations: first, this is an association between variables defined at different levels; second, the independence assumptions that underlie usual statistical methods are not plausible for dyadic variables, and may even be regarded as being antithetical to our understanding of social relations. The first issue was dealt with in the formulation of the hypotheses. Each of hypotheses H1-H26 deals either with the number of incoming ties towards an individual or the number of outgoing ties from an individual, a formulation that translates relations from the dyadic to the individual level. The number of outgoing ties is called the *out-degree*, while the number of incoming ties is called the *in-degree*.

The second issue is dealt with by statistical methods that have been recently developed specifically for studying dyadic relations, bundled into a network, as dependent variables. Specifically, these methods involve exponential random graph models (ERGMs; for detailed information about these methods see Robins, Pattison, Kalish & Lusher, 2007; Robins, Snijders, Wang, Handcock & Pattison, 2007). ERGMs have tie variables as dependent variables, indicating whether there is a tie from one individual to another individual.

Tie variables were defined for all dyads in a group and for each relation studied (contact frequency, positive relations, etc.). Tie variables were binary variables defined for pairs of individuals (i, j), with the value 1 if there is a tie from i to j , and 0 if there is no such tie. ERGMs represent the dependence between the tie variables in the network and can thus be regarded as variants of logistic regression adapted to the dependencies generated by the tie variables being structured in a network. The analysis was done using SIENA (simulation investigation for empirical network analysis) version 3.2 software (Snijders, Steglich, Schweinberger & Huisman, 2009). This chapter is not the place for an extensive explanation of ERGM; the specifications presented below are intended to give an intuitive explanation, together with some information enabling those who already have a grasp of these methods to know how the analysis was carried out. Further explanations about ERGMs can be found in the mentioned literature.

The data set comprises four networks of 12 individuals and one network of 11 individuals. Since all individuals can have potential ties to all other individuals, the total number of tie variables for all groups is $4 \times 12 \times 11 = 528$ plus $1 \times 11 \times 10 = 110$, adding up to a total of 638. Since each group on its own is too small for reliable analysis by ERGM, the groups were combined in such a way that ties are possible only between members of the same group, achieved by using structural zeros (see Snijders, Steglich, Schweinberger & Huisman, 2009). Parameters of the model are assumed to be the same for all five groups. The ERGMs were always estimated conditional on the total number of ties. The model specification consists of a so-called structural part representing network dependencies between tie variables, and a part representing the effects of the variables specified in hypotheses (H1-H26).

This study used ERGM according to the 'new specifications' (explained in Robins, Snijders, Wang, Handcock & Pattison, 2007), which fit observed social networks better than the earlier so-called Markov models. The model is composed of the following five components to model network dependencies:

- *reciprocity*: tendency to reciprocal ties;
- *alternating out-k-stars*: represents dispersion of number of outgoing ties (variance of out-degrees);
- *alternating in-k-stars*: represents dispersion of number of incoming ties (variance of in-degrees);
- *alternating independent two-paths*: represents association of out-degrees and in-degrees;
- *alternating k-triangles*: represents tendency to transitivity, that is, for three actors (i , j , and k), it holds that if i chooses j and j chooses k , there is a higher tendency for i to also choose k . This can represent clustering into smaller loosely structured subgroups, and hierarchy in the network.

For example, a positive parameter for alternating out-k-stars means that the out-degrees are more dispersed (i.e., have a higher variance) than would be expected for a network generated according to the other parameters and with a zero out-k-stars parameter. Similarly, a negative alternating independent two-path parameter means that the correlation between in-degrees and out-degrees is lower (i.e., less positive, or more negative) than would be expected based on the other parameters included in the model.

Three basic effects can potentially be estimated for each individual-based PD variable, as specified in the hypotheses: the out-ties effect, reflecting that an individual with high values of the variable will tend to have more outgoing ties; the in-ties effect, reflecting that an individual with high values of the variable will tend to have more incoming ties; and the similarity effect, reflecting that two individuals with similar values will have a higher probability of being tied. Which of these effects is included in the model follows from the tested hypotheses.

3.4 Results

3.4.1. Descriptive network measures for the distinct units

This section discusses the most salient relational characteristics and differences between the units to provide exploratory insight into the relational differences between individuals with different psychopathology.

Table 3.5 presents for all 5 patient units the descriptive statistics for network measures of 1) contact frequency (little/much association), 2) nature of association (positive/negative), 3) instrumental relations (material and relational), 4) influence relations (fear and

appreciation), and 5) hierarchical relations. The standard deviation provides information on the dispersion of out-degrees. The reciprocity index is an indication of the degree of mutuality in association, defined as the proportion of reciprocated ties.

Patients on the NPD unit (mean degree = 2.0) and BPD unit (mean degree = 1.8) have relatively high contact frequency, compared to patients on the PDD (mean degree = 1.1) and SUD (mean degree = 0.9) units.

The high proportion of reciprocal contact on the SO unit (reciprocity index (RI) = 0.90), is indicative of a large degree of mutuality in association. The PDD unit shows both a low level of association and low reciprocal contact (RI = 0.30), meaning that these are often one-way relationships.

On both the SO (mean degree = 4.6) and NPD (mean degree = 4.0) units, patients maintain relatively many positive relations. The reciprocity of positive relations for the narcissists, however, is considerably lower (RI = 0.40) than on the SO unit (0.72).

PDD patients show relatively few positive relations (mean degree = 1.6), as well as low reciprocity (RI = 0.36) in the positive relation. Few negative interactions are observed in any unit. Most are observed with the PDD patients (mean degree = 0.7), and most are mutual between patient pairs (RI = 0.60). The lowest number of negative relations were observed on the SUD unit (mean degree = 0.1).

Relatively many instrumental relationships are maintained on the SUD unit (mean degree = 3.0), SO unit (mean degree = 2.6) and BPD unit (mean degree = 2.4), about half are reciprocal on all three units (RI about 0.50). Primarily relational instrumental use is observed on the SO unit (mean degree = 1.3) and primarily material instrumental use on the SUD (mean degree = 1.7) and BPD units (mean degree = 1.6). Whereas relational instrumental relations on the SO unit are almost purely one-directional (RI = 0.14), reciprocity of material instrumental relations is larger for almost all patient units. Only substance abuse patients show one-directional material instrumental relations more strongly. The degree of primarily material instrumental relations on the PDD unit (mean degree = 0.9) is relatively low. Remarkable is the low relational instrumental use on the NPD unit (mean degree = 0.3).

Influence relations are strongest on the SO unit (mean degree = 4.0). Relatively few influence relations are maintained on the NPD (mean degree = 1.5) and PDD (mean degree = 1.7) units. The origin of influence in the case of the sex offenders is relatively often fear (mean degree = 1.0), while no influence due to fear was observed on the NPD and SUD units (mean degree = 0.0). All observed influence-fear relations were one-directional (RI = 0.00), presumably related to the hierarchical social structure of the units and the fearful nature of the influence. Influence out of appreciation is also most prominent on the SO unit (mean degree = 0.9). On the PDD unit, in contrast, this relation is seldom observed (mean degree = 0.3).

SO unit (N = 12)	Contact frequency	Positive	Negative	Instrumental		Influence	Hierarchy
				- material	- relational		
Mean degree	1.58	4.58	0.25	2.58	1.33	4.00	6.17
SD	1.04	2.22	0.43	1.66	1.25	3.89	3.80
RI	0.90	0.72	0.50	0.55	0.14	0.12	0.12
NPD unit (N = 12)	Contact frequency	Positive	Negative	Instrumental		Influence	Hierarchy
				- material	- relational		
Mean degree	2.00	3.92	0.25	1.67	0.25	1.50	4.17
SD	1.16	1.98	0.60	2.01	0.43	1.71	3.11
RI	0.71	0.42	0.50	0.43	0.00	0.20	0.00
SUD unit (N = 12)	Contact frequency	Positive	Negative	Instrumental		Influence	Hierarchy
				- material	- relational		
Mean degree	0.92	3.08	0.08	3.00	0.67	2.92	5.50
SD	0.64	1.89	0.28	1.53	0.85	3.59	3.45
RI	0.83	0.54	0.00	0.57	0.33	0.06	0.00
PDD unit (N = 12)	Contact frequency	Positive	Negative	Instrumental		Influence	Hierarchy
				- material	- relational		
Mean degree	1.08	1.58	0.67	0.92	0.33	1.67	2.42
SD	0.95	1.71	1.11	0.76	0.47	1.80	3.48
RI	0.30	0.36	0.60	0.38	0.33	0.11	0.00
BPD unit (N = 11)	Contact frequency	Positive	Negative	Instrumental		Influence	Hierarchy
				- material	- relational		
Mean degree	1.82	2.91	0.18	2.36	0.63	2.00	5.00
SD	0.83	1.51	0.39	1.87	0.77	2.70	2.85
RI	0.82	0.50	0.00	0.44	0.40	0.10	0.00

Table 3.5. Descriptive statistics (mean degree, SD = standard deviation and RI = reciprocity index) for network measures of the social relations on the five distinct patient units (N = 59).

The strongest hierarchical relations are found on the SO unit (mean degree = 6.2). The PDD unit has the fewest hierarchical relations (mean degree = 2.5). Hierarchical relations on the units are almost all one-directional, confirming the hierarchical structure of this relation.

Associations between social relations

To provide insight into the social relations of patient populations as completely as possible, information about the associations between the various relations is important. Table 3.6 presents the average associations for all patient units combined, thus avoiding information overload. As with the associations between disorders, the associations here are also expressed in Jaccard coefficients. This section discusses prominent variations in associations of sorts of relations for single patient units.

The strongest association was found between contact frequency and instrumental relations (0.42). Contact frequency is also related to positive relationships (0.38). Patients on the SO unit had a stronger association between contact frequency and instrumental relations (0.56) and a stronger association between positive and instrumental relations (0.51). On the NPD unit both contact frequency with instrumental relations (0.33) and positive with instrumental relations (0.26) were weaker than average. Influence relations turned out to be related most strongly to hierarchical relations on the units (0.34). Additionally, influence is to a lesser degree associated with positive relations (0.27), instrumental relations (0.27) and contact frequency (0.25).

		Contact frequency	Positive	Negative	Instrumental	Influence	Hierarchy
Jaccard coefficient							
Frequent ass.	Relational associations						
Positive		0.39					
Negative		0.02	0.01				
Instrumental		0.42	0.38	0.03			
Influence		0.25	0.27	0.07	0.27		
Hierarchy		0.11	0.22	0.03	0.16	0.34	

Table 3.6. Average associations between distinct social relations, expressed in Jaccard coefficients.

On both SO (0.56) and SUD (0.49) units, influence relations are associated with hierarchical relations more strongly than average. On the NPD (0.19) and the PDD (0.17) unit this relatedness is weaker than average. On the NPD unit, influence relations are more strongly related to contact frequency of patients (0.40). Both NPD (0.11) and PDD (0.17) units show a stronger association between influence and negative relationships. The SUD unit shows a stronger relatedness between influence and instrumental relationships (0.37).

Social interaction on the distinct units

Sex offenders maintained, as expected, relatively many relationships with each other, generally friendly and reciprocal. Negative interactions in this group were uncommon and when they did arise, consisted only of a mild form of negativity. These findings match the expectations for this group, characterized as having less impulsive and more harm-avoidant behavior. Even so, they are often influenced hierarchically by their fear of other patients. Interaction between these patients is not only positive but also instrumental and, as expected, instrumental relations are primarily relational. The relatively strong relatedness of positive with instrumental suggest shallow social interactions.

The fact that the NPD unit had many positive relations and only an average number of negative relations was contrary to what could be expected, according to the narcissistic PD characteristics. Also contrary to expectations, little influence was exerted, none caused by fear. These unexpected findings can probably be partly explained by the influence of social group dynamics, rather than by individual narcissism. Narcissism and feelings of grandiosity are often expressed to cope with underlying thoughts of inferiority. In interaction with average individuals, this coping mechanism may be effective, but in a homogeneously narcissistic setting, the patients could anticipate that such behavior would not be tolerated and would opt rationally for a more conflict-avoidant approach, with as a result, mutually friendly behavior and showing no fear. The less strong hierarchy on this unit is probably the result of conflict avoidance and reluctance to permit someone else to occupy the higher hierarchical positions.

The group with primarily substance abuse disorders had an average number of positive and almost no negative interactions. As expected, patients here tended to use a instrumental relationship with another patient more often for material benefit. Instrumental use was often done by those who exerted the most influence, not based on fear. These findings are in general agreement with the expected ability of these patients to maintain relatively smooth interactions. The association between instrumental, influence, and hierarchical relationships implies less impulsive and well-considered considerations about the choice of patients to use.

Patients on the PDD unit interacted, as expected, less frequently with each other and had more negative and less positive interactions. Together with low reciprocity in the

positive interaction, these findings are indicative of the absence of requisite social skills. Lack of emotional empathy may contribute to their negative interaction and inability to start and maintain constructive, more profound relationships.

Patients on the BPD unit interact rather a lot with each other and use each other instrumentally mainly for material profit, as was expected. Borderline characteristics including variability and instability of mood, thinking, and interpersonal relationships are mostly related to instability over time, so the most prominent characteristics of this disorder should be reflected by changes over time. Since this involves cross-sectional analysis, this study did not expect to find distinctions that typify this group of patients.

3.4.2 The association between social relations and personality disorders

This section presents the tests of hypotheses H1–H26, using ERGMs to analyze the social relations as explained briefly in Section 3.3.4. The models presented below include all the structural effects described in Section 3.3.4 as well as the effects that are postulated on the basis of prior considerations (H1–H26). Because of the limited statistical power, given the small size of the networks and correlations between the personality disorder variables, a second model was estimated with a smaller number of independent variables obtained by backward model selection for every relation. However, the backward selection models did not lead to significant changes in the outcomes of the initial models, so only the initial models are presented in this section. Appendix 3 presents the models based on backward selection.

ERGMs were always estimated conditional on the total number of ties. In some cases, two kinds of problems occurred with the model specification; such problems are not uncommon with the estimation of ERGMs (Snijders, Steglich, Schweinberger & Huisman, 2009). One problem is that an established effect is strong, but its precise size is hard to determine. The other problem is that due to the relatively small sample size and the relatively extensive model, including an effect leads to convergence problems. However, the effect does not seem to be important in representing the current data set. The parameter is then fixed at some value – a large value in the first case, zero in the second case – to obtain a reliable estimation. This is indicated in the tables below. For the presented models, convergence in all cases was good (all *t*-ratios for convergence less than 0.1).

Table 3.7 presents the results for contact frequency. There is a strong tendency towards reciprocity as well as transitivity. The size of the effect for schizoid and schizotypal PDs on outgoing contact frequency ties could not be well established, but it was found to be strongly negative. The other hypotheses related to contact frequency were neither confirmed nor rejected.

Contact frequency (all hypothesized effects)

Effect	PE	SE
Reciprocity	**4.09	0.49
Alternating out-k-stars	-0.58	0.44
Alternating in-k-stars	-0.78	0.46
Alternating independent two-paths	0.14	0.20
Alternating k-triangles	**0.66	0.17
Paranoid PD/out-ties (H1)	0.14	0.21
Schizoid/Schizotypal PD/out-ties (H2/H3)	-6.00	Fixed
Histrionic PD/out-ties (H4)	-0.51	0.60
Avoidant PD/out-ties (H5)	0.19	0.35
Dependent PD/out-ties (H6)	0.52	0.43

Table 3.7. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the contact frequency. +: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Table 3.8 presents the results for negative ties. There is a strong tendency towards reciprocity, but no systematic tendency of degree distribution (no significant alternating k-stars). Alternating independent two-paths and alternating k-triangles were fixed because of too little information in the data to allow reliable estimates of these effects. Without these effects, the model showed good convergence. Patients with antisocial and narcissistic PDs send more negative ties. For other PDs, no significant effects for negative relations were found.

Negative relation (all hypothesized effects)

Effect	PE	SE
Reciprocity	**5.08	0.97
Alternating out-k-stars	0.62	0.90
Alternating in-k-stars	0.66	0.83
Alternating independent two-paths	0.00	Fixed
Alternating k-triangles	0.00	Fixed
Paranoid PD/out-ties (H7)	0.02	0.63
Antisocial PD/out-ties (H8)	*1.19	0.60
Borderline PD/out-ties (H9)	-0.14	0.51
Narcissistic PD/out-ties (H10)	*0.79	0.46

Table 3.8. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the negative relation network. +: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Table 3.9 presents the results of analysis of positive ties. There is a strong tendency towards reciprocity as well as transitivity. PDs showed no significant effects for positive relationships.

Positive relation (all hypothesized effects)

Effect	PE	SE
Reciprocity	**2.34	0.32
Alternating out-k-stars	-0.22	0.29
Alternating in-k-stars	-0.28	0.31
Alternating independent two-paths	-0.09	0.08
Alternating k-triangles	**0.77	0.16
Avoidant PD/out-ties (H11)	0.03	0.15
Dependent PD/out-ties (H12)	0.10	0.23

Table 3.9. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the positive relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Table 3.10 presents the results of analysis of relational instrumental ties. No significant effects for PDs were found for instrumental relations in general. More specific relational instrumental relationships showed tendencies towards reciprocity, but no systematic tendency of degree distribution (no significant alternating k-stars).

Instrumental relation (relational) (all hypothesized effects)

Effect	PE	SE
Reciprocity	*1.67	0.79
Alternating out-k-stars	-0.75	0.58
Alternating in-k-stars	-0.58	0.57
Alternating independent two-paths	**0.94	0.34
Alternating k-triangles	**1.65	0.44
Paranoid PD/in-ties (H13)	-0.22	0.46
Antisocial PD/out-ties (H14)	**1.12	0.39
Narcissistic PD/out-ties (H15)	0.37	0.37
Dependent PD/out-ties (H16)	*1.14	0.58
Dependent PD/in-ties (H17)	0.43	0.51
Obsessive/comp. PD out-ties (H18)	-4.00	fixed
Obsessive/comp. PD in-ties (H19)	-0.83	1.14

Table 3.10. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the relational instrumental relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Those with high out-degrees tend to have low in-degrees (negative alternating independent two-paths) and there is a strong transitivity (alternating k-triangles). Those with antisocial and dependent PDs send more relational instrumental ties towards other patients. Individuals with obsessive-compulsive PDs tend to send fewer relational instrumental ties, but this effect was not significant, presumably because of the small group of respondents with this disorder in the research population.

Table 3.11 presents the results of analysis of influence ties. There is a strong tendency towards reciprocity as well as transitivity. The degree distribution is such that there are tendencies towards strong differences in out-degrees (positive alternating out-k-stars) and strong similarities in in-degrees (negative alternating in-k-stars), and those with high out-degrees tend to have low in-degrees (negative alternating independent two-paths). This degree distribution is suggestive of a status hierarchy, where those with high out-degrees are at the top of the status ladder and those with high in-degrees at the bottom. Individuals with antisocial PDs send more influence ties. Patients with avoidant and obsessive-compulsive PDs receive fewer influence ties than other patients.

Influence relation (all hypothesized effects)

Effect	PE	SE
Reciprocity	**1.05	0.44
Alternating out-k-stars	**0.63	0.25
Alternating in-k-stars	*-0.54	0.28
Alternating independent two-paths	**-.095	0.14
Alternating k-triangles	**1.08	0.21
Paranoid PD/in-ties (H20)	0.01	0.21
Antisocial PD/out-ties (H21)	*0.16	0.09
Histrionic PD/in-ties (H22)	0.29	0.34
Narcissistic PD/out-ties (H23)	0.03	0.08
Avoidant PD/in-ties (H24)	*-0.39	0.22
Dependent PD/in-ties (H25)	-0.02	0.28
Obsessive/comp. PD in-ties (H26)	*-1.09	0.52

Table 3.11. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the influence relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

3.5 Conclusions and discussion

This study provides novel insights into the association between PD symptomatology and personal networks of forensic in-patients subjected to TBS by the Dutch legal system.

The association was tested between social relations and distinct PDs as described in DSM-IV; cluster A (paranoid, schizoid, schizotypal), cluster B (antisocial, borderline, histrionic, narcissistic) and cluster C (avoidant, dependent and obsessive-compulsive). Hypotheses on social interactions, based on the categorical criteria of the disorders were formulated and tested. Besides PD symptomatology, this study investigated the most prominent comorbid psychiatric disorders for forensic in-patients, including sexual deviance, alcohol abuse, substance abuse, and pervasive developmental disorder.

The study population resided on five homogeneous units holding patients with PDs that shared crime or personality features (sexual delinquency, narcissism, substance abuse, pervasive developmental disorder and borderline). Based on the general characteristics of the patients, expectations about contact frequency as well as the nature of the interactions (e.g. positive/negative interaction, instrumental relation and influence) were formulated.

Because of their rational character and relational skills (often necessary to persuade the victims of their crimes) paraphilia-disordered sex offenders were expected to maintain more positive and less negative relationships, and have more relational instrumental contacts. With their impulsive and arrogant behavior, the narcissistic group of patients were expected to have more negative and hierarchical relationships. As for patients on the substance abuse disorder unit, the better functioning of their instrumental role was expected to lead to probably more instrumentally positive relationships, whilst their lack of basic communication skills would probably lead to lower contact frequency and more negative interaction. Impulsivity and unpredictable outbursts of anger in the borderline population gave reason to expect more negative relations for this group.

The descriptive analysis of the contact frequency and various relations (positive, negative, instrumental, and influence) maintained on these units generally confirmed expectations. Social interaction among narcissistic patients, however, contradicted expectations, as these patients had relatively many friendly relationships and few negative relations. This might be because narcissistic acting out can be attributed to a defense mechanism based on underlying thoughts of inferiority. It can be effective in interactions with individuals with widely diverse characteristics but a group of narcissistic patients will notice that it does not work on other narcissistic people and that may have caused them to adjust their behavior. Unstable interpersonal interactions are expected among patients with borderline PD, but this cross-sectional study could not test this.

The descriptive information on the social interactions of patients living in homogeneous units was used as background knowledge to formulate hypotheses about

the association between the five kinds of social relations (contact frequency, positive, negative, instrumental and influence relations) and the diverse PDs. Here it must be noted that the individuals on the units do differ, in part because of co-morbidity, so that the PDs do differentiate between individuals in and across groups. In this study associations were tested with ERGMs.

Various associations between social relations and cluster B and C disorders were established. The most frequently diagnosed PD, antisocial personality, turned out to be related, as expected, to more negative relations towards others, greater relational instrumental use of others, and greater exertion of influence. More negative interaction was found also, as hypothesized, for narcissistic patients. Since these effects are controlled for each other this implies that antisocial and narcissistic disorders contribute independently to negative interaction. Empirical support for this association was found in spite of the high co-morbidity between these disorders. For all of the cluster C PDs, some of the hypothesized associations with social relations were found. Those with avoidant PD proved, as expected, to be less influenced by other patients, probably because they manage to avoid being influenced by others. As was hypothesized, the dependent PD showed increased relational instrumental use of other patients, to fulfill their high need for others in their life. Finally, the obsessive-compulsive PD proved, as expected, to be associated with less relational instrumental use of other patients and less influence by other patients. This may be caused by the rigidity of their own standards and rules.

That many hypotheses received no support may have been due to the small total number of patients suffering from the respective PDs, leading to low statistical power. For the schizoid/schizotypal disorders of cluster A, for instance, only a tendency towards the hypothesized lower contact frequency was identified. No support was found for the expected lower contact frequency of paranoid and avoidant PDs. This may be because in the social setting of the unit it is difficult for patients to avoid interaction with others. Besides, social interaction is actively encouraged by the sociotherapists, and it is hard to avoid interaction in the patients' daily routine, consisting of several joint activities. The restrictions due to characteristics of the social setting could also be why no higher contact frequencies were found for the histrionic and dependent PDs.

Because the most prominent characteristic of borderline PD are related to behavioral instability over time, no effects could be determined cross-sectionally. The statistical power for histrionic PD was limited because of the limited number of patients with this disorder, which may be why no hypothesized effects were confirmed.

PDs are generally seen as disturbances of relational behavior. Relational aspects are considered in the treatment process of these patients, but only implicitly, and actual interaction patterns are often not specifically monitored during the process. No prior research was done into the actual interaction patterns of these patients. The results of

this research thus provide some first insights into the association between relational patterns and PD symptomatology. Despite the fact that the results of this study are based on measurements in a single forensic hospital with five patient groups, and thus are not necessarily generalizable, it seems that the outcomes do typify the situation in forensic institutions.

The DSM-IV categories were used to determine the PDs in this research. There is increasing dissatisfaction with this manner of diagnosis because of the varying outcomes in assessments by professionals, high diagnosis co-morbidity, and the opposite problem of inadequate coverage. Two patients can differ substantially even if both satisfy the diagnostic criteria of one PD category. The fact is, these issues can cause distortion in PD diagnosis and that may be one reason why some hypothesized associations were not established in this study. However, despite this limitation, several interesting associations were indeed confirmed.

In order to deal with limitations of the categorical approach of diagnose PDs, alternative models have been proposed in which personality disorders are regarded as dimensional traits rather than dichotomous categories. In this approach, maladaptive variants of personality traits merge imperceptibly into normality and into one another. This means PD symptomatology could be assessed more specifically and distinct disorders would be more mutually comparable. Further, differences in (relational) characteristics between PDs could be indicated more clearly and relational patterns could be studied in light of a few behavioral traits related to these disorders.

More research into the relational patterns of this patient population could be very useful for treatment purposes. Insight into the relational behavior of patients, as assessed by social network analysis, provides information about psychopathology that is complementary to the information obtained from traditional psychodiagnostics. Profound knowledge about the associations between relational patterns and disordered behavior may lead to additional possibilities for monitoring and intervention during the treatment process. In this study, relational patterns were measured by a consensus method applied to observations by the therapeutic personnel, which led to relatively objective assessment and moreover appeared to be motivational for the sociotherapists because of the insights they gained into day-to-day processes. Using this relational information, the progress of a patient may be monitored more reliably and interventions in social interactions could be developed that would contribute to treatment progress. For example, social settings could be created wherein a patient could best learn to deal with his/her own disorder. To take this one step further, it would be useful and interesting to have information about appropriate group compositions of patients with diverse disorders that could help accelerate the treatment process of patients.

Chapter 4

Assessing risk-related functioning in forensic psychiatric in-patients



4.1 Introduction

The Dutch penal code includes the TBS measure, aimed at protecting society against mentally disordered offenders. Forensic psychiatric patients with TBS are subjected to therapeutic treatment in closed forensic hospital settings, with the aim of reducing their future risk to society by establishing positive changes in the factors associated with violence (de Ruiter & Hildebrandt, 2002).

Accurate assessment of patients' reoffending risk is of great importance in forensic psychiatry, for instance, in deciding to allow temporarily leave, or to extend or end TBS (Brand & Diks, 2001). Several incidents involving forensic patients who evidently had not been assessed properly led parliament to investigate in 2005/2006 why the TBS measure was not capable of protecting society against this group of offenders. The final report indicated that assessment of forensic patients' future risk of violence had to be improved (Final report parliamentary enquiry TBS, 2006).

In establishing the level of risk to reoffend, there has been a shift from exclusive reliance on clinical experience and expertise to incorporating knowledge and tools derived from empirical research (Philipse, Koeter, Van den Brink & Van der Staak, 2004). Recent research has consistently shown that structured and empirically based methods outperform unstructured clinical assessments (Monahan, 1981, 1984; Grove, Zald, Lebow, Snitz & Nelson, 2000; Mossman, 1994; Quinsey, Harris, Rice & Cormier, 1998; Ægisdóttir, White, Sprengler, Maugherman, Anderson, Cook et al., 2006). Some studies in Dutch forensic practice have shown that purely clinical assessment made predictions hardly better than outcomes based on coincidence (e.g., De Ruiter, 2000; Philipse, 2005; De Vogel, 2005; Lodewijks, Doreleijers & De Ruiter, 2008). This finding supports the use of structured methods of risk assessment in forensic clinical practice. Structured methods are based on risk factors that are positively related to recidivism in empirical research (e.g., Bonta, Law & Hansson, 1998; Monahan, Steadman, Silver, Appelbaum, Robbins, Mulvey, Roth, Grisso & Banks, 2001). A comprehensive theoretical model to understand or explain relapse in delinquent behavior, however, is often lacking. Such a model might be found in the risk assessment and management model often used in the treatment of forensic psychiatric patients, based on theoretical 'What works' principles, that is, the risk-need-responsivity model (RNR; Andrew & Bonta, 1998; Andrews, Bonta & Wormith, 2006; Bonta & Andrews, 2007). Section 4.2.2 explains this model.

The most prominent risk assessment instruments are the HCR-20 (Webster, Douglas, Eaves & Hart, 1997) and the HKT-30 (Workgroup risk assessment forensic psychiatry, 2002). The latter was developed especially for the Dutch population. These instruments consist of both static risk items (e.g., criminal history, former substance abuse, behavioral problems in childhood), and dynamic risk items that are presumed to be changeable over time (e.g., insight into problems, social skills, coping skills). Although the combination of

static and dynamic items is prominent in the assessment of patient risk, information about the effect of therapeutic interventions can only be provided by changes in dynamic risk factors. Research by Hildebrand, Hesper, Spreen & Nijman (2005) showed the greatest predictive power for violent relapse of Dutch forensic psychiatric patients to be based on the dynamic risk assessment items.

The focus of this study is the part of risk-related functioning that is susceptible to change. HKT-30 items were used¹ in this study as the base for developing a suitable measure. This tool consists of 30 items, each corresponding to a risk factor. The risk factors used in this study are assumed to be changeable during the course of treatment. Some risk assessment items are used in the way they are presented in the original instrument, but most were complemented with related items to form a scale for more precise and sensitive assessment.

This chapter discusses the measure developed for assessing assumed changeable risk-related functioning in forensic in-patients, including the psychometric qualities of the scales and their inter-rater reliability. It also discusses the results of three repeated measurements of risk-related functioning in the five FPC units of patients suffering from PDs.

4.2 Background

4.2.1 Previous research on therapy outcomes

Initially, research into the effectiveness of treatment for forensic psychiatric patients imposed with TBS was retrospective and based mainly on measurements of recidivism. Two studies by Van Emmerik (1981, 1984) marked the first research into the risk of recidivism. Follow-up research (Van Emmerik, 1985; Van Emmerik, 1989; Leuw, 1995; Leuw, 1999; Wartna, Harbachi & Van der Knaap, 2005) measured several cohorts of patients who had been institutionalized in Dutch FPCs in the previous five years. Although these studies provided valuable insights into the extent to which patients reoffended, particularly the type and severity of reoffences, none of these aspects could be related to the patients' therapy or therapeutic progress during imprisonment, mainly because of the time lag between therapy and offence. Recent research into therapeutic outcomes focuses on the extent to which specific therapeutic aims are met, such as a decrease in certain psychiatric symptoms (e.g., Greeven & De Ruiter, 2004; Caldwell, McCormick, Umstead & Van Rybroek, 2007). However, for outcomes specifically related to the treatment of forensic psychiatric patients, the risk of offending is the most important criterion, for which reliable prospective assessment is also the most difficult (de Beurs & Barendregt 2008).

¹ Because of their slightly better predictive quality, items from the HKT-30 instead of the HCR-20 were used in this research (see Hildebrand, Hesper, Spreen & Nijman, 2005; Lammers, 2007).

The newest development in TBS treatment is ‘therapy outcome’ research that focuses on establishing the effect of a therapy or intervention. The parliamentary enquiry (Final report parliamentary enquiry TBS, 2006) recommended developing specific care programs for various groups of patients incarcerated in forensic psychiatric centers, e.g., the groups of patients with personality disorders, autistic disorders, psychotic disorders, and sex offenders. The care programs must contain therapies that correspond to the needs of specific patients. Empirical research must be done to establish which therapies and interventions work the best and ultimately collect evidence-based knowledge. It requires the development of care programs as well as instruments for distinct patient groups.

The central issue in this research is not concerned with measuring the comparative effects of various interventions, but assessing risk-related functioning in a patient. In other words, not the causal effect of a therapeutic intervention on patients’ risk-related behavior is the focus, but rather a reliable estimation of patients’ risk-related behavior and change in this behavior in the therapeutic process. The active elements in the therapeutic process are considered parts of a ‘black box’ (Van Marle, 2004). Establishing a patient’s risk-related functioning at one point in time can indicate the patient’s treatment state. The evolution of risk-related functioning can be interpreted as the progression of the patient during the course of treatment. This chapter presents a reliable measure for assessing a patient’s treatment state and progress over time.

4.2.2 Current therapeutic treatment

In the last decade the focus of treatment of Dutch forensic psychiatric in-patients has changed dramatically from a psychoanalytic and client-centered approach with an emphasis on personality to a cognitive-behavioral approach emphasizing risk reduction and the management of risk factors (Nieuwenhuizen, 2005). Progress has been made in the identification of success factors for effective treatment. According to the often used risk-need-responsivity model for treatment (Andrew & Bonta, 1998; Andrews, Bonta & Wormith, 2006; Bonta & Andrews, 2007) the effectiveness of programs depends on the following principles. The *risk* principle ‘asserts that criminal behavior can be reliably predicted and that treatment should focus on the higher risk offenders’; the *need* principle ‘highlights the importance of criminogenic needs in the design and delivery of treatment’; and the *responsivity* principle ‘describes how treatment should be provided’ (Bonta & Andrews, 2007). Programs and interventions according to ‘what works’ principles are almost always based on cognitive-behavioral change methods.

This approach assumes that cognitive, emotive, and behavioral patterns of individuals are inter-related and constitute interdependent aspects of a person’s adjustment. Cognition is assumed to be most important for an individuals’ mood, intentions, and actions. The therapy assesses an individual’s short and long-term goals in a given social context. An

individual's behavior is assumed to be directed at obtaining these goals (Cohen, 1985).

The following is a very brief sketch of how the therapy given to these patients is based on the cognitive-behavioral approach. The problems of patients with PDs manifest themselves in the individual's character and temperament. With regard to a character, personal beliefs, view of the world, the future, and the self are affected (Sperry, 1999). Temperament refers to the innate, genetic, and constitutional influences of personality; impulsivity and aggression are important elements of temperament for this group (Costello, 1996). Treatment of PDs requires adjustments to character and temperamental aspects of personality. Both clinical experience (Beck, Freeman & Associates, 1990; Davidson, 2008) and research (Linehan, 1993, Bienenfeld, 2007) suggest that adjustments in patients' temperament must precede the ultimate change in individuals' character. However, many patients with PD lack the basic skills (Stanley, Bundy & Beberman, 2001) required to overcome problems in regulating their temperament, often resulting in stress or even violent behavior. Treatment is initially directed at teaching the requisite personal and relational skills, and secondly initiating changes regarding the temperament and character aspects of personality in order to reduce the risk of a patient reoffending.

4.2.3 Developing a measure for assessing patients' risk-related functioning

This study developed a measurement instrument based on dynamic risk assessment factors to accurately assess the condition of forensic psychiatric patients' risk-related functioning and monitor changes in their functioning over time. The 13 dynamic clinical factors of the HKT-30 risk assessment tool (Working group risk assessment forensic psychiatry, 2002) were used as the starting point in the development of the items. The 13 factors are related to the recidivism risk of patients, as confirmed by Hildebrand, Hesper, Spreen & Nijman (2005). The current study retrospectively evaluated HKT items for patients discharged from the forensic hospital a few years earlier, and linked them to data of actual violent and general recidivism. Significant predictive power was found for eight factors related to violent recidivism ($r = .30$ to $.17$) and for six factors related to general recidivism ($r = .30$ to $r = .20$), as presented in Table 4.1.

Therapeutic intervention in the treatment process of forensic psychiatric patients is expected to have a potentially positive influence on factors which could lead to reduction of risk-related behavior and thus to decreased recidivism. The aim here is to develop an instrument that is best able to establish risk-related behavior and change in this risk-related behavior over time.

We created a scale to allow more adequate assessment of the HKT-30 factors for most of the dynamic clinical factors. The items included in the scale were based on the definitions and descriptions of the factors in the HKT-30 manual. Whenever possible, we

included the useful items from the Dutch translation of the Atascadero Skills Profile (Vess, 2001) that maps a broad spectrum of concrete behavior and skills.

Dynamic clinical HKT-30 factors	Violent recidivism (<i>r</i>)	General recidivism (<i>r</i>)
Insight in problems	.12	.09
Psychotic symptoms	.09	-.01
Substance abuse	.15	*.20
Impulsivity	***.30	***.30
Empathy	*.17	.10
Hostility	***.33	** .26
Social and relational skills	*.21	.15
Life skills	** .22	*.21
Acculturation problems	.08	.04
Attitude toward treatment	*.21	.12
Responsibility for the offence	** .25	** .30
Sexual preoccupation	-.02	-.00
Coping skills	*.17	*.20

Table 4.1. Predictive validity of dynamic clinical items of the HKT-30 for violent and general recidivism expressed in Pearson correlation coefficient. *: $p < .05$; **: $p < .01$; ***: $p < .001$ (two-sided). Source: Hildebrand, Hesper, Spreen & Nijman (2005).

The scales included: problem insight, substance abuse, impulsivity, empathy, hostility, social and relational skills, attitude towards treatment, and sexual preoccupation. We decided that the original HKT-30 items would provide sufficient information for 'psychotic symptoms' and 'acculturation problems'. Since it was impossible to create proper scales for 'life skills' and 'coping skills', HKT-30 items were used in these cases.

4.2.4 Quality of the scales

To establish the quality of the scales, a pilot study conducted two measurements (with a time interval of three months) on two units, 1) the SO unit and 2) the BPD unit. The sociotherapists working on both units were asked to evaluate the questionnaire for the patients they mentored. During the pilot study 41 patients were assessed. The two repeated measures were used as independent measures in the establishment of the quality of the scales.

HKT scale factor	Number of scale items	H Value	Cronbach's alpha (α)
Problem insight	5	0.78	0.93
Substance abuse	2	0.73	0.81
Impulsivity	4	0.47	0.83
Empathy	5	0.45	0.69
Hostility	4	0.54	0.80
Social relational skills	5	0.48	0.86
Attitude to treatment	3	0.69	0.83
Sexual preoccupation	4	0.65	0.84

Table 4.2. The unidimensionality and reliability of the scales developed in the pilot study.

The unidimensionality of the scales was evaluated by Mokken scale analysis (Mokken 1971; Mokken & Lewis, 1982, Molenaar & Sijtsma, 2000). The *H* value in Mokken analysis indicates the extent to which diverse items measure the same construct. The *H* value has to be at least 0.40, and an *H* value larger than 0.50 is considered strong (Mokken 1971; Mokken & Lewis, 1982). The reliability of the scales was measured by Cronbach's alpha (α). A scale is considered reliable when Cronbach's alpha is at least 0.70. A strong scale is considered to have a value of .80 or higher.

Results of the quality analysis showed reasonable to good unidimensionality and good reliability except for the 'empathy' scale. Because of its weaker quality, this scale was replaced by items from the Dijkstra & Van Erven (2002) empathy scale developed especially for the forensic psychiatric population.

Other decisions were also based on results of the pilot. The scales 'substance abuse' and 'sexual preoccupation' were removed from the questionnaire. Although the questionnaire did make the distinction, according to respondents it was unclear whether the questions related to the situation prior to imprisonment or to the present situation. The pilot showed that these characteristics applied only to a relatively small selection of the study population, and that was the main reason for removing these factors from the questionnaire.

The final version of the questionnaire as used in the data collection of three measurements contains 29 items. Three are the original dynamic, time-changing HKT items 1) self-management, 2) responsibility for offence, and 3) coping skills. These were measured by five pre-described categories, numbered 0 to 4, where 0 describes a non-problematic situation related to the measured construct, and 4 represents the most severe problematic situation related to the construct.

The remaining 26 items were related to six risk factors (insight into problems, impulsivity, empathy, hostility, social relational skills, attitude to treatment) formulated as statements that had to be evaluated on five-point scales. The value 0 represents the answer that the patients' real situation was the total opposite of the statement, 4 represents full correspondence between the statement and the patient's situation while the middle score of 2 is neutral. See Appendix 4 for the full questionnaire and an overview of the items.

4.3 Method

4.3.1 Research site

Data for this research was collected in FPC Dr. S. Van Mesdag, a forensic hospital in Groningen that provides residential treatment for some 200 patients imposed with TBS. For more information see Section 3.3.1.

4.3.2 Design of the study

The questionnaire used to assess patients' risk-related functioning included items that had shown good usability in the pilot, as described above. The study focused on PDs because most forensic psychiatric patients have PD symptomatology (80% of patients in the Netherlands; De Beurs & Barendegt, 2008) and they are known to be at high risk for recidivism. Data collection occurred three times (at six-monthly intervals) on the five units: 1) SO, 2) NPD, 3) SUD, 4) PDD and 5) BPD. This next section describes the study population in further detail.

The sociotherapists working on the units were asked to evaluate the patients they mentored, using the questionnaire. In addition, treatment coordinators (psychologists and psychiatrists whose offices are outside the units) were also asked to evaluate every patient under their responsibility. The questionnaires were completed within a time span of three weeks per measurement.

In total 49 sociotherapists participated in the research, 30 in the first, 32 in the second, and 33 in the third wave. Every patient on the units was (re-)evaluated in each wave. If the therapeutic mentor was unable to assess a patient for some valid reason, the questionnaire was filled in by the backup therapist. The same five treatment coordinators² participated throughout the study and their response rate was close to 100%. Two new patients who had arrived only recently on the unit could not be evaluated as their treatment coordinator lacked sufficient information.

² The treatment coordinator of the BPD unit was replaced during the third wave because of maternity leave.

		SO unit	NPD unit	SUD unit	PDD unit	PD unit
		(N = 12)	(N = 12)	(N = 12)	(N = 12)	(N = 11)
Age (years)	Measurement 1	45 (26-61)	33 (25-42)	38 (29-48)	40 (25-68)	38 (26-55)
IQ		99 (90-114)	104 (86-115)	97 (74-116)	99 (78-118)	92 (75-117)
Duration incarceration (months)		34 (16-59)	40 (11-111)	28 (15-47)	51 (14-137)	20 (0-39)
Duration TBS (months)		66 (37-154)	59 (12-116)	48 (15-96)	79 (19-179)	48 (4-142)
		(N = 12)	(N = 12)	(N = 12)	(N = 12)	(N = 12)
Age (years)	Measurement 2	45 (27-62)	36 (26-57)	39 (30-58)	38 (26-51)	38 (27-56)
IQ		99 (90-114)	107 (86-123)	95 (74-116)	100 (82-118)	95 (75-119)
Duration incarceration (months)		40 (22-65)	40 (4-117)	22 (2-40)	57 (9-143)	22 (4-45)
Duration TBS (months)		72 (43-160)	65 (18-122)	58 (18-165)	87 (25-185)	61 (10-148)
		(N = 12)	(N = 12)	(N = 12)	(N = 12)	(N = 12)
Age (years)	Measurement 3	42 (27-62)	36 (26-57)	41 (30-58)	40 (24-54)	38 (25-52)
IQ		97 (79-114)	108 (86-123)	93 (74-115)	100 (82-118)	96 (75-119)
Duration incarceration (months)		40 (24-69)	42 (6-123)	24 (0-46)	52 (7-103)	22 (7-51)
Duration TBS (months)		69 (27-118)	64 (9-128)	57 (5-171)	82 (20-191)	60 (7-154)

Table 4.3. Mean characteristics, including age, IQ, duration of incarceration, duration of TBS for patients on five treatment units in the three waves of measurement.

4.3.3 Study population

The research population totaled 78 patients; 15 on the SO unit, 15 on the NPD unit, 19 on the SUD unit, 16 on the PDD unit, and 16 on the BPD unit. Three patients switched units between measurements. The average age of the patients was 38 years (range 25-68) in the first measurement, 39 years (range 26-62) in the second, and 39 years (range 24-62) in the third measurement. Average age on the SO unit was somewhat higher than average, while the age of patients on the NPD unit was somewhat lower than average. Average IQ for the first measurement was 98 (range 74-118), for the second 99 (range 74-123), and for the third 99 (range 74-123). For the patients on the NPD unit the average IQ seemed to be somewhat higher. Patients on the SUD unit and BPD unit appeared to have a slight lower average IQ.

Average duration of incarceration in FPC Dr. S. Van Mesdag was 35 months (range 0-137) for the first measurement, 36 months (range 2-143) for the second, and for the third, 36 months (range 0-123). Incarceration on both SUD and BPD units was shorter on average, while patients on the PDD unit remained longer than average during the measurements. Patients in the NPD and SO units also remained slightly longer than average in the facility. Patients on the NPD and the PDD unit showed the largest dispersion in duration of incarceration.

The average duration of TBS was 60 months (range 4-179) at the first measurement, for the second 68 months (range 10-185), and for the third 66 months (range 5-191). The average duration of TBS is longer for the patients on the PDD and to a lesser extent for patients on the SO unit. On both the SUD and the BPD units the duration of TBS is shorter than average. Patients on the PDD, SUD, and BPD units show the largest dispersion in TBS duration. Table 4.4 presents an overview of the number of patients in the distinct units that were involved in the individual waves. All units contained 12 patients except for the BPD unit, which had only 11 patients involved in the third wave.

4.3.4 Analysis

Several analyses were performed to establish the psychometric qualities of the measure. First, inter-rater reliability provides information on any differences in the assessments done by therapeutic mentors and treatment coordinators. To determine inter-rater reliability, we calculated the mean absolute difference (MAD) values and the intraclass correlation coefficient (ICC) per questionnaire item for the assessments done by both mentor and coordinator. A two-way ANOVA was used to calculate the ICC with further assumptions underlying ICC (3.1) as described in Shrout & Fleiss (1979). The ideal value for MAD is 0 (lowest possible), while the ideal value for ICC is 1 (highest possible). A high MAD can in theory be combined with a low ICC; this indicates that the raters may have very different mean ratings, but the ratings correlate highly. To determine the unidimensionality and

	Involved patients	SO unit	NPD unit	SUD unit	PDD unit	BPD unit
		m1 = 12	m1 = 12	m1 = 12	m1 = 12	m1 = 11
		m2 = 12	m2 = 12	m2 = 12	m2 = 12	m2 = 12
		m3 = 12	m3 = 12	m3 = 12	m3 = 12	m3 = 12
All three measures		9	9	5	8	7
Only measurement 1		0	2	4	2	1
Only measurement 2		0	0	0	0	0
Only measurement 3		0	1	3	2	3
Only measurement 1 & 2		3	1	3	2	3
Only measurement 2 & 3		3	2	4	2	2
Total		15	15	19	16	16

Table 4.4. Participation of patients in the three measurements (N = 78).

reliability of the questionnaire scales, we conducted the same analyses as in the pilot study, namely Mokken scale analysis (Mokken 1971, Mokken & Lewis 1982) and reliability analysis (see Section 4.2.4 for an explanation).

Next, to distinguish between different aspects of risk-related functioning, we conducted principal component factor analysis on all items of the questionnaire. Varimax (orthogonal) rotation was used ultimately to best distinguish the factors. Scalability of the factors found was assessed by establishing their unidimensionality and reliability. The degree of factor inter-relatedness was investigated by Pearson correlation coefficients.

To assess risk-related functioning, scores for questionnaire items and for every distinguished factor were totaled for every patient. All scores were standardized to a value between 0 and 100 for mutual comparability. All items were coded so that a higher score meant less risk-related behavior for the patient, and thus better functioning.

For the analysis of change in risk-related behavior, we executed a multivariate repeated measures analysis, reporting time effects as well as differences between patient units related to functioning of patients.

4.4 Results

4.4.1 Inter-rater reliability

Table 4.5 presents MAD and ICC values for all three assessments of patients' risk-related behavior evaluated by sociotherapeutic mentors and treatment coordinators. The values are presented for the three HKT items included in the questionnaire, as well as for the separate scale items and the total scale values.

Item	MAD (SD) (m1)	ICC (m1)	MAD (SD) (m2)	ICC (m2)	MAD (SD) (m3)	ICC (m3)
Self care	1.26 (1.19)	.43	0.90 (0.93)	.60	1.07 (1.10)	.47
Responsibility for the offence	0.98 (0.99)	.46	0.75 (1.01)	.56	0.93 (0.88)	.56
Coping skills	0.88 (0.80)	.52	0.51 (0.77)	.67	0.63 (0.71)	.73
Insight in problems	4.03 (2.85)	.43	2.84 (2.39)	.73	3.07 (2.38)	.67
<i>1. Insight into mental processes</i>	0.95 (0.87)	.45	0.58 (0.70)	.70	0.80 (0.73)	.53
<i>2. Insight mental processes affecting behavior</i>	1.13 (0.80)	.28	0.73 (0.76)	.51	0.70 (0.78)	.70
<i>3. Ability to adjust behavior</i>	0.88 (0.77)	.52	0.66 (0.80)	.53	0.93 (0.76)	.48
<i>4. Awareness of problematic behavior</i>	0.88 (0.90)	.43	0.78 (0.69)	.64	0.82 (0.70)	.61
<i>5. Awareness disorders' influence on behavior</i>	1.15 (0.83)	.17	0.58 (0.67)	.74	0.85 (0.82)	.36
Impulsivity	3.22 (2.14)	.67	2.92 (1.96)	.69	3.20 (2.32)	.56
<i>6. Unpredictable and inconsiderate behavior</i>	1.12 (1.01)	.31	0.80 (0.88)	.63	1.10 (0.84)	.52
<i>7. Directedness towards immediate gratification</i>	1.05 (0.80)	.64	1.07 (0.92)	.39	1.00 (0.74)	.52
<i>8. Inconsiderate of effects of behavior</i>	0.94 (0.85)	.58	0.78 (0.83)	.47	0.97 (0.71)	.54
<i>9. Presence of uncontrolled rage and anger</i>	0.88 (0.94)	.67	0.75 (0.79)	.66	1.07 (0.88)	.52
Empathy	3.97 (2.77)	.44	2.57 (1.77)	.83	2.73 (2.07)	.72
<i>10. Ability to put oneself in another's place</i>	0.78 (0.82)	.51	0.70 (0.70)	.62	0.87 (0.65)	.57
<i>11. Intention to apologize if necessary</i>	1.07 (0.93)	.28	0.67 (0.71)	.65	0.93 (0.80)	.41
<i>12. Justified consideration of interests</i>	0.86 (0.63)	.50	0.52 (0.54)	.77	0.72 (0.61)	.61
<i>13. Sympathy for the needs of others</i>	0.90 (0.77)	.44	0.50 (0.57)	.78	0.77 (0.70)	.54
<i>14. Adjusting behavior to consider others</i>	0.98 (0.74)	.34	0.70 (0.67)	.60	0.65 (0.63)	.64

Hostility	3.44 (2.59)	.61	2.31 (2.06)	.80	3.02 (2.27)	.55
15. Attribution of hostile motives towards others	1.19 (0.87)	.47	0.72 (0.83)	.66	1.13 (0.83)	.36
16. Expression of passive aggression	1.17 (0.96)	.40	0.95 (1.06)	.41	1.10 (0.91)	.17
17. Expression of cynicism and irritations	1.00 (0.88)	.53	0.50 (0.71)	.79	0.83 (0.78)	.52
18. Expression of serious verbal aggression	0.91 (0.90)	.66	0.75 (0.73)	.71	0.95 (0.81)	.55
Social relational skills	3.79 (2.96)	.54	3.07 (2.61)	.60	3.43 (2.61)	.65
19. Adequate ability to maintain contact	0.69 (0.75)	.63	0.68 (0.83)	.56	0.88 (0.84)	.54
20. Possession of adequate interaction skills	0.95 (0.87)	.40	0.83 (0.83)	.41	0.86 (0.83)	.54
21. Recognition of offending and positive contact	0.93 (0.99)	.49	0.55 (0.70)	.63	0.78 (0.76)	.54
22. Assertiveness	1.10 (0.93)	.19	0.81 (0.93)	.30	0.97 (0.71)	.50
23. Basic daily life management skills	0.98 (0.85)	.44	0.75 (0.81)	.49	0.83 (0.74)	.55
Attitude to treatment	2.02 (1.68)	.71	1.98 (1.64)	.74	2.23 (1.70)	.52
24. Cooperation with treatment and therapy	0.72 (0.70)	.71	0.57 (0.72)	.78	0.77 (0.69)	.58
25. Openness to different insights	0.95 (0.76)	.60	0.68 (0.79)	.66	0.87 (0.68)	.56
26. Acceptance of rules in the forensic hospital	0.97 (0.84)	.43	0.73 (0.84)	.51	0.97 (0.82)	.25

Table 4.5. Inter-rater reliability of the treatment state of patients; differences in the scores of sociotherapeutic mentors and treatment coordinators per item for three measures (m1, m2, m3). MAD = mean absolute difference, ICC = intraclass correlation coefficient. Standard deviation (SD) represents the level of dispersion in the mean values of raters (N = 59/N = 60/N = 60).

The first measurement shows relatively many items with a MAD value above 1.00, the boundary at which differences between the sociotherapeutic mentor and treatment coordinator differ on average more than one category on a five-point scale. Most of these items have a relatively low ICC. The biggest differences in the two sets of assessments were found for the following items: assertiveness (social relational skills scale), insight into influence of mental processes on behavior (insight into problems scale), intention to apologize when necessary (empathy scale), and unpredictable, inconsiderate behavior (impulsivity scale). The items related to the attribution of hostile motives towards others, expression of passive aggression, and expression of cynicism and irritation (all from the hostility scale) as well as the self care item also showed MAD values above 1.00, but somewhat better ICC values than those mentioned above.

In the second measurement, only directedness towards immediate satisfaction (impulsivity scale) showed a MAD value higher than 1.00 and a relatively low ICC value. Assertiveness also showed a relatively low ICC value.

In the third measurement, low MAD and ICC values were found for expression of passive aggression and for attribution of hostile motives towards others (both hostility scale). Items with MAD values higher than 1.00 and better ICC scores were unpredictable, inconsiderate behavior, directedness toward immediate satisfaction (both impulsivity), and self care (HKT item). Additionally, a low ICC score was found for acceptance of rules in the forensic hospital (attitude towards treatment scale).

The improvement of the inter-rater reliability between the first and second measurement is especially remarkable. This improvement could be due to the effect of learning on the respondents during the measurements. Sociotherapists in particular were not accustomed to this form of assessing risk-related behavior in patients. However, growing familiarity cannot be the only reason because the third measurement showed some deterioration in inter-rater reliability as compared to the second measurement.

A second reason for differences in assessment is presumably that both groups of raters observed patients in their specific circumstances. Sociotherapists work on the unit and see the patients for the greatest part of the day whereas treatment coordinators often see patients individually in their offices (outside the unit) for a few hours per week for psychological assessment and psychotherapy. Patient behavior can be different in both settings, which may partly explain differences in assessment between the two groups of respondents. This possible explanation suggests that both points of view should be taken into account in a complementary way to obtain a picture of risk-related behavior that is as complete as possible. The inter-rater reliabilities for the total scale values of respondents proved satisfactory for all scales, except for insight into problems and empathy in the first measurement. Thus, the lack of reliability at the item level is not seen at the scale level due to compensation between items.

4.4.2 Unidimensionality and reliability of scales

Table 4.6 presents the unidimensionality and reliability of the scales for all three waves. Unidimensionality is expressed by the H value and reliability by Cronbach's alpha. For all three measurements all scales had H values higher than 0.50, which proved their strong unidimensionality quality (Mokken 1971; Mokken & Lewis, 1982). Almost all scales showed a Cronbach's alpha higher than 0.80, and may be considered strong. For the third measurement, only impulsivity and hostility showed values of just under 0.80, still a reasonable reliability (Nunnally, 1978).

HKT scale factor	Number of items	H Value (m1)	Cron.α (m1)	H Value (m2)	Cron.α (m2)	H Value (m3)	Cron.α (m3)
Insight into problems	5	.52	.83	.60	.85	.64	.82
Impulsivity	4	.57	.82	.64	.86	.54	.78
Empathy	5	.63	.88	.79	.92	.65	.84
Hostility	4	.64	.86	.73	.90	.60	.79
Social skills	5	.62	.88	.53	.85	.70	.88
Attitude to treatment	3	.69	.84	.76	.89	.64	.80

Table 4.6. The unidimensionality and reliability (H value and Cronbach’s alpha) of scales in the final questionnaire of the three repeated measures (m1, m2, m3).

	Measure 1			Measure 2			Measure 3		
Eigenvalue									
- Problem awareness			11.38			12.47			11.43
- Skills			3.30			3.41			2.13
- Impulse control			2.78			2.93			2.13
% of variance explained									
- Problem awareness			39.3			43.0			39.4
- Skills			11.4			11.8			7.9
- Impulse control			9.6			10.1			7.4
Construct/items	Factor loadings								
Factor	Problem awareness			Skills			Impulse control		
Insight in problems	m1	m2	m3	m1	m2	m3	m1	m2	m3
1. Insight into mental processes	.60	.64	.66	.53	.57	.47	-.08	-.02	.06
2. Insight into mental processes affecting behavior	.66	.61	.58	.40	.48	.50	.12	-.13	.12
3. Ability to adjust behavior	.66	.52	.43	.41	.36	.34	.12	.29	.31
4. Awareness of problematic behavior	.84	.83	.82	.10	.03	.16	.05	-.09	.04
5. Awareness disorders’ influence on behavior	.44	.79	.45	.31	.12	.15	-.07	.04	.36
Empathy	m1	m2	m3	m1	m2	m3	m1	m2	m3
10. Ability to put oneself in another’s place	.30	.56	.53	.81	.47	.61	.03	.32	.04
11. Intention to apologize if necessary	.65	.72	.68	.34	.25	.15	.14	.34	.11
12. Justified consideration of interests	.64	.68	.63	.34	.35	.52	.40	.37	.16
13. Sympathy for the needs of others	.67	.61	.58	.41	.38	.19	.09	.36	.21
14. Adjusting behavior to consider others	.53	.52	.54	.49	.45	.50	.23	.48	.24

Table 4.7. Principal component analysis with Varimax rotation for patients’ treatment state in three measurements over time with an interval of half a year.

Attitude to treatment	m1	m2	m3	m1	m2	m3	m1	m2	m3
<i>24. Cooperation with treatment and therapy</i>	.73	.73	.47	-.04	.09	.27	.31	.27	.39
<i>25. Openness to different insights</i>	.85	.83	.67	.16	.09	.31	.23	.21	.31
<i>26. Acceptance of rules in the forensic hospital</i>	.57	.65	.62	-.21	-.17	-.22	.55	.52	.43
Responsibility for the offence (HKT item)	.49	.57	.61	.40	.43	.33	.01	.14	.09
Social relational skills	m1	m2	m3	m1	m2	m3	m1	m2	m3
<i>19. Adequate ability to maintain contact</i>	.16	.26	.33	.69	.64	.63	.30	.40	.33
<i>20. Possession of adequate interaction skills</i>	-.05	.16	.26	.79	.76	.72	.04	.25	.21
<i>21. Recognition of offending and positive contact</i>	.21	.17	.18	.76	.69	.69	.08	-.08	.04
<i>22. Assertiveness</i>	.04	-.10	-.01	.64	.69	.74	.22	.07	0.7
<i>23. Basic daily life management skills</i>	-.01	.07	.10	.80	.85	.70	.31	.16	.32
Self-management skills (HKT item)	-.14	-.13	.25	.70	.61	.53	.34	.37	.34
Coping skills (HKT item)	.10	.29	.26	.61	.61	.51	.47	.49	.55
Impulsivity	m1	m2	m3	m1	m2	m3	m1	m2	m3
<i>6. Unpredictable and inconsiderate behavior</i>	-.19	.00	.05	.44	.37	.52	.62	.77	.37
<i>7. Directedness towards immediate gratification</i>	.04	.00	.25	.53	.23	.14	.51	.67	.33
<i>8. Inconsiderate of effects of behavior</i>	.19	.23	.14	.36	.48	.38	.57	.63	.55
<i>9. Presence of uncontrolled rage and anger</i>	-.12	.00	-.09	.21	.26	.37	.75	.81	.74
Hostility	m1	m2	m3	m1	m2	m3	m1	m2	m3
<i>15. Attribution of hostile motives towards others</i>	.33	.47	.38	.09	-.04	.18	.69	.60	.60
<i>16. Expression of passive aggression</i>	.40	.44	.35	.17	.01	-.08	.57	.67	.66
<i>17. Expression of cynicism and irritations</i>	.41	.42	.30	.02	-.11	.04	.59	.75	.66
<i>18. Expression of serious verbal aggression</i>	.15	.26	-.04	.13	.11	.31	.83	.78	.75

Table 4.7. (Continued) Principal component analysis with Varimax rotation for patients' treatment state in three measurements over time with an interval of half a year.

4.4.3 Factor analysis

Table 4.7 presents the outcomes of principal component factor analysis conducted on all items of the questionnaire used to assess risk-related behavior. A Varimax (orthogonal) rotation yielded a three factor solution that for each measure successively accounted for 60%, 65%, and 55% of the variance. The three factors (problem awareness, skills, and impulse control) correspond to the essential factors (character, skills, and temperament) in the cognitive-behavioral approach to treatment. Problem awareness includes insight into problems, empathy, and the HKT item responsibility for the offence. Skills comprises social and relational skills, and two HKT items, self-management, and coping skills. The final factor, impulse control, consists of impulsivity and hostility.

Domain	Problem awareness	Skills	Impulse control
Problem awareness (m1)	-		
Skills (m1)	.59** (N = 59)	-	
Impulse control (m1)	.55** (N = 59)	.58** (N = 59)	-
<hr/>			
Problem awareness (m2)	-		
Skills (m2)	.56** (N = 60)	-	
Impulse control (m2)	.59** (N = 60)	.52** (N = 60)	-
<hr/>			
Problem awareness (m3)	-		
Skills (m3)	.62** (N = 60)	-	
Impulse control (m3)	.58** (N = 60)	.66** (N = 60)	-

Table 4.8. Pearson correlations of the domains of risk-related functioning for the three repeated measures.

To determine the mutual association between factors of risk-related functioning, we calculated Pearson correlations for the three measurements (see Table 4.8). The correlations between factors seem to be approximately the same order of magnitude and about the same for every measurement (ranging from $r = .52$ to $r = .66$). Correlations between factors are relatively high because all measure patients' risk-related behavior. The specific factors illuminate specific aspects of patients' risk behavior.

Table 4.9 presents the psychometric qualities for the domains when considered as scales. Unidimensionality for all items of a specific domain appeared to be reasonable to good for all repeated measures. All domains could be considered reliable scales, indicated by Cronbach's alpha values higher than 0.80.

Domain	Total items	<i>H</i> (m1)	α (m1)	<i>H</i> (m2)	α (m2)	<i>H</i> (m3)	α (m3)
Problem awareness	14	.49	.91	.53	.94	.44	.91
Skills	7	.58	.90	.56	.87	.59	.91
Impulse control	8	.46	.86	.59	.91	.44	.85

Table 4.9. The unidimensionality and reliability (*H* value and Cronbach's α) of the domains of patients' risk-related functioning of the three repeated measures.

4.4.4 Changes in patients' risk-related functioning

This section considers the development of risk-related functioning of patients on the distinct units for three repeated measures and tests these measures with multivariate repeated measures analysis. The aim is to investigate possibilities of establishing average behavioral change over time. For the best possible comparison of measurements, we considered only those patients who had participated in all three waves. The results are presented so that a higher score represents less risk behavior and thus better functioning of the patient.

We found no significant change in the general risk-related functioning of patients over the three waves. However, we did identify differences in risk functioning between units $F(4, 33) = 4.25, p = .007$ (Figure 4.1). Patients on the NPD unit showed significantly worse general risk-related functioning than patients from all other units except the PDD unit, a difference not found to be significant in post-hoc tests.

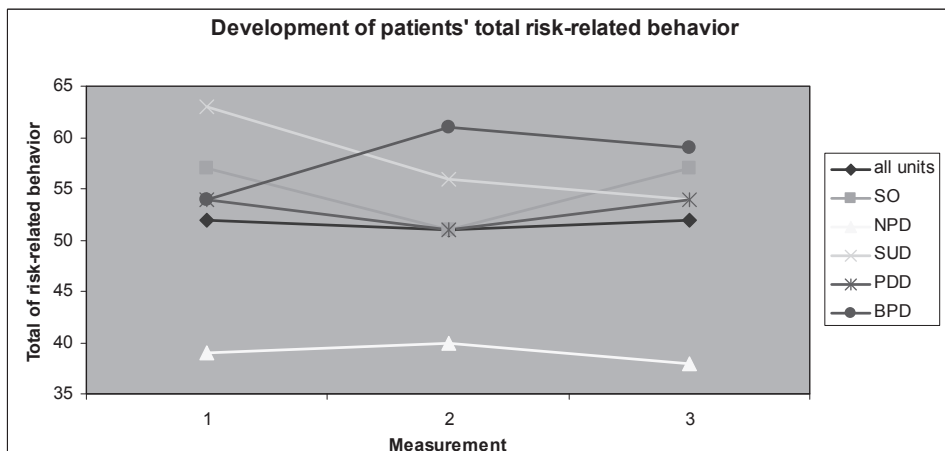


Figure 4.1. Development of patients' risk-related behavior for patients of the distinct patient units.

Considering the distinct factors of risk-related behavior, we saw no change in problem awareness of patients over time and no differences in patients' problem awareness between the distinct units (Problem awareness mean = 51.4). This was not visualized in a figure.

For risk related to skills, we established a significant change over time $F(2, 8) = 4.00, p = .023$, as well as differences between units $F(4, 33) = 11.12, p < .001$ (see Figure 4.2). Instead of the expected reduction, we observed an increase of risk over time. Especially patients on the SUD unit and to a lesser degree those on the PDD unit showed an increase in their risk related to skills over time.

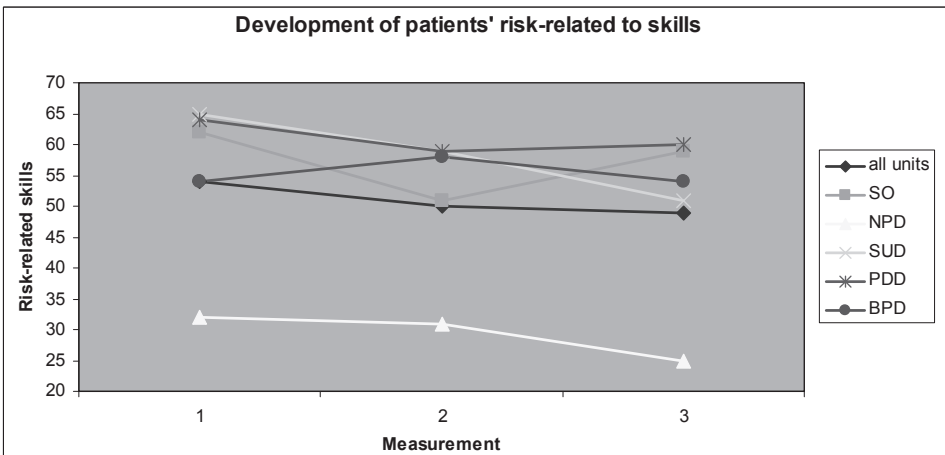


Figure 4.2. Development of patients' risk-related skills for patients of the distinct patient units.

The risk related to skills for patients on the NPD unit appeared significantly lower than for the rest of the patients (mean difference = 28.2). Over time, the functional deployment of skills worsened even further on this unit.

For risk-related impulse control, no significant changes were established in the development over time but there were significant differences between units, $F(4, 33) = 3.41, p = .019$ (see Figure 4.3). Patients from the SUD and BPD units appeared to have the best impulse control. Patients from the NPD unit showed less than average impulse control. A significant difference was found between patients on the NPD unit and patients on SUD unit (mean difference = 24.6).

Testing for the effects of age, IQ, duration incarceration and duration of TBS showed no significant differences.

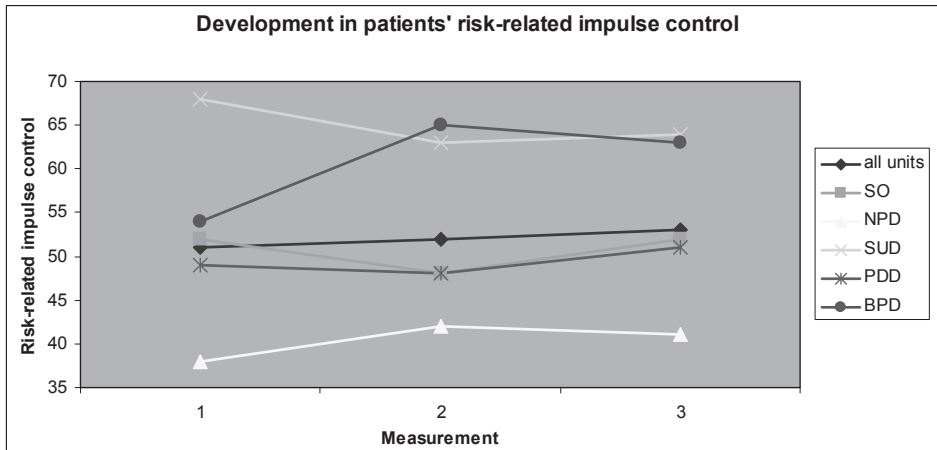


Figure 4.3. Development of patients' risk-related impulse control for patients of the distinct patient units.

4.5 Conclusion and discussion

This chapter investigated an instrument for the assessment of patients' risk-related functioning. It described the development of the instrument and reported on its usability and psychometric qualities.

The sociotherapeutic mentors and treatment coordinators of the units reviewed the questionnaire initially developed in the pilot study. The final version was based on their oral review and an examination of its psychometric qualities. Consistent with the three essential domains (cognition, temperament, and skills) of cognitive-behavioral therapy, the dominant treatment approach in forensic psychiatry, the final questionnaire distinguished three factors of risk-related functioning, namely, problem awareness, impulse control, and skills. This final questionnaire was used to measure the risk-related functioning of patients three times. It proved to be a good instrument for the purpose.

Inter-rater reliability between sociotherapeutic mentors (working on the unit) and treatment coordinators (working in offices outside the unit) seemed reasonably good. Almost all the questionnaire items were evaluated with a mean difference of less than one answer category, which was the boundary value determined for good inter-rater correspondence. A few items were evaluated with a mean difference just above this boundary value. However, the inter-rater correlation coefficient of the scale composed by those items often showed good values, indicating the compensation between items on a scale level. On the item level, the first measurement did not seem to be as good as the second and third measurements. In the first place, this might be due to a learning effect in the assessment of the sociotherapists. Unlike the treatment coordinators, they had no previous professional experience with risk assessment. Another reason for the differences

may be the different levels of contact in different contexts. Sociotherapists saw patients daily in their working hours on the unit, while treatment coordinators saw patients only in their offices, outside the unit, for individual therapy sessions. Putting both views together provided complementary insights into the observed behavior of patients' risk behavior during the treatment process.

The final questionnaire showed good unidimensionality and reasonable to good reliability for the scales. In addition, the psychometric qualities proved to be adequate for the distinguished factors, problem awareness, impulse control and skills.

Results related to the actual risk-related functioning of patients showed a time effect only for risk-related skills. We expected the strongest effect for skills because they may be more changeable than either cognition and temperament. Therapeutic interventions are aimed first at improving basic requisite skills of patients before moving on to the temperament or cognition domains of patients. However, unexpectedly, skills showed deterioration over time. A possible explanation for this remarkable finding could be that the entire study population was a group of patients that participated in all three measurements. This can cause a selection effect: those with unsatisfactory treatment progress are more likely to stay on. Relatively many patients therefore have a less than average treatment prospect. Skills such patients develop can be used to accomplish goals that are contradictory with treatment aims. Another reason could be harsher evaluation of risk-related skills over the course of time because of lack of progress, if a patient's behavior did not change in spite of therapeutic treatment.

Additional differences between patients of distinct units were found for general risk-related functioning, impulse control, and risk-related skills. The risk-related functioning of patients in general seemed to be worst on the NPD unit in comparison to those on other units. The greatest differences can be attributed to the bad risk-related skills of this group. Another prominent difference was found in impulse control. Narcissistic patients showed more problems in controlling their impulses than patients on the SUD unit. Possible reasons for this finding lie in the nature of patients' disorders on the NPD unit, predominantly narcissistic and antisocial PDs with psychopathic characteristics, often characterized by manipulative behavior. Additional skills may also be used for this. This may possibly explain the increase of risk behavior related to skills over time for this group. Patients with psychopathic characteristics can be rationally manipulative, whereas other patients may act more on impulse.

The difference found between the NPD and SUB units might be explained by the type of skills developed by patients on the latter unit. Substance use is often a social activity and socialization is often reported as the primary motivation for use (Warner, Taylor, Wright, Sloat, Springett, Arnold & Weinberg, 1994). This requires sophisticated social skills. A study by Carey, Carey & Simons (2003) into psychiatric patients with substance use disorder also reported better instrumental role functioning, which demands more impulse control for

abusers. This reasoning is in line with the differences found between the patients of the two patient units.

This chapter presented the results of patients' changes in risk-related functioning as an average of the situation on the five units, and its development of changes over time. That only one significant time effect was found for the functional domains does not automatically mean that individual patients showed no change in these domains. Some patients may have shown improvements, while the behavior of others may have deteriorated over time.

The questionnaire described here was developed for research into the association between social interactions and risk-related functioning. In a subsequent phase of this research, the patients' risk-related functioning will be linked to their social interaction variables on the individual level. Different states of risk-related functioning and changes in functioning over time, regardless of the direction, will then be considered and tested for all evaluated patients in the study population, not just a sample. Given the results in this chapter, the questionnaire we have developed seems qualified for the task.

Chapter 5

Social interaction related to the functioning of forensic psychiatric in-patients¹

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5.1 Introduction

In recent decades the degree to which individual behavior is affected by the social environment has become an important theme in research on criminal behavior (see Haynie, 2001, 2002) as well as on mental and physical health (see Kawachi & Berkman, 2001; see Halpern, 2005 for a review). With regard to criminal behavior, researchers have become aware that relations with others are not only a resource for achieving all kinds of socially desirable goals, but also that most criminal acts are not committed by one person working alone, but by groups of offenders. Indeed, prominent theories for the explanation of criminal behavior are rooted in propositions concerning relationships of offenders. For example, social control theory argues that criminal acts result from a lack of social integration and deficient bonds to other individuals and to social institutions (see Hirschi, 1969), while differential association theory (Sutherland & Cressey, 1955; Warr, 2002) posits, in contrast, that delinquent behavior is learned from interactions with others who are delinquent.

The argument that social integration generally affects all kinds of individual behavior and wellbeing, including mental health, dates back to Durkheim (1858-1917). Besides the classical example of suicide behavior (Durkheim, 1897), modern research found, for example, that having small networks and few confidante relationships go together with depressive symptoms (Berkman & Kawachi, 2000; Barnett & Gotlib, 1988).

Given this common acknowledgement of the importance of networks for delinquent and other socially disturbed persons, it is perhaps surprising that there is so little knowledge available about the relationships maintained by imprisoned people. Lindquist (2002) found that having more social relationships inside prison was associated with higher levels of distress for female inmates, whereas research by Brunt and Hansson (2002) showed the positive mental health effects of having an extended social network for people with severe mental illness in in-patient settings.

A social network perspective might be especially illuminating for forensic psychiatric patients. This is a specific selection of offenders with relationship disturbances who are institutionalized in groups sharing generally the same problems and a common therapeutic treatment. The relational base of their disturbance is illustrated by the personality disorders suffered by the largest population of forensic psychiatric patients (80%, WODC, 2008): *a chronic disturbance in one's relations with self, others, and the environment that results in distress or failure to fulfill social roles and obligations* (APA, 1994, 2000). The characteristics of the disorders, and the fact that these patients are incarcerated in fixed treatment groups, imply that the course of treatment and changes in the patients' behavior will be closely associated with their patterns of interactions and relationships. So far, the main tradition in the systematic investigation of interpersonal aspects of PDs is based on the interpersonal

circumplex research (Kiesler, 1986; Wiggins, 1982) and its extension to a FFM. The five factors of this model are neuroticism, extraversion, agreeableness, conscientiousness, and openness. In the circumplex approach, the interpersonal behaviors, traits, and problems of the PDs are presented and positioned as a blend of the dimensions, which makes it possible to identify similarities and differences among PDs. Evidence for the positioning of PDs in this model (Mullins-Sweatt & Widiger, 2006; Clark, 2007; Widiger & Trull, 2007) has supported the importance of interpersonal aspects of PDs. However, an important limitation in this line of research is the neglect of actual interactions between individuals and of the relational patterns in groups of such patients (Haslam, Reichert & Fiske, 2002).

This study collects information about the social relations maintained by patients with other group members. These dyadic relationships, when considered jointly as a social network, are studied by social network analysis (Wasserman & Faust, 1994; Carrington, Scott & Wasserman, 2005). Social network analyses can provide information about the group as a whole but also about the network positions of each individual in the group. The basic goal of this chapter is to show that detailed information on patients' functioning can be obtained through collecting specific information on the different dyadic relationships maintained by a patient in a forensic psychiatric hospital.

Forensic psychiatric hospitals in the Netherlands are obliged to use measures for the risk to reoffend, viz., HKT-30 (Workgroup risk assessment forensic psychiatry, 2002), an instrument especially designed for the Dutch forensic population, and HCR-20 (Webster, Douglas, Eaves & Hart, 1997), an internationally well-known risk assessment instrument. The measure of patients' functioning in this study was based on the changeable items of the Dutch risk assessment instrument HKT-30 (Workgroup risk assessment forensic psychiatry, 2002). A nationwide Dutch retrospective study among 156 released forensic patients by Hildebrand, Hesper, Spreen & Nijman (2005) showed that these items are associated with violent relapse, indicating patients' risk-related level of functioning.

To provide an exploration and benchmark for the study of networks of forensic psychiatric patients, this chapter investigates social networks in five groups of 12 patients subjected to TBS. We discuss how networks of three sorts of relations are related to the dynamic constructs of the HKT-30 concerning patients' functioning.

The remainder of this chapter is as follows. The next section discusses the theoretical framework and expectations for the associations of social relations and patients' functioning, leading to the formulation of hypotheses. The succeeding section describes the measurements and data. Finally, the last section presents the results, draws conclusions, and discusses the results.

5.2 Arguments and expectations

The research site is described Chapter 3, Section 3.3.1; important here is that in-patients are housed in units of about 12 persons, and spend most of their time on these units. The patients thus depend on a small group of others for all kinds of daily interactions, and their behavior is constantly monitored by staff members. It has been argued by Sijuwade (2007) that besides universal reasons for maintaining relationships with others, inmates/patients in closed institutions form interactions to 1) combat the dehumanizing and degrading environment, 2) define norms and roles so that expectations are clear, and 3) minimize risk of assault. Here we inquire into the degree to which the patients develop positive relationships with other patients, to what extent they influence each other, and to which degree they have instrumental relations; and what are the network patterns of these relations within the institutional groups. The three types of relations are defined as 'positive', friendly relations and friendships; influence relations lead to changes in other's attitudes and behavior; and instrumental relations are relationships mainly important for material or relational profit and less for the intrinsic value of the relation itself.

We study the association between these relationships with three domains of functioning, problem awareness, impulse control, and skills, including general life skills, social skills, and coping skills. These three domains represent basic elements of the cognitive-behavioral approach to treatment, as described in Section 4.2.2. They are considered to be distinct and of major importance in rating patients' functioning and hence their therapeutic progress; they are also crucial in assessing the risk of patients' recidivism. The choice of these three constructs was supported by a principal component analysis of the risk assessment items (see Section 4.4.3).

The type and pattern of personal networks in which a patient is embedded provide detailed knowledge of a patient's adjustment, which can complement the usual determination of functioning. As a first step in assessing the validity and interpretability of the social network measures, this chapter investigates the associations between the patient's social relations and functioning.

Problem awareness reflects the patient's cognitions about his personal problems and how these affect his social surroundings. If a patient admits to having severe psychopathological problems that caused his serious offences, he is expected to be more inclined to work on these problems and to adjust more favorably in line with therapeutic goals. Hence, we expect that patients with more problem awareness will tend to relate to each other and will maintain *more mutual relations with each other* (H1).

Since they are better motivated and show more empathy towards others, we expect them to maintain *more positive relationships* (H2) and *fewer instrumental relationships* toward other patients (H3). Furthermore, patients with more problem awareness and better treatment motivation are less suitable victims for instrumental use by others, so it is expected that they will *less be instrumentally used* by other patients (H4). Problem awareness is not expected to be directly related to influence relations between patients.

Impulse control reflects the degree of unpredictable and inconsiderate behavior and a disposition towards anger. A patient who lacks impulse control does not consider the consequences of his behavior. For patients with low impulse control, uncontrolled impulses often result in rage and anger. They more frequently attribute hostile intentions to others. Therefore, *fewer positive relationships* are expected, incoming (H5) as well as outgoing (H6). Patients with low impulse control are expected to *instrumentally use more* other patients (H7) because they do not consider the negative consequences of their behavior and possible damage to the relationship. Their impulsivity and hostile world view leads to the vulnerability of associating with patients whom they should rather avoid in view of treatment objectives. Others can convince them more easily to do things they should not do. It is expected that patients with less impulse control will be *more instrumentally used* (H8). Because of the unpredictable and violent acting out behavior of patients with less impulse control, *more* other patients are *influenced* by them (H9). At the same time they are themselves vulnerable to *the influence of more* other patients in general (H10).

Skills are related to widely diverse human abilities, such as self-management skills, skills to maintain relations in a satisfying way, and the ability to adequately cope with problems and stress. Patients with more skills can take better care of themselves and know better how to maintain social relations properly. It is expected that patients with better skills will maintain *more positive relationships* toward other patients (H11). Because these patients are less dependent on others and more attractive for social contact, it is also expected that other patients maintain *more positive relationships* toward them (H12). Because of their better ability to maintain relations appropriately, these patients will have *fewer instrumental relationships* with other patients (H13). As skills result in the ability to take better care of themselves and decrease vulnerability, it is expected that patients with more skills have *fewer incoming instrumental relationships* (H14). Skills increase the potential and value one patient can have for other patients. This enables the skilled patient to occupy a good position in the social hierarchy of the group. It is expected that a patient with more skills will have *more influence relationships* toward other patients (H15) and *fewer incoming influence relationships* himself (H16).

5.3 Method

5.3.1 Research site

As mentioned earlier, the research site is FPC Dr. S. Van Mesdag, one of the 13 forensic psychiatric hospitals in the Netherlands. For more information see Chapter 3, Section 3.3.1.

5.3.2 Design

Again, data collection was conducted on all five treatment units for patients with PDs: SO, NPD, SUD, PDD, and BPD. Patients of the first unit are grouped according to the type of offence (sex offenders), and have co-morbidity with varied PDs. Each unit was considered a closed network.

All sociotherapists working on the units were asked to evaluate three types of social relations and all possible dyadic relations between the patients on the unit, using a digital questionnaire designed for this purpose. Each unit was given a laptop, prepared with the questionnaire applicable to specific patients and therapeutic group in that unit.

To collect information on functioning, patients' mentors (sociotherapists) filled in a written questionnaire based on presumed changeable risk assessment items (see Section 5.3.3) for each patient in their charge. The unit treatment coordinators were asked to fill in the questionnaires for all patients in their unit.

The main reason for collecting information on patients' relationships from therapists, and not from patients themselves, was that patients could not be trusted to give valid and reliable responses. Their answer may be suspect, given their relational disturbances, manipulative behavioral tendencies, and mental disturbances. An additional reason is that by using the same respondents for all patients in a given group, response bias will be minimized for within-group comparisons. Ratings by third parties have been considered a landmark method more generally in the study of mental health (see Brown & Harris, 1978).

5.3.3 Measurements

Social relations

The three social relations were defined as follows:

1. positive: friendly and friendship relations with another patient
2. instrumental: using a relation to one's own advantage for material things (cigarettes, drug, money) and/or concerning the relation itself (protection, prestige, sexual favors) and less for the intrinsic value of the relation itself
3. influence: relation leading to changes in thinking or behavior of others.

Measurement of patients' functioning

Patients' functioning was measured by a total of 29 questionnaire items, based on the dynamic items included in the HKT-30² (Working group risk assessment forensic psychiatry, 2002), a Dutch professional guideline designed for the assessment of risk of future violence for TBS-ordered patients. Three of these items consisted of original, dynamic items of the HKT-30. These were 1) self-management, 2) responsibility for offence, and 3) coping skills. They were measured by five pre-described categories numbered from 0 to 4, in which 0 describes a non-problematic situation related to the measured construct, mounting to 4 representing the most severe problematic situation related to the construct. The other 26 items were scale items based on the rest of the HKT factors included in the research. Those scales (based on the definition of the factor) and translated items from the Atascadero Skills Profile (Vess, 2001) – a questionnaire to measure patients' skills – were used to more sensitively measure the dynamic HKT-30 items. The items are formulated as statements and are rated on five-point scales, from 0 to 4. The value 0 represents that the real situation of the patient is in total opposite of the statement, four represents full correspondence between the statement and the patients' situation. The middle score of 2 is neutral. Subscales were constructed based on information from a pilot study and all showed good reliability (Cronbach's alpha = 0.85 or higher). For more information on the development of the questionnaire and the psychometric qualities of the scales see Chapter 4.

5.3.4 Analysis

Patients' functioning: factor analysis

For the calculation of patients' functioning, all items were coded so that higher scores pointed to better functioning. To distinguish different aspects of patients' functioning, a principal component factor analysis was conducted on all items of the questionnaire. A Varimax (orthogonal) rotation specified a three factor solution that accounted for 65% of the variance. The three factors found could be interpreted as problem awareness, skills, and impulse control (see Section 4.4.3), which is in line with theory. The factor 'problem awareness' includes insight into problems, empathy, and responsibility for the offence. The factor 'skills' includes social skills, self-management, and coping skills. Finally, 'impulse control' includes impulsivity and hostility. For more information about the factor analysis see Section 4.4.3.

² The four dynamic HKT items that apply only to a subset of patients (psychotic symptoms, substance abuse, acculturation problems and sexual preoccupation) were excluded.

Association between social relations and patients' functioning: network analysis

Functioning variables are defined at the level of individuals whereas social relations are defined at the dyadic level that is concerned with inter-individual ties. This raises two methodological issues for the study of associations between functioning and social relations: first, this is an association between variables defined at different levels; second, the independence assumptions that underlie usual statistical methods are not plausible for dyadic variables, and may even be regarded as being antithetical to our understanding of social relations. The first issue was dealt with in the formulation of the hypotheses. Each of hypotheses 2-16 deals with either the number of incoming ties towards an individual or the number of outgoing ties from an individual, which is a formulation that has transformed the relations from the dyadic to the individual level. The number of outgoing ties is called the *out-degree*, while the number of incoming ties is called the *in-degree*. Hypothesis 1, on the other hand, is about pairs of individuals with a similar level of problem awareness and thereby has transformed the individual level to the dyadic level. The second issue is dealt with by the use of statistical methods that have recently been developed specifically for studying dyadic relations, bundled into a network, as dependent variables.

Specifically, the method utilized ERGMs (see Robins, Pattison, Kalish & Lusher, 2007a; Robins, Snijders, Wang, Handcock & Pattison, 2007b) that have tie variables as dependent variables, indicating whether or not there is a tie from one individual to another individual for all pairs of individuals in the group. Binary tie variables are defined for pairs of individuals (i, j) , with the value 1 if there is a tie from i to j , and 0 if there is no such tie. ERGM represent the dependence between the tie variables in the network and thus can be regarded as variants of logistic regression, which are adapted to the dependencies generated by the tie variables structured in a network. The analysis was done using the software SIENA version 3.2 (Snijders, Steglich, Schweinberger & Huisman, 2009). The specifications presented below are intended to give an intuitive explanation, together with some information enabling those who already have a grasp of these methods to know how the analysis was carried out. Further explanations about ERGMs can be found in the mentioned literature.

The data set comprises five networks of 12 individuals each. Since each individual potentially can have ties to the 11 other members of his group, the total number of tie variables is $5 \times 12 \times 11 = 660$. Each group by itself is too small for reliable ERGM analysis. The groups are combined in one analysis so that ties are possible only between members of the same group and so that model parameters are assumed to be the same for all five groups. This is achieved using structural zeros (see Snijders, Steglich, Schweinberger & Huisman, 2009). The assumption of common parameter values in the five groups is made because the total number of parameters in the model should not be too high in view of statistical power considerations.

This procedure is reasonable here because the parameters are expected to have the same signs (positive, negative) in the five groups, and although there might be differences between the groups in the 'real' values of the parameters, with these relatively small groups these differences are not expected to be significant.

The model specification consists of a so-called structural part representing network dependencies between tie variables, and a part representing the effects of the variables specified in hypotheses H1-H16. The total number of ties was conditioned upon within each group, and so no separate parameters are needed for the total number of ties per network. Markov specification (see Robins, Pattison, Kalish & Lusher, 2007) appeared to be adequate to model the network dependencies. This is a specification of network dependencies composed of five components:

- *reciprocity*: tendency to reciprocation of ties
- *transitive triplets*: represents tendencies towards transitivity, i.e., when for three actors i , j , and k it holds that i chooses j and j chooses k , there is a higher tendency for i also to choose k – this can represent clustering of the network into smaller loosely structured subgroups, and it also can represent hierarchy in the network
- *out two-stars*: represents dispersion of number of outgoing ties of individuals (variance of out-degrees)
- *in two-stars*: represents dispersion of number of incoming ties of individuals (variance of in-degrees)
- *two-paths*: represents association of out-degrees and in-degrees.

For example, a positive parameter for out two-stars means that the out-degrees are more dispersed (higher variance) than would be expected for a network generated according to the other parameters and with a zero out two-stars parameter. Similarly, a negative two-paths parameter means that the correlation between in-degrees and out-degrees is lower (less positive or more negative) than to be expected based on the other parameters included in the model. The Markov specification was supported because all t -ratios for convergence were less than 0.1 (see Snijders, Steglich, Schweinberger & Huisman, 2009).

For each individual-based functioning variable, as specified in the hypotheses, three effects can potentially be estimated: the out-ties effect, reflecting that an individual with high values of the variable will tend to have more outgoing ties; the in-ties effect, reflecting that an individual with high values of the variable will tend to have more extra incoming ties; and the similarity effect, reflecting that two individuals with similar values of the variable will have a higher probability to be tied. Which of these effects is included in the model follows from the tested hypotheses.

5.4 Results

The model presented below includes only those effects which are postulated on prior considerations (H1 – H16), together with the five mentioned structural effects. This is because the amount of data is limited and the three individual level variables, problem awareness, impulse control, and skills are correlated, so that in order to have a reasonable statistical power the number of parameters must be as small as possible.

5.4.1 Positive relations

Effect	PE	SE
Reciprocity	** 2.70	0.39
Transitive triplets	** 0.24	0.05
Out two-stars	** 0.30	0.07
In two-stars	0.07	0.10
Two-paths	** -0.33	0.06
Problem awareness similarity (H1)	0.04	0.33
Problem awareness out-ties (H2)	+ 0.77	0.49
Impulse control out-ties (H5)	0.20	0.38
Impulse control in-ties (H6)	-0.88	0.55
Skills out-ties (H11)	-0.48	0.58
Skills in-ties (H12)	* 2.04	0.87

Table 5.1. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the positive relation network. +: $p < .10$; *: $p < .05$; **: $p < .01$ (two-sided).

Table 5.1 presents the results of the analysis of positive ties. There are strong tendencies towards reciprocity as well as transitivity; the degree distribution is such that there is a tendency towards strong differences in out-degrees (positive out two-stars parameter) but not in in-degrees (non-significant in two-stars), and those with high out-degrees tend to have low in-degrees (negative two-paths). Those with higher social skills receive more incoming positive ties. The other variables do not have significant effects.

5.4.2 Instrumental relations

Effect	PE	SE
Reciprocity	** 1.83	0.50
Transitive triplets	* 0.40	0.16
Out two-stars	0.05	0.15
In two-stars	+ -0.62	0.32
Two-paths	0.05	0.17
Problem awareness out-ties (H3)	0.59	1.06
Problem awareness in-ties (H4)	-2.22	1.57
Impulse control out-ties (H7)	* -1.85	0.98
Impulse control in-ties (H8)	-1.65	1.30
Skills out-ties (H13)	-1.51	1.45
Skills in-ties (H14)	** 5.83	2.24

Table 5.2. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the instrumental relation network. +: $p < .10$; *: $p < .05$; **: $p < .01$ (two-sided).

Table 5.2 presents the results of the analysis of instrumental ties. There are strong tendencies towards reciprocity as well as transitivity. The only systematic tendency of the degree distribution is a weakly significant one against dispersion of in-degrees (weakly significant negative in two-stars parameter). In other words, incoming instrumental ties have a slight tendency to being equally distributed among patients. Those with higher social skills receive more incoming instrumental ties; those with higher impulse control send fewer instrumental ties. The other variables show no significant effects.

5.4.3 Influence relations

Effect	PE	SE
Reciprocity	** 1.91	0.45
Transitive triplets	-0.06	0.10
Out two-stars	** 0.54	0.05
In two-stars	* 0.33	0.11
Two-paths	* -0.18	0.07
Impulse control out-ties (H9)	** -1.12	0.42
Impulse control in-ties (H10)	* -1.77	0.79
Skills out-ties (H15)	** 1.68	0.59
Skills in-ties (H16)	0.14	1.04

Table 5.3. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the influence relation network. +: $p < .10$; *: $p < .05$; **: $p < .01$ (two-sided).

Table 5.3 presents the results of the analysis of influence ties. There is a strong tendency towards reciprocity, but not towards transitivity. The degree distribution is such that there are tendencies towards strong differences in out-degrees (positive out two-stars parameter) as well as in-degrees (positive in two-stars), and those with high out-degrees tend to have low in-degrees (negative two-paths).

This degree distribution is suggestive of a status hierarchy, where those with high out-degrees are at the top of the status ladder and those with high in-degrees at the bottom. Individuals with more social skills send more influence ties. Those higher in impulse control receive and send fewer influence ties.

For all three domains of patients' functioning (problem awareness, impulse control and skills), we found clear associations with social relations. These were strongest for impulse control and skills. Specifically, results are as follows. For the hypotheses about problem awareness, we found that patients with more problem awareness showed more outgoing positive relationships with other patients (H2). Hypotheses H1, H3 and H4, stating that patients with similar problem awareness will entertain more mutual positive relations, and patients with better problem awareness will have fewer incoming as well as outgoing instrumental relationships, were not confirmed. Hypotheses related to impulse control were confirmed incompletely. Patients with less impulse control maintained more outgoing instrumental relations (H7) and were influenced by more patients (H10). Patients with less impulse control were themselves influential toward more other patients (H9). Hypotheses H5, H6, H8, concerning negative associations of impulse control with positive incoming and outgoing relations, and concerning a negative association between impulse control and instrumental use by others, were not confirmed.

Skills turned out to be related to all considered relations, and the hypotheses were again incompletely confirmed. Patients with better skills receive more incoming positive relationships (H12), are instrumentally used by more other patients (H14), and showed more influence relationships towards other patients (H15). This confirms hypotheses H12 and H15. For hypothesis H14, the result was opposite to the hypothesized negative association between skills and instrumental use by others. Thus we may conclude that H14 was rejected. Hypotheses H11, H13 and H16, concerning associations between skills on one hand and positive relations and instrumental use toward other patients, and incoming influence relationships from other patients, were not confirmed.

5.5 Conclusions and discussion

This study provides novel insights into the association between patients' behavior and personal networks of patients with PDs who have committed serious violent offences. The empirical research was concerned with the association between social relations

and patients' functioning of five groups of in-patients subject to the TBS measure in the Dutch legal system. The dominant therapy for the group of patients with PDs focuses on the problems in patients' character, temperament, and skills. In line with this, patients' functioning is measured by variables representing three constructs labeled as problem awareness, impulse control, and skills. This distinction between three constructs was empirically confirmed using principal component analysis.

The association between three kinds of social relations: positive, instrumental, and influential relations, on one hand, and the three constructs of patients' functioning on the other hand was analyzed by ERGM. All three constructs of patients' functioning showed associations with social relations, although not all hypotheses were confirmed. Results indicate that more positive relations were maintained with patients that have better basic life, social and coping skills. A patient with more requisite skills is better equipped socially and so it is not surprising that other patients approach such persons more positively. Better skilled patients were also more instrumentally used by other patients. The opposite was expected, as patients with more skills were expected to be better able to defend themselves against being used for the benefit of other patients. The reason may be that skills make a patient more attractive for instrumental use, because there is more to gain from using a skilled person; such a tie could be interpreted as social capital. Perhaps a patient does not feel a strong urge to defend himself against being instrumentally used. Further, results showed a higher number of influence relationships for better skilled patients. The social skills seem to imply the possibility to influence others.

Impulse control turned out to be related only to patients' instrumental relations and influence, not to positive relations. Patients with better impulse control maintained fewer instrumental relations, influenced fewer other patients, and were themselves influenced by fewer other patients. A patient with better impulse control will better consider the consequences of his behavior. He may be less inclined to use other patients, as this could harm valuable relationships or treatment objectives. Because of their lower degree of impulsive behavior and less hostile world view, patients with more impulse control will be more predictable in their behavior and will be less of a negative influence on other patients.

Problem awareness turned out to be associated only with positive relations. Patients with better problem awareness maintained more positive relations toward other patients. When a patient realizes that he has a mental disorder and takes responsibility for the crime he committed, he is likely to have a more positive attitude to treatment. He may be more willing to put effort in therapeutic aims, and may show less problematic behavior. This can be reflected by the number of positive relations.

Associations between social relations and patients' functioning were found most and strongest in the domains of skills and impulse control, and least in the domain of problem

awareness. This may be considered natural as both social skills and impulse control are domains that reflect the relational aspect of patients' functioning. Problem awareness is a domain that refers more strongly to private cognitions and the character of the patient. Cognitive therapy often starts with skills training to neutralize a possible skills deficit of the patient that might activate the temperament and lack of impulse control of a patient. Temperament regulation should ultimately lead to the possibility to engage in therapeutic change directed at the character dimensions of the disorder.

The results of this research give a first insight into the association between relational networks in this category of patients and functioning variables reflecting their basic problem domains. For the first time this demonstrates that there is a clear association between mental health and the social networks of imprisoned, severely disturbed patients. The association was strongest for functioning constructs of skills and impulse control, the most important domains for direct therapeutic interventions. Since the treatment takes place in closed groups dominated by the network of relations in which the patients take part, we hope and expect that insight into these associations will be fruitful for treatment improvement as well as for obtaining better predictions for the risk of re-offence.

The research presented in the next chapter is longitudinal, focusing on the network dynamics of these patients and the development of their functioning over time. Longitudinal studies can give insight into the association of treatment progress and possible changes in social intercourse over time and the causality of these associations. It is particularly interesting to study how functioning of relational partners corresponds with progress in treatment. Such interactions were not studied in the cross-sectional study reported in this chapter because their interpretation is unclear in the absence of longitudinal information.

Chapter 6

**The co-evolution of social relations
and risk-related behavior of forensic
psychiatric in-patients**



6.1 Introduction

This study intends to contribute further insights into the risk factors of recidivism and changes in risk-related behavior of forensic psychiatric in-patients subjected to TBS.

Since the work of sociologists such as Durkheim (1885-1917) and Simmel (1858-1918), social networks and relations have been recognized as an important factor influencing the behavior and psychological wellbeing of individuals. The sociological, criminological, and psychological literature frequently mentions the importance of an individual's social environment to explain individual risk behavior. A major theoretical problem is the causal interpretation of the association between delinquent peers and one's own delinquency (see Matsueda & Anderson, 1998; Reed & Rose, 1998; Warr, 2002). Criminal behavior is for instance often explained by 'social control' theory (Hirschi, 1969, 1977) which states that social ties prevent individuals from engaging in criminal activities. In contrast, differential association theory (Sutherland, 1947) states that criminal behavior is learned through social contact in intimate personal networks. Research that offers more insight into the degree to which individual behavior is affected by the social environment has therefore become an important theme in criminology (see Haynie, 2001, 2002).

Although the literature and related empirical findings have shown the importance of social relations in explaining criminal behavior and mental wellbeing, surprisingly little research has been done into the social interactional patterns of forensic psychiatric patients. These patients receive therapeutic treatment for their violent acting out behavior that resulted from their psychopathology. Social relations seem especially important for the most prominent subgroup of forensic psychiatric patients, that is, those with personality disorders, who are characterized by disturbances in relations with self, others and the environment (APA, 1994, 2000), causing psychosocial disfunctioning.

The detailed description of the influence of the personal network on patients' risk for recidivism has recently obtained increased attention. Spreen, Pomp & Vermeulen (2006) developed the Forensic Social Network Analysis (FSNA) method, which can provide the researcher with a detailed picture of a patient's personal network in both his current circumstance and the situation he was in when he committed the offence. The patient's present risk to society can be assessed by comparing the networks of both situations.

Given the relational nature of the PDs found in a forensic psychiatric population and patients' social dependency on a relatively small group of fellow patients and staff in the institution, social relations are especially important to forensic psychiatric in-patients. The aim of TBS treatment is to reduce psychopathology and risk-related behavior of patients. Because of the association with social interactions it is expected that treatment progress will also affect the social interaction and relationships of patients. The cross-sectional research described in Chapter 5 provided some first insights into the association of social

relationships and risk-related functioning in all three domains of risk-related behavior, that is, problem awareness, impulse control, and skills. However, cross-sectional study does not provide information about the *evolution* of or developments in social relations and risk-related behavior and their association, or insight into the causal interpretation of the association. The present study is longitudinal and investigates the co-evolution of social relations and risk-related behavior, based on the following research questions:

- 1) *Are the relationship choices of forensic psychiatric in-patients affected by the risk-related behavior of other patients in their social network?*
- 2) *Is the risk-related behavior of forensic psychiatric in-patients affected by the risk-related behavior of other patients in their social network?*

To examine developments in social relations and risk-related behavior, data on three types of social relations (positive, instrumental, and influence relationships) and three risk-related behavioral domains (problem awareness, impulse control, and skills) were collected three times at six-monthly intervals from five treatment units for patients with PDs. A stochastic actor-based model was used to analyze social relations and behavior dynamics simultaneously.

6.2 Background

Since the dominant aim of the TBS measure is to protect society against mentally ill offenders, forensic patient recidivism has been important in the research on outcomes of the measure (see Van Emmerik 1981, 1984, 1985, 1989; Leuw, 1995, 1999; Canton, 2004; Wartna, Harbachi & Knaap, 2005; Bregman & Wartna, 2010; Keune & Van Binsbergen, 2010). Although these studies provided valuable insights into the degree to which patients reoffend, particularly the type and severity of reoffences and the characteristics of reoffenders, none of these aspects could be related to the therapy and the therapeutic progress during the time of imprisonment, mainly because of the time lag between therapy and offence. Recent research into therapeutic outcomes focuses more on the extent to which specific therapeutic aims are met, such as a decrease in certain psychiatric symptoms (e.g., Greeven & De Ruiters, 2004; Caldwell, McCormick, Umstead & Van Rybroek, 2007). The need for evidence-based treatment has become more prominent in forensic psychiatry. Identifying which therapies work best, for whom and under which circumstances requires building an evidence base for specific interventions and treatment programs through scientific research (de Beurs & Barendregt, 2008). Research into treatment interventions is at an early stage and the suitability of this kind of research to address questions regarding

the effectiveness of the TBS measure as a whole, including non-therapeutic influences such as the social environment on the patient unit, is limited.

For general research into the effectiveness of the TBS measure, one difficulty is that recidivism in most cases can only be determined much later than the actual time of provided treatment. Such research will obtain greater feasibility if it considers the *risk* of recidivism, and how this develops during the course of treatment. In the past recidivism risk was assessed clinically by the professionals working in the hospitals. However, because of the proven unreliability of these assessments, structured methods of risk assessment are increasingly being used (for advanced background information on risk assessment see Lammers, 2007; De Vogel, 2005; Philipse, 2005). Forensic psychiatric hospitals in the Netherlands have been obliged to use instruments such as the HKT-30 (Workgroup risk assessment forensic psychiatry, 2002), especially designed for the Dutch forensic population, and the HCR-20 (Webster, Douglas, Eaves & Hart, 1997), an internationally known risk assessment instrument. These instruments contain risk items, including some assumed to remain stable and others assumed to be changeable over time. The changeable risk factors could be used as an adequate measure to determine the effect of therapeutic treatment of forensic in-patients. The course of these factors over time can establish potential changes in risk-related behavior of a forensic patient.

A nationwide Dutch retrospective study of 156 released forensic patients by Hildebrand, Hesper, Spreen & Nijman (2005) confirmed associations of changeable risk factors with (violent) relapse of forensic psychiatric patients. Another study on escape and absconding on permitted leave, and their association with violent recidivism (Hildebrand, Spreen, Schönberger, Augustinus & Hesper, 2006) found that a combination of dynamic risk factors had a promising predictive value. The earlier mentioned results implicitly indicated the usefulness of these instruments as a measure for changes in behavior related to recidivism. De Jonge, Nijman & Lammers (2009) investigated the actual change in dynamic risk factors of 513 patients in three forensic hospitals, and found, despite small absolute differences, a statistical significant decrease of most of the risk behavior related to dynamic risk factors. The outcomes of a study by Brand & Spreen (personal communication, April 7th 2011) on some 160 patients also showed a decrease in risk for all dynamic risk factors of the HKT-30 over the course of treatment of these patients. The outcomes of these studies confirm the changeable character of these items, and thus the usability of dynamic risk factors for establishing behavioral changes during the treatment process of forensic patients.

The prominent role of structural risk assessment in forensic practice is in line with the paradigm switch in treatment in the last decade, from a psychoanalytic and client-centered approach with emphasis on personality, to a cognitive-behavioral approach

emphasizing risk reduction and managing risk factors (Nieuwenhuizen, 2005). The new treatment assumes that cognitive, emotive, and behavioral patterns of individuals are inter-related and constitute interdependent aspects of a person's adjustment. For patients with PDs, the most prominent forensic patient group, problems manifest themselves in the personality domains of character and temperament (see Section 4.2.2 for more on the cognitive-behavioral approach of treatment and personality domains).

The study described in Chapter 4 identified, three domains within the dynamic risk factors related to patients' character, temperament and requisite skills, namely patients' problem awareness, impulse control, and skills. The present study uses assessments in these risk domains as measures for patients' risk behavior.

As mentioned earlier, little research has been done into the social relations of forensic patients. In general criminology, the importance of social relations on delinquent behavior has been theorized in many ways and has become an important research theme in the last decade. According to the *influence* (or socialization) perspective, delinquent behavior of interaction partners plays an important role in the development of delinquent behavior through such social processes as cultural transmission, social reinforcement, imitation, or group pressure (Akers, 1973; Sutherland, 1947; Warr, 2002). According to the *selection* perspective, delinquency is caused by other factors (e.g. weak bonds and low impulse control), and individuals are assumed to associate with each other because they choose interaction partners with similar behavior (Gottfredson & Hirschi, 1990; Hirschi, 1969). A comparative assessment of the two mechanisms has been attempted (Baerveldt, Van Rossem & Vermande, 2003; Matsueda, 1982), but did not provide clear conclusions. Despite the fact that influence and selection processes represent competing explanations for delinquent behavior, several studies showed that these processes often operate simultaneously (Haynie, 2001, 2002; Krohn, Lizotte, Thornberry, Smith & McDowall, 1996; Matsueda & Anderson, 1998). However, conclusions on the extent to which selection of influence accounts for delinquent behavior in peer networks have been restricted by the fact that, until recently, statistical techniques to test for influence and selection effects concerning problem behaviors suffered several limitations (Steglich, Snijders & Pearson, 2010). Previous models were inadequate in their control for the mutual feedback processes between the dynamics of behavior and selection. Further, previous models failed to account fully for the interdependence of actors in the network, which violates the assumptions of independence in observations made using traditional statistical models (Steglich, Snijders & Pearson, 2010).

Statistical estimation of models for the evolution of social relations according to Snijders' dynamic actor-oriented model (2001, 2005) with the SIENA program makes it possible to deal with these limitations. This approach was used in the present study.

6.3 The study

The previously described theories and studies focused mainly on the association between social interaction and delinquency of individuals in society in order to explain how they came to behave delinquently. This study investigated patients' various social relations in association with their risk-related behavior. As in the previous chapters, the considered social relationships are positive relations, influence relations and instrumental relations. The considered behavioral domains of risk-related behavior are problem awareness, impulse control, and skills. These distinct behavioral domains represent basic elements of the cognitive-behavioral approach to treatment and are of major importance in assessing risk-related behavior during patients' therapy. Principal component analysis, as described in Chapter 4, provided support for the three behavioral constructs as measures for the risk-related behavior of patients. The basic structure in this study is a panel dataset on relationships and behavior. For a set number of moments in time (in this case, three times), data was collected on the network relationships and behavior variables of all individuals in (sub)groups of the units. Directed relationships with other patients were investigated for all actors in the networks; relationships did not have to be reciprocal.

In the study described in Chapter 5, associations were investigated cross-sectionally between the social relationships and risk-related behavioral domains. This study provided empirical evidence for this association. However, for a better understanding and causal interpretation of these associations, developments in social relationships and risk-related behavior should be investigated over time.

Developments in social interaction between patients and their behaviors can be expressed in terms of two types of changes made by the patient: a change in the social interaction with others or a change in one's behavior. Social interaction can, for instance, be brought about by the tendency of a patient to form relationships with those who have certain behavioral characteristics, and breaking off relationships with those who display other behavior. A patient with insight into his own problems and a cooperative attitude to treatment could express this behaviorally by participating actively in treatment programs and avoiding situations that could harm his treatment prospects. This patient could thus choose to interact with patients more in control of their impulses, decreasing the chance of disputes and serious escalations. On the other hand, a patient with less insight into his own problems and not motivated for treatment could choose to interact with patients displaying behavior directed at fulfilling short term or hedonistic needs. Some of this behavior could even be forbidden in the constitutional context (e.g., drug use). The possibility of having a 'partner in crime' to make the stay inside the facility more pleasant can be tempting for this patient.

Hypotheses	
Problem awareness	
H1	Patients with similar problem awareness will have a greater tendency to establish and maintain positive relations with each other
H2	Patients with more problem awareness will have a greater tendency to establish and maintain positive relationships toward other patients
H3	Patients with more problem awareness will establish and maintain fewer instrumental relationships toward other patients
H4	Other patients will establish and maintain fewer instrumental relations with patients with more problem awareness
Impulse control	
H5	Other patients will establish and maintain fewer positive relationships with patients with low impulse control
H6	Patients with low impulse control will have less tendency to establish and maintain positive relationships with other patients
H7	Patients with low impulse control will establish and maintain more instrumental relationships with other patients
H8	Other patients will establish and maintain more instrumental relationships with patients with low impulse control
H9	Patients with low impulse control will establish and maintain more influence relationships towards other patients
H10	Other patients will establish and maintain more influence relationships with patients with low impulse control
Skills	
H11	Patients with better skills will have a greater tendency to establish and maintain positive relationships
H12	Other patients will establish and maintain more positive relationships with patients with better skill
H13	Patients with better skills will establish and maintain fewer instrumental relationships with other patients
H14	Other patients will establish and maintain fewer instrumental relationships with patients with better skills
H15	Patient with better skills will establish and maintain more influence relationships towards other patients
H16	Fewer influence relationships will be established and maintained with patients with better skills

Table 6.1. Hypotheses for the association between positive, instrumental and influence relationships with problem awareness, skills, and impulse control, based on the hypothesis used in the cross-sectional study described in Chapter 5.

However, similarity between patients can also result from adjustments in social relationships. It could be based on a behavioral tendency of patients to adopt the behavior of those with whom they share a relationship. For example, when a patient interacts with another patient with good social skills, this other patient could learn to respond better in diverse social situations. A treatment-cooperative patient could also be convinced by a non-cooperative patient that it is better to make the best of the stay in the facility rather than hoping for the slight chance of good behavior leading to release in the near future. This then will influence the behavior of this patient negatively.

Hence, the dynamics of relationships of patients in the network and their behavior can be explained as a compound outcome of *selection* and *influence* processes. In this research we consider the patients' behavioral change process due to assimilation of the behavior of interaction partners (influence) as well as the patients' process of changing choices for interaction partners based on their behavior (selection).

The dynamic actor-oriented model (Steglich, Snijders & Pearson, 2010) for modeling co-evolution of network and behavior, analyzed with the SIENA program, can distinguish between selection and influence effects and deal with the statistical limitations of the models mentioned earlier. The dynamic actor-oriented model is used here to study the co-evolution of social relations and risk-related behavior of forensic in-patients.

The hypotheses are based in the first instance on the hypotheses considered in the cross-sectional study described in Chapter 5, and the results of those tests. For these hypotheses see Table 6.1, where they are grouped per behavioral domain. The hypotheses of the study described in this chapter use the term 'maintain' in its dynamic ongoing sense, that is, as the opposite of 'terminate'.

In this cross-sectional study the associations described in hypotheses 2, 7, 9, 10, 12, and 15 found confirmation. For hypothesis 14, an effect was found in the opposite direction than expected. The present study investigates various additional effects of similarity in behavior on social interaction that, apart from hypothesis 1, were not considered in the earlier study. The present study thus is oriented to the question of degree of confirmation of these results in a longitudinal study, with, moreover, a distinction between selection and influence effects of patients' risk behavior.

Given the lack of earlier research into the temporal association between social relations and behavior of forensic patients, this study is exploratory and formulates no additional hypotheses.

6.4 Method

6.4.1 Research site

As in the previous studies described in this book, data collection took place on the five units of personality disordered patients at FPC Dr. S. Van Mesdag, one of the 13 forensic psychiatric centers in the Netherlands that execute the TBS measure. This FPC provides residential treatment, mainly cognitive and behavioral therapy and skills training to some 200 patients. During the period of data collection, the patients received treatment designed to reduce risk-related behavior and symptoms of their psychopathology. For daily social interaction the patients depend on their small group of patients and staff.

6.4.2 Design and measures

The research population consisted of 78 patients allocated to five patient treatment units according to the following disorders: SO ($n = 16$), NPD ($n = 15$ patients), SUD ($n = 19$), PDD ($n = 16$), and BPD ($n = 15$). Average age was 39 years, average IQ was 99, duration of incarceration at time of measurement was 36 months on average, and duration of TBS was 65 months on average. Each of the five units was considered a closed network (any relationships with people outside the unit are disregarded). Diverse social relations as well as the level of risk-related behavior for patients were measured at three moments in time during the period 2003-2005.

All sociotherapists working on the patient units were asked to evaluate distinct types of social relations between their patients using a digital questionnaire designed for the purpose. Every unit was given a laptop prepared with the questionnaire applicable to the specific patient and therapist group of that unit. All sociotherapists working on the unit had to evaluate all possible patient dyadic relations defined as:

- 1) Positive: friendly relations and friendship with another patient
- 2) Instrumental: using another to one's own material benefit (for cigarettes, drugs, money) and/or the relation itself (for protection, prestige, sexual favors)
- 3) Influence: relations leading to cognitive or behavior change in another patient.

The main reason for collecting information on relationships from the patients' therapists, and not from the patients themselves was that patients could not be trusted to give reliable responses, given their relational disturbances, manipulative tendencies, and psychic disturbances. An additional reason is that using the same respondents for all patients in a given group minimizes response bias for in-group comparisons. Third-party ratings are considered a landmark method in a more general study of mental health (see Brown & Harris, 1978).

A written questionnaire including changeable risk assessment items was used to collect information on risk-related functioning from patients' mentors (sociotherapists) and unit treatment coordinators (psychologist/psychiatrist) responsible for the treatment policy of the patients (see Chapter 4 for more on the development of the questionnaire and

the psychometric qualities). Each mentor evaluated a questionnaire for each of his or her patients. The treatment coordinators filled in questionnaires for all patients on their unit. The measure of patients' functioning consisted of 29 items in total, based on the dynamic items included in the HKT-30¹ (Working group risk assessment forensic psychiatry, 2002), a Dutch professional guideline designed for the assessment of risk of future violence for TBS-ordered patients. Three items were dynamic (i.e. time-changing) items from the original HKT-30, namely 1) self-management, 2) taking responsibility for offence, and 3) coping skills, measured by five pre-described categories ranging from zero to four, where zero represents a non-problematic situation related to the measured construct, and four represents the most severe problematic situation.

The other 26 items were scale items based on the rest of the HKT factors included in the research. The items were formulated as statements and had to be evaluated on five-point scales (0–4). The value zero indicates that the real situation of the patient is the total opposite of the statement, four indicates full correspondence between the statement and the patients' situation. The middle score (2) is 'neutral'. All items were coded for the calculation of patients' functioning such that higher scores pointed to less risk-related behavior.

6.4.3 Analysis

Data were analyzed with SIENA (Ripley & Snijders, 2010) that carries out statistical estimation for the evolution of social networks according to the dynamic actor-oriented model (Snijders, 2001, 2005; for additional information on these models see Snijders, Steglich & Van de Bunt, 2010; Steglich, Snijders & Pearson, 2010). This study used the actor-oriented model to analyze the contributions made jointly by influence and selection processes in the observed dynamics of networks and patients' risk-related behavior. The model expresses that in response to the current network structure, their own current behavior and that of other individuals in the network, individuals can change either their network ties (here, for instance, start or break a positive relationship with another patient) or their behavior (here, increase or decrease of risk-related behavior) at arbitrary moments between the observations.

Relational and behavioral data were collected from and analyzed for all five units. Because each unit on its own was too small for reliable analysis, for the purposes of analysis the various networks were combined in one large network by using structural zeros (for more information on using structural zeros, see Ripley & Snijders, 2010).

Selection effects lead to change in network ties, while influence effects manifest themselves in behavioral change. These models assume that changes occur continuously between the discrete time points of the observations. A simulation procedure is used

¹ The four dynamic HKT items that only apply to a subset of the patients (psychotic symptoms, substance abuse, acculturation problems and sexual preoccupation) were excluded.

to estimate the likelihood of changes in both behavior and networks in response to the current network structure and the behavior of others. Estimates are derived from iterative simulations in the Markov Chain Monte Carlo (MCMC) approach (Snijders, 2005; Snijders, Steglich & Schweinberger, 2007). The simultaneously modeled estimation of behavioral and network changes is called the co-evolution of network and behavior.

The SIENA specification consists of three types of parameters. These are briefly explained here; further explanations can be found in Snijders, Steglich & Van de Bunt (2010). The first parameter concerns the behavior and network *rate functions* indicative of the average number of changes that occur in patients' behavior and networks.

The second type determines the changes in the network. It has two subtypes: structural effects, parameters that determine how the current network structure determines changes, and parameters representing dependence on risk-related behaviors. The structural network effects should be included to avoid overestimation of other network-related parameters and influence effects. In the current study, we controlled for the simultaneous occurrence of the following structural effects:

- *out-degree*: represents the average number of outgoing ties and thus the density of the network
- *reciprocity*: tendency to reciprocation of ties
- *transitive triplets*: represents tendencies to transitivity, i.e., for three actors (i , j , and k) it holds that when i chooses j and j chooses k , there is a higher tendency for i to also choose k – this can represent clustering of the network into smaller loosely structured subgroups, and can also represent network hierarchy
- *3-cycles*: given three actors (i , j , and k), when i chooses j and j chooses k , there is a higher tendency for k to also choose i . As with transitive triplets, 3-cycles represent closed structures, but whereas the former is in line with a hierarchical ordering, the latter goes against it. If the network has a strong hierarchy, a positive parameter for transitivity and a negative for 3-cycles is expected
- *in-degree – popularity*: represents the tendency of actors to send more ties to actor i with higher in-degree
- *out-degree – popularity*: represents the tendency of actors to send more ties to actor i with higher out-degree
- *out-degree – activity*: represents the tendency of actors i with higher out-degree to send more ties towards actors.

In addition to these structural network effects, three network parameters were estimated that represent selection effects with regard to risk-related behavior. 'Ego effects' represent the effect of a patient's risk-related behavior on sending relationships to others, influencing the number of maintained relationships from this patient to others. 'Alter effects' represent the effects of risk-related behavior on receiving relationships from other patients, influencing the number of relationships from others to this patient. Third,

'similarity effects' represent the tendency to form relationships with those who show similar risk-related behavior. The hypotheses H1 to H16 all correspond to ego, alter, or similarity effects of specific risk-related behaviors.

The third type of parameter in SIENA consists of those determining changes in risk-related behavior, referred to as the *behavioral dynamics* part of the model. The behavioral dynamics in this study are represented by the following parameters: linear shape effect, quadratic shape effect, behavior in-degree, behavior out-degree, and average alter effect.

These are explained as follows: (a more detailed explanation is given by Snijders, Steglich & Van de Bunt, 2010). The linear and quadratic shape effects represent changes in the distribution of the behavior. The linear shape effect represents the extent to which changes occur toward higher or lower values, while the quadratic shape effect represents polarization in risk-related behavior. A positive parameter value indicates that responses tend to occur on the extreme ends of the scale, whereas negative values suggest that responses are unimodally scattered around the group average. The average alter effect expresses that actors whose interaction partners have a higher average value of the behavior also have themselves a stronger tendency towards high values on the behavior. This is the main expression for social influence. The behavior in-degree effect expresses that actors who maintain many relationships have a higher tendency to the behavior. The behavior out-degree effect expresses that actors that maintain many relationships with others have a higher tendency towards the behavior. The models included the cross-effects of risk-related behavioral domains (problem awareness, skills, impulse control) and controlled for average differences between patient units in same behavioral domains.

Analysis started with a model that included the structural network effects of out-degree, reciprocity, transitive triplets, 3-cycles and degree-related effect of in-degree popularity, out-degree popularity, and out-degree activity. For the network dynamics, the model included the ego, alter and similarity effects of the risk-related behavioral domains. For behavioral dynamics the model included the linear shape, quadratic shape, in-degree, out-degree and average similarity effects for all three risk-related behavioral domains. Finally, all possible cross-effects between risk-related behavioral domains were included and every risk-related behavioral domain was controlled for unit differences (see Appendix 5 for the model used as starting point in the analysis). To achieve a reliable model, selection proceeded as follows. Out-degree, reciprocity, transitive triplets, 3-cycles, and linear and squared tendency effects were always kept in. Effects that had a *t*-ratio less than 0.5 were dropped stepwise. This was done first to obtain an intermediate model, under the requirement that effects of associations between social relations and risk-related behavior found in the cross-sectional analysis described in Chapter 5 remain included. Afterwards, these effects and non-significant average alter and in-degree and out-degree effects were also dropped stepwise (for the exact rules as applied in this study, see Appendix 5). This led to the results presented in the next section.

6.5 Results

6.5.1 Descriptive statistics

Table 6.2 presents the standardized mean scores (0-10) for the risk-related behavioral domains for the three measurements. For all three domains the average scores were close to the center of the scale. No large changes in average scores over time were established.

Domain	Measurement 1 (N = 59)		Measurement 2 (N = 60)		Measurement 3 (N = 60)	
	Mean	SD	Mean	SD	Mean	SD
Problem awareness	4.89	1.46	5.11	1.60	4.94	1.46
Skills	4.74	1.75	5.13	1.59	5.32	1.78
Impulse control	5.07	1.81	5.34	1.97	5.15	1.56

Table 6.2. Standardized mean scores (0-10) and standard deviations for the risk-related behavioral domains of the three measures.

Correlational analyses between the risk-related behavioral domains (see Table 6.3) revealed that correlations between the domains are about the same order of magnitude, and are about the same for every measurement (ranging from $r = .52$ to $r = .66$). Correlations between the domains are relatively high.

Domain	Problem awareness	Skills	Impulse control
Problem awareness (m1)	-		
Skills (m1)	.59** (N = 59)	-	
Impulse control (m1)	.55** (N = 59)	.58** (N = 59)	-
Problem awareness (m2)	-		
Skills (m2)	.56** (N = 60)	-	
Impulse control (m2)	.59** (N = 60)	.52** (N = 60)	-
Problem awareness (m3)	-		
Skills (m3)	.62** (N = 60)	-	
Impulse control (m3)	.58** (N = 60)	.66** (N = 60)	-

Table 6.3. Pearson correlations of the domains of patients' risk-related functioning of the three repeated measures.

6.5.2 Selection and influence for positive relations

Structural network effects

The results for the SIENA analysis for positive relations are presented in Table 6.5 (see below Table 6.4). Parameter estimates for the structural network effects out-degree, reciprocity, transitive triplets, 3-cycles and the degree-related effect of out-degree-activity were significant. The negative out-degree parameter (est. = -1.91, $t = -4.75$, $p < 0.001$) indicates that participants on average were more likely to have positive relations with a relatively small number of the patients on the unit. The positive reciprocity parameter (est. = 1.52, $t = 5.93$, $p < 0.001$) indicates that patients tend to form and maintain reciprocated positive relationships. The positive transitive triplets parameter (est. = 0.29, $t = 3.69$, $p < 0.001$) indicates a positive tendency toward transitivity. The negative 3-cycles parameter (est. = -0.36, $t = 3.11$, $p < 0.002$) indicates, together with the positive transitive triplets parameter, a strong hierarchical ordering in positive relationships. This network is thus characterized by closure as well as hierarchy. The positive out-degree-activity parameter (est. = 0.29, $t = 1.88$, $p < 0.06$) indicates that patients who maintain more positive relationships with others have an extra propensity to continue maintaining them.

Network dynamics for patients' risk-related behavior

The model selection procedure specified in Section 6.4 led to instable results with respect to the effects of impulse control on network change. In order to deal with this instability, in addition to the impulse control similarity effect, the interaction effect of impulse control ego and impulse control alter was included. The ego and alter effects of impulse control, although not significant, were retained to avoid risks of misinterpretation. For impulse control similarity, a negative effect was found (est. = -4.51, $t = -2.63$, $p < 0.009$) and for the interaction of the impulse control ego * impulse control alter, a positive effect (est. = 0.17, $t = 2.66$, $p < 0.008$). For impulse control, four effects were included in the model. To interpret this combination of four effects of one basic variable, it is best to construct a selection table (cf. Ripley and Snijders, 2011) which contains the combined effects of these four parameters on the log probability of forming or maintaining a particular tie.

This is given in Table 6.4, which shows the contributions of alter (displayed in the columns) and ego (displayed in the rows) to the objective function for the possible scores of (in the present case) 0 to 10 of patients' risk related to impulse control. The objective function is the log probability of making a particular choice when a tie is changed, as explained in Snijders, Van de Bunt, and Steglich (2010). The higher the number in the table, the more likely it is that ties will be formed from an ego to an alter with the respective values of impulse control.

		Alter									
Ego		1	2	3	4	5	6	7	8	9	10
	1	4.01	3.69	3.37	3.05	2.73	2.41	2.10	1.78	1.46	1.14
	2	3.77	2.62	2.48	2.33	2.18	2.03	1.89	1.74	1.60	1.45
	3	3.53	2.55	1.58	1.61	1.63	1.66	1.69	1.71	1.74	1.77
	4	3.29	2.49	1.68	0.88	1.08	1.28	1.48	1.68	1.88	2.08
	5	3.05	2.42	1.79	1.16	0.53	0.90	1.28	1.65	2.02	2.40
	6	2.81	2.35	1.89	1.44	0.98	0.53	1.07	1.62	2.17	2.71
	7	2.56	2.28	2.00	1.72	1.43	1.15	0.87	1.59	2.31	3.03
	8	2.32	2.21	2.10	1.99	1.89	1.77	1.67	1.56	2.45	3.34
	9	2.08	2.15	2.21	2.27	2.34	2.40	2.46	2.53	2.59	3.66
10	1.84	2.08	2.31	2.55	2.79	3.03	3.26	3.50	3.74	3.97	

Table 6.4. Selection table for the interpretation of outcomes of the four included effects of impulse control on positive relations.

A summary interpretation of Table 6.4 is as follows. Patients (egos) with low impulse control (range 1 to 3) prefer to maintain positive relationships with those (alters) also low on impulse control. Both of these groups of patients seem especially to reject those patients in the extreme opposite of impulse control of themselves. Patients with average values of impulse control (range 4 to 8) seem to prefer maintaining positive relationships with those having either low or high impulse control. Patients with high impulse control (range 9 to 10) seem to prefer positive relations with others also having high impulse control. On the whole, as ego’s own value of impulse control increases, his preference shifts to others with similar higher values of impulse control, but the low values in the middle of the table indicate that individuals with average values of impulse control are less likely to have positive relations with each other.

Behavioral dynamics in risk-related behavior

With regard to behavioral dynamics for the risk-related domains of problem awareness, skills and impulse control, the linear shape effects have the role of an intercept (Snijders, Steglich, Van de Bunt, 2010) and are not discussed here. For problem awareness (est. = -0.10, $t = -2.86$, $p < 0.004$), skills (est. = -0.16, $t = -3.15$, $p < 0.002$) and impulse control (est. = -0.12, $t = -3.78$, $p < 0.001$), significant negative quadratic shape effects were found. This indicated that the displayed risk-related behavior showed mainly moderation in behavior and not a polarization toward the extremes of the scales. The results further showed a tendency for patients who maintain more positive relationships with other patients to achieve higher skills, as indicated by the positive behavior skills out-degree parameter (est. = 0.08, $t = 1.58$, $p < 0.11$). Patients

who maintain more positive relationships with patients who have high skills on average, also have a stronger tendency themselves towards higher skills. This was indicated by the significant positive skills average alter parameter (est. = 0.31, $t = 2.07$, $p < 0.04$).

Network effects	PE	SE	t Value
Rate function (period 1)	5.25	0.851	-
Rate function (period 2)	6.85	1.203	-
Out-degree (density)	-1.91	0.402	-4.75***
Reciprocity	1.52	0.257	5.93***
Transitive triplets	0.29	0.078	3.69***
3-cycles	-0.36	0.117	-3.11***
Out-degree – activity (sqrt)	0.29	0.155	1.88*
Network dynamics			
Skills ego	0.10	0.072	1.44
Impulse control alter	-0.01	0.060	-0.22
Impulse control ego	0.07	0.078	0.85
Impulse control similarity	-4.51	1.716	-2.63***
Impulse control alter * Impulse control ego	0.17	0.065	2.66***
Behavior dynamics			
Rate function problem awareness (period 1)	2.48	0.754	-
Rate function problem awareness (period 2)	3.15	1.039	-
Rate function skills (period 1)	3.75	0.932	-
Rate function skills (period 2)	2.89	0.992	-
Rate function impulse control (period 1)	3.33	0.932	-
Rate function impulse control (period 2)	4.18	1.554	-
Linear shape problem awareness	0.00	0.108	0.01
Quadratic shape problem awareness	-0.10	0.036	-2.86***
Linear shape skills	-0.29	0.222	-1.32
Quadratic shape skills	-0.16	0.052	-3.15***
Skills out-degree	0.08	0.048	1.58
Average alter skills	0.31	0.147	2.07**
Linear shape impulse control	-0.08	0.095	-0.83
Quadratic shape impulse control	-0.12	0.032	-3.78***
Impulse control: control	0.04	0.020	1.80*

Table 6.5. Parameter estimates (PE) and standard errors (SE) of SIENA analysis for positive relationships and problem insight, skills and impulse control. *: $p < .10$; **: $p < .05$; ***: $p < .01$ (two-sided).

Cross-effects

No significant cross-effects of problem awareness, skills and impulse control were found for positive relationships. Of the control variables only the difference in average impulse control of patients on the diverse patient units seemed to contribute to the dynamics in the impulse control on the individual level. This was indicated by the positive Impulse control: control parameter (est. = 0.04, $t = 1.80$, $p < 0.07$). This effect may probably be interpreted as a regression to the mean: existing differences between the groups with respect to impulse control tend to be rather stable.

6.5.3 Selection and influence for instrumental relations***Structural network effects***

The results for the SIENA analysis for instrumental relationships of forensic psychiatric in-patients are presented in Table 6.6. Parameter estimates for the structural network effects out-degree, reciprocity, 3-cycles and the degree-related effect in-degree-popularity were significant. The negative out-degree parameter (est. = -1.20, $t = -2.02$, $p < 0.04$) indicated that patients on average were likely to maintain instrumental relations with a relatively small number of the patients on the unit. The positive reciprocity parameter (est. = 2.03, $t = 5.42$, $p < 0.001$) indicated that patients tend to form and maintain reciprocated instrumental relationships. The negative in-degree-popularity parameter (est. = -0.80, $t = -2.17$, $p < 0.03$) indicates that patients with lower numbers of incoming instrumental relationships are more attractive to patients for starting new and maintaining existing instrumental relations. The non-significant transitivity parameter and weakly significant three-cycles parameter indicate that there is no strong tendency toward clustering in the network, and no tendency toward hierarchy whatsoever.

Network dynamics for patients' risk-related behavior

Analysis of the network dynamics indicated that patients with better skills were more attractive to others for maintaining instrumental relationships. This was indicated by the positive effect of the skills alter parameter (est. = 0.346, $t = 2.98$, $p < 0.003$). Patients with less impulse control maintained more instrumental relationships with other patients. This was indicated by the negative effect of the impulse control ego parameter (est. = -0.362, $t = -3.32$, $p < 0.001$).

Behavioral dynamics in risk-related behavior

With regard to behavioral dynamics, for problem awareness (est. = -0.10, $t = -2.89$, $p < 0.004$), skills (est. = -0.07, $t = -2.55$, $p < 0.01$) and impulse control (est. = -0.12, $t = -3.90$, $p < 0.001$) significant negative quadratic shape effects were found. This indicated that the displayed risk-related behavior of patients showed moderation and thus few extremes. For instrumental relationships no influence effects on risk-related behavior were found.

Network effects	PE	SE	t Value
Rate function (period 1)	4.97	1.365	-
Rate function (period 2)	4.11	1.210	-
Out-degree (density)	-1.20	0.593	-2.02**
Reciprocity	2.03	0.375	5.42***
Transitive triplets	0.24	0.242	0.97
3-cycles	0.76	0.419	1.80*
In-degree – popularity (sqrt)	-0.80	0.368	-2.17**
Network dynamics			
Skills alter	0.35	0.116	2.98***
Impulse control ego	-0.36	0.109	-3.32***
Behavior dynamics			
Rate function problem awareness (period 1)	2.44	0.626	-
Rate function problem awareness (period 2)	3.15	1.113	-
Rate function skills (period 1)	3.49	0.938	-
Rate function skills (period 2)	2.99	0.791	-
Rate function impulse control (period 1)	3.30	0.875	-
Rate function impulse control (period 2)	4.18	1.121	-
Linear shape problem awareness	0.00	0.109	0.00
Quadratic shape problem awareness	-0.10	0.036	-2.89***
Linear shape skills	0.11	0.099	1.07
Quadratic shape skills	-0.07	0.029	-2.55**
Linear shape impulse control	-0.08	0.100	-0.76
Quadratic shape impulse control	-0.12	0.031	-3.90***
Impulse control: effect from C impulse control	0.04	0.020	1.75*

Table 6.6. Parameter estimates (PE) and standard errors (SE) of SIENA analysis for instrumental relationships and problem insight, skills and impulse control. *: $p < .10$; **: $p < .05$; ***: $p < .01$ (two-sided).

Cross-effects

As in the model for positive relationship, no significant cross-effects of problem awareness, skills and impulse control on patients’ behavior were found. As expected this is the same for instrumental ties, since no average alter, and behavioral in-degree/out-degree effects were established.

6.5.4 Selection and influence for influence relations

The original influence network was coded such that ego influenced alter. In the SIENA analyses, the transposed matrix was used, that is, ego was influenced by alter. This made it possible to interpret the average alter effect in such a way that ego is influenced by alter and not the other way around.

Structural network effects

Table 6.7 presents the results for the SIENA analysis of influence relations of forensic inpatients. Parameter estimates for the structural network effects out-degree, reciprocity, 3-cycles and the degree-related effect of in-degree-popularity were significant. The negative out-degree parameter (est. = -1.91, $t = -4.75$, $p < 0.001$) indicated that patients on average were influenced by a relatively small number of patients on the unit. The positive reciprocity parameter (est. = 0.98, $t = 3.89$, $p < 0.001$) indicated that patients tend to form and maintain reciprocated influence relationships. The non-significance of the transitive triplets parameter, together with the negative 3-cycles parameter (est. = -0.30, $t = -1.89$, $p < 0.006$) indicated that tendencies towards closure (formation of groups of three or more patients) do not exist in this network, but a strong hierarchy does exist in these relations. The positive in-degree-popularity parameter (est. = 0.89, $t = 6.39$, $p < 0.001$) indicates that there are 'influence hubs', that is, few patients who influence many others, while most patients are influential for few or no other patients.

Network dynamics for patients' risk-related behavior

Analysis of the network dynamics indicated that problem awareness of patients positively affected the degree to which patients are influenced by other patients (est. = 0.28, $t = 2.25$, $p < 0.03$). Furthermore, patients with similar problem awareness influenced each other (est. = 2.48, $t = 2.35$, $p < 0.02$). Some effects for the impulse control of patients were established. Patients with less impulse control were more influenced by other patients (est. = -0.12, $t = -1.68$, $p < 0.06$), but also influenced other patients more (est. = -0.37, $t = 3.12$, $p < 0.06$).

Behavioral dynamics in risk-related behavior

For problem awareness (est. = -0.10, $t = -2.89$, $p < 0.004$), skills (est. = -0.14, $t = -2.42$, $p < 0.02$), and impulse control (est. = -0.10, $t = 3.40$, $p < 0.001$), significant negative quadratic shape effects were found. This indicated that the displayed risk-related behavior showed mainly moderation in behavior and thus few extremes. The results indicated that patients who are influenced by other patients with higher skills, also have a stronger tendency themselves towards higher skills. This was indicated by the positive skills average alter parameter (est. = 0.37, $t = 1.75$, $p < 0.08$).

Network effects	PE	SE	t Value
Rate function (period 1)	4.79	0.879	-
Rate function (period 2)	3.11	0.526	-
Out-degree (density)	-2.96	0.351	-8.43***
Reciprocity	0.98	0.251	3.89***
Transitive triplets	-0.15	0.129	-1.18
3-cycles	-0.30	0.156	-1.89*
In-degree – popularity (sqrt)	0.89	0.140	6.39***
Network dynamics			
Effect of problem awareness on being influenced by others	0.28	0.126	2.25**
Effect of similarity in problem awareness on influence relation	2.48	1.056	2.35**
Effect of impulse control on influencing others	-0.12	0.074	-1.68**
Effect of impulse control on being influenced by others	-0.37	0.119	-3.12***
Behavior dynamics			
Rate function problem awareness (period 1)	2.46	0.564	-
Rate function problem awareness (period 2)	3.17	0.747	-
Rate function skills (period 1)	3.36	0.764	-
Rate function skills (period 2)	2.77	0.674	-
Rate function impulse control (period 1)	3.34	0.805	-
Rate function impulse control (period 2)	4.16	1.061	-
Linear shape problem awareness	0.01	0.106	0.05
Quadratic shape problem awareness	-0.10	0.036	-2.89***
Linear shape skills	0.04	0.106	0.37
Quadratic shape skills	-0.14	0.059	-2.42**
Average alter skills	0.37	0.213	1.75*
Linear shape impulse control	-0.07	0.094	-0.69
Quadratic shape impulse control	-0.10	0.030	-3.40***

Table 6.7. Parameter estimates (PE) and standard errors (SE) of SIENA analysis for influence relationships and problem insight, skills and impulse control. *: $p < .10$; **: $p < .05$; ***: $p < .01$ (two-sided).

Cross-effects

No significant cross-effects of problem awareness, skills and impulse control were found for influence relationships. In addition, no effects were established of differences in behavior related to the domains of problem awareness, impulse control and skills.

6.6 Conclusions and discussion

This study provided novel insights into the co-evolution of social relationships and risk-related behavior of forensic psychiatric in-patients. The empirical research was concerned with developments in social relations and risk-related behavior of patients suffering from PDs. The cross-sectional study described in Chapter 5 investigated the association between social relationships and risk-related functioning. The present study investigated this association in a longitudinal design, which enabled us to consider developments in social relationships and risk behavior as well as more details of their association. The longitudinal design made it possible to distinguish between selection and influence processes of risk-related behavior in the interaction of forensic psychiatric in-patients.

As in the cross-sectional study, positive, instrumental and influence relations and the risk-related functioning domains of problem awareness, impulse control and skills, were considered. Besides ego and alter effects, similarity effects were also included. Dynamic actor-oriented models (Steglich, Snijders & Pearson, 2010) analyzed with the SIENA program indicated and confirmed the inter-relatedness between social relationships and all three domains of patients' risk-related functioning. Earlier found associations were partly reconfirmed and some other or new longitudinal associations were established.

Patients with higher skills tend to have more positive relationships with other patients. A patient with more basic requisite skills (life, social, and coping) is better equipped socially, which probably enables him to maintain more positive relationships. Patients with high and low impulse control tend to select other patients with similar impulse control for positive relationships, while those with average impulse control tend to prefer positive relationships with those either high or low in impulse control. Instrumental relationships are more often directed toward patients with higher skills. The cross-sectional study also found this association, although the opposite was expected, as patients with more skills were expected to be better able to defend themselves against being used by patients. However, their skills may make these patients attractive for instrumental use by others as a kind of social capital. Patients with low impulse control tend to select more patients for instrumental ties.

Low impulse control patients consider the consequences of their behavior to a lesser extent, which may lead them to damaging their valuable relationships or the achievement of their treatment objectives. Patients with more problem awareness seemed to be selected more often by patients wanting to exert their influence. Patients with similar levels of problem awareness seemed especially to influence each other. This might indicate a higher sensitivity of patients with more problem awareness. Insight into one's own problems requires the ability to take at least some responsibility for one's own actions, some degree of empathy, and a relatively open attitude towards treatment. This might

make these patients also susceptible to influence exerted by others. Patients with less impulse control influenced more other patients and were themselves influenced more often. Their inconsideration for the consequences of their behavior probably makes them more susceptible to influence by others. Their increased impulsiveness and hostility will, besides, make them less predictable, which may explain their influence relations toward other patients. The influence process between patients was restricted to their skills. When patients maintained more positive relationships with others, or were influenced by others with on average higher skills, their skill levels seemed to be positively affected.

This longitudinal study confirmed many of the cross-sectional study results with regard to the association between these social relations and behavioral domains. The present study also found the strongest relatedness between social relations and the impulse control and skills of patients. The distinction found here was, however, that impulse control plays a role in determining network ties, whereas skills both determine and are influenced by network ties. Furthermore, effects were found for problem awareness in determining influence relations. Impulse control played a role at the group level, with the interpretation that differences between the units with respect to impulse control were relatively stable, while this was not specifically the case for existing differences with respect to skills or problem awareness.

These results provide some first relational indications for treatment status and progress in forensic treatment practice. Skills and impulse control of patients seem especially important in the selection of individuals for social interaction. Since behavioral domains are related to patients' risk behavior, maintaining certain kinds of relationships could be indicative for a patient not doing well. There would be a likelihood of increased risk behavior when patients maintain fewer positive relationships (risk related to their skills), maintain more instrumental relationships (risk related to impulse control), are more instrumentally used by others (risk related to skills), are more influenced by others (risk related to problem awareness and risk related to impulse control) and exert influence on more others (risk related to impulse control).

Apart from the importance of these behavioral characteristics for the selection of interaction partners, certain relationships proved important for the actual adjustment of risk behavior of patients. Influence by, and positive interaction with those having more skills (less risk-related skills), seems further to decrease the risk behavior of this person (less risk related to skills). This may provide in useful information for treatment practice.

These results require, however, some additional qualification, which is especially important in the case of influence relations. Understandably, influence between patients is important, but it seems that the content of the influence is particularly important. More skilled patients could for instance consciously influence others to achieve preconceived goals. Patients with impulsive behavior may have a great influence on others by affecting

the atmosphere on the unit with their disruptive behavior. It seems important to distinguish better between these kinds of influence. That patients with more problem awareness are more influenced and better skilled patients are used instrumentally by more others might be related to an increased relational vulnerability for patients who do better than average. In the treatment process, protecting this vulnerability might be necessary to prevent restrictions in treatment progress.

Chapter 7

Summary and conclusions



7.1 Summary

This dissertation presents research into the social relationships and networks of forensic in-patients, and thereby into a condition that has been shown not only to be important for individual behavior and wellbeing but is also presumed to be important in explaining the risk-related behavior of this population. This chapter presents summaries of the research by chapter, giving additional background information in the text boxes. Further on, it presents the general conclusion as well as the limitations of the research. The chapter closes by making suggestions for future research.

One measure in the Dutch legal system is the 'terbeschikkingstelling' (TBS). The TBS measure can be imposed on any perpetrators who have committed a serious offence for which they cannot be held fully responsible because they suffered from a mental illness at the time the offence was committed. They are deemed at risk to reoffend. Psychological treatment, usually executed in forensic psychiatric centers, is aimed at reducing risk-related behavior to protect society. Serious incidents with (former) forensic psychiatric patients made it necessary to investigate why the TBS measure was insufficiently able to protect society against these offenders. A parliamentary investigation led to several recommendations that today still guide policy in forensic psychiatry. The recommendations emphasized the necessity to obtain more insight into the effectiveness of TBS treatment and into the risk factors of recidivism.

Chapter 1: Introduction

It is generally acknowledged that social inter-relatedness affects all kinds of behavior and mental wellbeing of individuals. The importance of social interaction for delinquent behavior, which is implicitly assumed in several criminological theories (see Hirschi, 1969; Sutherland & Cressey, 1955), is confirmed by empirical research (e.g., Haynie, 2001, 2002). Forensic psychiatric patients are delinquents who have committed very serious crimes because of their severe psychopathology. The psychopathology of the largest subgroup, personality disorders (80%, de Beurs & Barendregt), has a relational nature (American Psychiatric Association, 1994, 2000). In the forensic institutional context, social relationships are especially important for coping with the demanded adjustments (Clemmer, 1940) and pains of imprisonment (Sykes & Messenger, 1960). Because patients stay in groups of relatively few individuals, on whom they are socially dependent for various aspects of life, their social relations and functioning are expected to be closely inter-related.

Surprisingly little research has been done into the actual social interaction patterns of forensic psychiatric in-patients. This study investigates the association, cross-sectional

and over time, between social relations and social networks and risk-related behavior of forensic psychiatric in-patients suffering from a personality disorder (PD).

The study applies social network analysis to gain insight into the patients' social relationships. This approach represents patterns of social relationships in terms of nodes (in this study, forensic psychiatric in-patients) and the ties (including several kinds of relationships) between these nodes. The study considers a broad spectrum of relationships, based mainly on the exchange approach in social network analysis. The overarching relations in this approach are companionship, emotional aid, and instrumental aid. These were included here in the more concrete forms of contact frequency, negative relations (hostile and unpleasant relations) as contrasted with positive relations (friendship and friendly relations), and instrumental relations (distinguishing between the material and relational). The study also considered influence and hierarchy relationships because of their important role in closed forensic settings and in the symptomatology of PDs.

First some measurement methods were developed to assess social relations and behavior of patients, to provide insight into the association between social relationships and risk-related functioning of patients with PDs. The social relations thus measured were associated to PDs to establish the relational nature of the disorders. Subsequently, the association between social relations and risk-related behavior was investigated both cross-sectionally and longitudinally.

Chapter 2: Applying social network analysis in a forensic psychiatric center

A pilot study was executed to investigate the possibility of mapping specific social relationships of patients residing in a forensic psychiatric center and to explore the potential of the method for treatment practice. The pilot served mainly as background for the further study, to obtain exploratory insight into the social relationships in association with some group and individual characteristics. Using social network analysis, the pilot study mapped the positive/negative, instrumental, and influence relationships of a unit of sex offenders (SO) ($N = 13$) and a unit for patients with borderline personality disorder (BPD) ($N = 11$). The patients' relationships were assessed by the sociotherapists working on their units. Results showed the suitability of the method to establish relational differences between patients, on both the group and individual level. The differences established in the groups are illustrated by differences in the numbers of maintained influence, positive, or instrumental relationships between patients on the unit.

The SO unit appeared to maintain mostly positive interactions, while the BPD unit showed more extremes in the nature of their associations, expressed in relatively more friendship as well as more hostility. Extremity in both positive and negative associations was expected because this is congruent with the pathology of borderline PD, such as impulsivity, black-and-white thinking and bad temper, as well as fear of abandonment and

low self-esteem. The generally friendly interactions and absence of hostility found for the sex offenders could be interpreted as a conflict-avoiding attitude of this group (consisting mainly of patients with paraphilia such as pedophilia). On both units, homogeneous subgroups of positively interacting individuals were identified with shared characteristics such as ethnical background and institutional past.

Most striking was the separation of the sex offenders into two subgroups, those with adult victims and/or non-sexual crimes, and those who committed sexual offences involving minors. Division into two subgroups corresponded to the network hierarchy, with pedophiles in the lower position. This finding made explicit the existence of hierarchy for a group that generally occupies the lowest hierarchical position in institutional settings.

Another difference between the units was the nature of instrumental relationships. Although the extent to which instrumental use occurred was more or less the same for both units, borderline patients seemed to maintain instrumental relationships mainly to gain access to material goods, whereas sex offenders used others for such relational purposes as protection, status, and entertainment. The results indicate more multiplexity in relationships of sex offenders. In the BPD population mainly positive, social support, and trust relations seem to be associated. This was interpreted as authentic 'healthy' social interaction. In contrast, the high association between positive, social support relations with instrumental relations on the SO unit was interpreted as superficiality in the interpersonal association of these patients.

Besides providing valuable information about social relations, the pilot study provides methodological confirmation that social network analyses can successfully establish meaningful differences between groups of forensic patients. For sociotherapists, the pilot study found an important extra value in the therapeutic process. Therapists indicated that participating in the study made them more aware of examining social relations on the unit and that enhanced their perceptions of patient behavior in the relational context. The new awareness added to their professionalism in their daily dealings with and assessment of this population.

The recognition of the resulting network images by therapists provided a first basis for validating the method. This information gave more detailed and clarifying information about relational associations between patients than what therapists usually observe directly in daily practice. This was illustrated by two interventions that came about because of the new network information. Two patients were transferred to other units, in the first case because of the patient's bad influence on others and in the second case because of the risk of violence the patient presented to others.

In summary, social network analysis seems useful to provide insight into social networks on patient units, and thereby it seems a good tool for further scientific research. This approach showed promise in contributing to the proposal of interventions in the treatment process.

Chapter 3: Relational patterns and networks of forensic in-patients with distinct personality disorders

Chapter 3 described a study into the relational patterns and networks of forensic in-patients allocated to treatment units according to their PDs. The largest population of forensic psychiatric patients consists of patients with various relational disorders. Interpersonal aspects figure prominently in clinical descriptions of many PDs, varying between the distinct PDs. Despite their interpersonal features, PDs are usually framed in terms of biological origin, developmental problems, or intrapersonal deficits, rather than interpersonal terms. However, traditions that systematically investigate the interpersonal aspects of PDs, such as the interpersonal circumplex and five-factor model have established rich clinical, theoretical, and empirical foundations for this association.

Although this research has contributed to better insight into the interrelatedness and thus into differences and similarities between distinct personality disorders no previous research has been done into the actual relational patterns of severely personality disordered individuals. To provide more insight into the association of relational patterns and personality disordered behavior, the current study investigated the social relations in five units of incarcerated patients with PD symptoms ($N = 59$).

The study consisted of a descriptive study into the social relations of the units composed of patients with the following homogeneous crime or personality features: 1) SO, 2) NPD, 3) SUD, 4) PDD, and 5) BPD. The study also described the occurrence of the most prominent psychiatric disorders in this group.

Patients in the SO unit appeared to maintain mainly positive and almost no negative relationships. Their association with others was relatively strongly associated to relational instrumental use. These outcomes matched the expectations based on the rational and harm-avoiding nature of this population and indicated a degree of shallowness in their social interaction.

Contrary to what was expected, relatively much positive interaction and little influence were found among patients on the NPD unit. These findings were attributed to the homogeneous composition of this group of individuals with the same personality characteristics. Narcissism is often seen as a mechanism to cope with underlying thoughts of inferiority. In an average setting these coping skills could be effective, but in this setting of similar individuals, provocative behavior could be punished. This may be why these patients turned to the conflict-avoidant approach, resulting in more positive relationships and less influence.

Patients on the SUD unit maintained an average number of positive and less negative relationships. As expected, this finding was indicative for these patients with the good skills required to maintain relatively smooth interactions. These patients tended more

often to use relationships with other patients for the resulting, mainly material benefits. This instrumental use was often initiated by those who exerted most influence, and was not based on fear. These findings were indicative for less impulsive and more well-directed considerations about whom to use.

On the PDD unit, patients associated less with each other. Their interaction was more often negative, and they exerted relatively much influence. The low number of hierarchical relations was an indication that influence was not exerted on purpose, but that these patients influenced others by their disruptive behavior. These findings matched the expected lower frequency of contact and absence of more profound relations for this group of patients.

For patients on the BPD unit, contact frequency was high and, as expected, they established more instrumental relations of a material nature. However, because most characteristics of borderline PD are related to instability over time, other relational patterns that were expected to typify this group could not be established in this cross-sectional study.

The relationship descriptions summarized here led to the hypotheses formulated for the second part of Chapter 3, which deals with empirical analysis of the associations between social relationships and distinct PDs/traits diagnosed according to the categorical classification system of DSM-IV: paranoid, schizoid, schizotypal (cluster A), antisocial, borderline, histrionic, narcissistic (cluster B), avoidant, dependent, and obsessive-compulsive (cluster C). Exponential random graph modeling (ERGM) was used to test cross-sectional associations and, especially for clusters B and C, the effects of PDs were established.

Patients with antisocial and narcissistic PDs maintained more hostile and unpleasant relationships with other patients. Individuals with antisocial and dependent PDs turned out to use patients more instrumentally for relational purposes. Patients with antisocial PDs exerted more influence on other patients, and patients with avoidant as well as obsessive/compulsive PDs proved to be less influenced by others.

The small total number of patients with certain PDs, for instance schizoid and schizotypal disorders, limited the statistical power to test for relational effects. Perhaps no support was found for hypotheses about contact frequency because of the institutional context of the patients; they could hardly ignore each other, even if they wanted to.

Despite the power issues and contextual restrictions mentioned above, and the fact that DSM-IV diagnoses are disadvantaged by excessive co-morbidity and inadequate coverage of distinct PDs, the associations found do indeed provide good insight into relational patterns of patients with diverse PDs, and thus into the relational nature of these disorders.

Chapter 4: Assessing risk-related functioning in forensic psychiatric in-patients

Chapter 4 described the development of an appropriate measure for the assessment of patient functioning. Because the dominant aim of TBS is to protect society, recidivism is important in research into outcomes of the measure. In this kind of research, information about the type and severity of reoffences and the characteristics of reoffending patients is not directly related to the treatment process. More specific insight into therapeutic outcomes requires research into the extent to which specific therapeutic aims are met, such as a decrease in certain psychiatric symptoms. This requires the construction of an evidence base for specific interventions and treatment programs through scientific research. So far, research into treatment interventions is still in its early days and the suitability of its addressing questions regarding the effectiveness of the TBS measure as a whole is limited. A *prediction* of the risk of recidivism during the treatment process seemed the best current measure to adopt.

A new measure, based on existing instruments for risk assessment, had to be developed for this purpose. The most frequently used risk assessment instruments are composed of risk factors assumed to be both stable and changeable over time. Because only changeable factors are interesting for interventions in the treatment process, only these were considered in this study. The measure developed for the present study was based on the dynamic (i.e., changeable) factors of the risk assessment instrument developed for the population of Dutch forensic psychiatric patients, the HKT-30. A scale, based on the definitions and descriptions of most of these factors was developed for a more adequate assessment.

In a pilot study held on two units (SO and BPD) sociotherapeutic mentors filled in a questionnaire for 41 patients. Based on the sociotherapists' comments and item analysis, the final questionnaire contained 29 items with nine risk factors measured by a total of 26 items, and three originally HKT-30 factors. A proper scale could not be developed for the HKT items; single items seemed to provide sufficient information.

For the actual study into the risk-related functioning of forensic in-patients, data were collected on five patient units with homogeneous crime or personality features: 1) SO, 2) NPD, 3) SUD, 4) PDD, and 5) BPD, at three time points ($N = 78$). Assessment was done by the sociotherapeutic mentors and treatment coordinators of the patients, and showed acceptable inter-rater agreement. Differences between assessments were interpreted as an expression of complementary observations of the patient in separate settings (sociotherapists in the daily routine of the patient unit, the treatment coordinator for only a few hours and outside the context of the patient unit). For the total scale items, inter-rater reliability proved satisfactory.

The psychometric qualities of the scales were good and the scales proved to have strong unidimensional qualities as well as a reasonable to strong reliability for all measurements. A principal component analysis executed on all scale items including the HKT items yielded, for all three measurements, a three factor solution that could be interpreted as the domains 1) problem awareness, 2) impulse control, and 3) skills. These factors seemed to correspond with the essential domains (character, temperament and skills) in the dominant treatment approach of forensic psychiatric patients with PDs, namely, cognitive-behavioral treatment (for background, see next text box).

The inter-relatedness between the domains of problem awareness, impulse control and skills seemed relatively strong (correlations ranged from $r = .52$ to $r = .66$). The inter-relatedness between factors seemed almost equally strong between factors at one moment and for a given factor over time.

The unidimensionality for all items of a specific domain appeared to be reasonable to good for all repeated measures. All domains could be considered reliable scales.

According to the cognitive-behavioral approach, personality disorders are manifested in individuals' character and temperament. Character affects personal beliefs, view of the world, the future, and the own self, while temperament refers to the innate, genetic, and constitutional influences of personality in which impulsivity and aggression are important elements.

Treatment of personality disorders requires modification of character and modulation of temperament. Both clinical experience (Beck, Freeman & Associates, 1990; Davidson, 2008) and research (Linehan, 1993; Bienenfeld, 2007) suggest that modulation of temperament must initiate ultimate modification of character. However, many patients with personality disorder lack mastery of the basic requisite skills (Stanley, Bundy & Beberman, 2001) for overcoming the deregulations of temperament often resulting in stress or violent behavior. Treatment is therefore initially directed at learning the requisite personal and relational skills, and modulating or regulating deregulated temperament. The aim is to increase patients' readiness and availability to engage in subsequent therapeutic change directed at character dimensions of the disorder.

Progression in risk-related functioning of patients on the distinct units was investigated with multivariate repeated measures analysis that considered only patients participating in all three measurements. Changes over time were established for skills only. Surprisingly, the risk related to skills seemed to increase on average. The largest differences were found in patients with narcissistic PD. These showed worse general risk-related functioning related to skills and larger risk related to impulse control. These results, however, apply only

to a select group of patients and concerned only the average situation on these units. For research into the association of social relationships and risk-related behavior of patients, differences between individuals and changes over time are especially important.

Chapter 5: Social interaction related to the functioning of forensic psychiatric in-patients

Chapter 5 described the first study into the association between social relationships and risk-related behavior of forensic psychiatric in-patients. It was a cross-sectional study of the association between relationships (positive, instrumental, and influence) and risk-related behavioral domains (problem awareness, impulse control and skills). The study population consisted of five units for the treatment of patients suffering from PDs ($N = 60$). Despite the acknowledged importance of social relationships for (delinquent) behavior and mental wellbeing, no actual research had previously been done into relational patterns of forensic psychiatric patients. Information on patients' social network patterns and the content of their relationships could, as this study assumed, provide detailed information about relational behavior which could complement the information on behavior of these patients provided by the traditional psychodiagnostics.

Relational information for this study was gathered through social network analysis of the assessments conducted by the sociotherapists working on the units. Each therapist working on the unit evaluated the relationships between all pairs of patients. Data on risk-related functioning of patients was collected by the measure described in Chapter 4.

The consensus networks of the various relationships were associated with the three domains of risk-related functioning identified in Chapter 4; problem awareness, impulse control, and skills. Exponential random graph models (ERGMs) in the SIENA program were used to test hypotheses about the associations. For all three domains of functioning, associations were found with social relationships of patients.

Patients with more problem awareness appeared to maintain more positive relationships with others. Those with better control over their impulses maintained more positive relationships with other patients. Patients with better impulse control maintained fewer instrumental and influence relations with other patients and tended to be less influenced by other patients. Patients with better skills were more often approached positively by other patients, but were also more often used instrumentally and exerted more influence on others. The strongest associations were established for the risk-related domains of skills and impulse control, the most important for direct interventions.

This study has established a first insight into the association between relational networks between this category of patients and variables reflecting their functioning in basic problem domains. It has demonstrated for the first time the clear association between mental health and networks of imprisoned patients. Insight into these associations may

be fruitful for improving treatment as well as for obtaining better predictions for the risk of re-offence of patients.

Chapter 6: The co-evolution of social relations and risk-related behavior of forensic psychiatric in-patients

This study investigated the co-evolution of the social relationships and risk-related behavior, using the same social relationships (positive, instrumental and influence) and risk-related behavioral domains (problem awareness, impulse control, skills) as described in Chapter 5, but this time in a longitudinal design. Information on social relationships and risk-related behavioral domains was collected for three points in time on the same five units ($N = 78$), with an interval of six months between each measurement. The longitudinal design allowed the possibility to distinguish between selection (formation and dissolution of relationships dependent on behavioral characteristics of other patients) and influence effects (adjustments in behavioral characteristics as a function of behavioral characteristics of interaction partners) in the association of relationships and risk behavior of forensic psychiatric in-patients.

For the longitudinal analyses, stochastic actor-based models implemented in the SIENA program were used simultaneously to gauge influence and behavior dynamics.

For positive interaction, patients with low impulse control appeared mainly to select others who were also low on impulse control, and patients with high impulse control selected other patients who were mainly high on impulse control. Patients with more skills had the tendency to select others more for positive interaction. Patients who maintained positive relationships tended to improve more in their skills. The skills of a patient were influenced by the skills of those with whom he had positive relationships.

Patients with more skills were more often chosen by others for instrumental relationships. Especially those with low impulse control appeared to use other patients instrumentally. Patients with more problem awareness appeared to be more influenced by other patients. Mainly those with similar levels of problem awareness influenced one another. Patients with less control over their impulses were influenced more by other patients, but also turned out to influence others more themselves. Patients influenced by others with high skills on average seemed to become more skilled themselves.

7.2 General conclusions

This research investigated the association, cross-sectional and over time, between social relations/networks and risk-related behavior of forensic psychiatric in-patients with PDs. First it studied the relational nature of the PDs suffered most prominently by this group of forensic in-patients. Despite restrictions in the available diagnostic information and lack

of statistical power due to the small number of patients in some of the PDs, the results confirmed the expected associations between disorders and social relations in a broad variety of disorders. It supports the hypothesized relational nature of PDs as illustrated by the definition of the term disorder: *a chronic disturbance in one's relation with self, others and the environment that results in distress or failure to fulfill social roles and obligations* (APA, 1994, 2000), and emphasizes the necessity to consider patients' deficits within their relational context.

Secondly, it studied the association between social relationships and risk-related functioning of patients. Associations with social relations were established for all three domains of risk-related functioning namely, problem awareness, impulse control, and skills, but these associations were established mainly for the domains of impulse control and skills. These findings are in line with the hierarchy in components of the cognitive-behavioral approach in treatment, in which interventions are initially directed at the patients' possible lack of requisite basic skills. The presence of requisite basic skills may activate the personality dimension of temperament and lack of impulse control. The regulation of temperament should ultimately lead to the ability to engage in therapeutic change directed at the character dimension, for example, problem awareness.

The findings demonstrated a clear association between mental health and social networks of imprisoned patients. The risk-related domains of functioning, for which intervention is best possible, proved to be related to social relationships. The cognitive domain of functioning and changes in this domain probably ask for more intense and directed interventions in the treatment process, such as psychotherapy.

Thirdly, it studied the co-evolution of social relationships and risk-related behavior of forensic psychiatric in-patients. The longitudinal design of the study distinguished between selection effects, such as the choice of interaction partners based on certain characteristics, and influence effects, in which an individual adjusts his behavior to the behavioral characteristics of interaction partners. Selection of interaction partners depended most strongly on impulse control, then on skills, and least on problem awareness. Influence effects from network partners were found only on patients' skills.

Both cross-sectional and longitudinal studies showed a great similarity in findings, which is indicative of the robustness of their conclusions. Both established effects mainly between social relations and the behavioral domains of impulse control and skills.

For treatment practice, results can be translated as follows. Of the behavioral domains, personal skills and impulse control seem to be especially important in the selection of individuals for social interaction. Since these behavioral domains are related to patients' risk behavior, maintaining certain kinds of relationships could be indicative for a patient not doing well. There would be a likelihood of increased risk behavior when patients maintain less positive relationships with others (risk related to their skills), maintain

more instrumental relationships with others (risk related to impulse control), are used instrumentally by fewer others (risk related to skills), are influenced by more others (risk related to problem awareness and risk related to impulse control) and maintain more influence relations with other patients (risk related to impulse control).

Besides the importance of these behavioral characteristics for the selection of interaction partners, certain relationships proved to be important in actually adjusting risk behavior. Influence relations from, and positive interaction with those with more skills (less risk-related skills), seems to decrease the risk behavior of a patient (less risk related to skills).

If therapists working on the units notice a patient interacting less positively with fellow patients, possibly because of a lack of basic requisite skills, this could be a reason to monitor this patient more closely. Therapists could motivate such a patient, for instance, to interact more with better skilled fellow patients (e.g., in a preconceived and staged setting). Because of their better skills, the skilled patients will probably understand the deficient behavior of the less skilled patient more easily, and so tolerate him more. The weaker patient might learn from interacting with skilled others and might, in doing so, improve his own skills level. This might enable the patient to maintain future interactions more positively and provide better coping skills that could ultimately help to reduce his risk of reoffending.

Therapists could further be alert for patients who interact, more than average, with fellow patients purely for the material and/or relational benefits offered by these relationships. The patient may lack consideration for the consequences of relational behavior with the instrumentally used person nor care about his own treatment prospects. Because better skilled patients are mainly used instrumentally, therapists could take care to prevent potential negative influences from instrumental abuse. However, the better skills of these individuals could also help them to defend themselves against possible negative influences due to instrumental use. Therapists could perhaps make patients, who usually maintain instrumental relationships, more aware of the possible consequences of their behavior.

When patients are strongly influenced by others this could be indicative of vulnerability in these individuals, because their behavior strongly depends on situational factors instead of internal control. This makes positive assessment of these patients at a certain point in time unreliable as a prediction for the future. Vulnerability to influence can, for instance, be due to peer pressure, but it was also established as a consequence of a diminished degree of impulse control. Such patients surrender more quickly to the whims of others. Treatment should be directed at increasing a patient's ego strength and ability to consider the consequences of behavior.

When a patient exerts a lot of influence on other patients, therapists could decide to monitor this patient more closely. However, the interpretation of influence relations

requires additional qualification. Not only patient's exerted influence is important, but more particularly the content of the influence. More skilled patients could, for instance, influence others consciously to achieve preconceived goals. On the other hand, patients with impulsive behavior could have a big impact on others if they influence the atmosphere on the patient unit by their disruptive behavior. It seems important to distinguish between these kinds of influence, more than was done in the current study. Two findings – patients with more problem awareness are more influenced, and better skilled patients are used more instrumentally by others – might be related to increased relational vulnerability for patients who do better than average. In treatment practice especially those patients should be protected against possible bad influences that can harm their treatment progression.

Impulse control appeared to have large consequences for various kinds of relational patterns, even though differences between units with regard to average impulse control were relatively stable. It may be worthwhile to pay extra attention to the composition of groups with respect to impulse control, and the way in which it influences not only social relations but also the treatment process.

Overall, this study provides initial evidence for the expected association between PD symptoms and actual interaction patterns of forensic psychiatric patients suffering from PDs. Since these patients are compelled to undergo TBS for the acting out behavior caused by this kind of psychopathology, their risk-related behavior was expected to be associated with their manner of interacting with others. This was indeed confirmed by this study. Because the risk behavior considered here consisted of criminogenic factors, that is, factors related to the patient's risk of reoffending, the study also provides initial insights into the possible association between interaction patterns of patients and their likelihood to reoffend. Hence this study provides a research response to the strong recommendation of the parliamentary committee (Final report research parliamentary enquiry TBS, 2006) to provide more insight into factors related to reoffending risk.

7.3 Limitations of the research

The research described in this book was part of a pioneering study into the relevance of social relations to the functioning of forensic psychiatric in-patients. Because of the lack of prior theoretical and empirical information on this topic, the main aim of the research was to provide basic empirical insight into this association. The investigations undertaken jointly in this research succeeded in establishing the importance of social relationships to risk-related functioning of forensic in-patients with PDs. Although this is an important first step, a more profound translation of the results into suggestions for interventions in treatment practice would be desirable.

Because the data was collected in only five units of patients with homogeneous crime and personality features in only one forensic hospital, the potential to generalize the research findings is limited. The composition of units may differ between forensic centers, and may influence the social context and behavior. Patients with similar characteristics might, for instance, prefer and strive for similar social positions, while patients with divergent characteristics might take on diverse social roles more naturally. The degree to which group composition influences research outcomes is not clear.

The relatively small sample of patients in the research population caused some statistical power difficulties. The network analyses had to deal with many dependencies between units and patients, and many variables had to be studied because of the broad nature of the study. In view of statistical power considerations, common parameter values were assumed for the five patients groups to minimize the total number of estimated parameters.

The investigations in this book only considered social interactions between patients on the same unit. Social interactions with, for instance, sociotherapists on the patient's unit, other individuals in the facility outside the unit, or people in the outside world were disregarded. Some of these interactions might be substitutes for social interaction with patients on the unit, and could affect interaction between patients and/or their treatment process. No information about these kinds of interactions was gathered.

Patients' risk-related functioning was established on the basis of an existing risk assessment instrument, selecting only those factors assumed to be changeable, and therefore called dynamic. Risk assessment instruments were developed to predict the chance that a patient will reoffend in the future. In spite of empirically established associations between factors and actual recidivism, many assessments can still be false positives (patients who do not reoffend, contrary to the assessment-based expectation) or false negatives (patients who did reoffend, contrary to the assessment-based expectation). Actual risk-related behavior of patients was established only with limited accuracy. Bias in these assessments can of course influence the research outcomes.

The social relationships of patients were assessed by sociotherapists working on the units. This seemed to be a good way of collecting data. Patients themselves were expected to provide biased information, since occasionally it might be more convenient for them or might seem in their interest to do so. However, in treatment practice it can also be in the patient's interest to manipulate the perception of sociotherapists. Thus it is possible that relationships are sometimes perceived by sociotherapists in ways that differ from the actual situation. To minimize bias, the relationships were assessed by all sociotherapists on the unit and a consensus network was established based on a rule of overlap between the assessments. Despite this, some patients may have been able to manipulate the perceptions of most of the team of sociotherapists, which then would have caused bias.

The research made no distinction between influence exerted on purpose by patients to achieve preconceived goals and influence as a result of their impulsive and disruptive behavior. For a thorough interpretation of some research findings, it seems important to make this distinction in future research.

The study into the social relationships of the diverse PDs used the categorical diagnoses of patients' PDs. Dimensional models have been proposed recently because of co-morbidity as well as the poor convergent and discriminant validity of this diagnostic method. Dimensional models express the distinct PDs in groups of behavioral domains, which allows for better comparison of the disorders. In the present study the inter-relatedness of characteristics was not sufficiently clear beforehand. Another restriction in this study were the low numbers of some PDs in the population, which placed restrictions on testing some of the hypotheses.

7.4. Recommendations for future research

This research provides first empirical evidence for the importance of social relationships to risk-related functioning in forensic psychiatric in-patients. In forensic practice it is important how these findings should be interpreted, and how well they can translate into possibilities for monitoring therapy and treatment interventions. Important questions include 'Should units be composed of patients with the homogenous characteristics or mixed groups of patients?' and 'How to intervene in patient relationships during the treatment process for the benefit of treatment outcomes?' Before these questions can be answered, the robustness and generalizability of the findings must first be established. The social relationships of patients in other forensic psychiatric centers, and among more and more diversely composed patient groups should also be investigated.

The assessment of social relationships of patients through social network analysis seemed to make a positive contribution to the sociotherapists' professionalism. Their assessment activated a process of awareness of the social context and stimulated them to examine more conscientiously the social relationships of individual patients. It is recommended to make the assessment of social relations a regular part of the forensic practice of sociotherapists. Data from these assessments could also be used in new research into the robustness and generalization of findings of the current research.

Because of the potential importance of social relationships with individuals other than patients on the unit, future research should also focus on interactions between patients and sociotherapists, individuals outside the patient unit and outside the closed setting. A first initiative to study the social relationships of patients with people outside the unit setting started recently, using forensic social networks analysis (FSNA) (Spren, Pomp & Vermeulen, 2006; Pomp & Bogaerts, 2008). Both research lines, those focusing on the

internal social relationships and those focusing on patients' external relationships can be linked. This will make it possible to investigate the relatedness between these distinct forms of patient social interaction. It will also indicate the degree to which relationships in the closed setting are indicative for the social relationships of an individual in a less restricted situation.

In the present study the risk-related functioning of patients was based on measures for the prediction of a patient's likelihood to reoffend. Future research could also focus on the association between social interaction and actual recidivism, and its characteristics, of forensic patients released from incarceration.

Although events occurring between the patient's time of release from the forensic center and the recidivism could play a prominent role in the relapse of these individuals, understanding their social interaction patterns may contribute to a more thorough explanation of recidivism behavior. To establish a more direct association between social relationships and treatment results, social relationships of patients should also be related to the effects of specific treatment and therapeutic interventions.

Samenvatting en conclusies

(Summary and conclusion in Dutch)



Samenvatting

Dit proefschrift beschrijft onderzoek naar sociale relaties en netwerken van forensische psychiatrische patiënten, een factor waarvan in algemene zin gebleken is dat deze belangrijk is voor individueel gedrag en welzijn en waarvan wordt aangenomen dat deze tevens belangrijk is in de verklaring van risico-gerelateerd gedrag van deze patiëntengroep. Eerst zal per hoofdstuk van dit proefschrift een samenvatting worden gepresenteerd. In aparte tekstblokken wordt enige achtergrondinformatie gegeven. Verder worden achtereenvolgens de algemene conclusie van het onderzoek, de beperkingen en suggesties voor vervolgonderzoek gepresenteerd.

Het Nederlandse strafrecht kent de maatregel 'terbeschikkingstelling' (TBS), die kan worden opgelegd aan plegers van zware delicten welke hun niet volledig kunnen worden toegerekend vanwege het bestaan van een psychische stoornis ten tijde van het delict en waarvoor tevens een aanzienlijke kans bestaat dat de persoon zal vervallen in herhaald delictgedrag. Psychologische behandeling, die veelal wordt uitgevoerd in een forensisch psychiatrisch centrum (fpc), is gericht op het terugbrengen van het risico-gerelateerd gedrag met als primaire doelstelling maatschappijbeveiliging. Verschillende ernstige incidenten met (ex) TBS-gestelden vormden in 2004 aanleiding voor het instellen van een parlementair onderzoek dat inzicht diende te geven in de vraag waarom de maatregel in zijn huidige vorm niet in staat bleek om de samenleving te beschermen tegen deze groep psychisch gestoorde daders. Dit onderzoek leidde tot verscheidene aanbevelingen die vandaag de dag nog steeds leidend zijn in de forensische psychiatrische beleidsvorming. De aanbevelingen benadrukten onder meer de noodzaak tot het verkrijgen van meer inzicht in de effectiviteit van de TBS-maatregel, evenals een vergroot inzicht in die factoren die samenhangen met recidiverisico.

Hoofdstuk 1: Inleiding

Al geruime tijd wordt aangenomen dat sociale verbondenheid invloed heeft op het gedrag en welzijn van individuen in algemene zin. Het belang van sociale contacten voor delinquent gedrag, dat wordt verondersteld in diverse criminologische theorieën (zie Hirschi, 1969; Sutherland & Cressey, 1955), wordt ondersteund door uitkomsten van empirisch onderzoek (zie bijvoorbeeld Haynie, 2001, 2002). Forensische psychiatrische patiënten zijn delinquenten die zeer ernstige delicten hebben gepleegd ten gevolge van zware psychopathologie. De psychiatrische problematiek van de grootste forensische psychiatrische subgroep, bestaand uit patiënten met een persoonlijkheidsstoornis (80%, De Beurs & Barendregt, 2008), wordt verondersteld van relationele aard te zijn (American Psychiatric Association, 1994, 2000). Voor het aanpassingsgedrag dat door de institutionele context van individuen in een gesloten setting wordt gevraagd (Clemmer, 1940), evenals voor het omgaan met het leed dat gepaard gaat met opsluiting (Sykes

& Messenger, 1960), blijken sociale relaties eveneens van groot belang. Omdat TBS-gestelden verblijven op afdelingen met een relatief klein aantal personen, van wie zij voor praktisch alle levensgebieden afhankelijk zijn, is de verwachting dan ook dat sociale relaties en functioneren van deze groep patiënten met elkaar verband houden.

Het is verbazingwekkend dat er, ondanks het algemeen onderkende belang van sociale relaties voor gedrag en welzijn, weinig onderzoek is verricht naar de specifieke sociale interactiepatronen van forensische psychiatrische patiënten. Om hier meer zicht op te krijgen is het onderhavige onderzoek gewijd aan het verband, cross-sectioneel en over de tijd, tussen sociale relaties/netwerken en risico-gerelateerd gedrag van forensische psychiatrische patiënten met persoonlijkheidsstoornissen die verblijven in een forensisch psychiatrisch ziekenhuis.

Voor het verkrijgen van inzicht in de sociale relaties van TBS-gestelden is in dit onderzoek gebruikgemaakt van Sociale Netwerkanalyse (SNA). Deze benadering presenteert patronen van sociale interactie in termen van 'punten' (in dit onderzoek staat elk punt voor een forensische psychiatrische patiënt) en 'lijnen' (deze kunnen bestaan uit diverse soorten van sociale relaties) tussen deze punten. Een breed scala aan soorten sociale relaties is meegenomen, voornamelijk gebaseerd op de sociale ruilbenadering. De overkoepelende soorten sociale relaties in deze benadering bestaan uit kameraadschap, emotionele steun en instrumentele steun. Deze soorten relaties zijn in het onderzoek meegenomen in de meer concrete vorm van contactfrequentie, negatieve relatie (vijandige en onplezierige relatie), positieve relatie (vriendschap en vriendelijke relatie) en instrumentele relatie (onderscheiden in materieel en relationeel instrumenteel gebruik). Vanwege de veronderstelde prominente rol van invloeds- en hiërarchische relaties binnen persoonlijkheidspathologie voor het sociale leven in gesloten forensische omgevingen, zijn deze relaties tevens in dit onderzoek meegenomen.

Hoofdstuk 2: De toepassing van sociale netwerkanalyse in een forensisch psychiatrisch centrum

Voor het verkrijgen van inzicht in de mogelijkheden om sociale relaties van patiënten die verblijven in een fpc (forensisch psychiatrisch centrum) specifiek in kaart te brengen, en om inzicht te verkrijgen in de bijdrage van deze methode voor de behandelpraktijk, is een pilot-onderzoek uitgevoerd. Deze studie diende voornamelijk als achtergrondinformatie voor de vervolgstudies en voor het verkrijgen van exploratief inzicht in de samenhang tussen de sociale relaties en enkele individuele en groepeigenschappen. Hiervoor zijn de positieve/negatieve, instrumentele en invloedsrelaties van patiënten op een afdeling van seksueel delinquenten ($N = 13$) en een afdeling met patiënten met borderline persoonlijkheidsstoornis (BPS) ($N = 11$) in kaart gebracht middels Sociale Netwerkanalyse.

De sociotherapeuten werkzaam op deze afdelingen hebben voor deze studie de sociale relaties van patiënten beoordeeld. De bruikbaarheid van deze manier om sociale relaties van patiënten in kaart te brengen, bleek uit de mogelijkheid om relationele verschillen van de patiëntgroepen inzichtelijk te maken, zowel op groeps- als op individueel niveau.

Verschillen binnen de patiëntgroepen werden onder andere vastgesteld door variaties in het aantal onderhouden invloed-, positieve en instrumentele relaties door patiënten. In de vergelijking van de twee afdelingen bleek dat de patiënten op de afdeling met de seksueel delinquenten voornamelijk positieve relaties onderhielden, terwijl borderline patiënten meer extremiteit lieten zien in de aard van hun interactie resulterend in zowel vriendschap als vijandigheid. Extremiteit in relationeel gedrag is congruent met de pathologische eigenschappen van individuen met een borderline persoonlijkheid, zoals aan de ene kant impulsiviteit en zwart-witdenken en aan de andere kant verlatingsangst en gebrek aan zelfvertrouwen, waardoor de uitkomsten in de lijn der verwachting lagen. De over het algemeen genomen vriendelijke interactie en afwezigheid van vijandigheid bij de groep seksueel delinquenten is tekenend voor de conflictvermijdende houding van deze groep patiënten (die voornamelijk bestaat uit patiënten met parafilieën zoals pedofilie). Op beide afdelingen werden subgroepen van positief interacterende patiënten met homogene eigenschappen onderscheiden, zoals overeenkomstige etnische achtergrond of overeenkomstig institutioneel verleden. De meest opvallende bevinding ten aanzien van de vastgestelde subgroepen betrof de scheiding van de seksueel delinquenten in twee subgroepen, namelijk die met een volwassen slachtoffer of (ook) een niet-seksueel delict, en een groep die seksuele delicten hadden gepleegd waarbij minderjarige slachtoffers betrokken waren. Deze scheiding bleek eveneens van hiërarchische aard te zijn, waarin de groep van pedofiele daders de laagste posities bezetten en patiënten behorende bij de andere groep de hogere posities. Deze bevinding gaf een verdere onderverdeling aan binnen een groep patiënten die in institutionele omgevingen als totale groep doorgaans de laagste hiërarchische positie bekleedt.

Verder bleek er een verschil te zijn tussen de wijze waarop patiënten van de beide afdelingen anderen instrumenteel inzetten. Hoewel de mate van instrumentele inzet min of meer hetzelfde was, bleken borderline patiënten groepsgenoten voornamelijk instrumenteel in te zetten voor het materiële gewin dat hun dit opleverde, terwijl seksueel delinquenten dit voornamelijk voor relationele doeleinden deden, zoals voor bescherming, status en vermaak. Bij seksueel delinquenten werd verder een grotere veelzijdigheid in relaties vastgesteld. In de BPS-populatie werd voornamelijk overlap geconstateerd in positieve, sociale steun- en vertrouwensrelaties, wat geïnterpreteerd kon worden als authentieke 'gezonde' sociale interactie. De grote samenhang tussen positieve, sociale steun- en instrumentele relaties op de seksueeldelinquentenafdeling daarentegen, werd

geïnterpreteerd als oppervlakkigheid in de interpersoonlijke omgang van deze groep patiënten.

Naast de inhoudelijk interessante resultaten van de studie ten aanzien van sociale relaties, werd de methodologische bevestiging van de waarde van Sociale Netwerkanalyse voor het vaststellen van relevante verschillen tussen groepen forensische patiënten gezien als de hoofdconclusie van deze studie.

In het meewerken van sociotherapeuten aan het onderzoek werd een belangrijke aanvullende waarde voor het therapeutisch proces gevonden. Deze therapeuten gaven aan dat deelname aan het onderzoek een proces van bewustwording had geactiveerd in het beschouwen van de sociale relaties op de afdeling, waardoor zij het gedrag van patiënten meer in de relationele context gingen bezien. Dit had bijgedragen aan professionalisering van de beoordeling van (relationeel) gedrag van deze populatie in het dagelijkse werk. De (h)erkenning van de netwerkfiguren van de sociale relaties tussen patiënten op de afdeling door therapeuten zorgde voor een eerste basis van de validatie van de methode. Hiernaast verschaftte deze informatie een gedetailleerder en meer verklarend beeld ten aanzien van relationele omgang tussen patiënten dan wat therapeuten observeren in de dagelijkse praktijk. Twee gepleegde interventies, waarbij patiënten mede op basis van netwerkinformatie uiteindelijk zijn overgeplaatst naar andere afdelingen, zijn hier illustratief voor.

Recapitulerend bleek Sociale Netwerkanalyse bruikbaar om gedegen inzicht te krijgen in de sociale netwerken op de patiëntenafdelingen en hierdoor een goed instrument om in te zetten in het verdere onderzoek. Verder bleken uitkomsten op basis van deze benadering te kunnen bijdragen aan interventies gedurende het behandelproces.

Hoofdstuk 3: Relationele patronen en netwerken van forensische psychiatrische patiënten met persoonlijkheidsstoornissen die verblijven in een forensisch psychiatrisch centrum

Hoofdstuk 3 beschrijft een studie naar relationele patronen van forensische patiënten met persoonlijkheidsstoornissen gedurende hun verblijf in een fpc. De grootste groep forensische psychiatrische patiënten lijdt aan persoonlijkheidsstoornissen, waarvan verondersteld wordt dat dit stoornissen van relationele aard zijn. In de klinische beschrijving en diagnostische criteria van veel persoonlijkheidsstoornissen nemen interpersoonlijke eigenschappen een centrale plaats in. De aard van deze eigenschappen variëren tussen de diverse varianten persoonlijkheidsstoornissen. Ondanks de interpersoonlijke eigenschappen van deze stoornissen, worden persoonlijkheidsstoornissen doorgaans beschreven in termen van biologische oorsprong, ontwikkelingsstoornissen of intrapersoonlijke beperkingen, in plaats van interpersoonlijke terminologie. Tradities waarin systematisch onderzoek is verricht naar interpersoonlijke

aspecten van persoonlijkheidsstoornissen, zoals het interpersoonlijk circumplex en het Vijf Factoren Model, hebben rijke klinische, theoretische en empirische fundamenten voor de samenhang vastgesteld. Dit heeft echter niet geleid tot inzicht in de daadwerkelijke relationele patronen van personen met deze stoornissen. Deze patronen zouden uitingen van deze stoornissen gedetailleerder kunnen weergeven en wellicht mogelijkheden voor interventies expliciteren. Om meer zicht te krijgen op de samenhang tussen relationele patronen en gedrag gerelateerd aan persoonlijkheidsstoornissen, werden in deze studie de sociale relaties van patiënten op vijf patiëntenafdelingen voor persoonlijkheidsstoornissen ($N = 59$) onderzocht. De studie bestond enerzijds uit een beschrijvende studie van de sociale relaties van de patiënten op deze afdelingen, die waren samengesteld op basis van homogene delict- of persoonlijkheidskarakteristieken: 1) seksueel delinquenten, 2) narcistische persoonlijkheidsstoornis, 3) middelenmisbruikstoornis, 4) pervasieve ontwikkelingsstoornis en 5) borderline persoonlijkheidsstoornis. Anderzijds zijn in deze beschrijvende studie ook de meest voorkomende psychiatrische stoornissen meegenomen.

Patiënten op de seksueeldelinquentenafdeling bleken voornamelijk positieve en praktisch geen negatieve relaties te onderhouden. De positieve sociale omgang van deze patiënten bleek hiernaast relatief sterk verband te houden met de instrumentele inzet van andere patiënten. Deze uitkomsten bevestigden verwachtingen ten aanzien van de rationele en conflictvermijdende aard van deze populatie, evenals de verwachtingen ten aanzien van oppervlakkige sociale omgang.

Op de afdeling met patiënten met narcistische persoonlijkheidsstoornis werden in tegenstelling tot de verwachting relatief veel positieve en weinig invloedsrelaties vastgesteld. Deze bevindingen werden toegeschreven aan de (homogene) samenstelling van deze groep van individuen. De uiting van narcisme wordt veelal gezien als een afweermechanisme met als doel het omgaan met onderliggende gevoelens van minderwaardigheid. In een alledaagse situatie kan dit mechanisme wellicht effectief zijn, maar in een situatie met allemaal individuen met soortgelijke eigenschappen kan dit als provocerend gedrag worden opgevat, en vervolgens afgestraft. Dit kan een reden zijn waarom deze patiënten 'kozen' voor een meer rationele en conflictvermijdende benadering, resulterend in meer positieve en minder invloedsrelaties.

Patiënten op de middelenmisbruikafdeling onderhielden een gemiddeld aantal positieve en minder dan gemiddeld aantal negatieve relaties. Deze bevinding was indicatief voor het verwachte (goede) sociale vaardigheidsniveau. Hiernaast bleken deze patiënten de relaties met andere patiënten vaker dan gemiddeld in te zetten voor het, voornamelijk materiële, voordeel dat dit opleverde. De instrumentele inzet werd in de meeste gevallen geïnitieerd door patiënten met de meeste invloed, en was overigens

niet gebaseerd op angst. Deze bevindingen bleken typerend voor de minder impulsieve en goed doordachte overwegingen van deze patiënten bij hun keus van te beïnvloeden personen.

Patiënten met pervasieve ontwikkelingsstoornis bleken beduidend minder sociale contacten te hebben. Voor zover er contact was, was dit veelal van negatieve aard en was er sprake van relatief veel onderlinge invloed. Het kleine aantal hiërarchische relaties op deze afdeling gaf aan dat deze invloed niet bewust werd uitgeoefend, maar meer voortkwam uit storend gedrag van deze patiënten dat het afdelingsklimaat verstoorde.

Deze bevindingen waren in overeenstemming met de verwachte lagere contactfrequentie en de afwezigheid van diepergaande relaties voor deze groep patiënten.

Voor patiënten op de borderline afdeling bleek de contactfrequentie hoog en werden er, zoals verwacht, meer (materieel) instrumentele relaties vastgesteld. Omdat de meeste eigenschappen van de borderline persoonlijkheidsstoornis echter gerelateerd zijn aan instabiliteit over de tijd, konden andere relationele patronen die typerend zijn voor deze groep niet worden vastgesteld in deze cross-sectionele studie.

Het hierboven samengevatte beschrijvende deel van de studie heeft bijgedragen aan de formulering van de hypothesen voor het tweede deel van de studie. Dit tweede deel bestond uit de empirische studie naar het verband tussen sociale relaties van patiënten en verschillende persoonlijkheidsstoornissen. De volgende diagnoses van persoonlijkheidsstoornissen/trekken volgens de categorische classificatie van de DSM-IV zijn hierin meegenomen: paranoïde, schizoïde, schizotypisch (cluster A), antisociale, borderline, theatrale, narcistische (cluster B), ontwijkend, afhankelijke en obsessief-compulsieve (cluster C) persoonlijkheidsstoornissen. Verbanden zijn getoetst door middel van 'Exponential Random Graph Modeling' (ERGM). Voornamelijk voor de cluster B en C persoonlijkheidsstoornissen zijn effecten gevonden. Patiënten met antisociale en narcistische persoonlijkheidsstoornissen bleken meer vijandige/onplezierige relaties met andere patiënten te onderhouden. Individuen met antisociale en afhankelijke persoonlijkheidsstoornis bleken hiernaast andere patiënten meer instrumenteel in te zetten, voornamelijk voor relationele doeleinden. Patiënten met antisociale persoonlijkheidsstoornis beïnvloedden meer andere patiënten, en patiënten met ontwijkende en obsessief-compulsieve persoonlijkheidsstoornissen waren minder vatbaar voor invloed van anderen.

Het kleine aantal patiënten met bepaalde persoonlijkheidsstoornissen, zoals de schizoïde en schizotypische persoonlijkheidsstoornissen, beperkte de statistische 'power' om te testen voor eventuele relationele effecten voor deze stoornissen.

De reden waarom geen bevestiging werd gevonden voor hypothesen met betrekking tot de contactfrequentie, kan te maken hebben met de institutionele context waarin de

patiënten verkeren. Hierin kunnen zij zich nauwelijks aan contact onttrekken of andere patiënten negeren. Ondanks zowel de eerdergenoemde statistische 'power' kwestie, de omgevingsbeperkingen van patiënten en het feit dat DSM-IV-diagnosen te kampen hebben met problemen zoals overmatige comorbiditeit en onvoldoende dekking van de verschillende persoonlijkheidsstoornissen, gaven de in het onderzoek gevonden verbanden toch goed inzicht in de relationele patronen van patiënten met diverse persoonlijkheidsstoornissen. En hiermee in de relationele aard van deze stoornissen.

Hoofdstuk 4: Het meten van het risico-gerelateerd functioneren van forensische psychiatrische patiënten

In hoofdstuk 4 is de ontwikkeling van een meetinstrument voor het vaststellen van het risico-gerelateerd functioneren van forensische patiënten beschreven. Omdat de hoofddoelstelling van de TBS-maatregel bestaat uit de beveiliging van de samenleving, is de recidive van patiënten een belangrijke maat geweest in onderzoek naar effecten van de maatregel (bijvoorbeeld Van Emmerik 1981, 1984, 1985, 1989; Leuw, 1995, 1999; Canton, 2004; Wartna, Harbachi & Knaap, 2005; Bregman & Wartna, 2010; Keune & Van Binsbergen, 2010). In dit soort onderzoek is informatie ten aanzien van de soort en ernst van recidive, evenals inzicht in eigenschappen van deze patiënten echter niet direct gerelateerd aan (ontwikkelingen in) het behandelproces. Specifieker inzicht in de effectiviteit van behandeling vraagt om onderzoek naar de mate waarin specifieke therapeutische doelen zijn bereikt, zoals een afname van bepaalde psychiatrische symptomen (zie bijvoorbeeld Greeven & De Ruiter, 2004; Caldwell, McCormick, Umstead & Van Rybroek, 2007). Hiervoor dient echter een 'evidence base' van specifieke interventies en behandelprogramma's te worden opgebouwd door middel van wetenschappelijk onderzoek (de Beurs & Barendregt, 2008). Onderzoek naar behandelinterventies is echter nog niet of nauwelijks voorhanden en de bruikbaarheid hiervan voor inzicht in de effectiviteit van de TBS-maatregel als geheel, is beperkt. De *voorspelling* van het risico op recidive *gedurende* het behandelproces lijkt hierom momenteel de beste optie.

In het kader van het onderhavig promotieonderzoek is hiervoor een meetinstrument ontwikkeld dat in eerste instantie gebaseerd is op een bestaand risicotaxatie-instrument. De meest gebruikte risicotaxatie-instrumenten bestaan uit risicofactoren waarvan een deel onveranderlijk en een ander deel veranderlijk over de tijd wordt verondersteld. Omdat slechts die factoren in het behandelproces relevant zijn waar gedurende het behandelproces in geïntervenieerd kan worden, zijn alleen de veranderlijk veronderstelde factoren in het onderzoek betrokken.

Het meetinstrument dat is ontwikkeld voor het onderzoek is gebaseerd op de klinische dynamische (d.w.z. veranderlijk veronderstelde) factoren van het risicotaxatie-instrument dat is ontwikkeld voor de Nederlandse populatie forensische patiënten, de HKT-30.

Om ervoor te zorgen dat deze factoren zo adequaat mogelijk konden worden vastgesteld, was voor de meeste een schaal ontwikkeld. De items van deze schalen waren gebaseerd op de definities en beschrijvingen van deze factoren. In een pilot-onderzoek dat op twee patiëntenafdelingen is gehouden (een afdeling met seksueel delinquenten en een afdeling van patiënten met borderline persoonlijkheidsstoornis) is voor 41 patiënten een vragenlijst afgenomen bij de sociotherapeutische mentoren van deze patiënten. Op basis van de opmerkingen van respondenten in combinatie met de analyse van de items, is een definitieve vragenlijst van 29 items ontwikkeld. Deze bestond uit 9 risicofactoren die gemeten werden door middel van 26 schaalitems en 3 originele HKT-30 items, elk bestaande uit één enkel item. Voor deze laatste items bleek het niet mogelijk om een gedegen schaal te ontwikkelen. Hiernaast zag het ernaar uit dat het ene item per risicofactor voorzag in genoeg informatie.

Voor onderzoek naar het risico-gerelateerd functioneren van forensische patiënten zijn gedurende drie keer ($N = 78$) data verzameld op de volgende vijf patiëntenafdelingen van patiënten met homogeen delict of persoonlijkheidstrekken: 1) seksueel delinquenten, 2) narcistische persoonlijkheidsstoornis, 3) middelenmisbruikstoornis, 4) pervasieve ontwikkelingsstoornis, 5) borderline persoonlijkheidsstoornis.

De interbeoordelaarsbetrouwbaarheid van het functioneren van patiënten, beoordeeld door zowel de mentor van de patiënt op de afdeling als de behandelcoördinator, bleek aanvaardbaar. De verschillen in het scoren tussen beide groepen professionals werden geïnterpreteerd als elkaar aanvullende observaties van het functioneren van de patiënt in een verschillende context (de sociotherapeuten in de context van de dagelijkse routine op de afdeling en de behandelcoördinator voor slechts een aantal uren buiten de context van de patiëntenafdeling). De interbeoordelaarsbetrouwbaarheid voor het totaal van de schaalitems bleek bevredigend.

De psychometrische kwaliteiten van de schalen bleken goed. De unidimensionele eigenschappen van de schalen bleken sterk en de betrouwbaarheid van de schalen redelijk tot sterk. Een principale-componentenanalyse uitgevoerd op de gezamenlijk schaalitems en de drie HKT-30 items, liet een 3-factorstructuur van domeinen zien die konden worden geïnterpreteerd als 1) probleembesef, 2) impulscontrole en 3) vaardigheden. Deze factoren corresponderden met essentiële domeinen (respectievelijk: karakter, temperament en vaardigheden) in de voornaamste behandelbenadering van forensische psychiatrische patiënten met persoonlijkheidsstoornissen, namelijk de cognitieve gedragstherapie.

Volgens de cognitieve gedragsbenadering manifesteren problemen van patiënten met persoonlijkheidsstoornissen zich in het karakter en het temperament van een individu. Het karakter van een persoon beïnvloedt zijn/haar overtuigingen, kijk op de wereld, de toekomst en de eigen persoon, terwijl het temperament verwijst naar aangeboren, genetische en constitutionele invloeden van persoonlijkheid waarin impulsiviteit en agressie belangrijke elementen zijn.

Behandeling van persoonlijkheidsstoornissen vereist aanpassing van karakter en ombuiging van het temperament van de patiënt.

Zowel klinische ervaring (Beck, Freeman & Associates, 1990; Davidson, 2008) als onderzoek (Linehan, 1993; Bienenfeld, 2007) stelt dat de aanpassing van het temperament veranderingen in het karakter van een individu mogelijk moet maken. Veel patiënten met persoonlijkheidsstoornissen hebben echter gebrek aan basisvaardigheden (Stanley, Bundy & Beberman, 2001), hetgeen vaak leidt tot stress of zelfs agressief gedrag. Behandeling is daarom in eerste instantie gericht op het aanleren van basale (relationele) vaardigheden en ombuiging van gedereguleerd temperament. Dit heeft als doel te bevorderen dat een patiënt toekomt aan therapeutische verandering gericht op de karakterdimensie van de stoornis.

Het onderlinge verband tussen de domeinen probleembesef, impulscontrole en vaardigheden bleek relatief sterk (correlaties variërend van $r = .52$ tot $r = .66$). De verbanden bleken bijna even sterk tussen de domeinen op eenzelfde tijdstip als voor een bepaald domein over de tijd. De unidimensionaliteit van alle items van een bepaald domein bleek redelijk tot goed voor alle herhaaldelijke metingen. Alle items van de domeinen bleken verder betrouwbare schalen.

De ontwikkeling in het risico-gerelateerd gedrag van patiënten op de verschillende afdelingen is onderzocht met herhaalde metingen-analyse. Hiervoor zijn de patiënten beschouwd die deelnamen aan alle drie de metingen. Veranderingen over de tijd werden alleen vastgesteld voor het vaardigheidsdomein. Opmerkelijk was dat het gemiddeld risicogedrag van patiënten gerelateerd aan vaardigheden bleek toe te nemen. De grootste verschillen tussen afdelingen bleken zich te manifesteren op de afdeling van patiënten met een narcistische persoonlijkheidsstoornis. Deze lieten relatief meer risico-gerelateerd gedrag zien met betrekking tot vaardigheden en impulscontrole. De resultaten van deze analyses zijn echter van toepassing op slechts een selecte groep patiënten en betreffen alleen de gemiddelde situatie op deze afdelingen. Voor onderzoek naar het verband tussen sociale relaties en risico-gerelateerd gedrag van patiënten is daarentegen voornamelijk het verschil tussen individuen en veranderingen bij individuen over de tijd van belang.

Hoofdstuk 5: Sociale interactie gerelateerd aan het functioneren van TBS-patiënten in een forensisch psychiatrisch centrum

In hoofdstuk 5 is de eerste studie naar het verband tussen sociale relaties en risico-gerelateerd gedrag beschreven. Het betrof een cross-sectionele studie naar de associatie van aan de ene kant de positieve, instrumentele en invloedsrelaties en aan de andere kant de risico-gerelateerde gedragsdomeinen probleembesef, impulscontrole en vaardigheden. De onderzoekspopulatie voor deze studie bestond uit patiënten van vijf afdelingen voor patiënten die behandeld werden voor persoonlijkheidsstoornissen ($N = 60$). Ondanks het algemeen erkende belang van sociale relaties voor (delinquent) gedrag en mentaal welbevinden, was er geen eerder onderzoek verricht naar relationele patronen van forensische psychiatrische patiënten op gesloten afdelingen. Informatie over sociale netwerkpatronen van patiënten en de inhoud van deze relaties zouden, zoals werd verondersteld in deze studie, kunnen voorzien in gedetailleerde informatie over (relationeel) gedrag. Dit zou belangrijke aanvullende informatie kunnen opleveren naast informatie over gedrag zoals wordt verstrekt door de traditionele psychodiagnostiek.

De relationele informatie over patiënten was voor deze studie verzameld aan de hand van beoordelingen van sociotherapeuten die werkzaam waren op de afdeling. Deze relaties zijn in kaart gebracht op basis van sociale netwerkanalyse. Alle therapeuten op de afdeling beoordeelden voor elke relatie soort de relaties tussen alle patiëntparen. De informatie omtrent het risico-gerelateerd gedrag van patiënten werd verzameld aan de hand van het meetinstrument dat is omschreven in hoofdstuk 4.

De consensusnetwerken van de verschillende soorten relaties werden gerelateerd aan de drie domeinen van risico-gerelateerd gedrag die waren onderscheiden in de principale-componentenanalyse van hoofdstuk 4: probleembesef, impulscontrole en vaardigheden. Voor het testen van de veronderstelde verbanden is net zoals bij de analyses in hoofdstuk 3 gebruikgemaakt van 'Exponential Random Graph Modeling' (ERGM) in de programmatuur SIENA.

Voor alle drie de functioneringsdomeinen werden verbanden gevonden met sociale relaties van patiënten. Patiënten met meer probleembesef bleken meer positieve relaties met anderen te onderhouden, net als patiënten die betere controle over hun impulsen hadden. Patiënten met betere impulscontrole bleken daarnaast minder instrumentele en invloedsrelaties te onderhouden en werden minder beïnvloed door andere patiënten. Vaardiger patiënten werden vaker positief benaderd door andere patiënten, maar werden hiernaast ook vaker instrumenteel ingezet en oefenden meer invloed uit op anderen.

De sterkste verbanden werden, algemeen genomen, vastgesteld voor de risico-gerelateerde domeinen van vaardigheids- en impulscontrole, wat de belangrijkste domeinen zijn voor directe behandelinterventies.

Deze studie voorzag in een eerste inzicht in het verband tussen relationele netwerken en functioneringsvariabelen in termen van risico-gerelateerd gedrag van forensische patiënten. Er werd een duidelijk verband aangetoond tussen gedrag en netwerken van opgesloten patiënten. Inzicht in deze verbanden zou vruchtbaar kunnen blijken voor verbeteringen van behandelingen evenals voor een betere inschatting van het risico op terugval in delictgedrag.

Hoofdstuk 6: De co-evolutie van sociale relaties en risico-gerelateerd gedrag van forensisch psychiatrische patiënten die verblijven in een forensisch psychiatrisch centrum

In deze studie is de onderling afhankelijke ontwikkeling onderzocht van sociale relaties en risico-gerelateerd gedrag van forensische patiënten die verblijven in een fpc. Voor deze studie is de associatie tussen dezelfde sociale relaties (positief, instrumenteel en invloed) en domeinen van risico-gerelateerd gedrag (probleembesef, impulscontrole en vaardigheden) als uitgangspunt genomen als in hoofdstuk 5, alleen dit keer in een longitudinale onderzoeksopzet. Informatie ten aanzien van zowel sociale relaties als de risico-gerelateerde gedragsdomeinen werd gedurende drie keer verzameld op dezelfde vijf patiëntenafdelingen als beschreven in hoofdstuk 4 ($N = 78$), met steeds ongeveer een half jaar tussen elke meting. Het longitudinaal design van deze studie maakte het mogelijk om onderscheid te maken tussen selectie (het vormen en afbreken van relaties op basis van gedragseigenschappen van patiënten) en invloed (aanpassingen in gedrag op grond van gedragseigenschappen van interactiepartners) in de associatie tussen sociale relaties en risico-gerelateerd gedrag.

Voor de longitudinale analyses zijn 'stochastic actor-oriented models' gebruikt om invloed en selectie gelijktijdig te kunnen vaststellen, zoals geïmplementeerd in het programma SIENA.

Patiënten met weinig impulscontrole bleken voor het onderhouden van positieve relaties voornamelijk andere patiënten te selecteren die eveneens over weinig impulscontrole beschikten, terwijl patiënten met veel controle over impulsen voornamelijk anderen voor positieve omgang selecteerden met eveneens veel impulscontrole. Meer vaardige patiënten lieten een tendens zien waarin zij meer dan gemiddeld andere patiënten selecteerden om positieve relaties mee te onderhouden. Patiënten die positieve relaties onderhielden met patiënten die over het algemeen vaardiger waren, bleken zelf ook vaardiger te worden. Patiënten met meer vaardigheden werden vaker uitgekozen door andere patiënten voor instrumentele doeleinden.

In het bijzonder bleken patiënten met weinig impulscontrole andere patiënten instrumenteel in te zetten. Patiënten met meer probleembesef bleken vaker beïnvloed te worden door andere patiënten, en met name patiënten met vergelijkbare mate van

probleembesef beïnvloedden elkaar. Patiënten met minder impulscontrole werden meer beïnvloed, maar bleken tegelijkertijd ook zelf meer patiënten te beïnvloeden. Patiënten die werden beïnvloed door patiënten met gemiddeld meer vaardigheden bleken zelf ook vaardiger te worden.

Algemene conclusie

In dit onderzoek staat de associatie, cross-sectioneel en over de tijd, tussen sociale relaties/netwerken en risico-gerelateerd gedrag van forensische psychiatrische patiënten met persoonlijkheidsstoornissen die verblijven in een fpc, centraal.

Hiervoor is ten eerste de relationele aard van de stoornissen van de meest prominente groep forensische patiënten, patiënten met persoonlijkheidsstoornissen, onderzocht. Ondanks beperkingen in de beschikbare diagnostische informatie en gebrek aan statistische 'power' vanwege het kleine aantal patiënten met sommige persoonlijkheidsstoornissen, bleken uitkomsten van het onderzoek de verwachtingen omtrent de associatie tussen stoornis en sociale relaties voor een breed scala aan persoonlijkheidsstoornissen te bevestigen. Dit ondersteunt de veronderstelde relationele aard van persoonlijkheidsstoornissen zoals wordt geïllustreerd door de definitie van deze stoornis: *een chronische verstoring in de relatie met zichzelf, anderen en de omgeving resulterend in nood of falen bij het vervullen van sociale rollen en verplichtingen* (American Psychiatric Association, 1994, 2000), en benadrukt de noodzaak om beperkingen van de patiënt te bezien in de sociale context.

Ten tweede is de associatie tussen sociale relaties en risico-gerelateerd functioneren van patiënten onderzocht. Voor alle drie de domeinen van risico-gerelateerd gedrag, namelijk probleembesef, impulscontrole en vaardigheden, werden er associaties met sociale relaties vastgesteld. Deze verbanden werden voornamelijk vastgesteld voor de domeinen impulscontrole en vaardigheden. Deze bevindingen stemmen overeen met de hiërarchische ordening van de componenten binnen de cognitieve gedragstherapeutische benadering in de behandeling, waarin interventies in eerste instantie gericht zijn op een mogelijk gebrek aan basisvaardigheden van patiënten. De aanwezigheid van basisvaardigheden kan mogelijk veranderingen in de persoonlijkheidsdimensie temperament, en hieraan gerelateerde impulscontrole, activeren. Het bijsturen van temperament moet uiteindelijk leiden tot mogelijkheden voor een patiënt om te komen tot therapeutische veranderingen gericht op de karakterdimensie, zoals het probleembesef van de patiënt. De resultaten van het onderzoek laten een duidelijk verband zien tussen gedrag en sociale relaties en netwerken van patiënten in een gesloten setting. In het bijzonder de gedragsdomeinen waarin het best therapeutisch valt te interveniëren, namelijk vaardigheden en impulscontrole, bleken verband te houden met sociale relaties. Het cognitieve domein van functioneren, zoals probleembesef, en veranderingen hierin

vragen naar alle waarschijnlijkheid om meer intensieve en specifiekere gerichte interventies binnen het behandelproces, zoals bijvoorbeeld psychotherapie.

Ten derde is de co-evolutie van sociale relaties en risico-gerelateerd gedrag van forensische psychiatrische patiënten die in een fpc verblijven, onderzocht. De longitudinale opzet van de studie maakte het mogelijk selectie-effecten (de keuze voor interactiepartners wordt gebaseerd op eigenschappen van deze individuen) en invloedseffecten (gedrag van een individu wordt aangepast op basis van gedrag van interactiepartners) van elkaar te onderscheiden. Verreweg de meeste van de vastgestelde effecten betroffen selectie.

Voor alle drie de gedragsdomeinen probleembesef, impulscontrole en vaardigheden werden effecten vastgesteld, waarvan de meeste en sterkste voor vaardigheden en impulscontrole.

Involedseffecten werden alleen vastgesteld voor gedrag gerelateerd aan vaardigheden. Zowel de cross-sectionele als de longitudinale studie lieten grote overeenkomst in uitkomsten zien, hetgeen een positieve aanwijzing geeft voor de robuustheid van de conclusies. Beide studies stelden hoofdzakelijk effecten vast tussen sociale relaties en de gedragsgerelateerde domeinen van impulscontrole en vaardigheden.

Voor de behandelpraktijk kunnen de resultaten als volgt worden vertaald: Van de gedragsdomeinen (probleembesef, impulscontrole en vaardigheden) blijken voornamelijk de vaardigheden en impulscontrole van patiënten van belang in de selectie van individuen voor sociale omgang. Aangezien deze gedragsdomeinen gerelateerd zijn aan het risicogedrag zou men, op basis van de resultaten van het onderzoek, kunnen stellen dat het onderhouden van bepaalde soorten relaties er op kan duiden dat het met een patient niet goed gaat. Toenemend risicogedrag wordt verwacht in het geval dat patiënten minder positieve relaties met anderen onderhouden (risico gerelateerd aan vaardigheden), meer instrumentele relaties met anderen onderhouden (risico gerelateerd aan impulscontrole), meer instrumenteel worden ingezet door anderen (risico gerelateerd aan vaardigheden), meer invloedsrelaties mee worden onderhouden door anderen (risico gerelateerd aan probleembesef en risico gerelateerd aan impulscontrole) en er meer invloedsrelaties onderhouden worden met anderen (risico gerelateerd aan impulscontrole).

Afgezien van het belang van deze gedragskenmerken voor de selectie van interactiepartners, blijken bepaalde relaties van belang voor de daadwerkelijke aanpassing van dit risicogedrag van patiënten. Invloedsrelaties en positieve interactie met patiënten met goede vaardigheden blijken de kans op risicogedrag over de tijd terug te brengen (minder risico-gerelateerde vaardigheden).

Wanneer therapeuten die werken op de afdelingen merken dat bepaalde patiënten minder positieve relaties onderhouden met anderen, wellicht vanwege een gebrek aan vaardigheden, kan dit een reden zijn om deze patiënten nauwlettender te volgen.

Deze patiënten zouden hiernaast bijvoorbeeld door therapeuten gemotiveerd kunnen worden om contacten te leggen met meer vaardige patiënten (dit kan bijvoorbeeld ook worden gedaan in een vooropgezette en geësceneerde setting). Patiënten die (sociaal) vaardiger zijn, zullen vanwege deze eigenschappen wellicht eerder het afwijkende gedrag van de patiënt zien in de context van zijn beperking en dit daardoor eerder tolereren. De patiënt zou door omgang met vaardiger patiënten kunnen leren en hierdoor zijn eigen vaardigheidsniveau verhogen. Dit zou kunnen bijdragen aan mogelijkheden van deze patiënt om toekomstige contacten positiever vorm te geven en meer copingvaardigheden op te bouwen die uiteindelijk kunnen bijdragen aan het terugbrengen van de kans op terugval in delictgedrag.

Therapeuten zouden verder patiënten die meer dan gemiddeld contacten met anderen onderhouden puur voor het materiële en/of het relationele voordeel, nauwlettender moeten volgen. Deze personen houden veelal weinig rekening met de consequenties van dit relationele gedrag voor zowel diegene die instrumenteel wordt ingezet als voor het behandelperspectief van de patiënt zelf. Omdat, zoals uit de resultaten blijkt, voornamelijk vaardiger personen instrumenteel worden ingezet, kunnen therapeuten extra aandacht hebben voor eventuele negatieve invloeden voor deze patiënten waarmee het (tenminste ten aanzien van vaardigheden) relatief goed gaat. De extra vaardigheden stellen deze patiënten echter wellicht in staat om zich beter te verweren tegenover eventuele negatieve invloed door instrumenteel gebruik. Om instrumentele inzet door patiënten terug te brengen zouden therapeuten misschien de consequenties van hun gedrag inzichtelijk kunnen maken.

Wanneer blijkt dat patiënten sterk worden beïnvloed door anderen kan dit ook een indicatie zijn voor therapeuten om deze patiënten nauwlettender te volgen. Beïnvloeding kan een patiënt kwetsbaar maken omdat zijn/haar gedrag sterk afhankelijk is van situationele factoren in plaats van interne controle. Dit maakt een positieve beoordeling van gedrag op een bepaald moment onbetrouwbaar als voorspelling voor de langere termijn (waarin omgevingsfactoren weer kunnen zijn veranderd). Deze ontvankelijkheid voor invloed kan bijvoorbeeld worden veroorzaakt door druk van andere patiënten, maar is hiernaast ook vastgesteld als een effect van verminderde impulscontrole. Deze patiënten geven zich sneller over aan de grillen van andere patiënten. Behandeling van deze patiënten zou zich moeten toeleggen op het vergroten van ego-sterkte van de patiënt evenals het vergroten van de mogelijkheden om consequenties van hun gedrag te overzien.

Ook in het geval dat een patiënt veel invloed op andere patiënten uitoefent, kan dit een indicatie zijn dat deze patiënt wellicht nauwlettender in de gaten gehouden moet worden. Echter, resultaten voornamelijk ten aanzien van invloed vragen om nadere specificatie. Zo kan men zich voorstellen dat niet zozeer de invloed op zichzelf van belang is, maar meer specifiek de aard van deze invloed. Meer vaardige patiënten kunnen bijvoorbeeld andere

patiënten beïnvloeden met het oog op het bereiken van een vooropgezette doelstelling. Aan de andere kant kunnen patiënten met impulsief gedrag veel invloed uitoefenen door storend gedrag op de afdeling, wellicht onbewust of onbedoeld. Het lijkt daarom van belang om (beter dan in dit onderzoek is gebeurd) onderscheid te maken tussen vormen van invloed.

De bevindingen dat patiënten met meer probleembesef meer beïnvloed blijken te worden en vaardiger patiënten meer instrumenteel ingezet worden door andere patiënten, zouden kunnen duiden op een toename in relationele kwetsbaarheid bij patiënten waarmee het beter dan gemiddeld gaat ten aanzien van risicogedrag. In de behandelpraktijk zouden deze patiënten beschermd moeten worden tegen potentiële slechte invloeden op het behalen van behandeldoelen en overige stagnatie in de behandelvoortgang.

Samenvattend kan worden gesteld dat het onderhavig onderzoek een eerste bewijs levert voor het bestaan van het verband tussen persoonlijkheidspathologie en interactiepatronen van forensische psychiatrische patiënten die aan persoonlijkheidsstoornissen lijden. Aangezien bij deze personen de TBS-maatregel is opgelegd voor acting out gedrag dat veroorzaakt wordt door dit soort psychopathologie, werd tevens verwacht dat hun risicogedrag samenhangt met de manier waarop zij relaties onderhouden met anderen. Deze verwachting is inderdaad door dit onderzoek bevestigd. Omdat het in dit onderzoek beschouwde risicogedrag uit criminogene factoren bestond, wat factoren zijn die samenhangen met risico voor recidive, werd ook een eerste inzicht verschaft in de mogelijke samenhang tussen interactiepatronen van patiënten en hun kans op recidive. Op deze wijze heeft dit onderzoek een bescheiden bijdrage geleverd aan de sterke aanbeveling van de parlementaire commissie TBS (Eindrapport onderzoek parlementaire enquête TBS, 2006) om meer inzicht te krijgen in de factoren die samenhangen met recidiverisico van deze groep patiënten.

Beperkingen van het onderzoek

De gepresenteerde studies in dit proefschrift zijn onderdeel van een pioniersonderzoek naar de relevantie van sociale relaties voor het functioneren van forensische psychiatrische patiënten die verblijven in een fpc. Omdat zowel theoretische als empirische informatie over dit onderwerp ontbraken, was het voornaamste doel van dit onderzoek om een eerste empirische basis te leggen voor dit verband. De studies die tezamen zijn uitgevoerd hebben inderdaad daadwerkelijk het belang vastgesteld van sociale relaties voor het risicogerelateerd gedrag van forensische psychiatrische patiënten die verblijven in een fpc. Dit is een belangrijke eerste stap. Een betere vertaling van de resultaten naar suggesties voor interventies in de behandelpraktijk zou echter wenselijk zijn.

Omdat de data zijn verzameld op vijf patiëntenafdelingen waar patiënten verblijven met homogene delict- en persoonlijkheidskenmerken in slechts één forensisch ziekenhuis, is de generaliseerbaarheid van de onderzoeksbevindingen beperkt. De samenstelling van patiëntenafdelingen kan verschillen tussen fpc's en deze samenstelling kan de sociale context en daarmee het gedrag van patiënten beïnvloeden. Patiënten met overeenkomstige eigenschappen kunnen bijvoorbeeld een voorkeur hebben voor en streven naar gelijke sociale posities, wat conflicten kan opleveren, terwijl in een groep van patiënten met diverse eigenschappen sociale rollen op een meer natuurlijke manier worden ingenomen. De mate waarin de groepssamenstelling de onderzoeksuitkomsten heeft beïnvloed, is nog onduidelijk.

De relatief kleine steekproef van patiënten in de onderzoekspopulatie leidde tot wat problemen in de statistische 'power'. Binnen de netwerkanalyses diende te worden omgegaan met veel afhankelijkheden tussen afdelingen en patiënten. Hiernaast dienden vanwege de brede opzet van de studie veel variabelen bestudeerd te worden. Om hier zo veel mogelijk statistische 'power' te behouden zijn voor de vijf patiëntenafdelingen gemeenschappelijke parameter verondersteld om het totale aantal te schatten parameters zo klein mogelijk te houden.

In de studies in dit proefschrift zijn slechts de onderlinge sociale relaties van patiënten op de afdeling beschouwd. Sociale interacties van patiënten met bijvoorbeeld sociotherapeuten die op de afdeling werken, met andere individuen in het instituut of met personen buiten de instelling, zijn in het onderzoek niet meegenomen. Deze contacten zouden een substituuut kunnen zijn voor sociale interactie van patiënten op de afdeling. In dit onderzoek is geen informatie meegenomen over dit soort contacten.

Het risico-gerelateerd gedrag van patiënten is vastgesteld aan de hand van risicofactoren van een veelgebruikt risicotaxatie-instrument, waarvan voor het onderzoek slechts de veranderbaar veronderstelde 'klinische' factoren zijn gebruikt. Risicotaxatie-instrumenten zijn ontwikkeld om de kans in te schatten dat een patiënt in de toekomst zal vervallen in delictgedrag. Ondanks vastgestelde verbanden tussen deze factoren en daadwerkelijke recidive van patiënten, kan er in de inschattingen sprake zijn van vals positieven (patiënten die hoewel dit wordt verwacht niet terugvallen in delictgedrag) en vals negatieven (patiënten die vervallen in delictgedrag hoewel dit niet was verwacht op basis van de taxatie). Het daadwerkelijke risico-gerelateerd gedrag is daarom binnen het onderzoek slechts met beperkte nauwkeurigheid vastgesteld, hetgeen invloed kan hebben gehad op onderzoeksresultaten.

Verder zijn de sociale relaties van patiënten ingeschat door sociotherapeuten die werkten op de afdelingen. Dit bleek een goede manier voor het verzamelen van gegevens voor dit onderzoek. Patiënten zelf zouden naar alle waarschijnlijkheid vooringenomen informatie hebben verstrekt, aangezien ze in sommige gevallen kunnen vermoeden dat

dit in hun belang zou zijn. Maar ook in de behandelpraktijk kan het in het belang van de patiënt zijn om de perceptie van de sociotherapeut te beïnvloeden. Hierdoor kan het zijn dat relaties van patiënten in sommige gevallen anders zijn waargenomen dan deze in werkelijkheid zijn. Om deze mogelijke verstoring te minimaliseren zijn de relaties ingeschat door alle therapeuten op de afdeling en is op basis van een regel voor overlap in deze inschattingen een 'consensusnetwerk' vastgesteld. Desondanks is het niet uit te sluiten dat sommige patiënten in staat zijn geweest om de perceptie van meerdere teamleden te manipuleren, waardoor toch vertekening is ontstaan.

In de studie naar het verband tussen sociale relaties en persoonlijkheidsstoornissen zijn categorische diagnoses van persoonlijkheidsstoornissen van de patiënten gebruikt. Vanwege comorbiditeit evenals het beperkte vergelijkend en onderscheidend vermogen van deze manier van diagnosticeren, zijn er onlangs voorstellen gedaan om te gaan werken met dimensionale modellen. In deze dimensionale modellen worden de verschillende persoonlijkheidsstoornissen uitgedrukt in groepen van gedragsdomeinen, hetgeen vergelijking van de verschillende persoonlijkheidsstoornissen beter mogelijk maakt. In het huidige onderzoek was de onderlinge associatie van eigenschappen van tevoren onvoldoende bekend. Een andere beperking was het kleine aantal patiënten met bepaalde persoonlijkheidsstoornissen, wat de mogelijkheid van het testen van bepaalde hypothesen bemoeilijkte.

Aanbevelingen voor vervolgonderzoek

Het onderhavige onderzoek voorziet in het eerste empirische bewijs voor het belang van sociale relaties voor het risico-gerelateerd functioneren van forensische psychiatrische patiënten die verblijven in een fpc. Voor de forensische behandelpraktijk is het belangrijk om te weten hoe deze bevindingen moeten worden geïnterpreteerd en hoe deze vertaald kunnen worden naar mogelijkheden in het beoordelen van patiënten en het plegen van constructieve interventies in de behandeling van deze patiënten. Belangrijke vragen hierin zouden kunnen zijn: 'Zouden patiëntenafdelingen moeten worden samengesteld met patiënten met dezelfde eigenschappen of zouden deze meer gemengd moeten zijn?' en 'Hoe kan er ten tijde van het behandelproces in sociale relaties worden geïntervenieerd ten behoeve van behandeluitkomsten?' Voordat dergelijke vragen kunnen worden beantwoord moeten eerst de robuustheid en de mate waarin bevindingen kunnen worden gegeneraliseerd, worden vastgesteld middels breder opgezet onderzoek.

De beoordeling van de sociale relaties van patiënten door sociotherapeuten middels sociale netwerkanalyse bleek, als neveneffect, positief bij te dragen aan de professionalisering van deze beroepsgroep. Het beoordelen activeerde een proces van bewustwording van de sociale context van patiënten en stimuleerde hen om sociale relaties van individuen nauwgezet te volgen. Het wordt daarom aanbevolen om de

beoordeling van sociale relaties regulier onderdeel te maken van het werk van deze groep forensisch werkers. De beoordelingsgegevens zouden hiernaast kunnen worden gebruikt voor de studie naar de robuustheid en generaliseerbaarheid van bevindingen.

Vanwege het potentiële belang van sociale relaties van patiënten met andere individuen dan medepatiënten op de afdeling, zou toekomstig onderzoek zich ook moeten richten op contacten van patiënten met sociotherapeuten, individuen buiten de afdeling en personen buiten de gesloten instelling. Een eerste initiatief in het bestuderen van sociale relaties van patiënten met personen buiten de forensische setting is onlangs gestart met de methode van Forensische Sociale Netwerkanalyse (FSNA) (Spreen, Pomp & Vermeulen, 2006; Pomp & Bogaerts, 2008). Beide onderzoeklijnen ten aanzien van sociale relaties van patiënten, de lijn die zich richt op de sociale relaties tussen patiënten binnen de instelling en de lijn die zich richt op externe relatie van patiënten, zouden in de toekomst mogelijk kunnen worden verbonden. Dit maakt het mogelijk om de associatie van deze twee soorten van sociale contacten van patiënten te onderzoeken. Daarnaast geeft dit inzicht in de mate waarin de relaties van een patiënt binnen de gesloten setting indicatief zijn voor de sociale relaties die deze persoon onderhoudt in een situatie waarin hem minder beperkingen zijn opgelegd.

In het huidige onderzoek was het risico-gerelateerd functioneren van patiënten gebaseerd op een maat voor de voorspelling van de kans op terugval in delictgedrag. Toekomstig onderzoek zou zich hiernaast ook kunnen richten op de associatie tussen sociale relaties en daadwerkelijke recidive van forensische patiënten na ontslag. Hoewel gebeurtenissen gedurende de tijd dat een patiënt in de gelegenheid is om te recidiveren een grote invloed kunnen hebben op het komen tot nieuw delictgedrag, zouden sociale interactiepatronen van deze patiënten wellicht kunnen bijdragen aan een grondiger verklaring van recidivegedrag.

Voor het verkrijgen van zicht op de meer directe associatie tussen sociale relaties en behandelresultaten, dienen sociale relaties tevens gerelateerd te worden aan de effecten van specifieke therapeutische interventies.

Appendices



Appendix 1. Network measures of various relations on the BPD and SO units

	Influence				Positive relation				Negative relation				Instrumental relation			
BPD	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc
Patient 1	1	10	1.00	0.04	4	2	0.11	0.05	1	1	0.12	0.00	4	0	0.09	0.00
Patient 2	4	1	0.15	0.00	4	1	0.12	0.02	0	1	0.09	0.00	2	1	0.26	0.00
Patient 3	1	5	0.32	0.00	3	3	0.13	0.04	0	0	0.09	0.00	2	1	0.26	0.00
Patient 4	1	4	0.62	0.00	1	1	0.11	0.00	0	0	0.09	0.00	3	7	0.32	0.25
Patient 5	3	3	0.16	0.04	3	3	0.13	0.03	0	2	0.14	0.00	3	7	0.32	0.20
Patient 6	3	0	0.09	0.00	3	2	0.13	0.02	0	0	0.09	0.00	1	1	0.26	0.00
Patient 7	1	1	0.12	0.00	2	1	0.11	0.00	0	0	0.09	0.00	0	1	0.26	0.00
Patient 8	6	2	0.11	0.10	1	2	0.26	0.00	3	1	0.12	0.17	4	4	0.29	0.21
Patient 9	2	1	0.10	0.00	0	0	0.09	0.00	3	2	0.13	0.25	0	0	0.09	0.00
Patient 10	3	1	0.10	0.02	1	5	0.30	0.05	0	0	0.09	0.00	3	2	0.24	0.00
Patient 11	3	0	0.09	0.00	0	2	0.14	0.00	0	0	0.09	0.00	3	1	0.24	0.00
SO	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc	Idc	Udc	Cc	Bc
Patient 1	1	8	0.31	0.13	4	4	0.31	0.20	0	1	0.09	0.00	4	4	0.48	0.12
Patient 2	3	3	0.24	0.00	4	4	0.36	0.41	0	0	0.08	0.00	3	4	0.40	0.11
Patient 3	3	4	0.24	0.01	3	3	0.30	0.00	0	1	0.09	0.00	4	4	0.50	0.10
Patient 4	3	4	0.27	0.11	3	3	0.30	0.00	1	1	0.08	0.00	4	4	0.50	0.10
Patient 5	0	0	0.07	0.00	2	2	0.34	0.16	0	0	0.08	0.00	1	0	0.07	0.00
Patient 6	1	6	0.14	0.08	6	6	0.38	0.28	0	0	0.08	0.00	7	6	0.57	0.74
Patient 7	2	0	0.07	0.00	2	1	0.24	0.13	0	0	0.08	0.00	2	2	0.50	0.15
Patient 8	2	2	0.13	0.08	4	3	0.32	0.00	0	0	0.08	0.00	2	1	0.38	0.00
Patient 9	0	0	0.07	0.00	0	5	0.55	0.00	0	0	0.08	0.00	1	2	0.46	0.00
Patient 10	4	2	0.09	0.02	1	4	0.32	0.00	3	1	0.08	0.02	4	4	0.57	0.45
Patient 11	6	0	0.07	0.00	6	4	0.32	0.31	0	0	0.08	0.00	1	2	0.39	0.00
Patient 12	1	0	0.07	0.00	5	3	0.32	0.00	0	0	0.08	0.00	1	2	0.39	0.00
Patient 13	3	0	0.07	0.00	7	5	0.36	0.25	0	0	0.08	0.00	2	1	0.38	0.00

Idc In-degree centrality

Udc Out-degree centrality

Cc Closeness centrality

Bc Betweenness centrality

Appendix 2. Overview of five-factor model domains and related facets

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Facets	Anxiousness	Warmth	Fantasy	Trust	Competence
	Angry hostility	Gregariousness	Aesthetics	Straightforwardness	Order
	Depressiveness	Assertiveness	Feelings	Altruism	Dutifulness
	Self-consciousness	Activity	Actions	Compliance	Achievement striving
	Impulsiveness	Excitement seeking	Ideas	Modesty	Self-discipline
	Vulnerability	Positive emotions	Values	Tenderness	Deliberation

Appendix 3. Models based on backward selection for contact frequency, positive, negative, instrumental and influence relations

Contact frequency (based on backward model selection)

Effect	PE	SE
Reciprocity	**4.08	0.48
Alternating out-k-stars	-0.55	0.43
Alternating in-k-stars	-0.77	0.45
Alternating independent two-paths	0.13	0.19
Alternating k-triangles	**0.66	0.18
Schizoid/Schizotypal PD/out-ties (H2/H3)	-6.00	fixed
Dependent PD/out-ties (H6)	0.48	0.38

Table A3.1. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of contact frequency. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Positive relations (based on backward model selection)

Effect	PE	SE
Reciprocity	**2.31	0.36
Alternating out-k-stars	-0.23	0.31
Alternating in-k-stars	-0.31	0.30
Alternating independent two-paths	-0.09	0.08
Alternating k-triangles	**0.78	0.18

Table A3.2. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the positive relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Negative relations (based on backward model selection)

Effect	PE	SE
Reciprocity	**5.12	1.02
Alternating out-k-stars	0.65	0.89
Alternating in-k-stars	0.70	0.84
Alternating independent two-paths	0	fixed
Alternating k-triangles	0	fixed
Antisocial PD/out-ties (H8)	*1.22	0.60
Narcissistic PD/out-ties (H10)	*0.83	0.44

Table A3.3. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the negative relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Instrumental relation (relational) (based on backward model selection)

Effect	PE	SE
Reciprocity	*1.88	0.73
Alternating out-k-stars	-0.73	0.58
Alternating in-k-stars	-0.49	0.54
Alternating independent two-paths	**-.086	0.34
Alternating k-triangles	**1.65	0.43
Antisocial PD/out-ties (H14)	**1.01	0.41
Dependent PD/out-ties (H16)	*1.20	0.62
Obsessive/comp. PD out-ties (H18)	-4.00	fixed

Table A3.4. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the relational instrumental relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Influence relation (based on backward model selection)

Effect	PE	SE
Reciprocity	**0.99	0.46
Alternating out-k-stars	**0.63	0.25
Alternating in-k-stars	*-0.54	0.30
Alternating independent two-paths	**-.095	0.14
Alternating k-triangles	**1.08	0.22
Antisocial PD/out-ties (H21)	*0.15	0.08
Avoidant PD/in-ties (H24)	*-0.35	0.20
Obsessive/comp. PD in-ties (H26)	*-0.97	0.49

Table A3.5. Parameter estimates (PE) and standard errors (SE) of ERGM analysis of the influence relation network. †: $p < .10$; *: $p < .05$; **: $p < .01$ (one-sided).

Appendix 4. Questionnaire for establishing risk-related functioning in forensic patients



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for
Social Science Theory and Methodology

Introduction

This questionnaire is part of research into the social relationships of forensic psychiatric patients and the association of these relationships with their risk-related functioning. This comprehensive research aims at the group of therapeutic treated patients with personality disorders in FPC Dr. S. van Mesdag. Over a period of one and a half years, data about the social relationships as well as data related to the individual patients' risk-related functioning will be collected for 3 times. By measuring on several occasions, changes in social interactions and functioning of the patient can be monitored. Besides, the association between social relations and the functioning of patients can be established with these data. Aim of the research is to increase insight in those factors directly related to the success of TBS treatment.

What can you expect in this questionnaire?

The questionnaire is divided into two parts, A and B. **Part A** consist of three items of the HKT-30, a risk assessment instrument. These items must be evaluated by marking the pre-described category *with the highest value* (values are numbered from 0 to 4) *applicable to the patient* (it is possible that categories with lower values are also applicable to the patient, but the highest value indicates the most severe condition).

In **part B** of the questionnaire, more specific formulated statements related to the personal risk-related characteristics of the patient are presented. The degree of agreement with the described situation has to be evaluated (with a number from 0 to 4, corresponding with the answers 'totally agree' to 'totally disagree') for the individual patient.

All questions have to be evaluated according to the recent situation of the patient (not more than most recent half year).

The research group wants -perhaps superfluously- to emphasize that information collected for this research will be treated strictly confidential. Only researchers of the research group can examine the filled in questionnaires. Results will not be presented on an individual level and anonymity of respondents will be guaranteed!

Further, we of course want to thank you for filling in the questionnaire and for your participation in this research!

With kind regards, the research group,

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B. Völker

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Questionnaire part A

Instruction: In this first part of the questionnaire please check the box that matches the *the highest scoring answer* applicable to the patient being evaluated. Please check one box only per theme!

Self-management skills

- 4 The patient has shortcomings, leading to serious problems for own health or safety or the health and safety of patients' surrounding
- 3 The patient has shortcomings, leading to problems with his surrounding
- 2 The patient has shortcomings, not leading to problems with his surrounding
- 1 The patient has to a limited extent shortcomings in his autonomy
- 0 The patient has no problems related to his autonomy

Responsibility for the offence

- 4 The patient completely denies the offence or his participation in it
- 3 The patient shows a superficial attitude or acts distant related to the offence, trivializes consequences of the offence and has an attitude of denial
- 2 The patient partly takes responsibility and conceals oneself behind accomplices or circumstances
- 1 The patient largely recognizes responsibility for the committed offences
- 0 The patient fully recognizes and does take responsibility for the committed offence

Coping skills

- 4 Insufficient or inadequate coping skills, with considerable chance of destabilization and the development of a chronic feeling of anger
- 3 Insufficient or primarily inadequate coping skills
- 2 Little coping skills, probably sufficient to deal with present circumstances
- 1 The patient has sufficient adequate coping skills, in case of long lasting problems there are some doubts about patients' stability
- 0 The patients has sufficient adequate coping skills

Questionnaire part B

Instruction: In this second part of the questionnaire please rate how closely the statements listed under each theme (see section headings) agree with the patient being evaluated. Please circle one answer for each statement (4 = 'totally agree' to 0 = 'totally disagree'). If in doubt, please circle the answer that comes closest to the actual situation.

Insight into problems

Evaluate the agreement with the following statements...

	4. Totally agree				
	3. Partly agree				4
	2. Neutral			3	4
	1. Partly disagree		2	3	4
	0. Totally disagree	1	2	3	4
1. The patient has insight into his own mental processes	0	1	2	3	4
2. The patient has insight into the association of his mental processes and his behavior	0	1	2	3	4
3. The patient has the ability to actually adjust behavior as a result of mental processes, in case this is necessary	0	1	2	3	4
4. The patient is aware of his problematic behavior	0	1	2	3	4
5. The patient shows awareness of the presence of psychiatric symptoms as well as how these symptoms influence his behavior	0	1	2	3	4

Impulsivity

Evaluate the agreement with the following statements...

4. Totally agree

3. Partly agree

2. Neutral

1. Partly disagree

0. Totally disagree

1. The patient shows unpredictable and inconsiderate behavior	0	1	2	3	4
2. The patient is directed toward immediate satisfaction	0	1	2	3	4
3. The patient does not consider the possible consequences of his behavior	0	1	2	3	4
4. The patient regularly (in frequency) expresses uncontrolled rage and anger	0	1	2	3	4

Empathy

Evaluate the agreement with the following statements...

4. Totally agree

3. Partly agree

2. Neutral

1. Partly disagree

0. Totally disagree

1. The patient has the ability to put himself in another's place	0	1	2	3	4
2. The patient expresses the intention to apologize toward others when necessary	0	1	2	3	4
3. The patient makes justified consideration of interests	0	1	2	3	4
4. The patient expresses the intention to sympathize with the needs of others	0	1	2	3	4
5. The patients expresses the intention to adjust behavior, taking into account opinions and feelings of others	0	1	2	3	4

Hostility

Evaluate the agreement with the following statements...

4. Totally agree

3. Partly agree

2. Neutral

1. Partly disagree

0. Totally disagree

1. The patient frequently attributes hostile motives towards others	0	1	2	3	4
2. The patient regularly expresses passive aggression	0	1	2	3	4
3. The patient regularly expresses cynicism and irritations	0	1	2	3	4
4. The patient frequently expresses severe forms of verbal aggression	0	1	2	3	4

Social relational skills

Evaluate the agreement with the following statements...

4. Totally agree

3. Partly agree

2. Neutral

1. Partly disagree

0. Totally disagree

1. The patient is able to maintain contact with others in an acceptable and adequate way	0	1	2	3	4
2. The patient has adequate communicative skills at his disposal	0	1	2	3	4
3. The patient knows when contact is provocative, offending, or positive	0	1	2	3	4
4. The patient is assertive in contact with others in an appropriate way	0	1	2	3	4
5. The patients shows basic verbal and non-verbal skills for managing daily life	0	1	2	3	4

Attitude towards treatment

Evaluate the agreement with the following statements...

4. Totally agree

3. Partly agree

2. Neutral

1. Partly disagree

0. Totally disagree

1. The patient cooperates with treatment and participates in therapy	0	1	2	3	4
2. The patient has an open attitude towards different insights and contact strategies	0	1	2	3	4
3. The patient accepts the issue of rules in the forensic hospital	0	1	2	3	4

Space for additional remarks and/or suggestions:

Appendix 5. Rules followed in the choice of longitudinal models

Rules

- A)** The model with the following specification was used as starting point (see figure on the right).
- B)** Out-degree, reciprocity, transitive triplets, 3-cycles, and linear and squared tendency effects were always kept in the model.
- C)** Up to and including step D, all effects established in the study reported in Chapter 5 were kept in the model. For positive relationships: problem awareness ego, and skills alter. For influence relations: impulse control ego, impulse control alter and skills ego. For instrumental relationships: impulse control ego, and skills alter.
- D)** Effects that had a t-ratio of less than 0.5 were dropped stepwise from the model.
- E)** Effects that had a t-ratio of less than 0.5 (now also allowed to drop non-significant average alter effect) were dropped stepwise from the model.

Network effects
Out-degree (density)
Reciprocity
Transitive triplets
3-cycles
In-degree – popularity (sqrt)
Out-degree – popularity (sqrt)
Out-degree – activity (sqrt)
Network dynamics
Problem awareness ego
Problem awareness alter
Problem awareness similarity
Skills ego
Skills alter
Skills similarity
Impulse control ego
Impulse control alter
Impulse control similarity
Behavior dynamics
Linear shape problem awareness
Quadratic shape problem awareness
Average alter problem awareness
In-degree problem awareness
Out-degree problem awareness
Linear shape skills
Quadratic shape skills
Average alter skills
In-degree skills
Out-degree skills
Linear shape impulse control
Quadratic shape impulse control
Average alter impulse control
In-degree skills
Out-degree skills
Cross-effects:
Effect of problem awareness on skills
Effect of problem awareness on impulse control
Effect of skills on problem awareness
Effect of skills on impulse control
Effect of impulse control on problem awareness
Effect of impulse control on skills
Control variables
Average degree of problem awareness on units
Average degree of skills on patient units
Average degree of impulse control on units

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‘Lucky I am in love with my best friend’

Ruud van der Horst
Groningen, oktober 2011

Curriculum vitae



Ruud van der Horst was born in Leiderdorp, the Netherlands on October 15, 1975. After completing secondary school in 1996, he studied Social Work at the Hanze University Groningen. For this study he worked one year as sociotherapist with TBS-ordered patients with personality disorders, and graduated in 2000. From September 2000 to February 2003 he studied Sociology at the University of Groningen and graduated with a thesis on research into the work experiences of sociotherapists working in a forensic psychiatric center (FPC). From 2003 to September 2005 he worked as researcher at FPC Dr. S. Van Mesdag and as a staff member for the civil legal services in Groningen. From September 2005 to December 2009 he conducted research for his PhD project 'Network effects on treatment results in a closed forensic psychiatric setting' at the University Center for Social Science Theory and Methodology (ICS), which was partly financed by FPC Dr. S. Van Mesdag. Since January 2010 he has been working as a researcher at the Scientific Research and Documentation Center of the Ministry of Security and Justice (WODC), conducting research into the TBS measure.

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