OFFENDERS WITH MENTAL HEALTH PROBLEMS AND PROBLEMATIC SUBSTANCE USE: TREATMENT INTERVENTIONS AND CRIME RELAPSE

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To all offenders with mental health problems and problematic substance use in Sweden and elsewhere: In the hope that this work in some way will do you good.
ABSTRACT

Background: The relationships between problematic substance use, mental health problems and criminal behavior have been firmly established in research. Offenders with mental health problems and concurrent problematic substance use have high risk of reoffending and may display low rates of treatment retention. The overall aim of this thesis was to explore treatment needs, treatment participation and crime relapse among Swedish offenders with mental health problems and problematic substance use.

Methods: The studies composing this thesis were part of the larger ongoing prospective follow-up project: Mental Disorder, Substance Abuse and Crime (MSAC) \((n = 207)\) including offenders with mental health problems and problematic substance use in Stockholm County. Data from the baseline assessment and follow-up assessments of the MSAC-project were analyzed, as well as data gathered from Swedish registers and semi structured in-depth interviews. The participants were followed for approximately three years. Both quantitative and qualitative methodological approaches were used.

Results: The following main findings emerged: (1) Participation in planned substance abuse outpatient visits was associated with a significantly reduced risk of criminal recidivism in the study population. (2) Higher scores of the Antisocial Psychopathy Checklist-Revised (PCL-R) facet and membership of a subgroup described as “Triply troubled with medical problems” were associated with an increased risk of criminal recidivism. (3) The Affective PCL-R facet was negatively related with participation in planned outpatient substance abuse visits and dry housing residence. (4) Among participants with various degrees of psychopathic personality traits, there were more similarities than differences in perceptions of substance abuse treatment. However, participants with a low degree of such traits stated that control requirements in treatment were rather manageable; whereas those with a high degree of psychopathic personality traits expressed that those requirements were difficult to fulfill. (5) All participants of the four previously defined subgroups/clusters of the study population showed improvements with regard to problem severity over the course of time, but the improvements were cluster-specific rather than sample specific. Cluster membership could also predict treatment participation and quality of life. (6) The Alcohol Use Disorders Identification Test (AUDIT) and the Drug Use Disorders Identification Test (DUDIT) showed reliability and concurrent validity in screening for substance dependence of alcohol and illicit drugs, as well as problem severity with regard to alcohol, drugs and illegal areas.

Conclusions: Among offenders with mental health problems and problematic substance use, participation in planned outpatient substance abuse interventions should be considered important from a clinical risk management perspective, and be encouraged. Some personality traits as well as subgroup membership (based on specific problem profiles) could be considered in order to individualize treatment planning and improve outcomes. In order to identify problematic substance use, the AUDIT and the DUDIT questionnaires could be used.
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<tr>
<td>AA</td>
<td>Alcoholics Anonymous</td>
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<tr>
<td>ACT</td>
<td>Assertive Community Treatment</td>
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<td>ANOVA</td>
<td>Analysis of variance</td>
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<td>APA</td>
<td>American Psychiatric Association</td>
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<td>ASI</td>
<td>Addiction Severity Index</td>
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<td>ASI-6</td>
<td>Addiction Severity Index, 6th version</td>
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<td>AUC</td>
<td>Area Under the Curve</td>
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<td>AUDIT</td>
<td>the Alcohol Use Disorders Identification Test</td>
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<td>CA</td>
<td>Cocaine Anonymous</td>
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<td>CAPP</td>
<td>Comprehensive Assessment of Psychopathic Personality</td>
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<td>CBT</td>
<td>Cognitive Behavior Therapy</td>
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<td>CI</td>
<td>Confidence Interval</td>
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<td>Community Reinforcement Approach</td>
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<td>DBT</td>
<td>Dialectic Behavior Therapy</td>
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<td>DSM</td>
<td>Diagnostic and Statistical Manual of Mental Disorders</td>
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<td>DSM-5</td>
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<tr>
<td>DUDIT</td>
<td>the Drug Use Disorders Identification Test</td>
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<td>ECA</td>
<td>Epidemiological Catchment Area</td>
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<td>FPA</td>
<td>Forensic Psychiatric Assessment</td>
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<td>HCR-20</td>
<td>Historical Clinical Risk-Management scale</td>
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<td>ICD</td>
<td>International Statistical Classification of Diseases and Health Related Problems</td>
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<td>ICD-10</td>
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<td>IPA</td>
<td>Interpretative Phenomenological Analysis</td>
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<td>MSAC</td>
<td>Mental Disorder, Substance Abuse and Crime</td>
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<td>OR</td>
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<td>RNR</td>
<td>Risk, Needs and Responsivity</td>
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<td>SCAN</td>
<td>Schedules for Clinical Assessment in Neuropsychiatry</td>
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<td>TriPM</td>
<td>Triarchic Psychopathic Measure</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WHOQOL-BREF</td>
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1 INTRODUCTION

In recent years in Sweden, several violent offenses committed by individuals with mental disorders have attracted a great deal of media attention. The debate on the relationship between mental disorder and violent criminality is not unique to Sweden, and has engaged policy makers, service providers as well as researchers both nationally and internationally (Douglas & Skeem, 2005; SOU, 2006:91). In particular, the discussion has focused on various strategies for treatment targeting offenders with mental disorders as a means of crime prevention.

The relationship between mental disorder and crime is rather complex. Previous studies have suggested a direct link between mental disorder and offending (Hodgins, 1992; Tehrani, Brennan, Hodgins, & Mednick, 1998) but recent research has shown that the increased risk of criminal behavior is attributable to co-morbid substance abuse and mental disorder, rather than to mental disorder alone (Elbogen & Johnson, 2009; Van Dorn, Volavka, & Johnson, 2011). Offenders with mental health problems\(^a\) and co-occurring problematic substance use\(^b\), sometimes referred to as triply troubled individuals (Lindqvist, 2007), constitute a population of significant concern. Their criminal behavior causes sufferings to their victims and high expenditures for legal processes, prison care or forensic psychiatric treatment. They have complex treatment needs (McNiel, Binder, & Robinson, 2005; Skeem, Eno Louden, Manchak, Vidal, & Haddad, 2009; Ruiz, Douglas, Edens, Nikolova, & Lilienfeld, 2012), and are likely to reoffend (Hartwell, 2004; Ruiz et al., 2012). From a crime prevention perspective, the need to elaborate strategies for treatment and to ensure treatment participation and retention in this population can be regarded as highly important.

Although offenders with mental health problems and problematic substance use have complex treatment needs, few studies have explored treatment participation and subsequent outcomes in this population. In a Swedish study, substance abuse treatment participation was associated with a reduced risk of reoffending (Gumpert et al., 2010). If substance abuse treatment does make a difference, appropriate substance abuse treatment programs should be available for these individuals. Research has however suggested that this population display rather poor rates of treatment retention (Van Stelle, Blumer, & Moberg, 2004) and that various factors, such as particular personality traits, influence participation in substance abuse interventions (Richards, Cacey, & Lucente, 2003). Exploring how various factors influence treatment participation may be beneficial in order to increase motivation and/or reduce dropout (Tsogia, Copello, & Orford, 2001). The present thesis was written with the overall aim to explore treatment needs, treatment participation and crime relapse among offenders with mental health problems and problematic substance use.

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\(^a\) In this thesis, the term mental health problems covers a range of mental health conditions, from psychiatric symptoms (e.g. feelings of depression or anxiety), to more severe conditions such as mental disorders (e.g. schizophrenia or bipolar disorder).

\(^b\) In this thesis, the term problematic substance use is used to subsume various levels of severity in alcohol- and drug-related problems, including hazardous use, harmful use, substance abuse or dependency. For more information on these various problems, see section 2.4.1.
2 BACKGROUND

2.1 THE RELATIONSHIPS BETWEEN PROBLEMATIC SUBSTANCE USE, MENTAL HEALTH PROBLEMS AND CRIMINAL BEHAVIOR

2.1.1 Problematic substance use in relation to criminal behavior

Problematic substance use is common among offenders. Approximately 60 to 70% of the Swedish prison inmates abuse alcohol and/or illicit drugs and about 40% of the patients within the Swedish compulsory inpatient forensic psychiatric care fulfill criteria for a substance use disorder (Håkansson & Berglund, 2012; Krantz & Elmby, 2007; The Swedish National Board of Health and Welfare, 2008). These figures are not unique to Sweden (EMCDDA, 2012) and in other studies, substance use disorders have been demonstrated in approximately 50 to 70% of prison inmates (Baillargeon et al., 2010; Chandler, Fletcher, & Volkow, 2009; Fazel, Bains, & Doll, 2006), and forensic psychiatric patients outside Sweden (Ogloff, Lempers, & Dwyer, 2004; Putkonen, Kotilainen, Joyal, & Tiitonen, 2004; Wheatley, 1998). Given the prevalence of problematic substance use among offenders, the importance of substance abuse treatment delivery to this population has been repeatedly highlighted (Douglas & Skeem, 2005; Prendergast, 2009).

The relationship between problematic substance use and crime has been firmly established (Bennet & Holloway, 2009; Bennet, Holloway, & Farrington, 2008; Grann & Fazel, 2004). Particular substances may be linked to particular types of crimes. For example, one study showed that the substances most commonly associated with the drug-crime connection included heroin, crack and cocaine and that the use of these substances were related to robbery, burglary and shoplifting (Bennet et al., 2008). The relationship between alcohol and criminal behavior in general, and violence in particular, has been confirmed (Boles & Miotto, 2003; Haggård-Grann, Hallqvist, Långstrom, & Möller, 2006; Lundholm, Haggård, Möller, Hallqvist & Thiblin, 2013), whereas the links between violence and other substances, e.g. cocaine, amphetamine, cannabis and opioids are rather unclear (Boles & Miotto, 2003; Hoaken & Stewart, 2003).

There also seems to be an association between multiple drug use (i.e. the use of more than one illegal drug) and crime. Bennet and Holloway (2005) demonstrated that twice as many multiple drug users as single drug users reported criminal behavior during a 12-month period, and the multiple drug users who offended reported twice as many offenses relative to the single drug users who offended. In Sweden, use, possession, buying, and selling of drugs are illegal activities per se, further contributing to the connection between problematic substance use and crime. Overall, research has identified problematic substance use as an important risk factor of criminal behavior and emphasized that such use should be taken into account in order to reduce the risk of criminal recidivism among offenders (Bennet et al., 2008; Chandler et al., 2009; Prendergast, 2009).

2.1.2 Problematic substance use in relation to mental health problems

Problematic substance use is related to mental health problems (Compton, Thomas, Stinson, & Grant, 2007; Regier et al., 1990; Swendsen et al., 2010). This relationship, often referred to as co-morbidity or dual diagnosis, is rather complex (Mueser, Drake, &

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*In this thesis, the term substance use disorder refers to either substance abuse or substance dependence of alcohol and/or illicit drugs according to DSM-IV criteria.*
Wallach, 1998). It may be that the presence of mental health problems increases the likelihood that an individual develops problematic substance use, or that a problematic substance use increases the risk of developing mental health problems. Another possibility is that both of these conditions appear around the same time and that neither causes the other.

Problematic substance use has been demonstrated in individuals with different types of mental health problems. As shown by the frequently cited North American Epidemiologic Catchment Area (ECA) study, approximately 60% of persons with bipolar disorder and about 50% of persons with schizophrenia also had a co-occurring substance use disorder (Regier et al., 1990). Problematic substance use is also common among individuals with other affective disorders e.g. depression and mania, and among individuals with anxiety disorders including phobia and panic disorder (Compton et al., 2007; Grant et al. 2004; Kushner, Abrams, & Borchardt, 2000). In addition, problematic substance has been demonstrated among people with personality disorders such as borderline and antisocial personality disorders (Compton et al., 2007; Regier et al., 1990; Trull, Sher, Minds-Brown, Durbin, & Burr, 2000).

Conversely, mental health problems have been demonstrated in individuals with problematic substance use. More specifically, the ECA study showed that about one-third of individuals with alcohol abuse or alcohol dependence and that about half of persons with drug abuse or drug dependence suffered from other psychiatric diagnoses, such as affective disorders, anxiety disorders or personality disorders (Regier et al., 1990). In addition, studies, including the ECA study, have shown prevalence rates of psychotic disorders/symptoms in people with problematic substance use (Dalmau, Bergman, & Brismar, 1999; McKetin, McLaren, Lubman, & Hides, 2006; Regier et al., 1990). Also, an association between multiple drug use and psychiatric symptoms has been demonstrated among offenders within the Swedish criminal justice system (Håkansson, Schlyter, & Berglund, 2011).

2.1.3 Mental health problems in relation to criminal behavior

Mental health problems are prevalent among offenders. Some of the mental disorders commonly reported in this population include personality disorders (notably antisocial personality disorder), affective disorders, anxiety disorders and psychotic disorders (Brugha et al., 2005; Butler, Allnutt, Cain, Owens, & Muller, 2005; Gunter et al., 2008). According to an international review of studies including 23 000 prisoners, about one out of seven prisoners fulfilled criteria for psychotic illnesses or major depression, and approximately half of the male prisoners and about 20% of the female prisoners fulfilled criteria for antisocial personality disorder (Fazel & Danesh, 2002). Moreover, a Swedish study on homicide offenders proposed that about 90% had a psychiatric diagnosis among which one in five fulfilled criteria for psychotic disorders and half fulfilled criteria for a personality disorder (Fazel & Grann, 2004). As expected, mental health problems are common among offenders within forensic psychiatric inpatient settings. More specifically, approximately 70 to 85% are estimated to fulfill criteria for a psychotic disorder (Douglas, Ogloff, & Hart, 2003; Putkonen et al., 2004; The Swedish National Board of Health and Welfare, 2008).

In the scientific community, the link between mental disorder and criminal behavior has been thoroughly investigated. In Sweden, this relationship has also gained a great deal of media attention during later years, as a result of a number of homicides, committed by individuals with mental disorder. Research has suggested this relationship to be rather complex. A direct link between mental disorder and criminal behavior, particularly
violence, has been suggested in studies from the early 1990s and onwards (Hodgins, 1992; Tehrani et al., 1998). Although such a link has been suggested, it is important to keep in mind that only a small fraction, i.e. about 5%, of all violent crimes, are in fact committed by individuals with mental disorder (Fazel & Grann, 2006).

Later studies have suggested that the relationship between mental disorder and crime is attributable to co-morbid substance abuse (Elbogen & Johnson, 2009; Van Dorn et al., 2011; Volavka, 2013). The North American MacArthur Violence Risk Assessment Study showed that there was no higher propensity for violence among mentally disordered individuals without co-occurring substance abuse than among other healthy residents in the same neighborhood (Steadman et al., 1998). In addition, Swedish studies have shown only a small increase in violence risk associated with schizophrenia and bipolar disorder unless the participants also had co-morbid substance abuse (Fazel, Lichtenstein, Grann, Goodwin, & Långström, 2010; Fazel, Långström, Hjern, Grann, & Lichtenstein, 2009). To conclude, the link between mental disorder and criminal behavior seems complex and depends to a substantial degree on co-morbid substance abuse (Douglas & Skeem, 2005; Melnick, Coen, Taxman, Sacks, & Zinsser, 2008).

2.1.4 Offenders with mental health problems and problematic substance use

As described above, the relationships between problematic substance use, mental health problems and criminal behavior have been thoroughly explored. According to a Swedish report, approximately 40% of the patients in the Swedish compulsory inpatient forensic psychiatry care suffer from co-morbid mental health problems and problematic substance use (The Swedish National Board of Health and Welfare, 2008). Such co-morbidity has been demonstrated in 60 to 70% of forensic psychiatric patients (Ogloff et al., 2004; Putkonen et al., 2004; Wheatley, 1998) and in 30 to 40% of prison inmates outside Sweden (Butler, Indig, Allnutt, & Mamoon, 2011; Hiller et al., 2005; James & Glaze, 2006).

Offenders with mental health problems and problematic substance use, sometimes referred to triply troubled individuals (Lindqvist, 2007), constitute a population of great concern. After release from prison or compulsory inpatient forensic psychiatric care, many end up unemployed and even homeless, having limited social networks and little family support (Hartwell 2004, McNiel et al., 2005; Skeem et al., 2009). Also, many show increased functional impairment (Grella, Greenwell, Prendergast, Sacks, & Mellnick, 2008), and suffer from victimization (Wood, 2012), medical problems (Eriksson et al., 2013), as well as their problematic substance use and mental health problems (Proctor & Hoffman, 2012; Ruiz et al., 2012). These individuals are also likely to reoffend (Hartwell, 2004; Ruiz et al., 2012).

Triply troubled individuals may be considered as a heterogeneous population with regard to problem severity and combinations of problems. A Swedish study, based on baseline data from the Mental disorder, Substance abuse and Crime (MSAC)-project, identified four subgroups, i.e. clusters of individuals, each with its own profile based on a unique combination of problems (Eriksson et al., 2013). The subgroups were 1) “Less troubled” individuals, with low degrees of problem severity in various domains, 2) “Severely triply troubled” individuals, with severe legal-, psychiatric-, alcohol-, drug- and family/social problems, 3) “Triply troubled with medical problems”; individuals with elevated problems in legal-, medical-, psychiatric- and drug domains and 4) “Working triply troubled”; including those with low levels of employment problems and medium levels of alcohol-, psychiatric- and legal problems. Eriksson and coworkers suggested that treatment and support delivered to triply troubled individuals need to be individualized
based on their specific problem profiles. Given their multiple treatment needs, however, coordinating interventions to this population may be challenging (Taylor, McMurrant, & Reis, 2007). Research has emphasized the need to elaborate strategies for treatment, support and crime prevention, particularly targeting this population (Hartwell, 2004; Lindqvist, 2007; Taylor et al., 2007).

Although triply troubled individuals have complex treatment needs, it is less well known what kinds and amounts of treatment this population actually utilizes. The few available studies have suggested a heavy use of mental health and substance abuse treatment (Hartwell, 2004; Jaffe, Du, Huang, & Hser, 2012) but also rather poor rates of treatment retention (Van Stelle et al., 2004). For instance, Van Stelle and colleagues showed that among triply troubled individuals enrolled in substance abuse treatment in prison, only 25% of the participants successfully completed the program. A Swedish study exploring treatment patterns (i.e. the amount and type of treatment utilization over time) suggested that triply troubled individuals can be considered as a heterogeneous population with regard to treatment use (Alm et al., 2011). The participants who displayed a non-stable treatment pattern were overrepresented in terms of violent and non-violent reoffending, whereas those with a stable treatment pattern with regard to low degree of treatment use or planned psychiatric treatment use were underrepresented in terms of reoffending. Another Swedish study explored the relationship between participation in planned substance abuse treatment and criminal recidivism in this population and concluded that more than six weeks of planned outpatient substance abuse treatment was associated with lower risk of reoffending (Gumpert et al., 2010). This finding has been supported by similar ones that emphasize the significance of substance abuse treatment in order to produce positive outcomes e.g. reduced problematic substance use and less criminal behavior among triply troubled individuals (Perry et al., 2014; Sacks, Chaple, Sacks, McKendrick, & Cleland, 2012).

2.2 ADDITIONAL RISK FACTORS FOR CRIMINAL BEHAVIOR
In addition to co-occurring problematic substance use and mental health problems, other factors that increase the risk of criminal behavior have been identified. Some of these are described in the following section.

2.2.1 Static and dynamic risk factors
Risk factors of future criminal behavior are often categorized as either static or dynamic (Andrews & Bonta, 2003), where static risk factors are those that are stable over time, and dynamic risk factors are those that are subject to change. Some of the static risk factors include male gender, younger age, previous offending, and family criminality or violence (Andrews, Bonta, & Wormith, 2006; Bonta, Law, & Hanson, 1998; Gendreau, Little, & Goggins, 1996), whereas some of the dynamic risk factors include interpersonal conflicts, antisocial cognitions or attitudes (Andrews et al., 2006; Douglas & Skeem, 2005; Gendreau et al., 1996), impulsivity, negative affectivity, and poor treatment participation and medication non-compliance (Douglas & Skeem, 2005; Webster & Jackson, 1997).

A number of assessment tools comprising static and dynamic risk factors have been developed in order to evaluate risk of future criminal behavior. One example is the Historical, Clinical, and Risk-Management scale (HCR-20; Webster, Douglas, Eaves, & Hart, 1997), which includes 20 factors that are related to risk of future violence. Included in the HCR-20 is psychopathy, another important risk factor of future criminal behavior. A
further description of the psychopathy concept is provided below, and the HCR-20 is more thoroughly described in section 4.2.3.3.

The predictive value of static and dynamic risk factors has been widely studied. Research suggests that static risk factors outperform dynamic risk factors in the prediction of recidivism among offenders with mental disorder (Bonta et al., 1998; Nilsson, Wallinius, Gustavsson, Anckarsäter, & Kerekes, 2011), but also that dynamic factors perform as well as static factors in predicting recidivism among general offenders and offenders with problematic substance use (Gendreau et al., 1996; Håkansson & Berglund, 2012). Altogether, dynamic risk factors have been identified as important targets for interventions in order to reduce the risk of criminal recidivism (Douglas & Skeem, 2005).

2.2.2 Psychopathy as a risk factor

In addition to the above factors, psychopathy has been identified as an important risk factor of criminal behavior, particularly violent acts (Hemphill, Hare, & Wong, 1998; Porter & Porter, 2007). Overwhelming empirical evidence shows that psychopathy serves as a predictor of reoffending and committing violence among offenders, and suggests that this risk factor needs to be considered in offender rehabilitation (Hare, 2006; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). There is dispute about whether psychopathy should be considered as a dynamic or static risk factor of criminal behavior. Psychopathic personality traits seem to remain relatively stable from childhood to adolescence (Andershed, 2010), but research on the stability of psychopathic personality traits from childhood into adulthood is scarce (Skeem et al., 2011). Thus, future research on this topic is warranted before any conclusion about the static or dynamic nature of psychopathy can be drawn. The following sections describe the definition(s) of psychopathy as suggested by the scientific literature, as well as the relationship between psychopathy and criminal behavior.

2.2.2.1 The definition of psychopathy according to Robert Hare

The concept of psychopathy has a long history. In 1809, the French psychiatrist Phillipe Pinel introduced the term “Manie sans delire” or “Insanity without delirium” to describe a condition that was marked by remorselessness, emotional instability and social drift, being the first formal description of what is now referred to as psychopathy (Hare & Neumann, 2006). More recent conceptualizations are linked to the American psychiatrist Harvey Cleckley (1941), who was the first to look more extensively at the psychopathic personality. Based on clinical interviews with psychiatric patients in a closed institution, Cleckley proposed 16 criteria for psychopathy, which were presented in his book The mask of sanity. Some of the criteria included deceitfulness, impulsiveness, pathological interpersonal relationships, and irresponsibility.

Based on Cleckley’s definition and his own clinical experience with prisoners, the Canadian psychologist Robert Hare developed the Psychopathy Checklist (PCL) as a tool for assessing psychopathy (Hare, 1980). The PCL was later revised into the current version, Psychopathy Checklist-Revised (PCL-R; Hare, 1991; 2003), commonly used in research and clinical settings. At present, psychopathy is not defined as a mental disorder by any of the diagnostic classification systems, but as suggested by Hare, the concept should be viewed as a construct that includes interpersonal and affective personality traits describing an arrogant, deceitful and deficient affective style, as well as impulsive and antisocial features. The PCL-R consists of 20 items that reflect these traits and features. Examples of the PCL-R items are grandiosity, superficial charm, lack of empathy, remorselessness, proneness to boredom, and juvenile delinquency.
The PCL-R items are rated on a three-point scale (0 = absent, 1 = possible/partial, 2 = present). The scoring relies on an interview with the individual as well as on additional file information such as criminal records. The total possible score for the PCL-R is 40 points and the cut-off score for psychopathy is 30 PCL-R points (Hare, 2003). However, a score of 26 PCL-R points has been suggested as valid in order to define psychopathy among offenders with mental health problems in Sweden (Grann, Långström, Tengström, & Stålenheim, 1998). The PCL-R can also be viewed as a continuous scale, assessing different degrees of psychopathy (Guay, Ruscio, Knight, & Hare, 2007) and has established good psychometric properties in various offender populations (Fulero, 1995; Hart & Hare, 1989; Shine & Hobson, 1997), including Swedish offenders with mental health problems (Grann et al., 1998; Laurell & Dåderman, 2005; Tengström, Grann, Långstrom, & Kullgren, 2000).

Research has shown different structural models of the PCL-R. One example is the Two-factor model, derived from factor analyses of the instrument (Hare, 2003; Harpur, Hare, & Hakstain, 1989). In this model, Factor I includes the affective and interpersonal traits of psychopathy such as superficial charm, grandiosity, and lack of empathy, whereas Factor II describes a socially deviant lifestyle involving behavior items such as impulsivity, poor behavioral control and juvenile delinquency. Also, a Three-factor model and a Four-facet model, derived from factor analyses, have been proposed. The Three-factor model describes psychopathy as a constellation of interpersonal and affective traits as well as behavioral items such as impulsivity, poor behavioral control, while excluding antisocial behavior as a part of the construct (Cooke & Michie, 2001). Finally, the Four-facet model divides the two original factors into four facets: the Interpersonal and Affective facets involving elements of Factor I, and the Lifestyle and Antisocial facets, involving behaviors of Factor II (Hare & Neumann, 2005). Two of the items, many short-terms relationships and sexual promiscuity, do not load on any of the various PCL-R factors or facets (Cooke & Michie, 2001; Hare, 2003; Hare & Neumann, 2005). The various PCL-R models and their items are more thoroughly described in Table 1.
Table 1. The various PCL-R models and their items.

<table>
<thead>
<tr>
<th>Two-factor model</th>
<th>Three-factor model</th>
<th>Four-facet model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor I: Interpersonal/affective</strong></td>
<td><strong>Factor I: Interpersonal</strong></td>
<td><strong>Facet I: Interpersonal</strong></td>
</tr>
<tr>
<td>Glibness/superficial charm</td>
<td>Glibness/superficial charm</td>
<td>Glibness/superficial charm</td>
</tr>
<tr>
<td>Grandiosity</td>
<td>Grandiosity</td>
<td>Grandiosity</td>
</tr>
<tr>
<td>Pathological lying</td>
<td>Pathological lying</td>
<td>Pathological lying</td>
</tr>
<tr>
<td>Manipulation for personal gain</td>
<td>Manipulation for personal gain</td>
<td>Manipulation for personal gain</td>
</tr>
<tr>
<td>Lack of remorse/guilt</td>
<td><strong>Factor II: Affective</strong></td>
<td><strong>Facet II: Affective</strong></td>
</tr>
<tr>
<td>Shallow affect</td>
<td>Lack of remorse/guilt</td>
<td>Lack of remorse/guilt</td>
</tr>
<tr>
<td>Lack of empathy</td>
<td>Shallow affect</td>
<td>Shallow affect</td>
</tr>
<tr>
<td>Failure to accept responsibility</td>
<td>Lack of empathy</td>
<td>Lack of empathy</td>
</tr>
<tr>
<td><strong>Factor II: Socially deviant lifestyle</strong></td>
<td><strong>Factor III: Behavioral</strong></td>
<td><strong>Facet III: Lifestyle</strong></td>
</tr>
<tr>
<td>Proneness to boredom</td>
<td>Proneness to boredom</td>
<td>Proneness to boredom</td>
</tr>
<tr>
<td>Parasitic lifestyle</td>
<td>Parasitic lifestyle</td>
<td>Parasitic lifestyle</td>
</tr>
<tr>
<td>Lack of realistic long-term goals</td>
<td>Lack of realistic long-term goals</td>
<td>Lack of realistic long-term goals</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>Impulsivity</td>
<td>Impulsivity</td>
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<tr>
<td>Irresponsibility</td>
<td>Irresponsibility</td>
<td>Irresponsibility</td>
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<tr>
<td>Poor behavioral control</td>
<td>Early behavior problems</td>
<td>Early behavior problems</td>
</tr>
<tr>
<td>Juvenile delinquency</td>
<td>Juvenile delinquency</td>
<td>Juvenile delinquency</td>
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<tr>
<td>Criminal versatility</td>
<td>Criminal versatility</td>
<td>Criminal versatility</td>
</tr>
<tr>
<td>Revocation of conditional release</td>
<td>Revocation of conditional release</td>
<td>Revocation of conditional release</td>
</tr>
</tbody>
</table>

In research during the past decades, the PCL-R has been extensively validated and referred to as “gold standard” for the measurement of psychopathy (Vitacco, Neumann, & Jackson, 2005). The PCL-R has been the single measure for psychopathy and has thus come to dominate clinical practice and research during this time (Skeem et al., 2011). In recent years, other conceptualizations of psychopathy have been proposed (some of these are briefly described below). Finally, it should be mentioned that two other instruments have been developed as derivates to the PCL-R. One is the Psychopathy Checklist-Screening Version (PCL-SV; Hart, Cox, & Hare, 1995), used for psychopathy screening in non-criminal populations, and the other is the Psychopathy Checklist-Youth Version (PCL-YV; Andershed, Kerr, Stattin, & Levander, 2002) used for the assessment of psychopathic traits in offenders aged 12 to 18 years.

2.2.2.2 Other conceptualizations and measurements of psychopathy

Although the PCL-R is the most validated measure of psychopathy (Vitacco et al., 2005), some researchers have found it problematic. One of the critiques directed towards the PCL-R concerns its focus on antisocial behavior. Researchers have suggested that psychopathy merely includes interpersonal and affective personality traits and that antisocial behavior is a correlate or a consequence of the psychopathic personality rather than an inherent part of the phenomenon (Skeem & Cooke, 2010). In response to this critique, Robert Hare has stated...
that the development of interpersonal and affective personality traits and antisocial behavior is an interactive and reciprocal process, i.e. that such traits and behaviors influence each other over the course of development rather than being static entities, and that they therefore are to be included in the psychopathy concept (Hare & Neumann, 2010). At the time of the writing of this thesis, there is still a dispute about whether or not antisocial behavior represents an inherent part of the psychopathy construct (Polaschek & Daly, 2013; Skeem et al., 2011). As concluded by Skeem and co-workers, more research is needed before any conclusions about this topic may be firmly drawn.

Another critique directed towards the PCL-R concerns its focus on psychopathy as a single homogeneous construct. According to Skeem and coworkers (2011), this issue is illustrated by the PCL-R’s approach to diagnosing psychopathy using cut-off scores, rather than assessing different dimensions of the construct. As argued by Hare and coworkers, the PCL-R was originally intended to index psychopathy as a single unitary construct, but it can also be used as a continuous scale assessing different degrees of psychopathy or be divided into different factors and facets (Hare, 2003; Guay et al., 2007). Studies have shown that the Factor I and II of the PCL-R correlate in opposing directions with external criterion variables such as trait anxiety (Harpur et al., 1989; Hicks & Patrick, 2006), which in turn implies that psychopathy, according to the PCL-R, can be considered to involve two underlying dimensions. It has also been suggested that psychopathy according to the PCL-R can be disaggregated into primary and secondary variants, where primary psychopaths have more pronounced core traits, scoring higher on Factor I, and secondary psychopaths display more signs of antisocial behavior, scoring higher on Factor II (Lykken, 1995; Skeem, Johansson, Andershed, Kerr, & Louden, 2007). Such findings do challenge the notion that psychopathy according to the PCL-R is a single homogeneous construct, but there remains substantial debate also on this topic (Skeem et al., 2011).

Given the critique directed towards the PCL-R, other conceptualizations and measurements of psychopathy have been proposed and developed, excluding antisocial behavior as a part of the psychopathy concept. One example is the Triarchic model which suggests that psychopathy can be conceptualized in terms of three distinct but intersecting constructs: Disinhibition, Boldness and Meanness, that can be measured with the Triarchic Psychopathy Measure (TriPM; Patrick, Fowles, & Krueger, 2009). Another conceptualization suggests that psychopathy can be divided into three super ordinate constructs: Fearless Dominance, Self-Centered Impulsivity and Cold-heartedness, and assessed with the Psychopathy Personality Inventory Revised (PPI-R; Lilienfeld & Windows, 2005). Finally, a third conceptualization describes psychopathy as symptomatology across six domains: attachment, behavioral, cognitive, dominance, emotional, and self. The instrument for assessing psychopathy according to this last definition is The Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2012).

2.2.2.3 The relationship between psychopathy and criminal behavior

Several studies have used the PCL-R in order to explore the prevalence of psychopathy among offenders. This generally varies between 15 and 25% among North American offenders and between 3 and 17% among European offenders (Cooke, 1998; Hare, Clark, Grann, & Thornton, 2000; Juriloo et al., 2014). Research has also confirmed that psychopathy is prevalent among offenders with mental health problems, and more specifically that approximately 20% of offenders with schizophrenia (Laajasalo, Salenius, Lindberg, Repo-Tiihonen, & Hääkenen-Nyholm, 2011; Tengström et al., 2000) and 30% of
offenders with antisocial personality disorder (Coid & Ullrich, 2010) fulfill criteria for psychopathy. Thus, in offender samples, the prevalence of psychopathy varies. Coid and colleagues (2009) argued that the higher prevalence of psychopathy among North American offenders may be explained by sample differences where North American samples comprise male prisoners with more serious criminality relative to European samples.

There is considerable evidence that psychopathy, according to the PCL-R and its derivates, is predictive of criminal behavior, and particularly violent acts. This has been demonstrated in populations including offenders with and without mental health problems (Hemphill et al., 1998; Porter & Porter, 2007; Tengström et al., 2000), psychiatric patients (Nicholls, Ogloff, & Douglas, 2004; Skeem & Mulvey, 2001), and the general population (Coid & Yang, 2011). Research has also proposed that the PCL-R is only a moderate predictor of criminal behavior and that its predictive capacity is driven by Factor II, or by the Antisocial PCL-R facet, relative to the other PCL-R factors and facets (Wallinius, Nilsson, Hofvander, Anckarsäter, & Stålenheim, 2012; Walters, Grann, Knight & Dale, 2008). As suggested by this research, the Interpersonal and Affective PCL-R facets are not particularly predictive of criminal behavior.

There is also evidence that psychopathy, also when assessed by other measurements, is predictive of criminal behavior. For example, research has shown that psychopathy according to the PPI-R predicts criminality or violence among adult offenders with and without mental health problems (Edens & McDermott, 2010; Edens, Poythress, Lilienfeld, Patrick, & Test, 2008), juvenile offenders (Vaughn, Howard, & DeLisi, 2008), and the general population (Uzieblo, Verschuere, Van den Bussche, & Crombez, 2010). Also, psychopathy according to the CAPP has been found to predict violence among offenders with mental health problems (Pedersen, Kunz, Rasmussen, & Elsass, 2010).

Due to the link between psychopathy and criminal behavior, researchers and clinicians have highlighted the need to elaborate treatment programs aimed to reduce criminal behavior among offenders with psychopathic personality traits (Skeem et al., 2011). In clinical practice and in research, there has been some pessimism regarding this possibility, as studies have indicated that this population neither respond to treatment, nor remain in various treatment programs (Ogloff, Wong, & Greenwood, 1990; Richards, et al., 2003). Treatment response and treatment behavior among offenders with psychopathic personality traits are more thoroughly described in section 2.7.2.

### 2.3 Risk Assessment and Offender Rehabilitation

Even though offender rehabilitation may involve multiple interventions with different targets, the main goal is to reduce the risk of criminal recidivism (Andrews, Bonta, & Wormith, 2011). This section focuses on assessment and rehabilitation of offenders as a means to reduce such risk.

#### 2.3.1 Dynamic risk factors as targets for interventions

One important first step of offender rehabilitation includes risk assessments, which may serve as a base for treatment planning. Although static risk factors are important in that they provide information about a person’s past (Ferguson, Ogloff, & Thomson, 2009), dynamic factors are essential as they may be amenable to treatment and change (Andrews et al., 2006; Douglas & Skeem, 2005). Identifying and matching offenders with treatment targeting dynamic factors is a central element in the work of offender rehabilitation. Some factors to be targeted include, for example, antisocial attitudes, psychosis and problematic
substance use (Douglas & Skeem, 2005). Also, a therapeutic alliance\(^d\) between the offender and the treatment provider and treatment adherence has been described as important components producing positive outcomes of offender rehabilitation.

One model used for guiding offender assessment and rehabilitation, and emphasizing the significance of treatment targeting dynamic risk factors is the Risk, Needs and Responsivity (RNR)-model (Andrews et al., 2011). Developed in the 1980s and first formalized in 1990, the RNR-model has been widely used in order to rehabilitate various offender samples. As suggested by its name, it is based on three core principles. The first principle, Risk, suggests that the intensity of treatment should match the risk level of criminal recidivism so that high-risk offenders receive high intensity interventions while low-risk offenders participate need less intensive interventions. According to the second principle, Needs, treatment services should focus on the offender and target his or her dynamic risk factors linked to criminal behavior e.g. antisocial attitudes and behaviors, poor problem-solving abilities, substance abuse, unemployment and/or anger. Finally, the third principle, Responsivity, underscores the importance of matching the treatment program with offender characteristics such as learning style, personality traits and cognitive ability, in order to optimize the chance of positive outcomes. Interventions that adhere to the RNR-principles have been associated with significant reductions in criminal behavior in various offender samples, such as among sexual offenders (Hanson, Bourgon, Helmus, & Hodgon, 2009), and violent offenders (Dowden & Andrews, 2000). Research has proposed that the RNR-model should be adopted by forensic psychiatric services as well as outpatient services (Andrews & Bonta, 2003; Howells, Day, Thomas-Peter, 2004). As suggested by Andrews and Bonta, delivery of RNR-interventions in outpatient settings would be beneficial as the offender may practice his or her skills in a real life environment.

### 2.3.2 Problematic substance use as a target

As mentioned, treatment for problematic substance use has been recognized as an important element of offender rehabilitation. Outcomes of substance abuse treatment may include reductions in problematic substance use, increases in medical and psychiatric health, improvements in social function, as well as reduction of threats to public health and safety (McLellan, McKay, Forman, Cacciola, & Kemp, 2005). Several studies have identified reduced crime rates as an important outcome. For example, according to two Norwegian studies, participation in substance abuse treatment (i.e. methadone maintenance treatment) was associated with significant reductions in both violent and non-violent criminality (Bukten et al., 2012; Havnes et al., 2012) and as suggested in two meta-analyses, substance abuse treatment had a significant effect in reducing both crime rates and drug use (Holloway, Bennet, & Farrington, 2006; Prendergast, Podus, Chang, & Urada, 2002). According to the two meta-analyses, the relationship between substance abuse treatment and reduced crime rates was however mediated by other variables, such as type of treatment program, age and gender. Therapeutic communities\(^e\) and methadone maintenance programs

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\(d\) A therapeutic alliance can be defined as the affective bond between patient and treatment provider and the patient's and treatment providers’ ability to agree on treatment tasks and goals (Martin, Garske, & Davis, 2000).

\(e\) An approach developed in the 1960s for the treatment of problematic substance use (De Leon, 2000). Core principles include fostering personal and social responsibility in managing the daily life, and promoting prosocial values within healthy social networks to achieve and sustain recovery from problematic substance use. The approach may be delivered in both residential settings and community settings.
were the most effective treatment approaches and interventions were more effective for males relative to females, and for younger rather than older individuals. Nonetheless, both reviews concluded that substance abuse treatment had a significant effect in reducing crime. In addition, previous studies have emphasized the efficiency of incarceration-based drug treatments, in reducing criminal behavior (Mitchell, Wilson, & MacKenzie, 2007; Turley, Thornton, Jonson, & Azzolino, 2004), and shown that participation in outpatient substance abuse treatment and therapeutic communities is associated with lower frequencies of crime relapse among triply troubled individuals (Gumpert et al., 2010; Perry et al., 2014; Sacks et al., 2012).

Given these encouraging findings, substance abuse treatment delivery to offenders should be considered as highly important. However, treatment designed specifically for offenders within inpatient forensic psychiatric settings rarely address problematic substance use (Mullen & Lindqvist, 2000; Ogloff et al., 2004) and substance abuse treatment programs in prison have been described as inadequate relative to inmates’ treatment needs (Belenko & Peugh, 2005). As a result, a considerable number of offenders never receive adequate treatment for their problematic substance use. Among offenders with mental health problems and problematic substance use, few empirical studies have tested the outcomes of substance abuse interventions. When released from prison or compulsory inpatient forensic psychiatric care into the community, these individuals face many difficulties and are likely to have remaining problems. Exploring what type of community interventions (e.g. mental health- and substance abuse interventions) they receive and/or utilize as well any associated outcomes (e.g. crime rates) may lead to important information that may be used in order to aid the development and delivery of appropriate treatment strategies to this particular population (Melnick et al., 2008). In turn this might facilitate their re-integration into society.

2.4 STRATEGIES TO TARGET PROBLEMATIC SUBSTANCE USE
This section presents an assessment and treatment model that can be used by caregivers in order to appropriately evaluate and target problematic substance use (Berman, Wennberg, & Källmén, 2012). First a comprehensive description of the term problematic substance use is provided in order to facilitate further reading of the thesis.

2.4.1 The definition of problematic substance use
The definition of the term problematic substance use varies. While some researchers focus on the consequences and define problematic use as a substance use that dominates a person’s life with negative mental and/or physical side effects (Mallett, Edwards, Keys, Myers, & Rosenthal, 2003), others focus on the consumption in itself and define the concept as a regular and heavy use of substances (Steinhausen, Eschmann, & Metzke, 2007). The term has also been used as a way of describing a continuum of alcohol- and drug related problems with various levels of severity (Sinadinovic, Berman, Hasson, & Wennberg, 2010). Similarly, in this thesis, the term will be used as an umbrella term that involves hazardous use, harmful use, substance abuse or substance dependence. The definitions of each of these problems are more thoroughly described below.

The manuals most commonly used for the classification of problematic substance use as well as other mental conditions are the International Statistical Classification of Diseases and Health Related Problems (ICD) published by the World Health Organization (WHO) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) published by the American Psychiatric Association (APA). The latest version of the ICD, the ICD-10, was
introduced in 1992 (WHO, 1992) whereas the latest version of the DSM, the DSM-5, was introduced in 2013 (APA, 2013). The DSM-5 involves several changes in the classification of problematic substance use and other mental conditions, as compared with its former version, the DSM-IV (APA, 2000). For instance, the conditions of substance abuse and substance dependence, defined in the DSM-IV, have been combined into a single entry named “substance use disorder”. In the studies included in this thesis, the DSM-IV definitions are used, both substance abuse and substance dependence. Thus, they are presented below.

According to the DSM-IV (APA, 2000), the concept of substance abuse involves fulfilling one or more of the following four criteria during a 12-month period: failure to fulfill obligations due to substance use, substance use in hazardous situations, recurrent legal problems associated with use, and continued use despite social or interpersonal problems associated with use. The concept is not defined in the ICD-10, but the manual defines harmful use, a condition equivalent to that of substance abuse. Harmful use is described as a pattern of use that causes physical and/or mental damage to health, for example depressive episodes or hepatitis due to substance use (WHO, 1992).

According to the DSM-IV, substance dependence requires three or more of the following criteria during a 12-month period: tolerance, withdrawal, larger intake than intended, a persistent desire to reduce intake, a large amount of time devoted to the substance use, giving up social, occupational or recreational activities because of substance use, and continued use despite physical or psychological harm caused by the substance (APA, 2000). Substance dependence is also defined in the ICD-10, which uses principally the same criteria, however, listed as six items (WHO, 1992).

Although not defined as a diagnostic entity by any of the above diagnostic manuals, the concept of hazardous use is commonly used in clinical settings and also in research. According to WHO (2013), the condition refers to a pattern of substance use that increases the risk of physical, mental and social harmful consequences for the user.

As noted above, the use of the concept of problematic substance in this thesis, may involve alcohol- and drug related problems with various levels of severity. Individuals with various severities of alcohol- and drug related problems may in turn be in need of various interventions. The following sections describe an evaluation model suggested by Berman, and colleagues (2012) that can be used by clinicians and service providers in order to assess and treat individuals with various levels of problematic substance use, including screening, assessment and diagnostics, treatment delivery, and re-test for treatment evaluation.

### 2.4.2 Step I: Screening

Screening offers a quick way to identify problematic substance use (Berman, Bergman, Palmstierna, & Schlyter, 2005). A number of self-report questionnaires have been developed in order to screen for problematic substance use. Two examples are the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), developed by the WHO and the Drug Use Disorders Identification Test (DUDIT; Berman et al., 2005) developed at Karolinska Institutet in Sweden. Both instruments are recommended for preferred use by the Swedish National Board of Health and Welfare (2007; 2014). For a further description of the AUDIT and the DUDIT, see section 4.2.3.1.
2.4.3 Step II: Assessment and diagnostics
Screening will help identify the possible need of a further evaluation of any type of problem (Berman et al., 2012). With regard to problematic substance use, a number of assessment instruments may be used for this purpose. One example is the Addiction Severity Index (ASI), a semi-structured interview that can be used by professionals and researchers. The ASI has been revised continuously since the first version was released in 1980 (McLellan, Luborsky, Woody, & O’Brien, 1980) and is now available in a sixth version (ASI-6; Cacciola, Alterman, Habing, & McLellan, 2011). Also, this instrument is recommended for preferred use by the Swedish National Board of Health and Welfare (2007; 2014). For a further description of the ASI-6, see section 4.2.3.2. Given that the ASI-6 is not a tool aimed to yield diagnoses, such procedures should be performed with the use of other instruments which are based on DSM- or ICD-criteria (Berman et al., 2012).

2.4.4 Step III: Treatment delivery
Once the problematic substance use has been identified, assessed and diagnosed, the next step is treatment delivery (Berman et al., 2012). There are a number of effective interventions in order to reduce problematic substance use; some of which are described in section 2.5.1.

2.4.5 Step IV: Re-test for treatment evaluation
For substance abuse interventions, treatment outcomes need to be assessed by re-test of problematic substance use (Berman et al., 2012), using tools described above. The next section provides a description of how the delivery of interventions that target problematic substance use is organized in Sweden.

2.5 THE SWEDISH TREATMENT SYSTEM FOR PROBLEMATIC SUBSTANCE USE
In Sweden, two principal systems are responsible for the delivery of treatment that target problematic substance use: the social services system, managed by the local municipalities and the health care system, managed by the County Councils. The primary responsibility of treatment delivery for problematic substance use rests at the municipalities (The Social Services Act, 2001: 453). This means that the municipalities are obligated to ensure that all individuals with problematic substance use, and those at risk of developing such use, receive appropriate interventions. The interventions offered by the social services system are those that do not require medical interventions and may take several forms, e.g. motivational interventions (see below), individual or group counseling, and housing (sometimes combined with various psychosocial treatment alternatives (see below) or control of abstinence). An individual could either seek support from the social services system him/herself or be referred by someone e.g. the health care system.

The social services also have the option of reporting their clients to a special court that might sentence them to compulsory treatment provided by a state organization: The National Board of Institutional Care (The Care of Abusers (Special Provisions) Act 1988:870). Compulsory treatment, for a maximum period of six months, should be considered if there is an obvious risk that the client, due to ongoing use of alcohol or illicit drugs, might harm him- or herself or others, and does not consent to voluntary treatment. In the short run, the aim of compulsory treatment is to immediately interrupt the use of substances. In the long run, the aim is to motivate clients to participate in voluntary
treatment. Research has however suggested that compulsory treatment can be used as a threat to urge clients into voluntary treatment (Storbjörk, 2006).

Although the municipalities have the primary responsibility for the delivery of interventions targeting problematic substance use, they collaborate to a large extent with the County Councils, who manage the health care system (The Health and Medical Service Act, 1982:763). In more severe problematic substance use, coordinated treatment plans are often necessary. Thus, the social services and the health care system can be seen as complementary to one another.

The health care system is responsible for providing specialist medical and psychiatric treatment related to problematic substance use, such as detoxification, emergency services and pharmacological treatment. Throughout Sweden, the Counties deal with treatment of problematic substance use in different ways and have different organizational structures. In some cases, such treatment is a part of the psychiatric care, while as other counties, as in Stockholm, there are separate Centers for dependency disorders, offering specialized dependency treatment (SOU, 2011:35). The services of the health care system are mainly financed by the County Council and are available at no or low cost for the patient. The treatment provided may be voluntary, court-ordered or referred to by the social services. In some cases the cost for the patient can be waived by the social services.

In addition to the above treatment systems, the state is responsible for the delivery of substance abuse interventions, e.g. twelve-step programs and motivational interventions (see below) to individuals within the criminal justice system (The Act on Correctional Treatment in Institutions, 1974:203). If an offender suffers from problematic substance use and there is an obvious link between the substance use and the offense, substance abuse treatment can be delivered as an alternative to a prison sentence for period up to two years (The Swedish Prison and Probation Service, 2012). In such cases the offender is sentenced to probation with a special treatment plan, which may involve substance treatment participation at a treatment center or in an outpatient setting. Also, before release from prison, inmates can receive a special action called Residential care which allows for the inmate to spend time at a family care home or at a treatment facility, in order to reduce the problematic substance use and facilitate the re-integration into society.

Sweden can be considered to have an extensive treatment system for problematic substance use. However, the system has been described as rather inadequate relative to the patients’ needs. According to a governmental report investigating the Swedish treatment system for problematic substance use, co-morbid mental health problems among individuals with problematic substance use were not always considered and multiple drug use was not appropriately treated (SOU, 2011:35). Furthermore, large differences were found between how different counties and municipalities interpret their responsibility towards individuals with problematic substance use, resulting in regional differences in access to the services. According to the same report, only one in five individuals with problematic substance use accessed the services. Thus, despite an extensive support system for problematic substance use, there are components of the services and the system that need to be addressed.

In Sweden, the types of interventions that should be delivered to individuals with problematic substance use are regulated by guiding principles according to the Swedish National Board of Health and Welfare. In 2007, this agency released a report describing such principles in order to provide policy makers and service providers with evidence based

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1 A Swedish government agency organized under the Ministry of Health and Social Affairs
recommendations for the delivery of interventions that target problematic substance use. In March 2014, the principles were revised in a preliminary follow-up report (The Swedish National Board of Health and Welfare, 2014). In 2015, they are to be released in a final version.

### 2.5.1 Recommended interventions for problematic substance use

The Swedish National Board of Health and Welfare (2007; 2014) recommend a number of interventions as efficient in order to reduce problematic substance use. Some are described below, categorized as brief interventions, psychosocial treatment, and pharmacological treatment.

#### 2.5.1.1 Brief interventions

The Swedish National Board of Health and Welfare (2007; 2014) as well as international research (Bernstein et al., 2005; Miller & Wilbourne, 2002), recommend brief interventions in order to reduce problematic substance use. Such interventions aim to make individuals with problematic substance use aware of the negative consequences associated with substance use as well as to increase the motivation for a behavior change. Brief interventions usually comprise one to four sessions, which may vary in length from 10 minutes to an hour or longer (Miller, Forcehimes, & Zweben, 2011). Different approaches could be taken such as counseling in order to encourage a behavior change, and exploring the level of motivation to change, using various motivational techniques (see below).

#### 2.5.1.2 Psychosocial treatment

Psychosocial treatment is an umbrella term covering diverse non-pharmacological treatment alternatives aimed to target problematic substance use as well as any problems associated with such use (The Swedish National Board of Health and Welfare, 2007; 2014). A range of different psychosocial treatment alternatives exist. Some of the alternatives that are recommended by The Swedish National Board of Health and Welfare are motivational interventions, cognitive behavior therapy (CBT), community reinforcement approach (CRA), and twelve-step programs.

Motivational interventions are effective in reducing problematic substance use (Hettema, Steele, & Miller, 2005; Miller & Wilbourne, 2002). Some of the motivational interventions commonly provided include Motivational Interviewing (MI; Miller & Rollnick, 2002) and Motivational Enhancement Therapy (MET; Miller, Zweben, DiClemente, & Rychtarik, 1992). MI is a conversation where the treatment provider, in a respectful way, helps the patient to clarify the motives for or against using substances, and to find a way to reach abstinence. In MET the procedure is similar to MI, but the patient also receives feedback from the treatment provider for the purpose of enhancing his or her willingness to change. MI and MET can be delivered as brief interventions (described above) or as regular treatment.

There is also evidence that CBT and CRA are effective treatment alternatives for reducing problematic substance use (Magill & Ray, 2009; Miller & Wilbourne, 2002; Slesnick, Presopnik, Meyers, & Glassman, 2007). In CBT the underlying assumptions are that substance use is a learned, maladaptive behavior, initiated and maintained by individual and environmental factors (Substance Abuse and Mental Health Services Administration, 1999). The goal is to improve the cognitive and behavioral skills by identifying the circumstances surrounding substance use (e.g. the setting, time or place), enhancing strategies to manage cravings and changing the patients’ thinking style. CRA
(Meyers & Smith, 1995) is a special intervention grounded in CBT which seeks to change
environmental contingencies in the patient’s life (e.g. labor, recreation, family
involvement). The goal is to promote a lifestyle that is more rewarding than one that is
dominated by substance use.

Also, twelve-step programs are recommended by The Swedish National Board of
Health and Welfare (2007; 2014). Such programs are commonly applied by self-help
groups such as Alcohol Anonymous (AA) or Narcotics Anonymous (NA) which are
international organizations of individuals with recent problematic substance use, who
support each other in order to maintain or achieve abstinence. The fundamental model of
the twelve-step programs is that there are twelve steps to be followed. Important features
are education, and personal inventory. International studies confirm that participation in
twelve-step programs is associated with reduced substance use (Timko, Moos, Finney, &
Lesar, 2000; Weiss et al., 2005).

2.5.1.3 Pharmacological treatment
Finally, the Swedish National Board of Health and Welfare (2007; 2014) recommends the
following pharmacological treatment alternatives in order to reduce problematic substance
use: Naltrexone, Disulfiram or Acamprosate for alcohol abuse or alcohol dependence and
Methadone and Buprenorphine/Naloxone for opiate abuse or opiate dependence. Also,
international studies have shown positive outcomes of such treatment alternatives (Connock
et al., 2007; Miller & Wilbourne, 2002). In Sweden, there is no pharmacological treatment
alternative formally approved for abuse of cannabis or stimulants (e.g. amphetamine or
cocaine), although studies have shown support for the efficacy of Disulfiram in reducing
cocaine use (Kosten et al., 2013) and for Naltrexone in reducing amphetamine use
(Jayaram-Lindström, Hammarberg, Beck, & Frank, 2008). The Swedish National Board of
Health and Welfare (2007; 2014), however, recommend the delivery of psychosocial
treatment alternatives to patients with longstanding stimulant and cannabis use. Also, it is
recommended that individuals with opiate abuse or dependence are given psychosocial
treatment alternatives in combination with pharmacological treatment in order to produce
positive treatment outcomes.

2.6 ADDITIONAL RECOMMENDATIONS FOR THE DELIVERY OF
SUBSTANCE ABUSE INTERVENTIONS
In addition to the above guidelines, there are other recommendations for the delivery of
treatment targeting problematic substance use. For example, such recommendations
concern the treatment setting as well as the treatment targets in order to produce positive
outcomes. These recommendations, as suggested by the scientific literature, are briefly
described below.

2.6.1 The treatment setting
In the past decades, there have been significant changes in the delivery of health care,
including interventions that target problematic substance use. In Sweden as well as in other
countries, such interventions are now primarily delivered in outpatient rather than in
inpatient settings (McLellan et al, 2005; Romelsjö, Palmstierna, Hansagi, & Leifman,
2005). The demands on clinicians treating patients with problematic substance use and
criminal behavior have thus increased, requiring delivery of efficient outpatient services as
well as ensuring public safety (Douglas & Skeem, 2005). In a review of the rationales for
providing in- or outpatient treatment, Finney, Hahn, and Moos (1996) stated that the former
implies a respite from environments associated with substance use and allow more careful monitoring of outcomes and intensive treatment, relative to the latter. On the other hand, Finney and co-workers emphasized that outpatient treatment provides a more realistic treatment context in which patients can recover from their problems and practice their new skills, and that such treatment thus should be considered as preferable.

Studies on the efficacy of in- and outpatient substance abuse treatment have suggested that outpatient treatment is comparably as effective as inpatient treatment, but that more intense treatment or longer duration in treatment may be associated with better substance use outcomes (Burdon, Dang, Prendergast, Messina, & Farabee, 2007; Hubbard, Craddock, & Anderson, 2003; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997). A previous Swedish study based on retrospective data found that outpatient substance abuse treatment after release from prison or compulsory inpatient forensic psychiatric care was associated with a reduced risk of reoffending (Gumpert et al., 2010). McLellan and coworkers (2005) emphasized the importance of continuous problem assessment of patients in outpatient settings as a means of proper treatment evaluation.

2.6.2 The treatment targets

Given the relationship between mental health problems and problematic substance use (Compton et al., 2007; Swendsen et al., 2010), research has highlighted the importance of integrated treatment (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998; Mueser & Drake, 2007). Unlike standard treatment, i.e. treatment that focus on only one of the two conditions, integrated treatment addresses the coexistence of problematic substance use and mental health problems by a multidisciplinary clinical team in the same setting. Such treatment participation may reduce potential conflicts between different treatment providers and eliminates the patient’s burden of attending two treatment programs simultaneously. Integrated treatment may be delivered in both in- and outpatient settings.

A special integrated approach is Assertive Community Treatment (ACT; Stein & Santos, 1998), developed particularly for helping individuals with more severe mental disorders to function in the community. A significant feature is that the multidisciplinary team tries to meet all treatment and rehabilitation issues, e.g. physical health, employment, interpersonal relationships, housing, substance abuse, mental health problems, and practical assistance of each patient, through an approach called Assertive outreach. Assertive outreach means that the interventions may be delivered in the patient’s personal environment, or in another community setting, rather than at the treatment facility/clinic only. The rationale is that many people with severe mental disorders have difficulties engaging in traditional services and thus that such an outreach may facilitate treatment engagement and participation.

The outcomes of integrated treatment and ACT have been widely explored. Among patients with dual diagnosis, integrated treatment has been associated with reductions in psychiatric symptoms and higher quality of life (Craig et al., 2008; Drake et al., 1998; Thorup et al., 2005), greater improvement in social functioning and better substance use outcomes (Drake et al., 1998; Petersen et al., 2005). Also, ACT approaches have been related to greater reductions in psychiatric symptoms and homelessness, better treatment/medication compliance and higher quality of life, relative to standard treatment among individuals with mental disorder (Coldwell & Bender, 2007; Manuel, Covell, Jackson, & Essock, 2011; Rosen, Mueser, & Teeson, 2007). Relatively few studies have explored the efficiency of ACT in terms of reducing problematic substance use. A review of four randomized clinical trials showed no to small effects of ACT on substance use
outcomes compared to control conditions, but proposed that the topic should be further explored before any conclusions should be firmly stated (Fries & Rosen, 2011).

2.7 FACTORS ASSOCIATED WITH TREATMENT PARTICIPATION

Previous research has indicated rather poor outreach of substance abuse interventions. According to a large North American population-based study, about 70% of those with problematic alcohol use had never participated in any substance abuse interventions (Grant, 1997). Moreover, in a sample of individuals with dual diagnosis, approximately half had not participated in any interventions targeting these problems during a two-year study period (Harris & Edlund, 2005). Retention rates may also be low; among triply troubled individuals enrolled in a prison-based therapeutic community program for problematic substance use, only 25% of the participants completed the program (Van Stelle et al., 2004).

Participation in treatment relies on various factors. Factors that are positively and negatively associated with treatment participation are commonly referred to as facilitators or barriers to treatment (Grant, 1997; Tsogia et al., 2001). Such factors can be both individual and contextual and are often explored in order to predict who will and who will not participate in treatment, to increase motivation and to reduce dropout. The following section describes some of the facilitators and barriers to treatment commonly reported in the scientific literature.

2.7.1 Barriers and facilitators to treatment participation

Some of the common contextual barriers to substance abuse treatment concern characteristics of the treatment system, including long geographic distances to services and long waiting periods for treatment (Appel, Ellison, Jansky, & Oldak, 2004; Farabee, Leukefeld, & Hayes, 1998; Redko, Rapp, & Carlson, 2006). Contextual facilitators to such treatment comprise, for example, external pressures by family or professionals and legal coercion (Hser, Maglione, Polinsky, & Anglin, 1998; Polcin & Weisner, 1999; Storbjörk & Room, 2008). Screening - or the lack thereof - may serve both as a barrier and facilitator to treatment access. Screening and assessment through the use of reliable and valid tools could be considered as a contextual facilitator to treatment targeting problematic substance use.

Some of the individual facilitators of relevance for substance abuse treatment include age, previous treatment experiences (Hajema, Knibbe, & Drop, 1999; Hser et al., 1998; Storbjörk & Room, 2008), motivation (Corsi, Kwiatkowski, & Booth, 2007; Weisner, Mertens, Tam, & Moore, 2001) and severity of problematic substance use, or mental health- and employment problems (Finney & Moos, 1995; Hasin, 1994; Storbjörk & Room, 2008). Moreover, patients’ perceptions of their service providers as trusting, accepting, and understanding has predicted longer treatment stays as well as future help seeking for problematic substance use (Jinks, 1999; Kasarabada, Hser, Boles, & Huang, 2002; Redko et al., 2006). Thus, positive treatment perceptions may also be considered as a factor that facilitates participation in substance abuse treatment. Individual treatment barriers have also been reported in the scientific literature, generally involving perceived stigma of treatment participation, lack of confidence in treatment and lack of motivation to change (Cunningham, Sobell, Sobell, Agrawal, & Toneatto, 1993; Grant, 1997; Mowbray, Perron, Bohnert, Krentzman, & Vaughn, 2010). An elevated risk- and problem profile can also be of relevance for treatment participation. This topic is reviewed in the next part of this section.
2.7.1.1 Risk- and problem profile in relation to treatment participation

As suggested by the RNR-model (Andrews et al., 2011), services should be more intense for individuals at high risk for criminal recidivism (risk principle) and targeted at problems that are linked to the development and continuation of criminal behavior, e.g. antisocial attitudes and behaviors, unemployment, and substance abuse (needs). With reference to the RNR-model, it may be hypothesized that individuals with an elevated risk profile and more needs, i.e. a severe problem profile, would receive large amounts of treatment and thus have high rates of treatment participation. As seen in a previous study, an elevated problem profile including severe alcohol and illicit drug use, family/social problems, criminal behavior, psychological problems, financial problems and medical problems, was positively associated with participation in an outpatient substance abuse treatment program (Joe, Simpson, Greener, & Rowan-Szal, 2004). Also, in research by Moss, Chen and Yi (2007; 2010), individuals with elevated levels of substance abuse, psychiatric co-morbidity, antisocial behaviors and antisocial attitudes had the highest rates of treatment seeking for problematic substance use during the past year, relative to those with lower levels of these features. Based on these findings, it may be hypothesized that an elevated risk- and problem profile would be positively associated with treatment participation, and thus function as a treatment facilitator. Nonetheless, elevated risk-profile (Hiller, Knight, & Simpson, 1999; Nunes, Cortoni, & Serin, 2010; Olver, Stockdale and Wormith, 2011) and specific risk factors of future violence e.g. criminal history, impulsivity and lack of motivation to change have been highlighted as factors negatively associated with treatment participation (Condelli & De Leon, 1993; Mowbray, Perron, Bohnert, Krentzman, & Vaughn, 2010; Nunes et al., 2010). Therefore, there is also support for the view that an elevated risk-profile can function as a barrier to treatment. A recent meta-analysis concluded that offenders with high needs (i.e. high levels of unemployment, low income, substance abuse and antisocial attitudes) and high risk of criminal recidivism also had the highest rates of treatment dropout from various crime-prevention programs (Olver et al., 2011). As suggested by Olver and co-workers, high risk and high needs among offenders should alert clinicians of which offenders that are at risk of treatment dropout, and, consequently, efforts may be directed to these individuals, which in turn may lead to improved treatment participation, retention and positive outcomes.

2.7.2 Treatment response and treatment behaviors among offenders with psychopathic personality traits

Psychopathic personality traits have been identified as predictors of poor treatment participation (Hobson, Shine, Roberts, 2000; Richards et al., 2003; Thornton & Blud, 2007), and have also been identified as significant risk factors of criminal recidivism (Hemphill et al., 1998; Porter & Porter, 2007). Many clinicians and researchers assume that offenders with these traits do not respond to various treatment programs aiming to reduce criminal behavior or that they are unlikely to participate in treatment, including interventions that target problematic substance use (Gudonis, Derefinko, & Giancola, 2009; Skeem et al., 2011). Nevertheless, little research has in fact tested these assumptions, and the results are so far inconclusive. The following sections review results from the scientific literature on treatment response and treatment behaviors among offenders with psychopathic personality traits. Also, a number of treatment approaches for this population, as suggested by the scientific literature, are reviewed.
2.7.2.1 Treatment response among offenders with psychopathic personality traits

Common beliefs in clinical settings and in research are that treatment programs overall have a low success rate in reducing criminal behavior among offenders with psychopathic personality traits. It has been suggested that treatment directed to this population helps them to develop better ways of manipulating and deceiving other people rather than to change their criminal and violent behaviors (Hart & Hare, 1997). It is important to note that research on this topic has shown inconclusive results. Some studies have proposed that certain treatment programs fail to reduce criminal behavior (Ogloff, et al., 1990; Young, Justice, Erdberg, & Gacono, 2000) or even increase rates of reoffending among offenders with psychopathic personality traits (Rice, Harris, & Cormier, 1992). For example, Rice and coworkers explored the outcomes of a therapeutic community program at a forensic psychiatric hospital, and reported that treated and untreated psychopathic offenders had similar rates of general recidivism after release, but that more of those who were treated were re-convicted for violent crimes. On the other hand, among offenders with low psychopathy scores, fewer of those who were treated were re-convicted for violent crimes, relative to those who had not participated in treatment. Although this study has been cited as evidence for the general wisdom that treatment “makes psychopaths worse”, it has also been described as rather flawed, given its retrospective nature and that the treatment program provided was highly inappropriate and harmful (see Skeem et al., 2011 for a further discussion). Due to these limitations, any conclusions about the treatability of psychopathic offenders should not be drawn from this particular study.

Other studies on the topic have yielded fairly optimistic results. For example, Skeem, Monahan, and Mulvey (2002) found that mental health treatment reduced violent behavior among psychiatric patients regardless of PCL-R scores and in a review of 42 studies, Salekin (2002) concluded that cognitive-behavioral interventions were efficient in reducing criminal behavior among offenders with psychopathy. Also, Olver and Wong (2009) found that psychopathic individuals in a sex offender program made progress on various needs according to the RNR-model, e.g. substance abuse, impulsivity and antisocial attitudes, and that such progress was related to fewer sexual and violent re-convictions. The above results obviously challenge the notion that offenders with psychopathic personality traits do not respond to treatment programs aiming to reduce criminal behavior.

2.7.2.2 Treatment behavior among offenders with psychopathic personality traits

In addition to criminal behavior, psychopathy is linked to problematic substance use (Taylor & Lang, 2006; Walsh, Allen, & Kosson, 2007). Such use is generally explained by Factor II of the PCL-R, and more specifically, by the impulsivity and the need for excitement among those with psychopathic personality traits (Derefinko & Lynam, 2007; Reardon, Lang, & Patrick, 2002). Although problematic use is common among offenders with psychopathy, these individuals may be reluctant to participate in substance abuse treatment. It has been proposed that this population only participate in such treatment when the use of substances has reached a level of severity such that interventions are required by the legal system or when treatment is an alternative to ordinary imprisonment (Gudonis et al., 2009). Studies on the topic have shown higher rates of treatment dropout, and relapse into substance use following participation in substance abuse treatment among individuals with psychopathy, relative to their non-psychopathic counterparts. More specifically, psychopathy scores have predicted relapse into substance use and treatment non-completion among patients in a methadone maintenance program and among female offenders in a prison-based substance abuse treatment program (Alterman, Rutherford, Cacciola, McKay,
& Boardman, 1998; Richards, et al., 2003). Furthermore, such scores have predicted dropout from substance abuse treatment programs among offenders with mental health problems and triply troubled individuals (Berger, Rotermund, Viet, & Hohnhorst, 2012; Van Stelle et al., 2004). A recent meta-analysis also suggested psychopathy to be one of the strongest predictors of dropout from various offender treatment programs, including sex offender- and domestic violence treatment programs (Olver et al., 2011).

The poor treatment participation among offenders with psychopathic personality traits has been related to the affective and interpersonal traits, i.e. the Factor I traits (Hobson et al., 2000; Olver & Wong, 2011), and hypothetically, these traits may function as barriers to treatment, including interventions that target problematic substance use (Thornton & Blud, 2007). More specifically, it has been proposed that individuals with grandiosity, a core trait of psychopathy (included in the Interpersonal facet), might fail to identify aspects of themselves that they need to change. Also, it has been suggested that individuals with traits such as callousness, and lack of empathy (included in the Affective facet), may have difficulties to establish a therapeutic alliance with treatment providers, which in turn may lead to poor treatment retention and participation (Olver & Wong, 2011; Thornton & Blud, 2007). Some of the Factor II traits have also been described as relevant in this regard. For example, it has been suggested that individuals with traits such as impulsivity and proneness to boredom (included in the Lifestyle facet) may not take treatment participation seriously, which can result in an increased likelihood of withdrawing from treatment. Also, individuals with features such as early behavior problems and criminal versatility (included in the Antisocial facet) commonly have difficulties in complying with treatment rules, which can result in treatment dropout. Given that psychopathic personality traits may function as barriers to treatment, the presence of such traits could possibly be of relevance for treatment perceptions.

It should be noted that few studies have explored the relationships between psychopathic personality traits and treatment behaviors among offenders, and that only two studies have explored this relationship with regard to treatment participation in a civil setting (Altermann et al., 1998; Skeem et al., 2002). Thus, also on this topic, further research is needed before any firm conclusions can be stated. According to Skeem and coworkers (2011), future research on treatment behaviors and treatment outcomes among offenders with psychopathic personality traits should involve randomization of participants to settings and appropriate control groups.

2.7.2.3 Treatment approaches for offenders with psychopathic personality traits

Offenders with psychopathic personality traits may pose a challenge to treatment providers. This may be illustrated by their hostility, suspicion, lack of motivation to change and non-compliance with treatment (Gudonis et al., 2009; Skeem et al., 2011). Given that they have been recognized as difficult to treat as well as to display poor rates of treatment retention and participation, researchers have proposed various approaches in order to ensure treatment participation and to produce positive treatment outcomes in this population (Olver & Wong, 2009; Thornton & Blud, 2007). One approach suggests that interventions should be adapted to affective psychopathic personality traits, i.e. lack of empathy and callousness, as these traits have been identified as predictors of treatment dropout (Olver & Wong, 2011). As described by a study of Olver and Wong (2011), offenders with these traits are likely to have difficulties in establishing a therapeutic alliance with treatment staff, and should therefore be provided with treatment programs that merely focus on tasks and goals, rather than the affective bond between the patient and the treatment provider. As
further described by this study, CBT-interventions could be beneficial in order to ensure treatment participation and to produce positive outcomes, rather than unstructured and nondirective treatment approaches.

In addition to the delivery of CBT-interventions, research has recommended the delivery of Dialectic Behavior Therapy (DBT; Linehan, 1993), a treatment program commonly used for patients suffering from borderline personality disorder. Some patients with affective psychopathic personality traits tend to be callous and easily offended by treatment providers, and thereby difficult to engage in treatment (Thornton & Blud, 2007). Research describing an adaptation of DBT for psychopathic offenders has proposed that validation, i.e. the treatment provider being non-judgmental and non-confrontational, seeing the patients' point of view and communicating to the patient that his/her thoughts and feelings are valid, may facilitate treatment engagement, treatment retention and positive outcomes in this population (Galiotta & Rosenfeld, 2012; Rosenfeld, 2011).

Another challenge in the rehabilitation of offenders with psychopathic personality traits is that their treatment goals may be different from those formulated by clinicians and service providers (Evans & Sullivan, 1990). For instance, individuals with these traits may participate in treatment merely to avoid imprisonment, and not to achieve abstinence or change their criminal lifestyle. Also, they may have low levels of motivation to change their behavior, which in turn may result in treatment dropout (Salekin, Worley, & Grimes, 2010; Wong & Hare, 2005). Researchers have proposed that motivational levels may be enhanced with various motivational techniques, and that such approaches should be used in order to ensure treatment participation and to produce positive outcomes in this population (Wong & Hare, 2005). Others have suggested that clinicians should explore and take into consideration the individual treatment goals of those with psychopathic personality traits. This may result in treatment retention as the patient may realize that treatment participation will be in line also with his or her ambitions (Evans & Sullivan, 1990).

A last challenge in the clinical work with offenders with psychopathic personality traits (mentioned in this thesis) concerns the characteristics of the treatment system. Generally, treatment providers do not take into account the presence of specific personality traits when delivering interventions (Staiger, Kambouropoulous, & Dawe, 2007). Routinely assessing personality traits in treatment settings, and taking different combinations of traits into account before treatment delivery, has been highlighted as beneficial in order to ensure treatment participation, and to produce positive treatment outcomes in various clinical samples, including those with psychopathic traits (Harkness & Lilienfeld, 1997; Gudonis, et al., 2009). Such procedures may aid delivery of different treatment programs to offenders with various combinations of psychopathic personality traits and also change the belief that these individuals are treatment-resistant.

2.8 SUMMARY OF THE RESEARCH FIELD

The associations between mental health problems, problematic substance use and criminal behavior have been widely explored in research (Elbogen & Johnson, 2009; Van Dorn et al., 2011). Offenders with mental health problems, and problematic substance use, sometimes referred to as triply troubled individuals, are of great concern to society, given their multiple treatment needs (McNiell et al., 2005; Skeem et al., 2009), and risk of criminal recidivism (Hartwell, 2004; Ruiz et al., 2012). The need to elaborate strategies for treatment, support, and crime prevention and to ensure treatment participation and retention in this particular population can be regarded as highly important.
Offenders with mental health problems and problematic substance use can be considered as a heterogeneous population with regard to problem severity and combinations of problems. A Swedish study based on baseline data from the MSAC-project identified subgroups, i.e. clusters of such individuals, each with its own profile based on a unique combination of problems assessed with the ASI-6 (Eriksson et al., 2013). The study suggested that treatment and support delivered to offenders with mental health problems and problematic substance use could be based on their specific problem profiles, i.e. their cluster membership. Nevertheless, the subgroups identified were based on data acquired at one time-point only. To be useful in clinical and research settings, they should also remain stable over time, as well as predict specific outcomes.

Studies have highlighted the importance of substance abuse treatment to offenders with mental health problems and problematic substance use, and proposed that such treatment is associated with reduced crime rates (Gumpert et al., 2010; Sacks et al., 2012). Thus, it seems reasonable to hypothesize that substance abuse interventions are beneficial for this purpose. Research has however suggested that this population may display rather low rates of treatment retention (Van Stelle et al., 2004) and that treatment participation relies on a number of factors, so called treatment facilitators and barriers (Tsogia et al., 2001). Facilitators to interventions that target problematic substance use may be screening and assessment of problematic substance use as well as problem severity, whereas barriers to such interventions may involve certain psychopathic personality traits (Thornton & Blud, 2007; Tsogia et al., 2001). Also, risk- and problem profile are factors that may be of relevance for intervention participation.
3 AIMS

The present thesis was written with the overall aim to explore treatment needs, treatment participation and crime relapse among offenders with mental health problems and problematic substance use. The specific study aims were to:

I) Assess the concurrent validity of the AUDIT and the DUDIT in the study population (Study I).

II) Explore perceptions of substance abuse treatment among participants from the study group with various degrees of psychopathic personality traits (Study II).

III) Explore the relationship between and certain offender characteristics, e.g. psychopathic personality traits and participation in substance abuse interventions (Study III).

IV) Assess the stability and predictive validity of the four previously defined subgroups/clusters of the study population (based on MSAC baseline data; Eriksson et al, 2013) (Study IV).

V) Explore the relationship between participation in substance abuse interventions and crime relapse in the study population. (Study V).
4 MATERIAL AND METHODS

4.1 THE SWEDISH LEGAL SYSTEM
According to the Swedish penal system, all offenders are prosecuted and sentenced in court following a criminal offense regardless of their psychiatric status (The National Board of Forensic Medicine, 2010). An offender with no known severe mental disorder at the time of the offense is sentenced to prison or probation (or an initial period of imprisonment followed by probation), while an offender who has committed a crime under the influence of a severe mental disorder should be sentenced to compulsory inpatient forensic psychiatric care (sometimes combined with special court order restrictions, or followed by compulsory outpatient forensic psychiatric treatment). The medico legal concept of severe mental disorder includes psychotic states with disturbed apprehension of reality, severe depression with suicidal ideation, or severe personality disorders or neuropsychiatric disorders with compulsive behavior or uncontrollable impulsivity with psychotic features. Certain cases of dementia, severe brain damage, and severe mental retardation also qualify as severe mental disorders.

If the court suspects an indication of a severe mental disorder a Forensic Psychiatric Assessment (FPA) is initiated (The National Board of Forensic Medicine, 2010). The FPA procedure can be viewed as a screening procedure that involves several steps. First, the legal system identifies whether a suspect shows any signs of mental health problems or if the history indicates that the crime may be related to such problems. If so, he or she is referred to a minor FPA (an hour-long clinical assessment, performed by specialist in psychiatry). The aim of this assessment is to explore whether the crime was committed under the influence of a severe mental disorder and to evaluate the need for a major assessment.

A major FPA is performed once the court has found evidence for the crime, but before conviction. The major FPA is performed at a forensic psychiatric assessment unit and involves inpatient observation by a multidisciplinary assessment team (forensic psychiatry, clinical psychology, social work, and forensic nursing). The assessment, which usually takes three to four weeks, includes psychiatric examination, psychological and personality testing, comprehensive description of the patient's life from childhood through adulthood, and ward observations. The final report, written by the assessment team, contains a conclusion on whether or not the crime was committed under the influence of a severe mental disorder. The court is responsible for deciding the sentence, e.g. imprisonment or compulsory inpatient forensic psychiatric care, based on the results of the assessment. FPAs are managed by the National Board of Forensic Medicine: an authority under the Ministry of Justice (The National Board of Forensic Medicine, 2010).

4.2 MENTAL DISORDER, SUBSTANCE ABUSE, AND CRIME (MSAC)
The studies included in this thesis are part of a larger research project: Mental disorder, Substance Abuse and Crime (MSAC). MSAC is a prospective cohort study of offenders with mental health problems and problematic substance use, initiated by the Division of Forensic Psychiatry, Department of Clinical Neuroscience, Karolinska Institutet. The main objective of the MSAC-project is to explore the relationships between participation in substance abuse interventions and outcomes including problematic substance use, mental health problems and criminal recidivism in this population.
4.2.1 Participants and procedure

All data for this thesis comes from the MSAC-project. Participants were recruited from the forensic psychiatric assessment unit and from two remand prisons, Kronoberg and Huddinge, located in Stockholm. All were recruited through the system described above, i.e. the participants were on remand and under the investigation of a crime, and had been identified by the legal system as individuals with current mental health problems. After screening, those with problematic substance use were invited to participate in the MSAC-project. For follow-up purposes, only those living in Stockholm County were included.

Criteria for participation in the MSAC-project included (a) being referred for a (minor or major) FPA, (b) having a record of hazardous use of alcohol and/or illicit drugs according to the AUDIT and the DUDIT and (c) being registered in the Stockholm County (population: 1.9 million). All participants who consented to participation were invited to a baseline-interview and three follow-ups (see below), and to permit access to their treatment and criminal records for the collection of follow-up data. A description of the measures and data sources used in the studies of this thesis is provided in section 4.2.3.

In order to recruit individuals to the project, individuals referred to a minor or major FPA were asked to fill in the AUDIT and the DUDIT as a screening procedure for hazardous use of alcohol and/or illicit drugs (see Figure 1).
In total, 754 individuals were asked to fill in the AUDIT and the DUDIT, among which 554 (73%) accepted screening. Among these, 252 individuals (45%) met the three above criteria for participating in the MSAC-project. Among those who met the criteria, 208 (83%) gave
their written informed consent to participate in the study. One participant later withdrew his consent and was removed from the data sets. Thus, in total, 207 individuals were included in the MSAC-project and participated in the baseline assessment.

After study inclusion and baseline assessment, the participants were subjected to follow-up on three occasions: 1) shortly before release from prison or discharge from forensic psychiatric hospital, 2) six months after the first follow-up, and, 3) 12 – 18 months after the second follow-up. The design of the MSAC-project was naturalistic and thus, the participants were not assigned to any specific treatment program(s).

Among the 207 MSAC-participants, 39 individuals (19%) were still in prison or admitted to a forensic psychiatric hospital at the end of the study and did not participate in follow-up. The dropout rate was low. Only ten individuals declined to participate in any of the follow-up assessments of the project. During the study, another 11 individuals were lost to follow-up, four participants died, and three emigrated from Sweden. In total, among the total MSAC-sample, 158 individuals (76%) participated in the first follow-up assessment, 149 individuals (72%) were assessed a second occasion, and 140 individuals (68%) participated in the third follow-up assessment. The flow of the participants throughout the follow-up assessments is described in Figure 2.

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8 Participants sentenced to non-institutional treatment such as probation participated in the first follow-up assessment six months after the baseline assessment.
Included in the MSAC-project and participated in baseline assessment: 

\[ n = 207 \]

In prison or admitted to a forensic psychiatric hospital during the follow-up period: \[ n = 39 \]

- Declined further participation: \[ n = 7 \]
  - Deceased: \[ n = 1 \]
  - Lost to follow-up: \[ n = 2 \]

Deceased: \[ n = 2 \]

Lost to follow-up: \[ n = 7 \]

Participated in first follow-up assessment: 

\[ n = 158 \]

Participated in second follow-up assessment: 

\[ n = 149 \]

Participated in third follow-up assessment: 

\[ n = 140 \]

Declined further participation: \[ n = 3 \]

- Deceased: \[ n = 1 \]
- Emigrated from Sweden: \[ n = 3 \]
- Lost to follow-up: \[ n = 2 \]

Figure 2. Participant flowchart for the Mental Disorder, Substance abuse and Crime (MSAC) project. Participants excluded from follow-up assessments are marked in boxes with a dashed line. In total, 140 individuals participated in the third follow-up assessment, shown at the bottom of the figure.

Five research assistants with either extensive experience of compulsory inpatient forensic psychiatric care in FPA units and/or with at least a B.Sc. degree in behavioral sciences were in charge of recruitment, screening and assessment of the MSAC-participants. Before the MSAC-project started, all assistants completed two to three days of training in administering the instruments, which involved lectures on the development and use of the instruments within research and clinical settings, rules for coding, interviewing style, case studies and role-play. Every week, the research assistants were handed a list of all individuals referred to a minor or major FPA within the Stockholm County during that particular week. The
individuals were asked to fill in the AUDIT and the DUDIT as a screening procedure of hazardous use of alcohol and/or illicit drugs. Immediately after screening, individuals who fulfilled the criteria for participating in the MSAC-project (see above) were offered study participation. The screening and baseline assessment took approximately 10 and 90 minutes, respectively, to complete. Recruitment, screening and baseline assessment of the participants took place from February 2, 2006 until April 21, 2009.

Participants sentenced to probation or about to be released from prison or compulsory inpatient forensic psychiatric care were contacted individually by telephone and were asked to participate in the follow-up assessments of the project. These assessments took place in quiet places of the participants´ choice such as at cafés or libraries in the Stockholm city center, or in remand- or prison settings, and lasted between one and three hours.

All follow-up assessments were performed from February 1, 2007 until January 18, 2012. As mentioned above, the first follow-up was to be conducted shortly before release from prison or discharge from forensic psychiatric hospital, whereas the second and third follow-ups were to be conducted six months after the first follow-up, and 12 – 18 months after the second follow-up, respectively. The mean time between baseline and the first follow-up was 13.43 months ($SD = 9.47$, range = 1 – 43 months), whereas the mean time between the first and second follow-up was 5.98 months ($SD = 1.95$, range = 4 – 23 months). Finally, the mean time between the second and third follow-up was 14.09 months ($SD = 3.81$, range = 10 – 38 months). As noted, the first follow-up was in some cases performed as early as one month after baseline. This was due to the fact that some participants had received short-term sentences in association with the index crime (e.g. imprisonment for two months). The second and third follow-ups were conducted in line with the planning. Cases where long times passed before the second and third follow-ups (e.g. 38 months) resulted from participants being difficult to locate.

4.2.2 Methodological considerations

In most treatment research on substance abusers and offenders with mental health problems, there is a shortage of studies using a qualitative methodology (Sullivan, 2005; Tsogia et al., 2001). Quantitative and qualitative methodological approaches are different in that the former emphasizes the measurement and analysis of numerical data in order to explore statistical relationships, while the latter emphasizes the examination and analysis of non-numerical data, e.g. written interview-text, in order to discover underlying meanings or patterns (Thomas, 2003). Triangulation, i.e. the use of both qualitative and qualitative methods in research, has been described as a way to reduce threats of validity, as well as to facilitate understanding of certain phenomena, challenge or confirm theoretical assumptions and generate new hypotheses (Sullivan, 2005; Thomas, 2003). The studies of this thesis are based on both qualitative and quantitative methodology to pursue to the overall aim of the thesis.

4.2.3 Measures and data sources

Data were collected through self-report instruments, participant assessments, registers, and semi structured in-depth interviews.

4.2.3.1 Screening

Screening for hazardous use of alcohol and/or illicit drugs was performed through the AUDIT and the DUDIT (Berman et al., 2005; Saunders et al., 1993). The AUDIT and the
DUDIT contain ten and eleven items, respectively, concerning frequency and quantity of use, symptoms of dependency (e.g., impaired control over use and increased salience of use), and harmful use (e.g., blackouts and injuries). The total score of the AUDIT is 40 points, whereas the DUDIT has a total score of 44 points. The two tools have several advantages to other instruments. For example, their administration time is brief (approximately five minutes each), and their items focus on consequences related to use occurring within the past year which yields the possibility to identify possible diagnosable alcohol- and drug-related problems. The instruments have demonstrated adequate psychometric properties among Swedish drug users (Berman et al., 2005). In the MSAC-project, hazardous use of alcohol was defined as an AUDIT score of 8 or more points for men and 6 or more points for women, and hazardous use of illicit drugs was defined as a DUDIT score of 1 point or more for both men and women (Saunders et al., 1993; The Swedish National Board of Health and Welfare, 2007; 2014). In Study I, the total scores of the AUDIT and the DUDIT served as independent variables in the statistical analyses computed (see section 4.2.6) in order to assess concurrent validity of the tools.

4.2.3.2 Baseline assessment
At the baseline assessment, the participants were interviewed with the Swedish translation of the ASI-6 (Cacciola et al., 2011; Öberg et al., 2006). The ASI-6 assesses problem severity within the following nine domains: medical, employment, alcohol, drugs, legal, psychiatric, and family/social domains, with the latter subdivided into family/social problems, family/social support and child problems. Its items concern time periods before and after 18 years of age, the past six months as well as the past 30 days prior to the interview. The responses on the items that concern problematic behaviors and circumstances during the last 30 days can be computed into nine Recent Status Scores (RSSs), ranging from 0 to 100. Specific statistical procedures are used to ensure equal weight of the items. Higher scores indicate greater problem severity and a greater need for treatment. According to recent studies, the ASI-6 has adequate psychometric properties (Cacciola, et al., 2011; Denis, Cacciola, & Alterman, 2013; Kessler et al., 2012). In Study I, the ASI-6 RSS (at baseline) for problem severity of alcohol, drugs and legal domains, served as dependent variables in the statistical analyses computed in order to assess the concurrent validity of the AUDIT and the DUDIT.

At the baseline assessment, a diagnostic assessment tool, developed by the MSAC research group, was used in conjunction with the ASI-6 for assessment of a substance use disorder, i.e. substance abuse or substance dependence (see Figure 3).
In the past year, have you had any withdrawal sickness shortly after you cut down or quit drinking/use of illicit drugs?
(YES/NO)

In the past year, have you had any trouble controlling, cutting back, or quitting drinking/using illicit drugs or spent much of the day drinking/using illicit drugs?
(YES/NO)

In the past year, have you had any medical or psychological problems, because of your drinking/illicit drug use?
(YES/NO)

Three of the above criteria fulfilled: Criteria for a dependency disorder fulfilled.

Fewer than three of the above criteria fulfilled: Criteria for a dependency disorder not fulfilled. Continue below.

In the past year, have you been less affected by alcohol/illicit drugs than before? For example, have you needed to use more alcohol/illicit drugs to experience the same effect as before? Or have you noticed that you can use more alcohol/illicit drugs than before without experiencing the same effect?
(YES/NO)

In the past year, have you used alcohol/illicit drugs in larger amounts than you intended?
(YES/NO)

In the past year, have you spent a great deal of time obtaining alcohol/illicit drugs, using alcohol/illicit drugs or recovering from the effects of alcohol/illicit drugs?
(YES/NO)
Figure 3. The Diagnostic tool used for assessment of substance use disorders, i.e. substance abuse and dependency disorders. The tool was based on items of the 6th version of Addiction Severity Index (ASI-6) and the Chapter 11 and 12 of the WHO Schedules for Clinical Assessment in Neuropsychiatry (SCAN).
The tool was constructed as a decision tree with ten dichotomous yes-or-no items based on DSM-IV criteria. The first three items were ASI-6 items, but their response options were modified to refer to symptoms of dependence during the course of one year instead of during the last 30 days. Participants who answered yes to these three items were considered to fulfill criteria for substance dependence, whereas those who answered yes to fewer than these three items were further assessed by five additional items according to the Swedish translation of Chapter 11 and 12 of the WHO Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Bransome, 1998; Wing et al., 1990; Wing, 1996) version 2.1. Participants who answered yes to three of these eight items in total were considered to fulfill criteria for substance dependence.

Participants who did not fulfill criteria for substance dependence were assessed for substance abuse by an item of the ASI-6 which had a modified response option referring to symptoms of substance abuse during the course of one year. Participants who answered yes to this item were considered to fulfill criteria for substance abuse, whereas a negative answer yielded further assessment by one last item of the SCAN. Participants who answered no to this last item were considered to have no disorder, that is, criteria for substance abuse or substance dependence were not fulfilled. Initially, the full Swedish translation of Chapter 11 and 12 of the WHO SCAN was used as a diagnostic tool for assessment of a substance use disorder. However, this instrument was perceived as too challenging by the participants, and was therefore replaced with the above assessment tool.

In Study I, substance abuse and substance dependence of alcohol and/or illicit drugs according to the diagnostic assessment tool and the SCAN served as dependent variables in the statistical analyses computed in order to assess the concurrent validity of the AUDIT and the DUDIT.

4.2.3.3 Follow-up assessments
At all three follow-ups, the ASI-6 (Cacciola et al., 2011) was used for further assessment of problem severity. At the first follow-up assessment, the PCL-R (Hare, 2003) was used for evaluation of psychopathic personality traits and the Historical Clinical Risk-Management Scale (HCR-20; Webster et al., 1997) was used for assessment of future risk of violence. A full description of the PCL-R is provided in section 2.2.2.1.

The HCR-20 contains 20 items that refer to static background factors (e.g., previous violence, employment problems, major mental illness and personality disorder) and current dynamic factors (e.g., lack of insight, impulsivity, lack of personal support, and stress) that are related to risk of future violence (Webster et al., 1997). As with the PCL-R, the items are scored on a three point scale (0 = absent, 1 = possible/partial, 2 = present), and the total maximum score is 40 points. The scoring relies on an interview with the individual as well as on additional file information such as criminal records. The items of the HCR-20 are divided into three scales: Historical, Clinical and Risk. The Historical scale has 10 items that refer to static background factors of violence, whereas the Clinical and Risk scales involves 5 items each that concern current dynamic risk factors of violence. In previous research, the instrument has predicted institutional and community violence and has demonstrated satisfactory psychometric properties (Belfrage, 1998; Gray, Taylor, & Snowden, 2008; Webster et al., 1997).

In Study II, the total PCL-R score was used in order to define individuals eligible for inclusion, (i.e. individuals with high and low degree of psychopathic personality traits, respectively). In Study III, the four PCL-R facets, the three HCR-20 scales, the nine ASI-6
RSSs (at the first follow-up assessment), and previous experiences of substance abuse treatment, according to the ASI-6, served as independent variables in the analyses in order to explore the relationships between offender characteristics and participation in substance abuse interventions. The total PCL-R was also used in Study IV in order to assess psychopathic personality traits and thus risk of criminal recidivism among the four subgroups/clusters mentioned above. Also, in Study V, the four PCL-R facets and the total HCR-20 score were entered as independent variables in the statistical analyses in order to control for variables (i.e. psychopathic personality traits and violence risk), possibly related to criminal recidivism.

Finally, at the third follow-up assessment, the participants’ quality of life was assessed with the Swedish version of the WHOQOL-Bref, a self-report questionnaire including 26 items to be answered on a five-point scale ranging from 1 to 5 (B. Nygren, personal communication, February 19, 2013; The WHOQOL Group, 1998). The items can be divided into four scales assessing quality of life in four domains: physical health, psychological health, social relationships and environmental conditions. The raw scores of each domain can be transformed into standard scores ranging from 1 to 100. Two of the items which concern overall quality of life and general health are not included in any of the domains. In previous research, the WHOQOL-Bref has demonstrated adequate psychometric properties (Skevington, Lotfy, & O’Connel, 2004). In Study IV, overall quality of life, general health, and quality of life in the four domains, served as dependent variables in the analyses in order to explore the predictive validity of the four subgroups in the study population in focus.

4.2.3.4 Register data

Information was also collected through Swedish registers by linking the participants’ social security number to the data. Data on treatment participation in the Stockholm County was extracted from the official registry on health care utilization in Stockholm County Council. The register contains data on about 95% of all consumed care in the county and involves in- and outpatient treatment, i.e. the number of admissions to treatment as well as the number of visits to public service providers of such treatment (e.g. counselors, psychologists, psychiatrists, registered nurses, or case managers). The data is divided into planned or emergency visits/admissions, and can be categorized into psychiatric, - somatic, - and substance abuse treatment.

In Studies III and V, the official registry on health care utilization in Stockholm County Council was used for assessment of participation in planned outpatient visits to substance abuse clinics and in Study IV this registry was used for assessment of participation in any (planned and/or acute) in- and outpatient psychiatric-, somatic- and substance abuse treatment. In Studies III and IV, the treatment participation variables concerned the time period from the date of the first follow-up assessment until the date of the third follow-up assessment and served as dependent variables in the statistical analyses computed. In Study V, participation in planned outpatient visits to substance abuse clinics concerned the time period from the date of release from prison of compulsory inpatient forensic psychiatric care until October 31, 2011, and served as an independent variable in the statistical analyses computed.

Furthermore, data on participation in substance abuse interventions delivered by the social services system in Stockholm County was gathered through the collection of social services records, requested from the local districts in the municipalities of the Stockholm County. These records were used in Studies III and V for the assessment of “dry housing”
residence, i.e. residence at a treatment or a supportive facility, where urine tests for drug intake and breath analyses of alcohol was regularly performed. In Study III, dry housing residence concerned the time period from the date of the first follow-up assessment until the date of the third follow-up assessment and served as a dependent variable in the statistical analyses computed. In Study V, dry housing residence concerned the time period from the date of release from prison of compulsory inpatient forensic psychiatric care until October 31, 2011, and served as an independent variable in the statistical analyses computed.

Information was also gathered from the forensic psychiatric research register, administered by the National Board of Forensic Medicine. This archive contains data on all FPAs performed in Sweden such as court record data on types of criminal offenses and sentences meted out as a consequence of such crimes. In Studies III, IV and V, this registry was used in order to describe the participants with regard to parameters such as index crimes, i.e., crimes committed in association with the FPA, and sentences meted out as a consequence of such crimes.

Finally, data on criminal recidivism was collected from the national crime register administered by the National Council for Crime Prevention. This registry includes data for all convictions in Sweden since 1973 and has high coverage. According to a previous study, only 0.001% of the convicted crimes had incomplete social security numbers during 1988 to 2000 (Fazel & Grann, 2006). In Study V, the register was used for assessment of criminal recidivism, (i.e. new convictions), which served as a dependent variable in the statistical analyses computed. Data on criminal recidivism concerned the time period from the date of release from prison of compulsory inpatient forensic psychiatric care until October 31, 2011.

4.2.3.5 Semi structured in-depth interviews
For Study II, information was collected through twelve semi structured in-depth interviews. An interview guide with pre-defined questions was developed and used in all interviews, but additional questions were also asked to elucidate the informant’s story. The guide was based on the study objectives as well as on literature reviews of the research field and was used in order to provide structure to the interviews and to ensure that similar topics were covered with all informants. For instance, the interviews concerned topics such as perceived facilitators and barriers to treatment, positive and negative treatment experiences, and perceptions of the ideal treatment, i.e. which treatment components that were perceived as having an impact on current problems.

The interviews took place at cafés in the Stockholm city center as well as in prison and remand settings. All interviews lasted 94 minutes on average ($SD = 15.74$ minutes, range = 69–118 minutes), were recorded using an mp3-player and transcribed verbatim. Significant pauses and laughs during the interview were also noted in the transcripts whereas identifiable features were omitted. Each interview generated 18 to 34 pages of typewritten text.

4.2.4 Characteristics of the MSAC-participants
The participants included in this thesis were sampled among participants of the MSAC-project, i.e. offenders with mental health problems and problematic substance use in Stockholm County. Among all participants included in the MSAC-project ($n = 207$), 190 individuals (92%) were men and 17 (8%) were women. A majority was born in Sweden (70%), and the mean age was 33.97 years ($SD = 11.12$). About half of the participants had
been subjected to a minor FPA (54%), whereas the remaining part of the participants had been subjected to a major FPA only, or to a major and a minor FPA (45%). For two of the participants, the minor FPA was later cancelled. Further descriptives of the sample are presented in Table 2.

Table 2. Criminality, sentences, psychiatric symptoms, substance use, HCR-20-scores, PCL-R-scores among the participants. Frequencies, means ($M$), standard deviations ($SD$), and ranges presented ($n = 207$).  

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Index crimes</strong>&lt;sup&gt;2&lt;/sup&gt; associated with the FPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violent crimes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>147</td>
<td>71</td>
</tr>
<tr>
<td>Narcotic-related crimes</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>Sexual crimes</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>Arson</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Property crimes</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>None (found not guilty)</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Sentences in association with the index crime</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imprisonment</td>
<td>135</td>
<td>65</td>
</tr>
<tr>
<td>Probation or fines</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Compulsory inpatient forensic psychiatric care</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>None (found not guilty)</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Prior psychiatric symptoms</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had trouble thinking/concentrating/remembering</td>
<td>166</td>
<td>80</td>
</tr>
<tr>
<td>Felt anxious, nervous or worried most part of the day</td>
<td>164</td>
<td>79</td>
</tr>
<tr>
<td>Felt depressed or down most of the day</td>
<td>164</td>
<td>79</td>
</tr>
<tr>
<td>Pushed, hit, thrown things at, or used a weapon</td>
<td>153</td>
<td>74</td>
</tr>
<tr>
<td>Had serious thoughts of committing suicide</td>
<td>132</td>
<td>64</td>
</tr>
<tr>
<td>Had difficulty controlling temper/urges to hit or harm</td>
<td>122</td>
<td>59</td>
</tr>
<tr>
<td>Had hallucinations</td>
<td>114</td>
<td>55</td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>102</td>
<td>49</td>
</tr>
<tr>
<td><strong>Prior use of substances</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>204</td>
<td>99</td>
</tr>
<tr>
<td>Cannabis</td>
<td>169</td>
<td>82</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>149</td>
<td>72</td>
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<tr>
<td>Sedatives</td>
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<tr>
<td>Cocaine</td>
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<tr>
<td>Hallucinogens</td>
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<tr>
<td>Other opiates</td>
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<tr>
<td>Heroin</td>
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<td>36</td>
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<tr>
<td>Inhalants</td>
<td>51</td>
<td>25</td>
</tr>
<tr>
<td><strong>Prior criminality</strong>&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean no of previous convictions</td>
<td>5.31</td>
<td>8.58</td>
</tr>
<tr>
<td><strong>Mean AUDIT and DUDIT total scores</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean AUDIT total score</td>
<td>14.75</td>
<td>10.49</td>
</tr>
<tr>
<td>Mean DUDIT total score</td>
<td>15.97</td>
<td>14.89</td>
</tr>
<tr>
<td><strong>Mean PCL-R scores</strong>&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td>Total PCL-R</td>
<td>14.11</td>
<td>7.94</td>
</tr>
<tr>
<td>Interpersonal facet</td>
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<td>1.53</td>
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<td></td>
<td>2.88</td>
<td>1.94</td>
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<td>------</td>
</tr>
<tr>
<td>Affective facet</td>
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<td></td>
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<tr>
<td>Lifestyle facet</td>
<td>4.82</td>
<td>2.77</td>
</tr>
<tr>
<td>Antisocial facet</td>
<td>3.23</td>
<td>2.58</td>
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<table>
<thead>
<tr>
<th>Mean HCR-20 scores</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total HCR-20</td>
<td>16.22</td>
<td>7.89</td>
<td>0–31</td>
</tr>
<tr>
<td>Historical scale</td>
<td>7.86</td>
<td>4.39</td>
<td>0–18</td>
</tr>
<tr>
<td>Clinical scale</td>
<td>4.02</td>
<td>2.39</td>
<td>0–10</td>
</tr>
<tr>
<td>Risk scale</td>
<td>4.59</td>
<td>2.84</td>
<td>0–10</td>
</tr>
</tbody>
</table>

1 Data presented according to the Central Archive of The National Board of Forensic Medicine, the sixth version of the Addiction Severity Index (ASI-6), the Alcohol Use Disorders Identification Test (AUDIT), the Drug Use Disorders Identification Test (DUDIT), the Historical, Clinical, Risk management Scale (HCR-20) and the Psychopathy Checklist-Revised (PCL-R).

2 The main crime at the index conviction

3 Assault, murder/attempted murder/manslaughter, threat and robbery

4 Data on prior psychiatric symptoms, use of substances and criminality concern the time period after 18 years of age.

5 The mean PCL-R and HCR-20 scores concern psychopathic personality traits and risk of violence among 158 MSAC-participants.

A majority of the participants had been convicted of violent crimes (71%) and been sentenced to imprisonment (65%) in association with the index crime. In total, 155 individuals (75%) had at least one conviction prior to the index crime. All participants had about five previous convictions on average.

The participants reported several psychiatric symptoms. After 18 years of age, most participants had experienced cognitive problems (80%), and felt depressed, anxious, nervous or worried most of the day (79%). Approximately half (49%) had attempted suicide. The mean total AUDIT and DUDIT scores were about 15 and 16 points, respectively. After 18 years of age, a majority had consumed alcohol (99%), cannabis (82%) and amphetamines (72%). Finally, among all MSAC-participants (n = 207), 158 individuals participated in the first follow-up and were assessed for psychopathic personality traits and risk of violence. Their mean total PCL-R and HCR-20 scores were about 14 points and 16 points, respectively.

### 4.2.5 Sampling of each study

All participants included in the studies of this thesis were sampled among the MSAC-participants (see Figure 4).
**STUDY I**
- Participated in baseline assessment of the MSAC-study:
  - $n = 207$

**STUDY II**
- Participated in the first follow-up of the MSAC-study and displayed a high or low degree of psychopathic personality traits:
  - $n = 40$
- Females: $n = 2$
- Not contacted for study participation: $n = 21$
- Declined study participation: $n = 5$

**STUDY III**
- Participated in the third follow-up of the MSAC-study:
  - $n = 140$
- Subjected to compulsory treatment for problematic substance use: $n = 6$

**STUDY IV**
- Participated in baseline assessment of the MSAC-study:
  - $n = 207$
- Screened positive for outliers: $n = 3$
- Imprisoned/ hospitalized/ had not completed all three follow-up interviews: $n = 51$
- Declined further MSAC participation/ deceased/emigrated/lost to follow-up: $n = 28$

**STUDY V**
- Participated in the first follow-up of the MSAC-study:
  - $n = 158$
- Found not guilty of the index crime: $n = 4$
- Declined further MSAC participation: $n = 3$
- Sentenced for the index crime after October 31, 2011: $n = 1$

**Final sample**
- **STUDY I**: $n = 181$
- **STUDY II**: $n = 12$
- **STUDY III**: $n = 134$
- **STUDY IV**: $n = 125$
- **STUDY V**: $n = 150$

Figure 4. Participants included in the five studies. Individuals excluded are marked in boxes with a dashed line.
In Study I, the sample comprised individuals who had participated in the baseline assessment \((n = 207)\). While the study was conducted, recruitment to the MSAC-project had not yet been completed and 200 of the final 207 participants had participated in the baseline assessment and were thus eligible for study inclusion. In total, 19 individuals were excluded: six who did not complete the ASI-6 interview, and 13 for whom the substance use disorders were inadequately derived. Thus, the final sample of Study I comprised 181 individuals.

The sampling procedure of Study II is referred to as purposive sampling, that is, to choose a sample that can represent the phenomena of interest (Maxwell, 2005). The participants were sampled among individuals who participated in the first follow-up of the MSAC-project and thus had been assessed for psychopathic personality traits \((n = 158)\). Participants with a high (i.e. \(\geq 26\) points on the PCL-R) and low (i.e. 0–5 points on the PCL-R) degree of psychopathic personality traits were considered eligible for inclusion \((n = 40)\). Among those, females \((n = 2)\) were not invited to participate, due to the fact that none displayed a high degree of psychopathic personality traits and the assumption that it would be rather complicated to analyze the results from a mixed gender study cohort. The remaining 38 individuals divided into the two above groups were ranked in ascending order according to their study ID numbers assigned at recruitment to the MSAC-project. Starting with those with the lowest study ID numbers in each group, the individuals were contacted individually by telephone and were invited to participate and told that the interview would concern their perceptions of treatment. Hence, the individuals were consecutively recruited to the study. Among the 38 individuals, 17 were contacted (21 individuals were not contacted) among which five declined. The remaining twelve individuals accepted study participation and were thus included in the study.

In Study III, the participants were sampled among individuals who had participated in the third and last follow-up of the MSAC-project \((n = 140)\). As the focus of the study was to explore the relationship between offender characteristics and voluntary participation in substance abuse interventions, six participants who had been subjected to compulsory substance abuse treatment were excluded from the study. Thus, the sample of Study III comprised 134 MSAC-participants.

In Study IV, the participants of the study were sampled from those who had participated in the baseline assessment (from which the subgroups were derived). Among those \((n = 207)\), three individuals who screened positive for outliers on the ASI-6 problem severity domains were excluded, as well as 51 individuals who were still imprisoned or hospitalized at the end of the study or had not completed all three follow-up interviews. Also, 28 participants, who were either deceased, lost to follow-up, emigrated from Sweden or had declined further study participation were excluded. Thus, the sample of Study IV comprised 125 MSAC-participants.

Finally, in Study V, the aim was to explore the relationship between participation in substance abuse interventions and criminal recidivism. Therefore, we sought to include individuals who been living in the community during the observation period; meaning that we included those who had been released from prison or compulsory inpatient forensic psychiatric care. Among those who had participated in the first follow-up (which took place prior to release; \(n = 158)\), we excluded eight individuals; four who had been found not guilty of the index crime, three who declined further study participation and one who was sentenced for the index crime after the end-point of the study, i.e. after October 31, 2011. Thus, the total sample of Study V comprised 150 MSAC-participants.
4.2.6 Analyses of each study

Both statistical and qualitative analyses were performed. In all studies, means, frequencies, standard deviations, and ranges were used to describe the participants. The specific analyses performed in each study are more thoroughly described below.

4.2.6.1 Study I

In study I, receiver operating characteristic (ROC) analyses were computed in order to analyze the concurrent validity of the AUDIT and the DUDIT in relation to substance abuse and dependency disorders. ROC analysis is often used to determine diagnostic accuracy of a screening tool (Fawcett, 2006). Generally, within such an analysis, continuous variables (variables on a ratio or interval scale) serve as independent variables, whereas dichotomous yes-or-no variables (variables on a nominal scale) serve as dependent variables. The analysis produces ROC-curves and an effect size, referred to as the area under the curve (AUC), commonly reported together with 95% confidence intervals (CI). The interpretation of the AUC is the probability that a randomly chosen individual from the positive group (i.e., participants with a disorder) has a test score higher than a randomly chosen individual from the negative group (i.e., participants with no disorder). The range of the AUC is 0 to 1, where 0 equals a perfect negative relationship between the two variables, .5 means no relationship or accuracy no better than chance, whereas an AUC of 1 indicates a perfect positive relationship, i.e., 100% accuracy.

The ROC analysis produces the sensitivity (the proportion that are accurately recognized by the screening tool in fulfilling criteria for a disorder) and the specificity (the proportion that are accurately recognized by the tool as not fulfilling criteria for a disorder) over all possible cut-off scores of a screening tool (Fawcett, 2006). Based on sensitivity and specificity proportions, optimal cut-off scores for the tool can be chosen. Adequate sensitivity must be ensured to exclude false positives (the proportion that are falsely recognized by the tool in fulfilling criteria for a disorder) since screening is intended to capture as many affected individuals as possible. However, the sensitivity must be balanced against specificity for minimizing the false negatives (the proportion that are falsely recognized by the tool as not fulfilling criteria for a disorder). Within the study, The ROC curves were constructed by plotting sensitivity against the false-positive rate for all the possible cut-off scores of the AUDIT and DUDIT.

Also, bivariate Pearson product moment correlation coefficients were computed in order to analyze the concurrent validity of the AUDIT and the DUDIT in relation to the alcohol, drugs and legal problem severity domains of the ASI-6. This coefficient is a measure of the linear relationship between two continuous variables (Pallant, 2007). It ranges from -1 to +1, where a negative value represents a negative association, and a positive value represents a positive association, between the two variables. The strength of the coefficient can be determined by the guidelines according to Cohen (1988). As suggested by these guidelines, a correlation coefficient of ±.10 represents a weak or small association: a correlation coefficient of ±.30 is considered a moderate correlation and a correlation coefficient of ±.50 or larger represents a strong or large association. Before the Pearson correlation coefficients were computed, data were checked for normal distribution by visual inspection. The distributions of the AUDIT, DUDIT and the ASI-6 legal problem severity domain were skewed, and therefore square root and log transformations were used.

Variables on ordinal scale are often treated as continuous variables in statistical analyses (Pallant, 2007).
Finally, Cronbach's alpha coefficients, ranging from 0 to 1, were calculated in order to examine the internal consistencies of the tools (Pallant, 2007). All statistical analyses were performed with SPSS 16.0.

4.2.6.2 Study II

In study II, a qualitative analysis of individual semi structured in-depth interviews was performed in order to explore perceptions of substance treatment among the study participants. The method of choice was Interpretative Phenomenological Analysis (IPA), designed to explore participants’ views and experiences of a certain phenomenon (Smith, Flowers, & Larkin, 2009; Smith, Jarman, & Osborn 1999). The method aims to illustrate personal perceptions, rather than to produce an objective statement of the phenomenon and emphasizes that research is a dynamic process in which the researcher takes an active role. While the aim is to achieve an “insider” perspective IPA assumes that the researcher cannot do this directly or completely. Access to a participant’s experience depends on the researcher’s own preconceptions through a process of interpretative activity. The method is often used when the researcher is concerned with a complex research area that has not been explored previously.

IPA is not a prescriptive approach but a set of flexible guidelines that can be adapted. With reference to these guidelines, the analysis was performed in various stages. In the first stage, a template was defined. This would direct the analysis in the subsequent stages (Crabtree & Miller, 1999). The rationale for the use of a template was that it may enable the researcher to search for relevant text segments that are related to the research question(s), and may help provide structure to the process of analysis. The template may be pre-defined, based on previous theory or research evidence, or developed after initial exploration of the data. Within the current study, the latter approach was applied.

The template was defined by continuous readings of four transcripts during which content related to the research questions were marked. After assessment of agreement in the markings (all co-authors independently performed this procedure), it was decided that content involving perceptions of substance abuse treatment provided by institutions or voluntary organizations should be included in the template. The final template was then used for further identifying segments of text to be subject to analysis. During the second stage of the analysis, all transcripts were read until a sense of whole was gained and keywords were noted in the margins. The keywords were then transformed into preliminary sub-themes which emerged both from raw data and from the concepts a priori defined in the template. In the third stage, the names previously given to the sub-themes were changed to reflect a more latent content of the narratives. Constantly, during this stage, all interviews were re-read and the content of the narratives was categorized as either belonging or not belonging to the sub-themes already emerged. Content that did not fit into the already existing sub-themes was categorized into new sub-themes. In the last stage of the analysis, all sub-themes were clustered together into themes of a more general content. Those sub-themes that did not fit any of the themes were removed. Differences in perceptions of treatment between participants with a high and low degree of psychopathic personality traits were specially noted upon. In stages two to four, the program Open Code 3.6 was used in order to define preliminary sub-themes, final sub-themes and themes. This program was developed by Umeå University for coding of qualitative data and can be downloaded from the Internet (ICT Services and System Development and Division of Epidemiology and Global Health, 2009). Table 3 provides an example of the formulation of keywords,
sub-themes, and final themes, based on segments of interview text. The descriptive statistics of Study II were performed with SPSS version 20.0.

Table 3. Example of the formulation of keywords, sub-themes and final themes based on segments of text.

<table>
<thead>
<tr>
<th>Segments of text (Quotations)</th>
<th>Keywords</th>
<th>Sub-themes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>I only did it [initiated treatment] for the sake of my friends. Because they wanted me to go there, and in some way, I wanted to relieve them from their responsibility</em> (0-5 PCL-R points).</td>
<td>Treatment initiation Reasons Friends Pressures</td>
<td>Being subjected to formal and informal pressures</td>
<td>Turning points</td>
</tr>
<tr>
<td><em>The social services forced me more or less. They told me that if I didn’t go there voluntarily they would commit me to compulsory treatment. Therefore, there wasn’t much to consider. It’s never fun being treated under such circumstances</em> (≥26 PCL-R points).</td>
<td>Treatment initiation Reasons Social services Pressures Avoidance Compulsory treatment</td>
<td>Being subjected to formal and informal pressures</td>
<td>Turning points</td>
</tr>
<tr>
<td><em>In general, it doesn’t bother me. It’s done quite easily, and there’s nothing to worry about. I just go there and leave my samples, and I keep my appointments. That has worked well</em> (0-5 PCL-R points).</td>
<td>Treatment attendance Requirements Sobriety Manageable</td>
<td>Control</td>
<td>The perceived imbalance between caregivers and caretakers</td>
</tr>
<tr>
<td><em>Although I was homeless and a substance abuser, they [the social services] claimed that I did not fit in to the category they gave rental apartments to […] It’s like this; you have to be clean for one year before you can get an apartment. And that’s not very easy when you’re homeless; that is, to stay clean when you have to sleep at toilets and in basements…</em> (≥26 PCL-R points).</td>
<td>Access to support Requirements Sobriety Difficult</td>
<td>Control</td>
<td>The perceived imbalance between caregivers and caretakers</td>
</tr>
<tr>
<td><em>In treatment, I’m automatically placed in an inferior position. I have to prove this and that. It’s me against them [the treatment providers], somehow. They can decide whatever they want</em> (≥26 PCL-R points).</td>
<td>Inferior position Burden of proof Power</td>
<td>A sense of inferiority</td>
<td>The perceived imbalance between caregivers and caretakers</td>
</tr>
</tbody>
</table>

4.2.6.3 Study III

In Study III, chi-square tests were used to test differences in prevalence and one-way repeated measures analysis of variance (ANOVA) was used to compare means. Chi-square tests can be used to investigate whether two or more samples are different from each other on categorical data (Pallant, 2007) and the one-way repeated measures ANOVA can be used to compare participants of a sample on two or more continuous variables. ANOVA only indicates whether there are differences within or between samples, and therefore, post-hoc analyses must be performed in order to explore exactly where the differences occur. For Study III, the method of choice was the Bonferroni post-hoc test for multiple comparisons.

In order to explore the relationships between the offender characteristics and participation in substance abuse interventions, multiple hierarchical logistic regression models were computed. The multiple hierarchical logistic regression analysis is capable of
predicting a dichotomous outcome using multiple continuous and/or categorical independent variables (Tabachnick & Fidell, 2007). The independent variables can be entered in a predetermined order in blocks or steps, according to logical or theoretical considerations. This yields the possibility to observe how much of the overall variance in the dependent variable that can be explained by independent variables of particular interest when statistically controlling for others.

In order to explore how the different types of offender characteristics, i.e. problem severity, violence risk and psychopathic personality traits, would contribute to the prediction of participation in substance abuse interventions, the regression analysis was performed in three blocks. In the first block, merely the problem severity variables were entered as predictors, whereas the violence risk variables and the PCL-R facets were added as predictors in the second and third block, respectively. The Nagelkerke R-square acquired from the analysis indicated how much of the overall variance in the dependent variable that could be explained by the independent variables entered in each block (Tabachnick & Fidell, 2007).

Furthermore, the multiple hierarchical logistic regression analysis produces an Odds Ratio (OR), which is a measure of the association between an independent variable and the dependent variable (Tabachnick & Fidell, 2007). The OR is the change in odds of being in one of the categories of the dependent variable, e.g. having had at least three planned visits to an outpatient substance abuse clinic when the value of the independent variable is increased by one unit. If the independent variable is dichotomous and increases from 0 to 1, the OR may be considerable. On the other hand, if the independent variable is continuous, the OR may be small since it represents the change in odds per unit increase of the variable. ORs greater than 1 reflect the increase in odds of being in one of the categories of the dependent variable with a one-unit increase of the independent variable, whereas ORs less than 1 reflect the decrease in odds of being in one of the categories of the dependent variable with a one-unit increase of the independent variable. As an example, in the study, an OR of 1.5 indicates that the odds of having had at least three planned visits to an outpatient substance abuse clinic are increased by 50% with a one-unit increase of the independent variable.

The logistic regression also produces a 95% CI which can be used to estimate the precision of the OR. A large CI indicates a low precision of the OR, whereas a small CI indicates a high precision of the OR. All statistical analyses in Study III were performed with SPSS 20.0.

### 4.2.6.4 Study IV

In Study IV, a three-way repeated measures ANOVA (i.e. a three-way between within ANOVA) was used to explore the stability of the subgroups/clusters. This statistical method can be used to explore the relationships between and three categorical independent variables (both between- and within-subject variables) with at least two levels, e.g. 1) cluster membership (four levels), 2) problem severity domain (nine levels) and 3) time (two levels) and one continuous dependent variable (e.g. problem severity ranging from 1 to 100). The analysis tests whether there are significant main- and interaction effects for each of the independent variables. A main effect refers to the direct effect of an independent variable (averaging over levels of the other independent variables) on the dependent variable whereas an interaction effect refers to a situation where an effect of one independent variable (averaging over levels of the third independent variable) depends on
the levels of the second independent variable. Such an effect is usually referred to as a two-way interaction.

Furthermore, the three-way repeated measures ANOVA tests whether there is a significant three-way interaction (Kirk, 1995). A three-way interaction can be described as a number of two-way interactions varying over the levels of the third independent variable, i.e. simple interaction effects. An example of such an effect is the interaction between cluster membership and problem severity domain at baseline and at follow-up, respectively. In order to interpret the three-way interaction, the simple interaction effects should be tested for significance (Kirk, 1995). Within the study, the simple interaction effects were tested using two-way repeated measures ANOVA which explores the effects of one between-subject variable (e.g. cluster membership) and one within-subject (e.g. time) variable on the dependent variable (e.g. problem severity ranging from 1 to 100).

Any significant simple interaction effect should be followed by tests of simple simple main effects which can be described as the comparison of the levels of one independent variable at each level of the other independent variables. For example, one such effect is the comparison of the four clusters at each of the nine problem severity domains at baseline. The simple simple main effects were tested using one-way ANOVA and one-way repeated measures ANOVA. The first analysis mentioned explores the effect of one between-subject independent variable on the dependent variable, whereas the second explores the effect of one within-subject independent variable on the dependent variable. Any significant simple simple main effects were followed by Tukey post-hoc tests whenever applicable (p <.05). Finally, in order to explore the predictive validity of the subgroups/clusters, chi-square tests, and one-way ANOVAs along with Tukey Post-hoc tests were computed. All statistical analyses were performed with SPSS 20.0.

4.2.6.5 Study V

In Study V, survival analyses were computed in order to explore the relationship between participation in substance abuse interventions and criminal recidivism (Therneau, & Grambsch, 2000). Such analyses are commonly used when the dependent variable of interest is dichotomous, usually referred to as an event (e.g. crime relapse), and when the researcher is interested in exploring time to such an event. In the study, the following analyses were computed: Extended Kaplan-Meier (K-M) curves along with a log-rank test, an extended Cox-proportional-hazards regression model (Snappin, Jiang, & Iglewicz, 2005; Therneau & Grambsch, 2000), and a stratified Cox-regression for within-individual analyses (Allison, 2009). All analyses are described in more detail below.

First, two extended K-M curves were calculated (Snappin et al., 2005). These were computed in order to describe the unadjusted association between participation in substance abuse interventions and criminal recidivism and to explore the probability of survival i.e. the probability of not committing a new crime among individuals participating in substance abuse interventions, and those not participating in such interventions, respectively. Extended K-M curves allows for exploration of survival when the independent variables of interest are time-dependent covariates, i.e. independent variables changing over the course of time. In the study, both variables for participation in substance abuse interventions, i.e. at least three visits to an outpatient substance abuse clinic and dry housing residence during the observation period, were treated as time-dependent covariates.

Furthermore, a main focus of the study was to explore time to multiple events, i.e. multiple convictions. In order to handle multiple convictions, the observation time in the extended K-M analysis was reset at 0 at the main crime of the conviction. For consistency,
the multiple events were treated in the same fashion in the Cox-regression described below. Also, a log-rank test was computed in order to determine statistical significance between the extended K-M survival curves (Therneau & Grambsch, 2000). A p-value below .05 of the log-rank test indicates that the participants represented by the two curves have different probabilities of survival, i.e. non-relapse into criminality.

Secondly, an extended Cox-proportional-hazards regression model was estimated (Therneau & Grambsch, 2000). This model can be regarded as an extended version of the original Cox model, allowing for analysis of both continuous and/or categorical independent variables that can be static or time-varying in order to predict multiple events. In the analyses, a conditional model was appropriate, i.e. an individual’s second conviction was conditioned on that he or she had already been convicted. The independent variables entered in the model were factors possibly predicative of reoffending as well as the two variables (see above) for participation in substance abuse interventions.

As with a logistic regression (see above), the independent variables in an extended Cox-proportional-hazards regression can be entered in a predetermined order in blocks or steps, according to logical or theoretical considerations (Tabachnick & Fidell, 2007). This yields the possibility to observe whether the model significantly improves when variables of particular interest are added as predictors. Thus, in the study, the analyses were performed in two blocks in order to independently evaluate how the substance abuse intervention participation variables would contribute to the prediction of criminal recidivism.

Furthermore, the analysis produces a Hazard Ratio (HR), which, as the OR, measures the association between an independent variable and the dependent variable (Kay, 2004; Tabachnick & Fidell, 2007). More specifically, the HR is an expression of the hazard or chance of having the event, e.g. a new conviction, when being in one category of the independent variable, e.g. the group with at least three planned visits to an outpatient substance abuse clinic during the observation period, as compared to the hazard or chance of having the events when being in the other category of the independent variable, e.g. the group with fewer than three planned visits to an outpatient substance abuse clinic during the observation period. A HR greater than 1 reflects an increase in risk of having the event, whereas a HR less than 1 reflects a decrease in risk of having the event. As with the logistic regression, the Cox-regression also produces a CI which can be used to estimate the precision of the HR.

When modeling a Cox proportional hazard regression, a key assumption is proportional hazards, i.e. that the hazards ratio does not vary with time (Kay, 2004; Tabachnick & Fidell, 2007). There are several methods to test or explore this assumption. One is visual inspection of K-M curves, representing two participant groups. An indication of proportional hazards implies curve shapes that are approximately the same and a proportional distance between the two. Such visual inspection was performed in order to explore the assumption of proportional hazards.

Finally, both the extended K-M curves and the extended Cox-proportional hazards model are unadjusted analyses (Allison, 2009). Thus, any relationships between the substance abuse intervention participation variables and criminal recidivism observed from these analyses could be due to confounding. Within the study we sought to reduce the risk of confounding by two methods: a) adding other independent variables than those of particular interest, which could be regarded as confounders when predicting criminal recidivism and b) performing a within-individual analysis carried out by a stratified Cox-regression. The latter was performed by letting each individual serve as his or her own
control and thus comparing the risk criminal recidivism for the same individual during periods of participation in substance abuse interventions and periods of non-participation in such interventions. This adjusts for all factors that are constant within each participant during the observation time, thereby reducing the risk of confounding. Within the study, all descriptive statistics were computed using SPSS, version 20 and the survival analyses were computed using Stata, version 13.

4.2.7 Ethical considerations

Before inclusion to the MSAC-project, all participants were provided with an oral and a written description of the study. All gave their written informed consent to participate in the assessments and authorized access to their treatment and criminal records. All individuals were informed that participation or non-participation in the MSAC-project would not affect their present situation in terms of medico-legal status, that all data would be kept confidential, and that they could withdraw from the study without further explanation. To protect the integrity of the participants, all data were stored in data files with personal identification numbers and names removed. All raw-data were kept securely at the Division of Forensic Psychiatry, Department of Clinical Neuroscience, Karolinska Institutet. The MSAC-project was approved by the Regional Ethical Committee in Stockholm (Dnr 2005/1265-31, Date: 2005-12-07).
5 AIMS AND MAIN RESULTS

5.1 STUDY I
The aim of Study I was to assess concurrent validity of the AUDIT and the DUDIT among offenders with mental health problems and problematic substance use. Concurrent validity was assessed by analyzing whether these tools could screen for substance abuse and dependency disorders of alcohol and/or illicit drugs, and whether they would correlate with the alcohol-, drug- and legal problem severity domains of the ASI-6.

Among the 181 participants included in the study, 164 (91%) were men and 17 (9%) were women. The mean was 33 years (SD = 10.88) and a majority (69%) was born in Sweden. The mean total scores of the AUDIT and the DUDIT were 14.66 points (SD = 10.19) and 16.92 points (SD = 14.38), respectively. In total, 92 individuals (51%) fulfilled criteria for substance dependence of alcohol, whereas 22 (12%) met criteria for alcohol abuse. In addition, 108 participants (60%) met criteria for substance dependence of illicit drugs and 16 individuals (9%) met criteria for substance abuse of illicit drugs.

For the AUDIT and the DUDIT in relation to a dependency disorder of alcohol and illicit drugs, the ROC analysis produced an AUC of .88 (95% CI = .83–.93, p < .001) and .93 (95% CI = .89–.96, p < .001), respectively. At an AUDIT cut-off score of 13 points, sensitivity was .83 and specificity was .78. Also, at a DUDIT cut-off score of 12 points, both sensitivity and specificity was .85.

For the AUDIT and the DUDIT in relation to substance abuse disorder of alcohol and illicit drugs, the ROC analysis produced an AUC of .69 (95% CI = .60–.78, p < .01) and .61 (95% CI = .50–.72, p < .1), respectively. Furthermore, the Pearson product moment correlations revealed that the AUDIT was associated with alcohol problem severity (r = .66, p < .001) and that the DUDIT was associated with drug problem severity (r = .85, p < .001) as well as legal problem severity (r = .45, p < .001). Finally, reliability analysis revealed Cronbach's alpha coefficients of .89 for the AUDIT and .94 for the DUDIT.

5.2 STUDY II
The aim of Study II was to explore perceptions of substance abuse treatment among offenders with mental health problems and problematic substance use with various degrees of psychopathic personality traits, and to investigate whether there were any differences in such perceptions between those with a high and low degree of psychopathic personality traits.

The mean age of the 12 male participants included in the study was 38 years (SD = 15.60 years, range = 23–65 years) and four were born in Sweden. At the time of the semi-structured in-depth interview, two participants were in prison, one was on remand, and the remaining individuals resided in the community. Six participants displayed a high degree of psychopathic personality traits (referred to as the H-group) while six individuals displayed a low degree of such traits (referred to as the L-group). The mean total PCL-R scores of the participants with a high or low degree of psychopathic personality traits was 27.17 (SD = 1.83) and 3.50 (SD = 1.38) respectively. The mean total Factor I and Factor II scores of former participants were 7.83 (SD = .98) and 15.67 (SD = .81), respectively. At the time of the in-depth interview, five informants had a problematic substance use and were utilizing substance abuse treatment. Altogether, eight had previous experiences of such treatment utilization.
In order to explore perceptions of substance abuse treatment among the participants, an IPA of semi structured in-depth interviews was performed. This analysis resulted in seven final themes illustrating perceptions of substance abuse treatment (see Figure 5). The final themes and their sub-themes are described in more detail in the text below.

The first theme involved various factors that contributed to Feeling like an outsider in relation to the treatment system. For example, informants from both the H- and the L-groups identified that the long wait for treatment, including lengthy phone queues when calling treatment providers, as well as having to spend several hours in waiting rooms before treatment appointments created a feeling of limited treatment access. To some H-participants, the mere concept of treatment had no significance to them as individuals. It was mainly perceived as a word used by authorities and caregivers and sometimes perceived as a term referring to a meaningless “cosmetic” activity, in the sense that treatment programs only existed for the sake of providing society with a positive image of treatment allocation. Several H-participants had also experienced a struggle with caregivers and social services when seeking treatment, describing that efforts were needed to make caregivers and social services listen to their problems, and to give them treatment access.

The participants also described Psychological barriers to treatment utilization, which formed the second theme. For example, keeping up appearances, i.e. keeping a straight face rather than showing how one felt and seeking help or trying to handle a problem on one’s own, was viewed as one barrier to treatment utilization among both H-
and L-participants. Unique to the H-group was that lack of confidence in treatment and the perceived stigma of treatment utilization were perceived as treatment barriers, whereas the L-participants identified lack of perceived treatment need as such a barrier.

The third theme involved various factors or events that had acted as Turning points for a change of attitudes towards treatment and treatment behavior. According to both participant groups, turning points for the former involved having hit the rock bottom e.g. having an overdose or losing custody of a child, whereas turning points for the latter included being subjected to formal and informal pressures i.e. pressures from friends, family or authorities. Furthermore, the fourth theme Treatment context matters involved complaints from both participant groups regarding lack of activities and too much focus on medication in treatment. L-group informants also stated that there was usually a poor physical treatment environment within treatment settings, including treatment facilities with unpainted walls and old furniture.

The fifth theme comprised descriptions of The perceived imbalance between caregivers and caretakers. For example, both participant groups described occasions when they had been subjected to control by treatment providers and social services, which could be perceived as inconvenient, for instance when one had to provide urine specimens or blood samples to prove being abstinent. Members of the two groups had somewhat different perceptions of the control requirements imposed on them. The L-informants described that such requirements were manageable, although sometimes inconvenient, whereas the H-participants said that they were often difficult to fulfill. Participants from both groups also described that they had been subject to prejudice from caregivers. The H-informants had felt that the prejudice involved being viewed as a criminal whereas the L-informants had felt that the prejudice involved caregivers’ views that having a problematic substance use was their own fault. H-group participants also described a sense of inferiority towards caregivers. Caregivers could be viewed as superior, deciding how the treatment should be assigned.

The informants also described A variety of positive outcomes of treatment utilization, which formed the sixth theme. Both H- and L-participants identified mental/emotional outcomes such as increased confidence and self-esteem, social outcomes such as an ability to re-integrate into society and instrumental outcomes, including various privileges in prison. Finally, the seventh theme involved Perceptions of the ideal treatment, i.e. treatment components that were perceived as having an impact on ongoing problems. Both groups stressed the importance of an individualized and all-encompassing treatment, i.e. one that should target the individuals’ specific treatment needs, and deal with housing, economy, complete abstinence from alcohol or illicit drugs, food and clothing. Also, psychotherapy, and a therapeutic alliance built on empathy and trust, was considered by both groups as essential components of the ideal treatment. Unique to the H-informants was the opinion that they wanted caregivers to help increase their motivation and to treat them with respect. Finally, both groups stressed the importance of structure in the treatment system, involving rules and check-ups of patients. Such structure was perceived to prevent relapse into alcohol and/or illicit drugs.

5.3 STUDY III
The aim of Study III was to explore the relationship between offender characteristics (i.e. problem severity, previous treatment experiences, violence risk and psychopathic personality traits) and participation in substance abuse interventions (i.e. least three planned
visits at substance abuse outpatient clinic and/or residence in dry housing) among offenders with mental health problems and problematic substance use.

Among the 134 participants included in the study, 121 (90%) were men and 13 (10%) were women. The mean age was 35 years ($SD = 10.81$) and a majority (68%) were born in Sweden. The mean HCR-20 and PCL-R scores were 15.91 ($SD = 8.15$) and 13.87 points ($SD = 8.17$) respectively. A total of 15 individuals (11%) had a PCL-R score equal or higher to 26 points, and thus fulfilled criteria for psychopathy. The participants mainly had personality traits referring to the Lifestyle PCL-R facet and few traits of the Interpersonal PCL-R facet (ANOVA repeated measures $F (3, 399) = 77.22, p < .001$, Bonferroni’s test for multiple comparisons: Lifestyle > Antisocial, Affective > Interpersonal).

During the observation period (i.e. the time period from the date of the first follow-up assessment until the date of the third follow-up assessment of the MSAC-project), 44 participants (33%) had at least three planned visits to an outpatient clinic delivering substance abuse treatment, whereas 31 individuals (23%) had resided in dry housing on at least one occasion. Among the former, 20 individuals (45%) had also lived in dry housing, whereas 24 (55%) had no such experiences ($\chi^2 (1, 134) = 18.35, p < .001$). Among those with less than three planned visits to outpatient clinics ($n = 90$), eleven (12%) had lived in dry housing.

The multiple hierarchical logistic regression analyses computed in order to explore the predictive capacity of the offender characteristics in relation to the outcomes, showed that drug problem severity (OR: 1.12, 95% CI = 1.04–1.20, $p < .01$) and employment problem severity (OR: 1.08, 95% CI = 1.01–1.16, $p < .05$) predicted planned visits to outpatient substance abuse clinics, whereas family/social problem severity (OR: 1.09, 95% CI =1.01–1.17, $p < .05$) predicted dry housing residence. Also, there were negative associations between the Affective PCL-R facet and participation in both planned outpatient visits (OR: .61, 95% CI = .45–.81, $p < .01$) and dry housing residence (OR: .52, 95% CI = .35–.76, $p < .01$). The explained variance increased when the HCR-20 scales and the PCL-R facets were added as predictors in the analyses.

5.4 STUDY IV

The aim of Study IV was to assess the stability and predictive validity of the four previously defined clusters/subgroups of the study population (based on MSAC baseline data; Eriksson et al, 2013). This was explored by analyzing problem severity and problem severity changes of the clusters throughout the course of time, as well as by analyzing the relationship between cluster membership and outcomes such as quality of life and treatment participation. A special focus was to explore, on a subgroup level, whether clusters with varying risk of criminal recidivism, and varying treatment needs would differ with regard to treatment participation.

Among the 125 participants included in the study, 111 individuals were men (89%) and 14 (11%) were women. The mean age was 36 years ($SD = 11.23$) and most (72%) were born in Sweden. The participants were unevenly distributed among the four clusters (numbers from the study by Eriksson and co-workers in brackets): “Less troubled”, $n = 21$ (35), “Severely triply troubled”, $n = 19$ (30), “Triply troubled with medical problems”, $n = 31$ (52), and “Working triply troubled”, $n = 54$ (87). When analyzing possible differences between the problem severity domains separately by time and clusters, it was shown that all cluster profiles changed to some degree at follow-up. At follow-up, each cluster profile was more similar to the other three clusters, as compared to baseline (see Figure 6).
Although all clusters showed improvements from baseline to follow-up, the “Severely triply troubled” cluster exhibited most differences in problem severity, i.e. on five of the nine scales (i.e. drug, alcohol, psychiatric, legal, and family/social problems: $F(2, 545) = 27.37, 4.95, 13.90, 25.25, \text{ and } 14.23$, respectively, $p < .05$ for all). The “Working triply troubled” exhibited improvements in four areas (i.e. alcohol, psychiatric, legal, and family/social problems: $F(2, 545) = 14.86, 18.80, 5.13, \text{ and } 23.53$ respectively, $p < .05$ for all), whereas the “Triply troubled with medical problems” exhibited improvements in three areas (i.e. drug, medical, and legal ($F(2, 545) = 15.93, 9.56, \text{ and } 11.82$, respectively, $p < .05$ for all)). Finally, the “Less troubled” exhibited improvements in two areas (i.e. alcohol and legal: $F(2, 545) = 5.41 \text{ and } 4.97$, respectively, $p < .05$ for all).

For about half of the problem severity domains, the differences or similarities between the clusters from baseline remained at the follow-up. More specifically, at baseline, there were significant differences between some of the clusters for eight of the nine problem severity domains, (i.e. drug, alcohol, psychiatric, medical, legal, employment, family/social support, and family/social problems: $F(3, 545) = 31.87, 3.63, 10.57, 11.01, 9.93, 3.13, 6.14, \text{ and } 8.46$, respectively, $p < .05$ for all), whereas at follow-up, the differences remained for three of the domains (i.e. for drug, psychiatric, and family/social support: $F(3, 545) = 6.31, 5.16, \text{ and } 8.06$, respectively, $p < .05$ for all). At follow-up, the “Severely triply troubled” and the “Triply troubled with medical problems” still exhibited a relatively higher problem severity regarding drugs compared to the other clusters. The “Triply troubled with medical problems” and the “Working triply troubled”
still exhibited a relatively higher psychiatric problem severity compared to the “Less troubled”. Finally, the “Less troubled” still exhibited a higher problem severity of family/social support compared to the “Working triply troubled”.

Moreover, there were differences between the clusters with regard to PCL-R score: \(F(3, 121) = 5.05, p < .01\). The “Severely triply troubled” cluster scored significantly higher on the total PCL-R, and thus displayed a higher degree of psychopathic personality traits, as compared to the less troubled cluster and the working triply troubled cluster (Tukey post hoc test). Based on this result, the “Severely triply troubled” cluster was considered to have the highest risk of criminal recidivism. Also, the cluster membership in itself defined the most extensive need of treatment. Thus, participants of this cluster were considered to be higher-risk and higher-need participants, relative to the other clusters.

During the treatment period (i.e. the time period from the date of the first follow-up assessment until the date of the third follow-up assessment of the MSAC-project), the “Less troubled” cluster had participated in a smaller proportion of outpatient somatic treatment \(\chi^2(3, 125) = 9.67, p < .05\) as well as outpatient substance abuse treatment \(\chi^2(3, 125) = 10.53, p < .05\), relative to the other clusters. When exploring whether cluster membership could predict quality of life, the results showed significant differences between the clusters with regard to quality of life in the physical \(F(3, 119) = 5.28, p < .01\), social relationships \(F(3, 119) = 4.75, p < .01\), and environment domains \(F(3, 119) = 3.82, p < .05\) of the WHOQOL-BREF. The results indicated higher quality of life for the “Working triply troubled” cluster in these domains. In addition, the “Less troubled” individuals displayed higher quality of life in the physical domain, relative to the “Triply troubled with medical problems” (Tukey post hoc test).

5.5 STUDY V
The aim of Study V was to explore the relationship between participation in substance abuse interventions (at least three planned visits to an outpatient substance abuse clinic during the observation period and/or dry housing residence) and criminal recidivism. In addition, the aim was to control for variables possibly related to criminal recidivism such as psychopathic personality traits and cluster membership.

Among the 150 participants included in the study, 136 (91%) were men and 14 (9%) were women. The mean age was 33.67 years (\(SD = 11.41\)) and most were born in Sweden (69%). A majority had been convicted of violent crimes (75%) and been sentenced to imprisonment in association with the FPA (61%). The mean total PCL-R and HCR-20 scores for the total sample were about 14 and 16 points, respectively. A total of 17 participants (11%) had a PCL-R score equal or higher to 26 points.

During the observation period (i.e. from the date of release from prison of compulsory inpatient forensic psychiatric care until October 31, 2011), 47 individuals (31%) had a record of at least three planned visits to an outpatient substance abuse clinic, whereas 35 individuals (23%) had resided in dry housing on at least one occasion. Among the former, 17 individuals (36%) had also lived in dry housing, whereas 30 individuals (64%) had no such experiences \(\chi^2(1, 150) = 6.31, p < .05\). In total, 76 individuals (51%) had reoffended with at least one conviction during the observation period.

When exploring the relationship between participation in substance abuse interventions and criminal recidivism, the extended Kaplan-Meier curves showed that the participants with at least three planned visits to an outpatient substance abuse clinic had a higher probability of not committing a new offense during the observation period, relative to those with fewer than three planned visits (log rank test, \(p = .005\)). Also, the extended Cox-proportional-
hazards regression model with multiple events showed that the participants with at least three planned visits to an outpatient substance abuse clinic had a significantly reduced risk of criminal recidivism relative to those with fewer than three planned visits to such a clinic (HR: .47, 95% CI = .29–.77, p < .01). Moreover, higher scores of the Antisocial PCL-R facet was associated with an increased risk of criminal recidivism (HR: 1.16, CI = 1.06–1.27, p < .01) as well as membership of the subgroup/cluster “Triply troubled with medical problems” (HR: 2.00, CI = 1.36–2.95, p < .001). The remaining variables entered in the model, i.e. age, the number of previous convictions, the Interpersonal, Affective and Lifestyle PCL-R facets, violence risk score, the "Less troubled” and “Severely triply troubled” clusters and dry housing residence, did not predict the outcome. Finally, the stratified Cox-regression confirmed the results of the extended Cox-proportional-hazards regression model. The within-participant hazard ratio for at least three planned visits to outpatient substance abuse clinics in relation to criminal recidivism was .25, (CI = .11–.60, p < .01) suggesting that after adjustment for all confounders that are constant within a participant, the risk of criminal recidivism was reduced by 75%. In this analysis, the association was not statistically significant for dry housing residence.
6 DISCUSSION

6.1 GENERAL DISCUSSION

6.1.1 Substance abuse interventions and reduced risk of crime relapse

Firstly, the results of Study V confirm that offenders with mental health problems and problematic substance use indeed are likely to reoffend into criminal behavior. Approximately half \((n = 76)\) of the study sample had reoffended with at least one criminal conviction during the observation period. This finding supports previous research (Jaffe et al., 2012; Sacks et al., 2012). However, another main finding of Study V was that participation in planned outpatient visits was associated with a significantly reduced risk of reoffending. This result was derived both from the between-individuals analysis, i.e. the extended Cox-proportional-hazards regression model, and the within-individual analysis, i.e. the stratified Cox-proportional hazards regression model, computed in the study. As shown by the former analysis, participation in planned outpatient visits was associated with a significantly reduced risk of reoffending regardless of other factors possibly related to criminal recidivism; i.e. age, the number of previous convictions, psychopathic personality traits, risk of violence, and cluster membership. Also, as shown by the latter analysis, when each participant served as his or her own control, participation in planned visits to outpatient clinics had an even stronger relationship to the outcome. The finding that participation in outpatient substance abuse interventions is associated with a reduced risk of criminal recidivism is in line with previous research showing that participation in methadone maintenance treatment, therapeutic communities (Holloway, Bennet, & Farrington, 2006; Perry et al., 2014; Prendergast, Podus, Chang, & Urada, 2002) and incarceration-based drug treatments, (Mitchell, Wilson, & MacKenzie, 2007; Turley, Thornton, Jonson, & Azzolino, 2004), is related to reduced crime rates. Thus, treatment targeting problematic substance use seems to be beneficial regardless the type of intervention provided.

The findings of Study V could also be interpreted as if individuals with mental health problems may benefit from some kind of stability in their contact with the health care system, in that it may reduce negative outcomes such as criminal behavior. In the study, such stability was defined as at least three planned visits to an outpatient substance abuse unit, or residing in dry housing residence, both of which were used as relevant proxies for willingness to accept the conditions related to substance abuse interventions in general. Regardless of the positive association with lower crime relapse rates, the limitation concerns the lack of information of what was provided during those visits or time periods. Hypothetically, abstinence control (i.e. urine tests for drug intake and breath analyses of alcohol) could play a role, since outpatient visits often include abstinence control, and in the case of dry housing residence, such control is a prerequisite. Other factors affecting the outcome could be perceived support, motivational interventions, medication etc. The finding is in line with a recent study showing that prescription of antipsychotics and mood stabilizers is associated with a reduced risk of violent criminality (Fazel, Zetterqvist, Larsson, Långström, & Lichtenstein, 2014). It may be considered worthwhile to encourage and motivate offenders with mental health problems and problematic substance use to start treatment, keep coming to their appointments and use their prescribed medications. Given that previous treatment experiences may facilitate future treatment participation (Hser et al., 1998; Storbjörk & Room, 2008), it could be argued that these individuals should also be invited and motivated.
to participate in substance abuse interventions already during correctional- and forensic psychiatric placement.

To conclude, substance abuse treatment programs are widely available in Sweden, and substance abuse is a risk factor that potentially could be easily targeted with the aim to reduce criminal behavior. To conclude, allocation of community based, outpatient substance abuse interventions and participation in such interventions could be regarded as important risk management strategies.

### 6.1.2 Antisocial psychopathic features, problem profile and increased risk of crime relapse

According to the findings of Study V, there were also other factors associated with an increased risk of criminal recidivism, namely higher scores on the Antisocial PCL-R facet and membership to a previously defined subgroup described as “Triply troubled with medical problems”. However, the Interpersonal, Affective, and Lifestyle PCL-R facets were unrelated to criminal recidivism. This suggests that the capacity of the PCL-R to predict criminal recidivism is driven mainly by the antisocial psychopathic features (i.e. earlier behavior problems and criminal versatility), a finding that is in line with earlier research (Wallinius et al., 2012; Walters et al., 2008). Blackburn (2007) proposed that the interpersonal and affective personality traits, described as the “core traits” of psychopathy, are expressed primarily in the form of narcissism and aggressive behavior but not necessarily through criminal behavior. This might explain why these traits did not predict criminal recidivism in Study V. The total problem load might hypothetically explain the higher risk of criminal recidivism among the participants of the cluster “Triply troubled with medical problems”; in this case a combination of medical problems along with psychiatric problems and problematic substance use. Similar reasoning has also been proposed in earlier research (Scott, Foss, Lurigio, & Dennis, 2003; Young, Fluellen, & Belenko, 2004).

Given that the Antisocial PCL-R facet and membership of the “Triply troubled with medical problems” cluster were associated with an increased risk of criminal recidivism, those with antisocial psychopathic features and a problem profile that involve high levels of medical, psychiatric, legal and drug-related problems may be considered a particularly vulnerable subgroup. This highlights the importance of assessing antisocial psychopathic features and problem profiles and adjusting clinical work accordingly.

### 6.1.3 Affective psychopathic personality traits as potential treatment barriers

The presence of psychopathic personality traits may function as barriers to participation in substance abuse interventions (Thornton & Blud, 2007). The main finding of Study III was that affective PCL-R facet was negatively associated both with participation in planned outpatient visits and dry housing residence. Thus, affective psychopathic personality traits could be considered to have relevance for treatment retention (Thornton & Blud, 2007. This result is in line with previous research showing that affective psychopathic personality traits predict dropout from sex-offender treatment programs (Olver & Wong, 2011). One approach to target affective psychopathic personality traits is to adapt the treatment program to such traits (Andrews et al., 2011; Olver & Wong, 2011). It has been suggested that offenders with affective psychopathic traits tend to have difficulties in establishing a therapeutic alliance with treatment staff, and that approaches focusing on such an alliance are likely to fail (Olver & Wong, 2011; Thornton & Blud, 2007). CBT-interventions have been proposed (Olver & Wong, 2011; Wong & Hare, 2005) to be efficient in facilitating treatment participation and
retention, since they focus on tasks and treatment goals and are based on social learning rather than relational aspects of treatment. Other researchers have suggested using DBT-interventions for those with psychopathic personality traits (Galietta & Rosenfeld, 2011). Given the proneness to be offended by, for example, treatment providers, DBT-interventions focusing on validation techniques (e.g. non-judgmental/non-confrontational approaches), have been described as beneficial in order to minimize the risk of treatment dropout. Based on the results of Study III and as well as previous research (Galietta & Rosenfeld, 2012; Olver & Wong, 2011), it seems reasonable to hypothesize that the delivery of CBT- and DBT-interventions could be beneficial in order to ensure treatment participation, retention and positive treatment outcomes among offenders with mental health problems, problematic substance use and affective psychopathic personality traits.

6.1.4 The possible relevance of antisocial psychopathic features for treatment perceptions

The results from Study II showed more similarities than differences in perceptions of substance abuse treatment between the two participant groups, i.e. those with high or low degree of psychopathic personality traits. Informants throughout the sample shared the view on what factors that should constitute “ideal treatment”; e.g. a therapeutic alliance and psychotherapy. Nonetheless, some differences were noted; for instance, participants with a low degree of psychopathic personality traits stated that control requirements that accompanied treatment interventions were rather manageable whereas those with a high degree of psychopathic personality expressed that they were difficult to fulfill.

One conclusion from Study II was that degree of psychopathic personality traits may not be the only dimension that influences treatment perceptions but that certain psychopathic features, e.g. antisocial psychopathic features, may have relevance for such perceptions. For instance such traits may be associated with a difficulty in conforming to control in treatment and thus to comply with treatment rules (Thornton & Blud, 2007). In turn, poor capacity or willingness to comply with treatment could lead to treatment dropout. Participation in low-demand or low-threshold substance abuse programs, including high flexibility and little or no control of patients, have been associated with reduced substance use and treatment retention among individuals with co-occurring mental health problems and problematic substance use (Blankertz & Cnaan, 1994; Brunette, Mueser, & Drake, 2004; De Leon, Sacks, Staines, & McKendrick, 2000). Thus, participation in such programs could also possibly be beneficial for offenders with mental health problems, problematic substance use and antisocial psychopathic features.

6.1.5 The relevance of assessing psychopathic personality traits

As suggested above, psychopathic personality traits may be of relevance for various outcomes. More specifically, antisocial psychopathic features may be related to an increased risk of criminal recidivism and poor treatment compliance, and affective psychopathic personality traits may be associated with poor treatment participation and retention. These potential relationships may indicate the need for assessment and consideration of psychopathic personality before treatment allocation among offenders with mental health problems and problematic substance use. As proposed by previous research, such procedures may aid the delivery of differentiated interventions to offenders with various combinations of psychopathic personality traits, enhancing the chance of treatment participation and treatment retention as well positive treatment outcomes (Gudonis et al., 2009). As described in the background section of this thesis, a number of assessment tools for psychopathic
personality traits exist, among which the PCL-R is clearly the most used and validated instrument (Vitacco et al., 2005). This tool may be useful in order to assess such traits in correctional settings. However, it might be less relevant to assess psychopathy using a particular cut-off score, but more relevant to merely assess particular types of psychopathic personality traits given that these may indicate various outcomes.

6.1.6 The usefulness of considering subgroups/cluster memberships

Offenders with mental health problems and problematic substance use may be considered as a heterogeneous population. The four clusters/subgroups identified in the study by Eriksson and colleagues (2013), i.e. the “Less troubled”, the “Severely triply troubled”, “Triply troubled with medical problems” and “Working triply troubled” each had their own profiles based on a unique combination of problems. The findings from Study IV showed that participants of all clusters exhibited substantial improvements over the course of time. Nevertheless, the improvements were cluster-specific rather than sample-specific, i.e. the participants in clusters characterized by a more comprehensive problem load to begin with - most notably the “Severely triply troubled” cluster - showed larger improvements over the course of time relative to the other clusters. Thus, the findings seem to indicate that severity with regard to mental health problems, alcohol and illicit drugs and criminal behavior may be reduced over the course of time in the study population regardless of cluster membership, but also that that cluster membership could be used as a base for treatment planning. The findings were in line with other studies showing that mental health problems and problematic substance use may be reduced over the course of time (Drake et al., 2006).

The predictive validity of the clusters was explored in relation to treatment participation and quality of life. In line with the RNR-model (Andrews et al., 2011) it was hypothesized that those with higher risk of criminal recidivism (as defined by the total PCL-R score) and more treatment needs, i.e. participants of the “Severely triply troubled” cluster, would participate in more treatment, relative to the other clusters. Similarly, it was expected that those with lower risk of criminal recidivism (as defined by the total PCL-R score) and fewer treatment needs, i.e. the participants of the “Less troubled” cluster, would participate to the least extent in the treatment. The participants of the latter cluster did, as expected, participate in a significantly smaller proportion of outpatient somatic and substance abuse treatment, but the “Severely triply troubled” individuals did not participate in treatment to a larger extent relative to the participants of the other clusters. There may be several explanations to this finding, for example the presence of affective psychopathic personality traits which may have contributed to poor treatment participation or treatment dropout, as suggested in Study III, as well as in other research (Hobson et al., 2000; Olver & Wong, 2011).

Furthermore, the findings of Study IV showed that cluster membership could predict quality of life, which has been identified as an important outcome indicating future well-being among individuals with mental health problems and problematic substance use (Tiffany, Friedman, Greenfield, Hasin, & Jackson, 2011). Also, according to the results of Study V, cluster membership could predict criminal recidivism. These findings are in line with previous research suggesting that subgroups of clinical samples may predict problem severity, aggression and delinquency as well as treatment engagement (Moss, et al., 2010; Rowe, Liddle, Caruso, & Dakof, 2004) As emphasized in an earlier study, considering subgroups in clinical populations may be efficient in order to match patients to interventions, facilitate management of patients, predict the risk of reoffending as well as provide cost-efficient interventions (Frisman et al., 2009). The findings of Study IV are in line with this
research, showing that subgroups based on distinct problem profiles among offenders with mental health problems and problematic substance use can provide information about future problem severity, quality of life, treatment participation as well as criminal recidivism.

6.1.7 The usefulness of the AUDIT and the DUDIT
Problematic substance use is a considerable problem among offenders (Douglas & Skeem, 2005; Prendergast, 2009) and thus, such use should be identified and appropriate interventions should be allocated. According to the results of Study I, the AUDIT and the DUDIT showed concurrent validity in screening for a dependency disorder and problem severity as well as internal consistency. In the study population, the AUDIT and the DUDIT could be used in the first step of the assessment and treatment model proposed by Berman and colleagues (2012). The administration of these two tools may yield an indication of substance dependence and problem severity which can be further evaluated with the use of longer assessment tools such as the ASI-6, and diagnostic instruments based on ICD- and DSM-criteria.

6.2 METHODOLOGICAL DISCUSSION
The studies composing this thesis are characterized by both strengths and limitations. Some of these are discussed below.

6.2.1 Study design
All studies were part of a lager observational project, i.e. MSAC, following a cohort of offenders with mental health problems and problematic substance use throughout a number of years. Given this study design, and the statistical analyses used in the thesis, all findings should be regarded as correlational rather than causal. Another study design, using an appropriate control group and randomization of participants to settings would have resulted in higher internal validity, i.e., yielded a better opportunity to draw conclusions about cause and effect. Observational studies are open to confounding, i.e. the influence of other variables on a relationship between an independent variable and a dependent variable. In the studies of this thesis, the risk of confounding was handled by a) adding other independent variables than those of particular interest in order to predict the outcomes and b) performing a stratified Cox-regression (see section 4.2.6.5), adjusting for all factors that are constant within each participant during the observation time. Given that these two approaches were used, the risk of confounding can be considered as somewhat reduced.

6.2.2 Sampling and study participants
Within the MSAC-project, 754 suspected offenders refereed to a major or minor FPA were asked to fill in the AUDIT and the DUDIT as a screening procedure for hazardous use (see Figure 1). Among these, 207 individuals were included in the study. This proportion (27%) could be regarded as rather small. However, all the 754 individuals were not expected to be included in the MSAC-project since all of them were not expected to fulfill the three study inclusion criteria: being referred for a (minor or major) FPA, having a record of hazardous use of alcohol and/or illicit drugs, as well as being registered in the Stockholm County. Among those who did not accept screening (n = 200), there might have been individuals fulfilling the inclusion criteria. The fact that these could not be included is a limitation. Among those who accepted screening (n = 554), 493 individuals were registered in the Stockholm County (89%) and 252 individuals (45%) did fulfill all three criteria and could
thereby be included. The inclusion of 207 individuals out of 252 eligible individuals (82%) could be considered as a fairly high rate.

During the entire follow-up period of the MSAC-project, some of the participants were still in prison or compulsory inpatient forensic psychiatric care (n = 39). These individuals did not participate in the follow-up assessments and were excluded from all studies except for Study I. A larger proportion of these individuals was sentenced for murder/attempted murder/manslaughter in association with the FPA, relative to the participants of study III ($\chi^2(1, 170) = 26.46, p < .001$), study IV ($\chi^2(1, 161) = 25.71, p < .001$), and study V ($\chi^2(1, 189) = 29.87, p < .001$). It is also likely that the participants still in prison or compulsory inpatient forensic psychiatric care would have displayed higher degrees of psychopathic personality traits and violence risk scores as well as higher rates of criminal recidivism, in comparison to the participants included in these studies. Thus, the included participants could be regarded as an intermediate sample, i.e. offenders with some psychopathic personality traits, a medium risk of future violence, and a problematic criminal history, and not the highest risk group of offenders per se. The findings should be inferred to such groups, primarily. Nonetheless, the findings of this thesis are relevant since these offenders are relatively common, spend rather short time periods in prison of forensic psychiatric hospitals, and thus to a large extent, rely on community services to assist them in their re-adjustment process.

Moreover, the study participants of this thesis mainly displayed features referring to the Lifestyle and Antisocial PCL-R facets and few personality traits according to the Interpersonal and Affective PCL-R facets. As suggested by Skeem and Cooke (2010), the psychopathy construct merely includes interpersonal and affective traits. In line with this view, the study participants may be regarded as more antisocial/impulsive than truly psychopathic. Nonetheless, in the studies, the study participants were referred to as having psychopathic personality traits, rather than being psychopathic, and the psychopathy definition according to Hare (2003) was considered as valid. A further discussion on the definition of the psychopathy concept lies beyond the scope of the thesis.

In Studies III, IV and V, the dropout rate was low. Only ten participants declined further study participation and were therefore excluded. This should be considered a methodological strength. Also, the participants were followed during a relatively long time, i.e. about three years. This should also be considered as a methodological strength given the challenges of maintaining contact with this study population and that previous studies on offenders with mental health problems and problematic substance use have had shorter follow-up times (Jaffe et al., 2012; Sacks et al., 2012).

For two MSAC-participants, the planned minor FPA was later cancelled. These individuals had not been subjected to any (major or minor) FPA. Nonetheless, they were included in Studies III, IV and V. Given that one criterion for participation in the MSAC-project was referral to a (major or minor) FPA – with the ambition to include offenders with mental health problems and problematic substance use - they were still considered eligible for study participation as both individuals fulfilled criteria for hazardous use of alcohol and/or illicit drugs and reported mental health problems according to the ASI-6. Unfortunately, information about the causes of the FPA cancellations was not available.

Also, five of the MSAC-participants were found not guilty of the index crime. All five were included in Study I, and three were included in Studies III and IV. It could be argued that these individuals should not be considered as offenders and that they therefore should have been excluded from study participation. Nonetheless, according to the ASI-6, all five individuals had at least one conviction prior to the FPA, and given their previous criminality,
their inclusion was considered as justified. However, they were excluded from Study V as the study outcome was criminal recidivism. Given that they had been found not guilty of the index crime they could not be considered to be at risk for criminal recidivism in relation to an index crime that had not been confirmed through conviction.

All participants of the MSAC-project were residents of the Stockholm County, and thus recruited from an urban area. Also, they had been referred for a minor or major FPA and can be considered to have greater mental health problems than the average offender. Consequently, the findings of this thesis may not be generalizable to offenders in rural areas and generalizations to general offenders should be made with caution. In addition, a majority of the participants in the studies were men, and the results should therefore foremost be generalized to offenders who are male.

Finally, Sweden has a legal system that differs from many other countries. In Sweden, all offenders are prosecuted and sentenced in court following a criminal offence regardless of their psychiatric status. The court uses the result of the FPA to decide the sentence for a particular offence. Although FPAs or similar assessments are performed in other countries, their results are used to evaluate whether the suspected offender is unaccountable for the crime, and if so, he or she is not sentenced at all, but may be handed over to compulsory inpatient forensic psychiatric care. The generalizibility of the results to international settings could thus be questioned. Regardless, the study population need not necessarily be regarded as diverse to offenders with mental health problems and problematic substance use outside Sweden merely due to this circumstance, as they exhibited features common in such groups, e.g. mainly males with high degrees of self-reported problem severity and rather high rates of reoffending (Jaffe et al., 2012; Sacks et al., 2012). Thus, results of the thesis should be considered to have relevance for offenders also in other countries.

6.2.3 Validity and reliability of the measures and data sources
In Studies III, IV and V, data on treatment participation, dry housing, and criminal recidivism were collected through Swedish registers and thus, they can be considered as valid, i.e. this information was not subject to the bias associated with self-report data. However, it was not possible to obtain data on more specific details about additional types of interventions, (e.g. details on pharmacological treatment or other psychosocial interventions provided by the social services). The use of official recidivism data could have excluded some crimes that were not prosecuted, thus leading to underestimation of crime relapse rates. Furthermore, the data on treatment participation only indicated physical presence at an outpatient clinic or in an inpatient setting targeting problematic substance use, mental health problems and somatic problems. No further specification of which type of treatment that was provided could be obtained from the registers used in the studies. This could be regarded as a limitation.

Besides the use of registers, much data in all studies was also gathered from self-report. Thus, under-reporting due to social desirability or pure recall problems, or over-reporting due to over-exaggerating might have occurred. The use of other data sources could have minimized the risk of recall bias. For instance, analysis of biological samples (e.g. hair-, blood- or urine samples) could have yielded a more valid measure for problematic substance use, relative to the self-report measures used for this purpose. However, the collection and analysis of such samples would have been expensive, time-consuming and lead to high rates of participant dropout. Instead of such procedures, we relied on studies that suggest good validity of self-report measures of problematic substance use, in comparison with analyses of biological samples (Del Boca & Darkes, 2003; Napper, Fisher, Johnson, & Wood, 2010).
According to the results of Study I, the AUDIT and the DUDIT showed concurrent validity in screening for substance dependence of alcohol and illicit drugs, respectively. As mentioned above, the outcome variables chosen for this study included substance use disorders based on DSM-IV criteria. In the writing of this thesis, the DSM-5 has been released and the concepts of substance abuse and substance dependence have been combined into a single entry termed “substance use disorder”. Thus, these concepts could be considered no longer valid as separate entities. Therefore, further analyses would be required to make the results of Study I fully compatible with the DSM-5 definition of substance use disorder. However, the concept of substance dependence is defined in the ICD-10, which is still used in clinical practice. Therefore, the results of Study I, indicating concurrent validity of the AUDIT and the DUDIT in screening for substance dependence, can be regarded to have clinical relevance. However, the suggested cut-off scores for substance dependence i.e. an AUDIT score of 13 points and a DUDIT score of 12 points, deviate from the cut-off scores of 16, 20, and 25 points for alcohol and drug dependency, respectively, reported in earlier research (Berman et al., 2005; 2012; Miller et al., 1992). Therefore, cut-off scores proposed in Study I should be used with caution in clinical settings.

To obtain a DSM based disorder of substance use abuse or dependence (Study I) a tool developed by the MSAC-research group was in the majority of cases used. Usually, when concurrent validity is demonstrated, a screening tool correlates well with a measure that has previously been validated (McIntire & Miller, 2006). The tool developed by the MSAC-research group had not been validated for research. For a small number of participants (n = 16), the full SCAN was in order to obtain a disorder. Using the full SCAN in all cases could have led to more valid results. However, this was not an option given that the participants perceived being administered the full SCAN as too challenging. The assessment tool developed by the MSAC-research group was based on items of the SCAN and the ASI-6; instruments that have good validity (Cacciola et al., 2011; Kessler et al., 2012; Rijnders et al., 2000). It was therefore assumed that this tool could be used in order to fulfill the study objective.

In Studies II, III, IV and V, the PCL-R was used for the assessment of psychopathic personality traits. The PCL-R has been rather criticized in previous research and during later years, a number of other assessment tools for psychopathic personality traits have been developed. Consequently, another instrument, e.g. the PPI-R (Lilienfeld & Windows, 2005) or the CAPP (Cooke, et al., 2012) could have been used in order to assess psychopathic personality traits. Nonetheless, the PCL-R is clearly the most validated measure of psychopathic personality traits and allows for comparisons with other research (Hare & Neumann, 2010; Fulero, 1995; Vitacco et al., 2005), making it suitable for the assessment of psychopathic personality traits among offenders. However, future studies on the study population could use other tools than the PCL-R in order to explore the prevalence of psychopathic personality traits in this population.

In Study IV, the total score of the PCL-R was used to define the level of recidivism into criminality among the four subgroups/clusters described above. As defined by the results of the PCL-R, the “Severely triply troubled” cluster showed the highest degree of psychopathic personality traits and thus the highest risk of recidivism into criminality. In line with these results, it might have been expected that membership of the “Severely triply troubled” cluster would have been associated with increased the risk of criminal recidivism. However, according to the results of Study V, membership of the cluster “Triply troubled with medical problems” was associated with an increased risk of reoffending while membership of the
“Severely triply troubled” cluster did not predict that outcome. Nonetheless, the PCL-R has been suggested by previous research to accurately assess risk of recidivism (Hare, 2006) and therefore it was used in this regard. However, the findings suggest that another tool such as the HCR-20 may be more optimal in order to define risk of criminal recidivism.

Research assistants collecting the data for this thesis received formal training for all assessment tools used in the MSAC-project prior to participant recruitment. However, no inter-rater- or test-retest reliability of the assessments was performed. Previous research has demonstrated adequate reliability of all instruments used in the studies: the AUDIT (Bergman & Källmén, 2002; Reinert & Allen, 2007), the DUDIT (Berman et al., 2005), the PCL-R (Fulero, 1995; Hare, 2003), the HCR-20, (Beltraå, 1998; Dernevik, 1998), The ASI-6 (Cacciola et al., 2011; Denis et al., 2013; Kessler et al., 2012), and the WHOQOL-Bref (Skevington et al., 2004). Thus, acceptable reliability was assumed.

Study II was based on qualitative methodology, and semi-structured in-depth interviews were performed in order to collect data. Conducting qualitative semi-structured interviews puts high demand on the quality of the interviewer who has to be flexible and interactive in relation to the informant (Maxwell, 2005). It was an advantage that I, as the interviewer, had previous experiences of (both quantitative and qualitative) interviewing with offenders and substance abusers. However, an additional interview with each participant, conducted by a second interviewer, could have provided means for asking follow-up questions in un-probed areas and counter-acted subjectivity. Also, data collection through another source such as ward observations, could have contributed to further support of the findings. Moreover, there may have been a wish for a richer data set, by including more study participants, and especially those with more traits according to Factor I of the PCL-R, in order to fully understand the possible relevance of psychopathic personality traits for perceptions of substance abuse treatment. Nevertheless, the participants of the MSAC-project had a rather low degree of Factor I traits and IPA advocates fairly small samples sizes, i.e. about ten participants, which enables the researcher to retain focus and to fully engage with the transcripts (Smith et al., 1999). Given that the participants were consecutively recruited and twelve individuals had been included, no further individuals were recruited to the study.

6.3 FUTURE DIRECTIONS

Previous research as well as the results of this thesis illustrate that offenders with mental health problems and problematic substance use have complex treatment needs and are at risk of criminal recidivism (Hartwell, 2004; Eriksson et al., 2013). Research exploring the kinds and amounts of treatment participation and associated outcomes in this population is rather scarce (Alm et al., 2011). Thus, this needs to be further explored in research. More specifically, future studies on this topic should focus on which specific elements of planned outpatient substance abuse interventions that might be beneficial for the reduced risk of criminal recidivism, as well as whether the coercive or voluntary nature of this intervention participation might produce such outcomes. Also, future research should explore other outcomes of participation in planned outpatient visits such as problematic substance use and mental health problems in order to further explore the efficiency of this intervention.

This thesis proposes a number of treatment programs that could possibly be beneficial for offenders with mental health problems, problematic substance use and psychopathic personality traits, e.g. CBT- and DBT- interventions as well as low-demand treatment programs. In order to draw any firm conclusions about whether such interventions should be recommended, future research should explore the outcomes of such interventions e.g. treatment retention, problematic substance use, mental health problems and criminal behavior.
in this population. Preferably, future research on these topics should include appropriate control groups and randomization to treatment settings.

The findings of the thesis showed concurrent validity of the AUDIT and the DUDIT in screening for substance dependence of alcohol and illicit drugs. Given that the suggested cut-off scores for substance dependence deviate from cut-off scores proposed in earlier research, both the AUDIT and the DUDIT need to be further assessed before any specific cut-off scores for a substance use disorder can be regarded as valid in this population. Thus, this could also be a topic for future research. Also, future studies should include offenders with mental health problems and problematic substance use scoring high on Factor I of the PCL-R in order to deepen the understanding of the possible relevance of psychopathic personality traits for perceptions of substance abuse treatment in this population.

Furthermore, the results of Studies IV and V confirmed the usefulness of sub grouping the study population in clusters in order to predict future problem severity and other outcomes such as quality of life, treatment participation and criminal recidivism. The clusters were derived by cluster analysis based on the problem severity domains of the ASI-6. As no previous study has explored the usefulness of the ASI-6 in classifying offenders with mental health problems and problematic substance use, this should be repeated in future research.

Finally, the participants included in the studies of this thesis had spent rather short times in prison and compulsory inpatient forensic psychiatric care. Future studies on offenders with mental health problems and problematic substance use should include offenders spending longer times in such closed institutions in order to evaluate whether the findings of the thesis may be applicable also to these individuals.
7 CONCLUSIONS

Based on the above findings, the following conclusions are drawn:

- Among offenders with mental health problems and problematic substance use, participation in planned substance abuse outpatient interventions seems to be related to a reduced risk of reoffending. Thus, such interventions should be considered as important risk management strategies.

- Individuals with antisocial psychopathic features and a problem profile that includes drug-related problems, psychiatric problems, legal problems, as well as medical problems may be considered as a particularly vulnerable subgroup for criminal recidivism. Assessing the risk and need profile of each individual and adjusting clinical work accordingly may increase the chance of positive outcomes.

- Affective and antisocial psychopathic personality traits may be of importance not only for crime relapse but also for treatment perceptions and treatment participation. Given the potential benefit of such treatment, such personality traits need to be identified and considered in clinical settings.

- Subgroups based on distinct problem profiles among offenders with mental health problems and problematic substance use may provide information about future problem severity, quality of life, treatment participation and criminal recidivism. Considering clinical profile/subgroup membership may be beneficial in relation to treatment planning and risk management.

- The AUDIT and the DUDIT can be considered to have concurrent validity in order to identify problematic substance use in the study population.
8 ACKNOWLEDGEMENTS

During this journey of being a doctoral student I have had the opportunity to work with a number of intelligent and helpful people. This thesis would not have been finished without their help.

First of all, my greatest thanks go to my main supervisor Clara Hellner Gumpert, for introducing me to this fascinating research field and for giving me the opportunity to become a doctoral student. I am grateful for your support and guidance during this journey. Thank you also for sharing your competence, for always having my best interest in mind and for believing I could do it, also at times when I didn’t think so myself.

I am grateful to my co-supervisor Charlotte Alm. You have made my life as a doctoral student much easier by cheering me up and encouraging me when things have been tough. Also, you have given me advice and constructive criticism, always leading to a considerable improvement of my work. Thank you for making my work better and for being there during this journey.

My gratitude further goes to my co-supervisor Tom Palmstierna, for interesting and fruitful discussions, excellent feedback and statistical advice. Thank you also for being so positive and enthusiastic. Having you as my co-supervisor certainly made this journey a fun and important experience.

Moreover, I am grateful to my mentor Joakim Westerlund and to my former supervisor Pia Langemar. Thank you both for seeing my potential and pushing me towards the world of science, even as early as during my undergraduate studies. Furthermore, my co-authors, and members of the MSAC-research group: Åsa Eriksson, Marianne Kristiansson and Anne H Berman, thank you for your academic input and making my work better. I would especially like to thank Anne for giving me the opportunity to work as a research assistant in the substance abuse field before I started my PhD studies. Also, I am grateful for your support, advice and quick responses to my queries during the years we’ve worked together. My gratitude also goes to Professor John Monahan, for valuable advice throughout the MSAC-project, and to Ingvar Rosendahl for the statistical analyses in study V.

To Eva Bjerke, who did most of the data collection in the MSAC-project; thank you for your efforts in locating our participants, and for travelling all around the country to do the interviews and assessments. Also, thanks for support, and for assuring that I, once in a while, actually left the office after eight hours of work. Furthermore, I would like to thank Mats Wikström, Martina Gumpert and Anna Palmstierna for valuable help with collection and coding of the register data, and David Öhberg and Jonas Larsson for guidance on the use of the ASI-6 and calculation of Recent Summary Scores.

My colleagues at the Division of Forensic Psychiatry: Shilan Caman and Karolina Sörman, who also took part in the data collection for the MSAC-project, thank you for valuable discussions on psychopathy, as well as support, and friendship, and for making these years a really fun period of my life. Moreover, I am grateful to Jocke Sturup, Katarina Howne, Mats Persson, and Eva Norén for support, inspiring conversations, and for making the Division of Forensic Psychiatry a fun place to work at. To Mariana Dufort, my dear friend and colleague, thank you for support, language revisions, fruitful methodological discussions, and for all the laughs we’ve had throughout the years. My former colleagues Kim Andersson and Gerd Bergman, thank you for support, encouragement and all the fun times we had together, collecting data in the DOGSS-study. Moreover, I am grateful to staff...
at the forensic psychiatric assessment unit and staff at the Huddinge and Kronoberg remand prisons, for valuable help when we recruited participants to the MSAC-project. Furthermore, my gratitude goes to my parents Hardy and Karin Durbeej for support all the way. To my sister Madeleine Durbeej-Hjalt and to my brother Bo Durbeej, who both took the paths to become researchers long before I did; Madde, thank you for much support and advice, Bobbo, thank you for support, advice, excellent language revisions, and for constantly being there when I needed you. Furthermore, thanks to my brother-in-law Tord Hjalt, for advice, and to my nieces Agnes and Alma and to my nephew Anton for being so wonderful.

Many thanks go to my friends outside work (in no particular order!): Kärstin Jansson, Mimmi Babuschak, Mia Ryngbeck, Jessica Solingius, Mathilda Stendahl, Anna Rolf, Michelle Göransson, Nina Sipilä, Linda Carlsson, and Robban Malm. Although I have sometimes been rather absent during these years you have understood and supported me all the way. Thank you guys!

I am grateful to the participants of the MSAC-project, for sharing their life stories. I feel privileged to have met you and to have learnt about your lives. Without your time and effort, this thesis would not have been written. To the Swedish Council for Working Life and Social Research and to Karolinska Institutet; thank you for financially supporting this research.

My extended gratitude goes to Karin Hagren Idewall. Thank you for your endless trust in my ability to complete this thesis and for your patience, tremendous support and excellent feedback on my work. You and Malva-Lo fill my life with so much meaning and joy. Thank you both for being a part of my life. I love you!
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