Department of Psychology, University of Helsinki, Finland

Taina Tuulikki Laajasalo

Finnish Homicides and Mental Disorders:
An investigation of offense and offender characteristics

ACADEMIC DISSERTATION

To be presented, with the permission of the Faculty of Behavioural Sciences of the University of Helsinki, for public examination in Auditorium XII, University main building, on the 7th of March 2007, at 12 noon.
To my family
CONTENTS

Abstract
Tiivistelmä
Acknowledgements
Abbreviations
List of original publications

1. Introduction........................................................................................................................................ 14
   1.1 Homicide in Finland....................................................................................................................... 14
   1.2. General risk factors of homicide ................................................................................................ 14
   1.3 Psychological perspectives on homicide ....................................................................................... 16
   1.4 Association between mental illness and violence ......................................................................... 21
      1.4.1 Personality disorders .............................................................................................................. 22
      1.4.2 Psychosis ............................................................................................................................... 23
      1.4.3 Substance abuse ..................................................................................................................... 27
      1.4.4 Characteristics of the homicidal acts committed by persons with mental illness ............. 28
   1.5 Summary of the literature review ............................................................................................... 29
2. Aims of the Study ............................................................................................................................. 31
3. Subjects and Methods .................................................................................................................... 32
   3.1 General information – The Study Procedure ............................................................................... 32
   3.2 Forensic Psychiatric Examinations .............................................................................................. 33
   3.3 Subjects in Studies I-II ................................................................................................................ 34
   3.4 Subjects in Studies III-IV ........................................................................................................... 35
   3.5 Statistical analyses ...................................................................................................................... 36
4. Results ............................................................................................................................................... 38
   4.1 Offender and victim demographics ............................................................................................. 38
   4.2 Study I ........................................................................................................................................ 39
   4.3 Study II ....................................................................................................................................... 43
   4.4 Study III ..................................................................................................................................... 47
   4.5 Study IV ..................................................................................................................................... 49
5. Discussion ......................................................................................................................................... 51
   5.1 Main findings ............................................................................................................................... 51
   5.2 Methodological considerations .................................................................................................... 61
      5.2.1 Strengths .................................................................................................................................. 61
      5.2.2 Limitations .............................................................................................................................. 62
   5.3 Conclusions and implications for future research ........................................................................ 65
APPENDIX I: DSM-IV-TR definitions of Key Terms ........................................................................... 70
APPENDIX II: Coding Scheme ........................................................................................................... 71
ABSTRACT

Although the majority of people with mental illness are not violent, scientific studies over the last decades show that certain psychiatric disorders increase the risk of violent behavior, including homicide. This thesis examined crime scene behaviors and offender background characteristics among mentally ill Finnish homicide offenders. Previously, homicide crime scene behaviors have been investigated in relation to offender demographic characteristics, whereas this study compares the behaviors of offenders with various mental illnesses. The study design was a retrospective chart review of the forensic psychiatric statements of Finnish homicide offenders. The work consists of four substudies.

The aims of the study were as follows: To describe differences in the childhood and family backgrounds as well as in the adolescent and adult adjustment of Finnish homicide offenders belonging to different diagnostic categories (schizophrenia, personality disorder, alcoholism, drug addiction or no diagnosis). Further, the study examined associations between the crime scene behaviors and mental status of these offenders. Also, the distinguishing characteristics between two groups of offenders with schizophrenia were examined: early starters, who present antisocial behavior before the onset of schizophrenia, and late starters, who first offend after the onset of mental disorder. Finally, it was investigated how the use of excessive violence is associated with clinical and circumstantial variables as well as offender background characteristics among homicide offenders with schizophrenia.

The main findings of the study can be summarized as follows. First, offenders with personality disorder or drug addiction had experienced multiple difficulties in their early environments: both family and individual problems were typical. Offenders with schizophrenia were relatively well-adjusted in childhood compared to the other groups. However, in adolescence and adulthood, social isolation, withdrawal and other difficulties attributable to these offenders’ illness became evident. In several aspects, offenders with alcohol dependency resembled offenders with no diagnosis in that these offenders had less problematic backgrounds compared to other groups. Second, the results showed that crime scene behaviors, victim gender and the victim-offender relationship differ between the groups. In particular, offenders with a diagnosis of schizophrenia or drug addiction have some unique features in their crime scene behaviors and choice of victims. Offenders with schizophrenia were more likely to kill a blood relative, to use a sharp weapon and to injure the victim’s face. Drug addiction was associated with stealing from the victim and trying to cover up the body. Third, the results suggest that the offense characteristics of early- and late-start offenders with
schizophrenia differ only modestly. However, several significant differences between the groups were found in characteristics of offenders: early starters had experienced multitude of problems in their childhood surroundings and also later in life. Fourth, violent acts where the offender did not commit the offense alone or had previous homicidal history were predictive of excessive violence among offenders with schizophrenia. Positive psychotic symptoms did not predict the use of excessive violence. Nearly one third of the cases in the sample involved multiple and severe violence, including features such as sadism, mutilation, sexual components or extreme stabbing.

In sum, mentally disordered homicide offenders are heterogeneous in their offense characteristics as well as their background characteristics. Empirically based information on how the offender’s mental state is associated with specific crime scene behaviors can be utilized within the police force in developing methods of prioritizing suspects in unsolved homicide cases. Also, these results emphasise the importance of early interventions for problem families and children at risk of antisocial behavior. They may also contribute to the development of effective treatment for violent offenders.

Tutkimuksessa pyrittiin kuvaamaan viiteen eri diagnostiseen kategoriaan (diagnostoona joko skitsofrenia, persoonallisuushäiriö, alkoholiriippuvuus, huumausaineriippuvuus tai ei diagnoosia) kuuluvien henkirikoksen tehneiden henkilöiden taustapiirteitä. Tutkittiin myös sitä, millä tavoin henkirikokseen liittyvä käyttäytyminen on yhteydessä tutkittavien psykiatrisen sairasteen. Lisäksi vertailtiin kahta skitsofreniaa sairastavista henkirikoksien tekijöistä koostuvaa ryhmää, joista toiseen kuuluvat henkilöt ovat syylistyneet rikoksiin jo ennen psykkistä sairastumista ja toiset vasta sairastumisensa jälkeen. Edelleen tutkittiin myös sitä, millaiset klitiiset piirteet, tilannetekijät tai tekijänä liittyvät piirteet ennustavat ylenmääräisen väkivallan käyttöä henkirikoksissa, joiden tekijä sairastaa skitsofreniaa.


Yhteenvetona voidaan todeta, että mielenterveyshäiriöiset henkirikoksen tekijät ovat heterogeeneinen ryhmä niin tekoon liittyvän käyttäytymisen, kuin tekijän taustaan liittyvien piirteiden osalta. Tuloksia on mahdollista soveltaa käytännössä esimerkiksi rikostutkimuksessa, jossa on hyödyksi tieto mahdollisista yhteyksistä rikospaikalla havaittavissa olevan käyttäytymisen ja rikoksentekijöiden ominaisuuksien, esimerkiksi mielenterveyshäiriöiden, välillä. Lisäksi tulokset tuovat uutta tietoa sekä henkirikokseen syylistyneiden, että riskiryhmien kuuluvien lasten ja nuorten hoidon ja hoitoonohjauksen suunnittelun.
ACKNOWLEDGEMENTS

There are numerous people who have contributed to the completion of this thesis either directly or indirectly and who I need to thank. This all began as a master’s thesis project supervised by Docent Helinä Häkkänen. Without her support and competent guidance during those early phases I would not have had the courage to start the voyage toward a PhD. The speed of her e-mail responses is legendary, as is her knowledge, common-sense, and the ability to explain even the most complicated things clearly. I am most grateful and highly indebted to her. I also want to thank Heikki Summala, the supervisory professor of this thesis, and other members of our Criminal and Forensic Psychology Research Group for their support along the way.

This dissertation was carried out at the Department of Psychology at the University of Helsinki and I want to thank the Department for the facilities to perform this study. I am grateful for the financial support I have received from the Finnish Cultural Foundation and Oscar Öflund Foundation. I also want to thank the National Authority of Medicolegal Affairs for their co-operation. This thesis was reviewed by docent Matti Holi M.D., PhD. and Professor Hannu Lauerma M.D., PhD., who I wish to thank for their very valuable and constructive comments.

While completing this project I have had the pleasure of working as a psychologist in the municipality of Nummi-Pusula as well as a research assistant at the National Public Health Insitute. These vacancies enabled me to learn clinical as well as research-related skills, and in both places I made great new friends. My profound thanks to these people for teaching me so much, it has been a pleasure to work with all of you.

My deep thanks are also due to all my non-work related friends for reminding me that life consists of so much more than just duties. Anna, Parppis-jengi, Mari, and Katja, just to mention a few, thank you all. You help me take life a little more lightly.

Ansä and Timo (great in-laws!) and Kaisa-Maija (the best little sister and friend!): thank you for your kindness, support and very high quality babysitting services!

My parents have helped in countless ways. I wish to deeply thank my mother Hilkka and my father Keijo for loving me unconditionally as well as having faith in my abilities from the very beginning.

This thesis is dedicated to my beloved family. Teemu, I feel most privileged to have such an encouraging, challenging, and, most importantly, caring companion in life. Let the journey continue. Finally, I owe thanks to the most precious and important person in my world, Noomi, who aided in the completion of this project by sleeping long naps during the first months of her sweet existence.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASPD</td>
<td>Antisocial personality disorder</td>
</tr>
<tr>
<td>DSM</td>
<td>Diagnostic and Statistical Manual of Mental Disorders</td>
</tr>
<tr>
<td>ICD</td>
<td>International Classification of Mental Disorders</td>
</tr>
<tr>
<td>IRR</td>
<td>Interrater reliability</td>
</tr>
<tr>
<td>MMPI</td>
<td>Minnesota Multiphasic Personality Inventory</td>
</tr>
<tr>
<td>NAMA</td>
<td>National Authority of Medicolegal Affairs</td>
</tr>
<tr>
<td>OR</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>WAIS-R</td>
<td>Wechsler Intelligent Scale-Revised</td>
</tr>
</tbody>
</table>
List of Original Publications

This doctoral thesis is based on the following original publications, referred to in the text by Roman numerals I-IV.


1. INTRODUCTION

1.1 HOMICIDE IN FINLAND

For decades, the Finnish rate of homicides has been one of the highest in Europe, 3.3 / 100,000 citizens (Lehti, 2006). Between the years 1995-2004 the annual number of incidents has varied between 113 – 155 (Henkirikosraportti, 2004). The clearance rate of homicide offenses known by the police has traditionally been very high, with only about 5-10% of the homicides remaining unsolved each year (Kivivuori, 2001).

Presence of alcohol abuse is a typical feature of Finnish homicide: An estimated 80 - 85% of male homicide offenders are under the influence of alcohol at the time of the killing (Lehti, 2006; Pajuoja, 1995) and in two thirds of the cases both the victim and the offender are drunk (Lehti, 2006). Even though alcohol intoxication, either alone or combined with abuse of medicines, is very common in the context of Finnish homicide, the role of other illicit drugs seems to be relatively small (Lehti, 2006). Conflicts leading to homicide are most often related to disputes within a drinking group and the majority of the victims are killed in familiar settings such as private or holiday apartments (Kivivuori, 1999; Kivivuori & Aromaa, 2001). A knife or other sharp instrument is the method of inflicting death in about 40% of the homicides, about one quarter of the victims are shot (Kivivuori, 2001). After the offense, 13% of the offenders try to hide the victim's body. A majority of the offenders, however, do not try to conceal the crime and many voluntarily contact the police or ask someone to do so (Kivivuori, 1999). Internationally, as well as in Finland, in the majority of the homicide cases the offender and the victim know each other (Kellerman & Mercy, 1992; Kivivuori, 2001).

1.2 GENERAL RISK FACTORS OF HOMICIDE

Homicide is an outcome of a complex set of factors intertwined together. An array of individual variables, both biological and psychological, as well as the surrounding social environment contribute to the risk of violence. Before examining psychological and psychiatric aspects of homicide in detail, we first review demographical, contextual, biological and situational risk factors. As distinctions between these factors are not clear cut, classifications of variables related to violence risk are bound to be arbitrary to some extent.
Gender, age, socioeconomic status, education, and criminal history are demographic factors found to be associated with violence and homicide risk. A great majority of all violence is perpetrated by men (Monahan, 1992) and the majority of homicide offenders and victims are men both internationally and in Finland (Kellerman & Mercy, 1992; Kivivuori, 1999; Lanzcron, 1963; Lehti 2006). In Finland only about 10% of all homicides are committed by females, though the consensus is that the number of violent crimes committed by females is increasing (Kivivuori, 1999; Putkonen, Collander, Honkasalo & Lönnqvist, 2001). Females are more likely both to kill and to be killed by a member of their family or an intimate acquaintance, whereas men are more likely to kill and to be victims of strangers or acquaintances (Kellerman & Mercy, 1992; Lehti 2006). In Finland, the risk to commit a homicide is greatest between the years 20-29 for males and 30-39 for females (Lehti 2006). The risk of violence diminishes with age (e.g. DeJong et al., 1992; Klassen & O’Connor, 1988), although it seems that among mentally disturbed offenders the risk of violence peeks later compared to non-disturbed offenders (Bjorkly, 1995). The socio-economic status of violent offenders is often poor (e.g. Swanson, Holzer, Ganju & Jono, 1990). A history of school truancy (Krakowski & Czobor, 2004) as well as other academic and occupational difficulties have been associated with violence (Raine, Brennan, Mednick & Mednick, 1994; Stueve & Link, 1997). A great majority of Finnish homicide offenders and victims are either manual workers or not actively participating in the labour force (Kivivuori, 1999; Lehti 2006). Earlier violent behavior is an important predictor of future violence (Gilders, 1997; McNiel & Binder, 1995) and this is true for both mentally ill and non disordered offenders (for a meta-analysis, see Bonta, Law & Hanson, 1998).

In addition to the aforementioned individual factors, aspects of current environment, i.e. contextual factors such as family and neighbourhood, contribute to the risk of violent offending. Foster home placements have been associated with violence (Krakowski & Czobor, 2004) and violent, abusive families as well as parental psychiatric illness have been found to be common among violent offenders (Pajuoha 1995), especially among homicidal juveniles (Busch, Zagar, Hughes, Arbit & Bussell, 1990; Lewis et al., 1985; Lewis et al., 1988). Income inequality as well as social disorganization have been identified as neighbourhood level risk factors for homicide (Krueger, Bond Huie, Rogers & Hummer, 2004).

A number of biological factors including, for example, genetic and biochemical aspects have been suggested as possible contributors to violence and homicide. The possibility of a predisposing genotype has been raised. In two studies on antisocial adolescent (although not necessarily violent) behavior it has been found that a particular variant of the gene influencing monoamine oxidase-A activity is related to the antisocial behavior when combined with an adverse childhood environment (Caspi et al., 2002; Foley et al., 2004). Further, elevated rates of men with XYY chromosome abnormality are found among sexual homicide perpetrators (Briken, Habermann, Berner & Hill, 2006).
Especially the role of serotonin in aggressive behaviour and antisocial disorders has been discussed (Bradford, 1996) in regard to biochemical markers and neurotransmitter abnormalities. In particular, abnormally low concentrations of 5-hydroxyindoleacetic acid (5-HIAA), a metabolic bi-product of the neurotransmitter serotonin, have been found in the cerebrospinal fluid of persistently aggressive and violent offenders (Linnoila & Virkkunen, 1992; Virkkunen, Goldman, Nielsen, Linnoila, 1995). Serotonin and other neurotransmitters may also have a role in homicide. Disturbance during fetal neural development is another possible factor for increasing the risk of violent offenses (Tehrani & Mednick, 2000) and low or lowered cholesterol levels at least in young adult males (Troisi & D'Argenio, 2006), as well as decreased glucose metabolism in the prefrontal cortex (Raine, Buschbaum, Stanley, Lottenberg, Abel et al., 1994) may also be possible biological correlates of violence risk. Finally, several studies investigating the cognitive functioning of violent offenders have found neuropsychological impairment among both adolescent and adult offenders (Deiker, 1973; Lewis et al., 1988; Nestor, Kimble, Berman & Haycock, 2002).

**Situational factors**, which are present immediately at the time of the event, also contribute to the occurrence of homicidal violence. Examples of situational risk markers of homicides include the presence and availability of weapons (e.g. Killias, 1993; O’Donnell, 1995; Wiebe, 2003) as well as provocations and threats by the victim (Luckenbill, 1977; Felson & Steadman, 1983).

**1.3 Psychological perspectives on homicide**

Even though the majority of modern psychologically oriented theories emphasize the combined contribution of psychological, biological, and environmental factors to violent behaviour, traditional psychological theories of violence and homicidal behaviour have been either descriptive or based on psychoanalytic theories. Descriptive theories focus on defining perpetrator’s personality constellation and traits, whereas psychoanalytic theories try to identify what unconscious and conscious processes affect the homicide offender’s behaviour. Learning and social cognitive perspectives also now contribute to the research of violence and homicide.

A number of personality traits are associated with murder and violence. It has been proposed that criminals in general and violent offenders in particular form a heterogeneous group and differ from their psychological characteristics (Eysenck, 1964; Keltikangas-Järvinen, 1978). Eysenck (1964) believed that people varied along two personality dimensions, extraversion-introversion and neuroticism-stability. Persons scoring high on both extraversion and neuroticism where more likely to become criminal. Later a dimension labelled psychotism was added, which was thought to be
highly correlated with criminality (Eysenck, 1964). It has also been suggested that violent offenders showing extreme aggression might actually be overcontrolled and introverted, acting violently only after prolonged provocation (Blackburn, 1968). Lack of guilt and low inhibition against aggression are some of the features associated especially with psychopathic offenders, who are also described as superficially charming, unreliable, pathologically egocentric and generally impoverished in their emotional reactions (e.g. Cleckley, 1941). On the other hand, guilt feelings, depression and a constant state of anxiety are associated with homicidal behaviour (Hirose, 1979), especially with neurotic violent offenders (Keltikangas-Järvinen, 1978). A review of clinical and personality features increasing the risk for violence identified four personality dimensions associated with violent behavior: Poor impulse control, problems with affect regulation, threatened egotism or narcissism defined as an inflated sense of self-worth, and paranoid cognitive personality style (Nestor, 2002).

No single psychodynamic theory on homicide or violence exists. Freud (1923/1962) related criminal behaviour to unconscious guilt, originating from Oedipal-stage and wishes for parental death. Psychodynamic theories also emphasized offenders’ lack of self-control and failure to repress basic desires: A diminished superego control (Miller & Looney, 1974), underdeveloped ego (Miller & Looney, 1974; Smith, 1965) and primitive and sadistic fantasies (McCarthy, 1978; Prentky et al., 1989; Satten, Menninger, Rosen & Mayman, 1960) might underlie violent and homicidal behaviour. The roots of violence and homicide are thought to be in severe early deprivation (Satten et al., 1960) and trauma in early object relations (Miller & Looney, 1974) and it has been theorized that the act of homicide consists of narcissistic rage, which functions as an attempt to return the person to infantile omnipotence (McCarthy, 1978). The attachment theory, which was influenced by psychoanalytical thinking, sees violence in terms of attachment gone wrong. It has been proposed that an insecure attachment style (Bowlby, 1973), which is associated with antisocial behaviour in childhood, might also be associated with aggression and violent behaviour later in life (Bailey, 1996; Fonagy, 1999). Many of the concepts used within early psychoanalytical theories have been criticized as difficult to test empirically, which makes them hard to falsify. An additional limitation is that they are mostly based on case-studies, which decreases the possibilities to generalize the results.

Social learning theory (Bandura, 1973) emphasizes the importance of observing and learning from others. Learning by modeling may contribute to the occurrence of violent behavior (Bandura 1973; Lewis, Shanok, Pincus & Glaser, 1979; McCord, 1979). In sociocognitive theories the importance of knowledge structures, such as schemas and scripts, in the cognitive evaluation and interpretation of events is emphasized. In experience-based, well-rehearsed schemas and scripts interpersonal aggression may be an acceptable response to frustration (Dodge, Pettit, Bates & Valente, 1995; Huesmann,
1986; Lochman & Lenhart, 1993). For example, faulty information processing may lead to a pattern of misinterpreting the actions of others as aggressive, which in turn may lead to violent criminal acts. In the unifying general aggression model, proposed by Anderson and Bushman (2002), cognition (e.g. acquired knowledge structures), affect (e.g. mood, emotion), and arousal mediate the effects of situational (e.g. provocation, accessible weapons) and personological (e.g traits, values, beliefs) variables on aggression.

As stated in the beginning of the section, the majority of the researchers now emphasize the interaction between psychological, biological, and environmental factors, which together contribute to violent behaviour (Ainsworth, 2001; Moffit, 1993; Raine, Brennan, Mednick, & Mednick, 1994; White & Haines, 2000). Raine, Brennan and Mednick (1997) investigated the interplay of multiple variables from different domains. They found that maltreatment and rejection from caregivers combined with birth complications may increase the likelihood of becoming violent. Likewise, Moffit (1993) proposed that life-course persistent antisocial behaviour develops when a childs neuropsychological problems interact with his criminogenic environment. Furthermore, it seems that increasing the number of stressors increases the risk of behavioural problems both in childhood and later in life (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Rutter et al., 1975a, 1975b; Sameroff, Seifer, Zax, & Barocas, 1987). When risk factors in the domains of child, family, school, and demographic characteristics were assessed, boys with four or more risk factors for homicide were 14 times more likely to commit homicide than violent individuals with fewer than four risk factors (Loeber et al., 2005).

Offender profiling
One limitation of the aforementioned psychological theories and classifications is that they do not investigate the way the homicide has been carried out, but instead focus their analysis only on the offender (Santtila, Canter, Elfgren, Häkkänen, 2001; White & Haines, 2000). They are also centered on looking at differences between individuals who commit different types of crimes, for example homicide offenders versus other criminals, which makes it difficult to investigate differences between individuals committing the same crime in behaviourally different ways (Canter, 2000). Older trait theories, such as Eysenck’s views, have been criticised of being rather simplistic, even though it appears that certain personality types, such as psychopaths, are more predisposed to crime (Ainsworth, 2001). Partly because of these limitations, in previous decades a number of researchers interested in the psychological aspects of homicide have started to more extensively investigate the acts and behaviours shown by the offenders.

In the 1970’s the Federal Bureau of Investigation (FBI) made attempts to classify criminals on the basis of their behavioural characteristics. The approach was named
crime scene analysis, because it included careful search for behavioural cues at the crime scene. Lately, the FBI’s approach has been criticized for lacking any scientific, theoretical base and for relying mainly on voluntary interviews and self-reports of offenders (Ainsworth, 2001; Muller, 2000). The validity and reliability of FBI’s system have not been empirically tested and are therefore questionable.

Since these early attempts, analyzing offenders’ behaviors has evolved into a more systematic scientific investigation and a psychological framework has been applied (Ainsworth, 2001). As in many other areas of psychology, investigative psychology or statistical profiling aims to identify what sorts of people carry out what sorts of actions (Canter, 2000). As well as deepening our understanding of the psychological processes underlying criminality, analysing crime scene actions produces useful information to people trying to solve crimes. It has been stated that ”many inferences that are important to police investigators can be redefined as psychological questions open to empirical study” (Canter, 2000). With regard to homicide, the aim of studies conducted in the field has been two-fold: to establish a classification system of homicide crime scenes, as well as to establish scientific foundations for an approach that would be useful for those investigating these crimes in practice.

Based on statistical analysis of crime scene actions, different types of homicides can be classified (e.g. Godwin, 2001; Salfati 2000b; Santtila et al., 2003). In the thematic approach adopted by several previous studies, the offenders are expected to reflect some characteristic theme in their crime scene actions. The basic idea of this approach is that a group of actions together indicate some dominant aspect of the offender’s style, which may also be related to their characteristics (Canter, 2000). According to aggression theorists, individuals’ characteristic level of aggression is learned in childhood and, as well as other forms of social behaviour, this characteristic aggressiveness is thought to be relatively stable through time and situations (Huesmann & Eron, 1989; Huesmann, Eron, Lefkowitz & Walder, 1984). In terms of offender profiling this means that the offender’s aggressive style is also relatively consistent across crimes and in addition reflects his general way of interacting in the rest of his life (Salfati & Canter, 1999). Only a limited amount of inferences from the offender’s background can be derived from his crime related behaviors, however, since all inferences must be based on the information available at the crime scene (Canter, 2000). Possible inferences, which also benefit the police investigators’ work, include characteristics such as offender’s sex, possible criminal record, or antisocial lifestyle. Also, as homicide results from a social interaction between two or more individuals (Keltikangas –Järvinen, 1978; Salfati, 2001), the relationship between the offender and his victim is an important offender characteristic that may be inferred from the crime scene behaviour and that it is also useful information to police investigators (Canter, 2000; Santtila et al., 2001).
of inferences that cannot be reliably made include psychodynamic interpretations of the offender’s motives or mental processes (Canter, 2000).

In the empirical models of violent behavior that have been formulated within the investigative psychology research field the division into expressive (hostile) and instrumental aggression (Fesbach, 1964) has been widely used (e.g. Salfati & Canter, 1999; Santtila et al., 2001). Instrumental aggression is goal-oriented. The primary aim is not to hurt, but to obtain some object from the other person, for example by means of robbery or sexual assault. Fear of losing the desired goal may lead to hurting someone. Expressive aggression, on the other hand, is motivated by a desire to actually injure and hurt another person, and is often unplanned. It has been proposed that expressive aggression is a more basic form of aggression, whereas the use of instrumental aggression would represent a more pathological development (Cornell et al., 1996). In terms of offender profiling, expressive themes indicate, for example, that the victim, who is often known by the offender, is not just an object, but has some significance to the offender (Salfati & Canter, 1999). Crime scene action variables indicating a close relationship between the victim and the perpetrator (and thus also indicative of expressive aggression) include, for example, victim found at home, female victim, a single sharp injury and injuries to the victims upper extremities (Karlsson, 1999).

One of the critical remarks that has been raised against instrumental expressive dichotomy is that instrumental and expressive acts might actually be polar ends of a continuum and an act might contain elements of both types of aggression (Miethe & Drass, 2001). Some have even stated that instrumental and expressive aggression are concepts that have outlived their usefulness (Bushman & Andersson, 2001). The instrumental and expressive dichotomy, however, seems to be a useful classification tool when examining behavioural structures found in homicides. Based on multidimensional analysis of the offender’s crime scene behaviors expressive and instrumental thematic structure can be found from British (Salfati, 2000a; Salfati & Canter, 1999), Finnish (Santtila et al. 2001), Greek (Salfati & Haratsis, 2001) and most recently Canadian (Salfati & Dupont, 2006) homicides.

In addition to distinguishing different types of homicides, previous studies have identified similar thematic differences (expressive/instrumental) in offender characteristics. Instrumental background characteristics relate to, for example, the offender having a previous criminal record or periods of unemployment, whereas expressive background characteristics relate to personal relationships and emotional issues (Salfati 2000b; Salfati & Canter, 1999; Santtila, Häkkänen, Canter & Elfgren, 2003). Furthermore, several attempts have been made to link crime scene behaviors to offender characteristics (Salfati & Canter, 1999; Santtila et al. 2003). If consistencies between offender background characteristics and the different ways offenders commit their offenses exist, this would be a scientifically valid base for offender profiling. So
far, however, there has only been limited success. For example, in a study by Salfati (2000a), 31% of homicide offenders were classified as having an expressive background (relating to personal relationships and emotional issues), whereas 24% were classified as having an instrumental background (relating to previous criminal record). The analysis of the associations between behaviors and characteristics showed that only 48% of the cases with a dominant behavioral theme exhibited the same theme (either expressive or instrumental) in their behaviors and background characteristics. In fact, of those exhibiting expressive homicide crime scene behavior, 58% had an instrumental background (Salfati, 2000a). As attempts to link the offender’s crime scene behaviors to offender characteristics have succeeded modestly at best, it has been suggested that offender profiling may be challenged by the fact that crime scene behaviors may only be moderately associated with demographic features (such as age, socio-demographic features, or criminal records) of offenders (Mokros & Alison, 2002). Further, Mokros and Alison (2002) suggested that future studies should search for a framework that is grounded in personality psychology, which would shift the focus from demographic variables to the personality aspects of the offenders.

1.4 ASSOCIATION BETWEEN MENTAL ILLNESS AND VIOLENCE

Several reasons why establishing the relationship between mental illness and violence is important exist: public safety, consequences for those who commit violent acts (e.g. prison versus mental health care), and, last but not least, the well-being of mentally disordered people (Link & Stueve, 1995). Association between mental illness and crime has been a popular topic for centuries. Since ancient Greece it has been believed that mentally ill commit more crimes than the general population (Monahan, 1992). Early scientific studies did not support this common belief and according to studies done prior to the 1960s the crime rate among mentally ill was no higher than that of the general population. Although there are several methodological difficulties that have to be overcome when studying the association between mental disorder and violence (see e.g. Schanda, 2006), during the last decades the number of studies linking violence and homicide with mental illness, although net necessarily causally (Arboleda-Florez, Holley & Crissanti, 1998), has increased significantly. With regard to homicide, in a large study it was estimated that as much as 90% of the homicide offenders had some psychiatric diagnosis (Fazel & Grann, 2004).

In most studies on the relationship between mental illness and violence, psychiatric diagnoses are based on Diagnostic and Statistical Manual (DSM), now in its fourth version. DSM, published by the American Psychiatric Association, is a categorical classification scheme, in which a set of diagnostic criteria indicates what symptoms must be present (and must not be present) in order for an individual to qualify for a particular diagnosis. Another categorical classification system, International
Classification of Mental Disorders (ICD) is published by the World Health Organization (WHO). Although these diagnostic systems have been criticized, for example, for arbitrary distinctions between normal and abnormal personality (Barnow et al., 2006) and increasing the co-occurrence of multiple psychiatric diagnoses (Maj, 2005), they are extensively used in a variety of mental health settings. In this section, the associations of different psychiatric diagnosis to homicidal violence are reviewed.

1.4.1 PERSONALITY DISORDERS

Prevalence of personality disorders among homicide offenders is high. In Scandinavian studies numbers between 34% (Eronen, Hakola & Tiihonen, 1996) and 54% (Fazel & Grann, 2004) have been reported. The odds ratio for homicide has been estimated to be ten times higher for persons with a diagnosis of personality disorder compared to the general population (Eronen et al. 1996).

Although violent behavior has been associated with a number of psychiatric disorders, it is most commonly associated with antisocial personality disorder (ASPD) or psychopathy and the majority of studies conducted on the relationship between violence and personality disorders have focused on these disorders. Psychopathy and ASPD are partly overlapping concepts and although psychopathy is not a diagnostic category in DSM-IV, it has been described as a special form of personality disorder (Hare & Hart, 1993). ASPD is defined mainly by antisocial behaviors, where as affective and interpersonal dimensions of psychopathy (such as narcissism, callous interpersonal style, lack of empathy, and remorselessness) are not included in the definition. Almost all psychopaths meet the criteria for ASPD, but most individuals with ASPD are not psychopaths (e.g. Hare, 1996b). Both of these disorders are significantly overrepresented among forensic psychiatric populations (Fazel & Danesh, 2002; Rasmussen, 1995).

ASPD is a significant predictor of violent offending (Hodgins & Côte, 1993, Rasmussen & Levander, 1995). Prevalence of ASPD among homicide offenders is estimated to be around 11% for men and 13% for women, compared with only 1% and 0.3% among the general population (Eronen et al., 1996). In a Finnish study (Eronen et al., 1996) the odds of homicide among persons with ASPD were 16 times greater for men and 76 times higher for women. Psychopathy, which is now assessed by a well-validated Psychopathy Checklist Revised (PCL-R), is also generally considered to be a robust predictor of violence risk and recidivism (e.g. Hare, 1996a; Hare, 1996b; Rice, 1997), including homicide (e.g. Laurell & Dåderman, 2005). In a sample of Swedish homicide offenders the prevalence of psychopathy was as high as 31% (Laurell & Dåderman, in press).
Traits like hostility and impulsivity are characteristics of several personality disorders and there is some evidence that individuals with other than antisocial personality disorder might also have an elevated risk of behaving violently. For example, in Raine (1993) those with borderline personality disorder were found to be predisposed to extreme forms of violence. Also, in DSM classification system violent behavior is a defining feature of borderline personality disorder (APA, 1987). Furthermore, Coid (1998) associated narcissistic personality disorder with homicide. All in all the relationship between different personality disorders and violence has not been clearly established yet and with the exception of psychopathy and ASPD, not much is known about personality disorders’ relationship to violence and homicide (Burke & Hart, 2000). Fazel and Grann (2004) found that the prevalence of any cluster B personality disorder among homicide offenders was 17%, compared with only 6% and 1% of cluster A and C disorders. It has even been suggested that some personality disorders, such as avoidant, may even lower the risk of criminal behaviour (Hodgins & Müller-Isberner, 2000).

1.4.2 Psychosis

People suffering from "major mental disorders", defined as schizophrenia, manic-depressive psychosis, psychogenetic psychosis, or other psychosis, have been found to be more violent than other diagnostic groups (Hodgins, 1992; Hodgins, Mednick, Brennan & Engberg, 1996). The heterogeneous group of “major mental disorders” has, however, been criticised for consisting of disorders with very different associations to homicidal behaviour. For example, Tiihonen and Hakola (1995) calculated that the risk of male homicidal behaviour for schizophrenia was 6.5 times higher than that of the general population, compared to only a 1.8-fold risk for those with major affective disorder. In another study schizophrenia increased the odds ratio of homicide by about tenfold among both genders (Eronen, Tiihonen & Hakola, 1996). Eronen, Hakola and Tiihonen (1996) estimated that 6% of Finnish homicide offenders had schizophrenia compared with a prevalence of only 1% among the general population, similar numbers have been obtained in prevalence studies conducted in other countries (Shaw, Appleby & Amos, 1999; Shaw et al. 2006). Further, only 2% of the homicide offenders suffered from psychoses if schizophrenia was excluded (Eronen et al., 1996). The odds ratio for homicide among persons suffering from these disorders was not elevated. Supporting these results, Schanda, Knecht, Schreinzer, Stompe, Ortwein-Swoboda & Waldhoer (2004) found that major mental disorders were associated with an increased likelihood of homicide (two-fold in men and six-fold in women), but this was exclusively because of schizophrenia. However, higher numbers of psychoses among homicide offenders have also been reported in some studies (Fazel & Grann, 2004).
Coborbidity of substance abuse and other psychiatric disorders is common among psychotic homicide offenders. For example, Putkonen, Kotilainen, Joyal & Tiitonen (2004) found that there were three major diagnostic categories of psychotic homicide offenders. About one-half had a triple diagnosis of ASPD combined with substance abuse and major mental disorder, one-quarter had "pure" dual diagnosis of substance abuse and mental disorder, and one-quarter were only diagnosed with major mental disorder. However, even when comorbid diagnosis are taken into consideration there still exists an association between psychotic disorders and violence (e.g. Schanda, 2006).

**Schizophrenia**

Although people suffering from schizophrenia are more likely to be victims of violence rather than commit violent acts themselves (Brekke, Prindle, Baie & Long, 2001; Fitzgerald, de Castella, Filia, Filia, Benitez & Kulkarni, 2005; Hiday, Swartz, Swanson, Borum, Wagner, 1999; Honkonen, Henriksson, Koivisto, Stengard, Salokangas, 2004), people with schizophrenia seem to be somewhat more likely to be violent than others (Stueve & Link, 1997; Wallace, Mullen, Burgess, Palmer, Ruschena & Browne, 1998; Walsh, Buchanan, Fahy, 2002). The association between schizophrenia and violence has been found in studies of incarcerated violent offenders (Eronen, Hakola & Tiitonen 1996; Wallace, Mullen, Burgess, Palmer, Ruschena, et al., 1998), studies of people with schizophrenia discharged from hospitals (Lindqvist & Allebeck, 1990), investigations of unselected birth cohorts (Arseneault, Moffit, Caspi, Taylor & Silva et al., 2000; Brennan, Mednick & Hodgins, 2000), as well as in community-based epidemiological studies (Swanson, Holzer, Ganju & Jono 1990). Interestingly, frontal lobe dysfunction seems to play a role in both violent behaviour as well as in schizophrenia and it has been stated that impaired executive functioning caused by reduced functional response in the frontal and inferior parietal regions may lead to serious violence in schizophrenia (Kumari, Aasen, Taylor, Ffytche, Das et al. 2006). Secondary diagnosis of a personality disorder (Moran, Walsh, Tyrer, Burns, Creed et al., 2003) or comorbid substance abuse (e.g. Tiihonen, Isohanni, Räsänen, Koiranen & Moring, 1997; Wallace et al., 1998), often combined with medical non-compliance (Swartz, Swanson, Hiday, Borum, Wagner et al, 1998) further increase the risk of violence.

Moffit (1993) distinguished early-onset offenders, who from a young age displayed a persistent pattern of antisocial behaviour, from late starters, who started offending in adulthood. The distinction of early- and late-start offenders has also been applied to offenders with schizophrenia. Tengström, Hodgins and Kulggren (2001) showed that of 272 schizophrenic offenders 27% could be identified as early starters and 73% as late starters. Early-start offenders with schizophrenia present conduct problems from an early age and often have an additional diagnosis of ASPD. Furthermore, they also score higher on measures of psychopathy (Tengström et al., 2001). Contrary to the early starters, the late-start offenders with schizophrenia usually do not offend before symptoms of their illness emerge. One hypothesis is that the relationship between
disorder and offending might be different for early- and late-start offenders with schizophrenia (Tengström et al., 2001). Studies show that antisocial behaviour is more frequent amongst schizophrenics’ biological relatives (e.g. Heston, 1966). It has been further hypothesized that especially schizophrenic offenders who start offending before the onset of their illness would have relatives with criminal records and an inherited vulnerability for both antisocial behaviour and psychosis (Hodgins, 2000). Furthermore, Hodgins, Kratzer and McNeil (2002) showed that neonatal complications increased the risk for early-start offending and were likely to interact with inherited vulnerabilities, such as impulsivity or sensation seeking. Previous research has also shown that early-start offenders with schizophrenia come from more stressful environments than late starters (Tengström et al., 2001) and, as children, they exhibit more conduct problems (Hodgins & Jansson, 2002). As adults, early starters have a poor employment history compared to late starters (Tengström et al., 2001).

**Psychotic symptoms**

Lately there has been increasing interest in studying the association between violence and individual elements of psychotic symptoms and their phenomenology in more detail (e.g. Bjorkly 2002b; Buchanan et al., 1993; Buchanan, 1997). Positive psychotic symptoms, predominantly delusions and hallucinations, have been suggested to be associated with violent behavior and these symptoms seem to be more severe among those persons with schizophrenia who engage in violent acts (Fresán, Apiquian, Fuente-Sandoval, Löyzaga, Garcia-Anaya et al. 2005; Hodgins, Hiscoke & Freese, 2003; Krakowski, Czobor, Chou, 1999). Positive symptoms most commonly associated with homicidal violence are delusions, especially delusions of persecution (e.g. Joyal, Putkonen, Paavola & Tiihonen, 2004; Shore et al, 1989; for a review see Bjorkly, 2002a). Some support also exists for an association between violent behavior and threat-control-override symptoms, which are comprised of the perception of threat from others and a feeling that one’s thoughts or mind are controlled by outside forces (Hodgins et al. 2003; Link & Stueve, 1995; Swanson et al. 1996, however, for contrasting results see Appelbaum, Robbins & Monahan, 2000 and Stompe et al. 2004). Other delusional symptoms associated with violence include religious delusions or ideation (e.g. Kunst, 1999; Maas, Prakash, Hollender & Regan, 1984) and delusional misidentification syndromes such as Capgras syndrome (e.g. Silva, Harry, Leong & Weinstock, 1996), however, it seems that these symptoms are also often accompanied by persecutory ideas. The significance of delusional distress has also been examined. The presence of fear (Kennedy, Kemp & Dyer, 1992), anxiety, and/or anger (Appelbaum, Robins & Roth et al., 1999; Buchanan et al., 1993; Kennedy, Kemp & Dyer, 1992; Silva et al., 1996) may act as a distress factor especially when combined with persecutory delusions, making it more likely that a delusion is being acted upon.

The association between hallucinations and violent behavior has long been suggested by clinical lore. Existing research does not unequivocally support this view, even though
higher levels of violence have been found among hallucinating than non-hallucinating offenders (Haefner & Boker, 1982; Lowenstein, Binder & McNiel, 1990; Noble & Rodger, 1989). Focus of the research has been on the role of violent command hallucinations, however, two reviews on the subject of command hallucinations conclude that the link between command hallucinations and violence is not firmly established (Hersh & Borum, 1998; Rudnick 1999). Overall, the evidence regarding the association between violence and hallucinations is not consistent (Bjorkly 2002b) and the nature and frequency of other than auditory hallucinations has not been studied extensively.

It has been suggested that there exists a violence escalating interaction between delusions and hallucinations (Swanson, Borum, Swartz & Monahan, 1996; Taylor, 1998; however see also Appelbaum et al., 2000) and that hallucinations alone rarely trigger violence (Taylor et al., 1998). A thematic consistency between hallucinations and delusions has also been proposed as a risk factor, increasing compliance with command hallucinations (Beck-Sander, 1997; Junginger, 1990)

Motivation
In addition to more attention being paid to the phenomenology of psychotic symptomatology among violent offenders, another shift in the research literature can be seen from a focus on violence rates to motivational influences (Junginger & McGuire, 2004). Although a number of studies have found that persons suffering from psychosis can be directly motivated by delusions or hallucinations (Steury & Choisinski, 1995, Junginger 1995; Junginger, Parks-Levy & McGuire 1998; Taylor 1998; Joyal et al. 2004), determining the exact motivation of a violent act committed by an psychotic individual is challenging (Joyal et al., 2004; Taylor, 1985; Taylor 1998; Junginger & McGuire, 2004). A recent study found that 60% of the homicidal acts committed by men with schizophrenia were motivated by psychotic symptoms, however, a subgroup of offenders with both schizophrenia and ASPD were significantly less likely to be motivated by psychotic symptoms than offenders without a comorbid personality disorder (Joyal, Putkonen, Paavola & Tiihonen, 2004). A study by Taylor (1998) suggested a similar distinction between psychotic offenders with and without ASPD. Thus, the presence of a symptom at the time of the violent crime does not indicate that the symptom motivated the offense. Other symptoms of psychosis, such as poor impulse control (Fresán et al., 2005) may also play a role. Moreover, multiple environmental or situational risk factors in addition to psychotic symptoms are likely to be involved. Overall, it should remembered that that the occurrence of violence among psychotic individuals is also influenced by circumstantial factors associated with violence among non-psychotic offenders, not only be their psychopathology (Joyal et al., 2004; Swanson, Borum, Swartz & Hiday et al, 1999). It is likely that persons suffering from psychosis are especially vulnerable to general criminogenic factors such as poverty, social deprivation, substance abuse, and deficits of modern mental health care (Schanda,
1996). Hiday (1997) has proposed a model of the connection between mental illness and violence, which includes a broad range of risk factors ranging from biological to social (figure 1).

![Figure 1. Neurobiological Pathology Paths to Violence.](image)


1.4.3 Substance abuse

Substance abuse disorders and intoxication are strong predictors of violent behavior both among the general population and the mentally ill (Steadman et al., 1998). The link between alcohol abuse and violence is strong and has been widely studied (see Boles & Miotto, 2003, Bushman & Cooper, 1990 and Parker & Auerhahn, 1998 for reviews). The role of other substances, however, is less clear (e.g. Parker & Auerhahn, 1998), even though at least the recent abuse of amphetamine and cocaine (Smart, Mann & Tyson 1997) has been linked to violence. Some evidence that cannabis increases the
degree of seriously violent behavior among non-delinquent users also exists (Friedman, Terras & Glassman, 2003).

In regards to homicide, according to Wallace et al. (1998), diagnosis of substance abuse by itself increases the risk of homicidal behavior six fold. In a large sample of homicide offenders a quarter of the offenders had a substance abuse diagnosis when only principal diagnoses were included, nearly half if secondary diagnoses were also taken into account (Fazel & Grann, 2004). Comorbidity of substance abuse with psychoses or personality disorder significantly increases the risk of homicide (Eronen, 1995; Eronen, Hakola & Tiihnien 1996; Schanda, Knecht, Schreinzer, Stompe, Ortwein-Swoboda & Waldhoer, 2004; Wallace et al., 1998; Walsh et al, 2002).

1.4.4 CHARACTERISTICS OF THE HOMICIDAL ACTS COMMITTED BY PERSONS WITH MENTAL ILLNESS

The limitation of the majority of the studies on the relationship between violent crime and mental disorders is that they have mostly concentrated on the frequency rather than the nature of the violent acts (Steyru & Choinski, 1995). Some studies have, however, examined the victim-offender relationship among the mentally ill homicide offenders and the results suggest that the relationship between psychotic homicide offenders and their victims is more likely to be intra-familial (Gillies, 1976; Daly & Wilson, 1988; Steury & Choinski, 1995; Nijman, Cima & Merckelback, 2003; Wong & Singer, 1973). It should be noted that there seems to be a gender effect, as both psychotic and non-psychotic females kill mostly inside their families (Gottlieb, Gabrielsen & Kramp, 1987), although women with antisocial personality disorder and psychopathic characteristics have been found to be more likely to victimize acquaintances and strangers compared to other women (Weizmann-Henelius, Viemero, Eronen, 2003). Furthermore, females with a personality disorder or psychosis differ in relation to their victim’s age. Females with a personality disorder kill more adults, whereas psychotic defendants kill more children (Putkonen, Collander, Honkasalo, & Lönnqvist, 2001). Stranger homicides seem to be associated rather with alcohol or drug misuse than mental illness (Shaw et al., 2004). Males, psychotic or non-psychotic, rarely kill children (Gottlieb et al., 1987). Taken together it makes sense from an evolutionary psychology point of view that mentally ill offenders, compared to non-mentally ill offenders, kill proportionally more familiar persons: according to proponents of evolutionary psychology, killing one’s child or blood relative makes no sense in evolutionary terms and should be considered a more disturbed act (Daly & Wilson, 1988).
In addition to examining victim-offender relationship only a few studies have examined other offense characteristics among the mentally ill homicide offenders. Steury and Choinski (1995) showed that psychotic defendants frequently used knives and other sharp instruments, were less often intoxicated, and rarely used gratuitous violence. Tengström et al. (2001) showed that among violent schizophrenic offenders the early starters were convicted at a younger age and of more crimes than late starters. Furthermore, Stueve and Link (1997) found that the crimes committed by offenders with both ASPD and a major mental disorder were more violent compared to those committed by the offenders with only a major mental disorder. For example, a higher percentage of the offenders with dual diagnosis reported weapon use (66%), compared to the offenders with only a major mental disorder (4%). Tengström et al. (2001) showed that compared to late starters, early starters were more often intoxicated at the time of the homicide. Petursson and Gudjonsson (1981) suggested that mentally ill offenders may exhibit “abnormal” behavior after the act. Furthermore, Robertson (1988) suggested that the majority of the mentally ill men are arrested at the crime scene and especially schizophrenics often report themselves to the police.

Violence and homicides committed by psychopathic offenders are more often “cold-blooded” and instrumental (Williamson, Hare & Wong, 1987; Porter, Woodworth, Earle, Drugge & Boer, 2002) and include more gratuitous, sadistic, and sexual violence than those committed by non-psychopathic offenders (Woodworth & Porter, 2003). Joyal et al. (2004) found that a subgroup of homicide offenders with both schizophrenia and ASPD were less likely to be judged as responding to psychotic symptoms, instead they were more likely to have used alcohol and to be involved in an altercation with the victim prior to the incident than offenders without ASPD. They also assaulted non-relatives more frequently.

1.5 **Summary of the Literature Review**

A large array of individual variables and situational variables, as well as the surrounding social environment contribute to the risk of homicide. It is unlikely that any single psychiatric, psychological, socio-cultural, or biological theory can explain a complex behavioural phenomena such as homicide. When examining homicide, the interplay of multiple variables from different domains should be born in mind.

The rate of violence among the mentally disordered is higher than that of those who are not ill and a large majority of homicide offenders have some psychiatric diagnosis. The greatest risk seems to be associated with diagnosis of substance abuse or personality disorder. With regard to psychosis and homicide, even when sociodemographic variables and comorbid disorders are taken into consideration most studies show a
statistically significant, albeit modest association, most proven in persons suffering from schizophrenia.

Overall, most of the previous psychiatric studies on the relationship between mental illness and homicide have concentrated on finding statistical relationships between mental illness and violent behavior. Psychologically oriented theories on the other hand focus their analysis only on the offender and rarely investigate the way the homicide has been carried out, even though that kind of information could further the understanding of the psychological processes underlying homicide and also contribute to the work of those investigating homicides in practice. In recent years research on crime scene behaviors has evolved to a more systematic scientific investigation and a psychological framework has been applied. Nearly all previous studies on homicide crime scene behaviors have utilized a thematic approach, where clusters of behaviors are analyzed. With this method, behavioral structures of homicides have been identified, however, attempts to link crime scene behaviors to offender characteristics have, at best, succeeded modestly.
2. AIMS OF THE STUDY

The general aim of the present study was to increase the understanding of how differences in homicide offenders and their crime related behaviors are associated with differences in these offenders’ mental status in Finnish homicides. A multidisciplinary approach has been adopted, with theoretical roots mainly in recent studies in investigative and criminological psychology as well as forensic psychiatry. The specific aims of the original publications were:

I To describe differences in the childhood and family backgrounds as well as in adolescent and adult adjustment of Finnish homicide offenders belonging to five different diagnostic categories. Based on previous clinical research it could, for example, be hypothesized that background characteristics of psychotic offenders differ from those with a personality disorder. All in all, it was expected that several differences in the background characteristics would emerge.

II To investigate crime scene behaviors among five groups of Finnish homicide offenders with a different psychiatric diagnosis. It was hypothesized that homicide crime scene behavior among, for example, psychotic offenders differs from those with a personality disorder. Study aims to link two domains of research, namely, research on the association of mental illness and violence to research on homicide crime scene behaviors. Contrary to previous studies, individual behaviors rather than clusters of behaviors were analyzed independently of each other.

III To examine the distinguishing characteristics in the backgrounds and in the crime scene behaviours of two groups of Finnish homicide offenders with schizophrenia. Early starters, who present antisocial behaviour before the onset of schizophrenia, were compared with late starters, who first offend after the onset of mental disorder. It was hypothesized that early-start offenders would exhibit more instrumental features in their homicides and would also differ in the frequency of active psychotic symptoms present at the time of the offense. On the basis of the current literature it was also anticipated that the early starters would have had more problematic childhood experiences.

IV To investigate how the nature of homicidal violence is associated with clinical and circumstantial variables as well as offender background characteristics among a sample of psychotic offenders. Specifically, this descriptive study aimed to identify factors that are associated with the use of excessive violence among homicide offenders with schizophrenia. Special emphasis was set on investigating how individual psychotic symptoms are associated with excessive violence.
3. SUBJECTS AND METHODS

3.1 GENERAL INFORMATION – THE STUDY PROCEDURE

This study forms part of a larger series of studies on Finnish homicide conducted at the Criminal and Forensic Psychology Research Group in the University of Helsinki, Department of Psychology. The study design was a retrospective chart review of the forensic psychiatric statements of Finnish homicide offenders. Based on a detailed research plan with ethical considerations, the permission to use the forensic examination statements of the offenders was granted by the National Authority for Medicolegal Affairs (NAMA). Copies of all the statements are filed in NAMA’s archives, from where the forensic psychiatric examination statements were collected and content analysed by the principal researcher. Content analysis is a method of analyzing data and it is used to study the form or content of texts or spoken word (Holsti, 1969, Krippendorf, 1980). In the present study content analysis was applied quantitatively, i.e. the content of the statements was described statistically and the frequency of items was investigated. A list of variables was based on literature review of violence, especially homicide and psychiatric disorders (the list of variables with brief explanation appear in appendix). Variables represented several domains (e.g. offenders crime scene and post-offense behaviors, child and parent behaviors, child and adult psychiatric contacts and diagnoses, history of offending and substance abuse, family, school, and demographic factors). Previous studies on homicide crime scene behaviors based on instrumental/expressive dichotomy informed the selection of crime scene behaviour related variables. Also, as aim of this study was to produce information that could be of practical use, variables related to crime scene behaviors (especially in study II) were chosen based on their estimated and hypothesized usefulness in terms of prioritizing suspects in investigative work. We did not, for example, analyze behaviors that are very situation specific, dependent perhaps on the victim’s ability to resist the offender (i.e. injury sites across the body).

Presence or absence of a variable was coded in a dichotomous format, where the variable was coded as a 1 if it was present and as a 0 if absent. Dichotomies were used since the information was drawn from files which are not written for research purposes and the range on information they contain is variable.

In addition to forensic mental health examination statements, the Finnish police computerized Criminal Index File was searched for information on all the selected cases. Permission to use the information was granted by the Ministry of the Interior’s Police department. The Criminal Index File includes sociodemographic data, such as the age and sex of the victim and the offender. It also includes a police’s description of the offense and the crime scene. Supplement data from the Criminal Index File was
available for a majority of the cases from year 1992 onwards. Absence of significant differences between the cases for which Criminal Index File data could be obtained and cases where it could not be obtained was confirmed with statistical analyses while conducting the study III.

Homicides in the Finnish criminal law are divided into murder, manslaughter, second-degree manslaughter (which was added to the nomenclature in 1995), infanticide, and involuntary manslaughter. The present study investigated only murders and manslaughters. Infanticides were not included as in them both the offender and victim are explicit, and furthermore, they are considered a special type of homicide with specific psychiatric, demographic as well as social features (e.g. Putkonen, 2003; Resnick, 1970). In the research literature attempted and fulfilled homicides are often studied together, the rational usually being that individuals who are charged with attempted homicide intended to kill their victims but they did not die by chance. According to studies homicide and attempted offenders resemble each other in a number of demographic and other variables (e.g. Kivivuori 1999; Langevin, Ben-Aron, Wortzman, Dickey & Handy, 1987; Medlicott, 1976), however, some studies have found differences between attempted and fulfilled homicide offenders, for example in terms of inpatient psychiatric histories, witnesses present during the criminal act and nonresponsiveness towards their actions (Weisman & Sharma, 1997). To prevent possible confounding effects, the attempted acts were not included in the present study. Also, involuntary manslaughter was not included as, by definition, it does not include volition. Furthermore, by excluding both involuntary manslaughters as well as homicide attempts the aim was to ensure that the sample would be as representative as possible: offenders charged with involuntary manslaughter or attempted homicide are not ordered to a forensic psychiatric examination as often as those charged with fulfilled murder or manslaughter (Pajuoja, 1995; Wagner-Prenner, 2000).

3.2 Forensic Psychiatric Examinations

Insanity in some form was already an excuse in the earliest systems of law and offenders considered to be mentally ill were relieved of responsibility (Moore, 1980; Pajuoja 1995). According to the Finnish Penal Code from 1889, criminal responsibility varies from normality to insanity, corresponding to the offender’s mental health (Pajuoja, 2001). Currently offenders are assigned to one of the three categories of accountability: full responsibility, diminished responsibility, or without criminal responsibility. A majority of persons accused of serious violent acts are ordered to a forensic psychiatric examination. It has been estimated that as many as 85 % of Finnish homicide offenders accused of murder or manslaughter go through a forensic psychiatric examination (Pajuoja, 1995). According to the Finnish legislation, the examination may be requested by the offender, attorney, or the prosecutor and the
district courts decide independently whether a detailed forensic psychiatric evaluation should be made (Finnish Law, 1998). However, almost all homicide offenders are examined by a psychiatrist to help the court to make the decision (Eronen, Hakola & Tiihonen, 1996). The assessment is organized by NAMA in a state hospital. The examination is extensive, lasting approximately 4-8 weeks, and it includes the gathering of anamnestic data from childhood to present from various sources (standardized questionnaires are filled by family members and relatives, medical and criminal records, school and military), psychiatric evaluation, standardized psychological tests (e.g. WAIS-R, MMPI) to assess the personality and cognitive abilities of the offender, interviews by a social worker and a psychologist, physical examinations and observation of the offender by the hospital staff (Eronen, Repo, Vartiainen & Tiihonen, 2000). Based on this data the psychiatrist prepares a detailed statement depicting the evaluated psychiatric state of the offender at the time of the crime. A psychiatric diagnosis and a statement of the criminal responsibility are also given. After 1987, the diagnoses have been made according to DSM-III-R (APA, 1987) criteria. ICD-10 (WHO 1992) became the official classification in 1996, but DSM-IV (APA, 1994) has in addition been widely used (Putkonen, 2003). The report and the diagnosis are evaluated and approved by NAMA’s psychiatrists and at least one judge. The overall quality and reliability of Finnish forensic psychiatric examinations is considered to be high (Eronen, Repo, Vartiainen & Tiihonen, 2000).

It should be noted that when forensic psychiatric examinations take place, the juridical process is not complete and the alleged perpetrator is being accused of a crime. For the sake of clarity, however, in this study the word offender is used when the subjects are discussed.

3.3 Subjects in Studies I-II

Based on the diagnosis given in the statements, were gathered 200 examination statements of homicide offenders. Each of the following four groups contained 50 offenders: 1) persons with schizophrenia 2) persons with a diagnosis of alcoholism or drug dependency (with no serious mental illness), 3) offenders with a personality disorder, and 4) offenders with no diagnosis. The last group included examinees with either no diagnosis at all or less serious disorders, such as mild or reactive depression. The gathering of the data began from examinations conducted in the year 2001, progressing as far back as was necessary to find 50 offenders for each group. Cases selected for the study were from the years 1989-2001. From these 200 subjects offenders with both schizophrenia and personality disorder were excluded (but they were studied in detail in Study III). Mentally deficient offenders or those suffering from organic disorders were also excluded. The rationale behind the sample selection was to
gather reasonable-sized diagnostic groups for statistical comparisons, although it followed that the sample as a whole does not reflect the true distribution of psychiatric diagnosis (for example, offenders with schizophrenia are overrepresented). The final study data consisted of 182 cases, of which 25% were murders. The percentage of murders is similar to that annually seen in Finland (e.g. Kivivuori, 1999).

It is a matter of debate whether alcoholism and drug addiction should be grouped under the label of mental illness (Heim, 2000). In this study these disorders were treated as mental illnesses as they are currently defined as such by the diagnostic classification systems used in the forensic psychiatric examinations. Also, since violence is differentially associated with alcoholism and drug abuse (e.g. Parker & Auerhahn, 1998), offenders with these diagnoses were studied separately. Before statistical analysis five offender subcategories were formed: offenders with personality disorder (n=44), drug dependency (n=15), alcohol dependency (n=43), schizophrenia (n=43), and no diagnosis (n=37). In a sub-group classification schizophrenia and personality disorder exceeded alcoholism: an alcoholic with a diagnosis of personality disorder or schizophrenia was assigned to these diagnostic groups, regardless of his alcoholism. However, drug dependent offenders were assigned to their own category even if an additional diagnosis of personality disorder (but not schizophrenia) was present. Three cases where the diagnosis of schizophrenia was not unambiguous occurred. In two cases the final diagnosis was schizotypal personality disorder and in one schizoaffective disorder. In all these cases, however, schizophrenia was given as a possible “optional diagnosis”, which is why these cases were included in the sample. These cases where also included in studies II-IV. With regard to personality disorders, a majority of those diagnosed with personality disorder were either mixed-type (38.6%) or antisocial (34.1%). Five offenders (11.3%) were classified as immature personalities and four offenders (9.1%) were diagnosed with borderline personality disorder. In addition, paranoid personality disorder, narcissistic personality disorder, and passive-aggressive personality disorder each occurred once in the sample.

3.4 SUBJECTS IN STUDIES III-IV

For study III, archives of forensic examination statements were searched for homicide cases where the offender had been given a diagnosis of schizophrenia. For purposes of this study, the offenders with comorbid personality disorder were also included. The sample included 109 subjects diagnosed with schizophrenia between the years 1987 and 2002. The Criminal Index File data was used when available. Early starter was defined as an individual who had been convicted of a crime by the age of 18. In recent studies on violent offenders those convicted before their 18th birthday have been classified as early starters (e.g. Hodgins & Jansson, 2002; Tengström et al., 2001), however, in order
to increase the inevitably small size of the early starter group the maximum age for the
early starters was raised to include those who were 18-years old at the time of
conviction. It should be noted that since there is a variable time lag between the offense
and the conviction, virtually all early starters had committed their first offense before
their 18th birthday. It should also be noted that the age of criminal majority in Finland is
15, which means that felonies committed by offenders under 15 years of age are not
registered in the Finnish Central Criminal Register. In order to provide accurate data,
i.e. to detect older crimes committed by minors, all crimes mentioned in the statement
(both self-reported or informant reported in addition to those derived from official files)
were taken into account when defining early- and late starters. Official records
frequently produce a lower frequency of violence than self- or informant reports (e.g.
Steadman, Mulvey, Monahan, Robbins, Appelbaum et al., 1998). Subjects in study IV
were the same as in study III, but the sample was expanded so that it included forensic
psychiatric examination statements of 125 offenders diagnosed with schizophrenia
between years 1986 and 2004.

3.5 Statistical analyses

All the data were entered in the SPSS program (version 10.0 or 12.0) for statistical
analysis.

Missing data
In some cases information on a variable could not be found in the statement. In some
studies all missing categorical values are coded as zero (i.e. as not present), however,
this might be misleading (Långström et al., 1999) as it is possible that the the presence
of the variable is not written down in the statement. In this study the majority of missing
values were treated as missing data, but exceptions were made (missing values replaced
by 0) with the variables concerning the criminal history of offender’s parents or family,
parental alcohol abuse, and familial psychopathology or suicide. It was assumed that the
absence of these variables indicated that they were not present in the case as this type of
information is usually screened in the examination.

Reliability analysis
Kappa statistic (Cohen, 1960) was used to evaluate the inter-rater agreement (IRR) for
each categorical variable. For continuous variables Pearson’s correlation coefficient was
used. Two raters (both authors in studies I-III and primary researcher and a trained
research assistant in study IV) independently coded a randomly chosen subset (10%) of
the sample. With few exceptions, the Cohen’s kappa value was acceptable (p < 0.05) for
each variable, indicating significant reliability in the IRR (Cohen, 1960; Landis &
Koch, 1977). When the amount of IRR did not reach statistical significance (p < 0.05),
the variable was eliminated from further analyses, leaving a total of 90 categorical variables and eight continuous variables for statistical analysis.

**Univariate analyses**

In all studies statistically significant differences between the groups were tested by using the chi square-test of independence for categorical variables. The possibility of false significant results due to multiple significance tests was born in mind, however, the Bonferroni correction was not used in the present study as it is a highly conservative test which might increase the chance of a type II error (Perneger, 1998). To avoid false significant results due to multiple significance tests, the significance level was set at 0.01 in studies I and II, results significant at $p < 0.05$ level were occasionally reported as trends. In studies III and IV the significance level was set at 0.05. In cases where any expected cell size was under five, the Fisher’s two-tailed exact test was applied. For continuous variables, the t-test (two group comparisons) or one-way ANOVA (several group comparisons) was used when the variable was normally distributed, for continuous skewed variables the Mann-Whitney test or Kruskall-Wallis test was administered.

**Multivariate analyses**

In studies I, II and IV, logistic regression analysis was used to test the importance and power of selected variables. A method of entering the variables into the logistic regression model was forcing: selected variables considered to be important on the basis of the univariate analysis and literature review were included in the model. In addition, in study III discriminant function analysis was conducted to determine which factors discriminated between the early and late starters. At this point all missing values were replaced by zero as these analyses require complete data for all of the subjects.
4. RESULTS

The main results of each of the substudies are shortly presented here. Detailed information can be found in the original publications.

4.1 OFFENDER AND VICTIM DEMOGRAPHICS

Studies I and II
Among the 182 homicide cases examined in studies I and II there were 18 women offenders (9.7%). The offenders’ gender did not differ significantly between offenders belonging to different diagnostic groups. The age ranged from 15 to 70 years (mean = 38.35 years, SD = 11.68 years) and did not differ significantly between women and men. However, analysis of variance (ANOVA) showed that offenders’ age differed significantly in relation to the diagnostic group (F = 5.051, p < 0.001): offenders with drug dependency were significantly younger compared to other groups (mean = 26.87 years vs. 39.32 years, SD = 7.50 vs. 11.40). There were 14 cases (8%) with multiple dead victims. Twelve offenders killed two victims and two offenders three victims. Of the 198 killed victims, 29% were females. Victim gender differed significantly between the diagnostic groups. None of the drug addicts killed a female compared to 37% of the alcoholics, 35% of the offenders with schizophrenia, 27% of those with no diagnosis, and 25% of the personality disordered. No significant differences between the diagnostic groups were found in the victims’ ages (mean = 40.62 years, SD = 16.55).

Studies III and IV
Of the 109 offenders with schizophrenia in study III, seven (6%) were females. 27 (25%) were classified as early starters, and 82 (75%) as late starters. Out of seven female subjects there was only one early starter (14%). A personality disorder was diagnosed in nine (33%) of the early starters and four (5%) of the late starters (p < 0.001). Substance abuse disorders were likewise more common among early starters. Drug abuse/dependence was diagnosed in 13 (48%) of the early start offenders and 7 (9%) of the late starters (p < 0.01), alcohol abuse/dependence in 17 (65%) of the early starters and 28 (35%) of the late starters. (p < 0.001). Early start offenders were significantly younger at the time of the homicide compared to late starters (t (61) = -3.593, p < 0.01, mean = 30.19, SD = 8.62 compared with mean = 37.80, SD = 11.95). There were 115 homicide victims. In 48 (42%) cases the victim was a female. Victims’ age ranged from 1 to 85 years and no significant differences in victim gender or age between the two offender groups existed. In study IV the sample was expanded so that there were 125 offenders, the mean age for offenders being 35.67 years (range 15-69, SD = 11.464). There were multiple homicide victims in eight cases: seven offenders
killed two victims and one offender killed three victims. In 12 (10%) of the cases, there were two offenders.

4.2 Study I

Results of the univariate analyses

Summary of significant results found in the univariate analysis is presented in Table 1.

Childhood
With regard to variables related to the early family environment, personality disordered offenders had most frequently experienced at least one institutional placement in childhood (30%), and in this regard they differed from all the other groups except those with drug dependency (p < 0.01). The number of parents or step-parents abusing alcohol was also significantly higher among personality disordered (71%, p < 0.001). In contrast, psychopathology in a family member, excluding parents, was significantly higher in the schizophrenic group (44%, p < 0.001). School problems (e.g. deficits in attention and concentration) were significantly more prevalent among drug addicts and personality disordered (p < 0.001), and furthermore, as can be expected, these offenders were also more likely to have attended special education at some point of their schooling (p < 0.01).

Adulthood
Occupational education had been interrupted significantly more often by offenders with the diagnosis of drug dependency (57%, p < 0.01). Also, of male offenders over 18 years old, military service was conducted significantly more often by alcoholics and offenders with no diagnosis (p < 0.01). Significantly less unemployed persons occurred in the group of offenders with no diagnosis (p < 0.01). Altogether 42% of the offenders with schizophrenia were on a sickness pension, and, as can be expected, this was significantly more than in any other group (p < .001).

Offenders with no diagnosis lived alone less often compared to other groups, whereas the percentage of offenders living alone was the greatest among offenders with schizophrenia (54%, p < 0.01). In parallel with these results, offenders with schizophrenia lived significantly less frequently with an intimate partner (46%) and were less likely to have been married or in a live-in relationship (62%, p < 0.001). The number of marriages or live-in relationships was greatest among personality disordered. They were also more often divorced, however, this result only approached a significant level. Personality disordered and offenders with no diagnosis were more
Table 1. Summarized results of Study I: significant differences in background characteristics in relation to the five diagnostic groups (%).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional placement**</td>
<td>9.3</td>
<td>11.6</td>
<td>30.2</td>
<td>2.8</td>
<td>21.4</td>
<td>14.5</td>
<td>179</td>
<td>*<em>3 &gt; 4; <em>1, 2 &lt; 3</em></em></td>
</tr>
<tr>
<td>(Step) parental alcohol abuse***</td>
<td>46.5</td>
<td>33.3</td>
<td>70.5</td>
<td>27.0</td>
<td>60.0</td>
<td>46.4</td>
<td>181</td>
<td><strong>2, 4 &lt; 3</strong></td>
</tr>
<tr>
<td>Familial psychopathology (excluding parents)**</td>
<td>18.6</td>
<td>44.2</td>
<td>13.6</td>
<td>13.9</td>
<td>6.7</td>
<td>21.5</td>
<td>181</td>
<td><strong>1, 3, 4, 5 &lt; 2</strong></td>
</tr>
<tr>
<td>Child/adolescent psychiatric contact**</td>
<td>7.3</td>
<td>10.0</td>
<td>37.2</td>
<td>20.6</td>
<td>35.7</td>
<td>20.3</td>
<td>172</td>
<td><strong>3, 5 &gt; 1</strong></td>
</tr>
<tr>
<td>School problems***</td>
<td>41.5</td>
<td>28.6</td>
<td>61.0</td>
<td>34.3</td>
<td>85.7</td>
<td>45.1</td>
<td>173</td>
<td>*<strong>5 &gt; 1, 2, 4; 2 &lt; 1, 3, 5</strong></td>
</tr>
<tr>
<td>Special education**</td>
<td>7.0</td>
<td>4.7</td>
<td>21.4</td>
<td>13.9</td>
<td>42.9</td>
<td>14.0</td>
<td>178</td>
<td><strong>1, 2 &lt; 5</strong></td>
</tr>
<tr>
<td>Unemployed**</td>
<td>62.8</td>
<td>37.2</td>
<td>56.8</td>
<td>24.3</td>
<td>50.0</td>
<td>46.4</td>
<td>181</td>
<td><strong>1, 3 &gt; 4</strong></td>
</tr>
<tr>
<td>Occupational education interrupted***</td>
<td>11.6</td>
<td>23.2</td>
<td>18.6</td>
<td>5.6</td>
<td>57.1</td>
<td>18.4</td>
<td>179</td>
<td>*<strong>5 &gt; 1, 3, 4</strong></td>
</tr>
<tr>
<td>Military service**</td>
<td>87.9</td>
<td>63.4</td>
<td>60.0</td>
<td>81.3</td>
<td>46.2</td>
<td>71.0</td>
<td>156</td>
<td><strong>1, 4 &gt; 2, 3, 5</strong></td>
</tr>
<tr>
<td>Lives alone**</td>
<td>43.9</td>
<td>53.7</td>
<td>25.6</td>
<td>18.9</td>
<td>27.3</td>
<td>35.5</td>
<td>169</td>
<td><strong>2 &gt; 3, 4, 5</strong></td>
</tr>
<tr>
<td>On a sickness pension***</td>
<td>4.7</td>
<td>41.9</td>
<td>15.9</td>
<td>13.5</td>
<td>7.1</td>
<td>18.2</td>
<td>181</td>
<td><strong>2 &gt; 1, 3, 4, 5</strong></td>
</tr>
<tr>
<td>Lives with an intimate partner***</td>
<td>29.3</td>
<td>9.5</td>
<td>46.2</td>
<td>59.5</td>
<td>18.2</td>
<td>34.1</td>
<td>170</td>
<td><strong>4 &gt; 2</strong></td>
</tr>
<tr>
<td>Ever married or had a live-in relationship***</td>
<td>87.5</td>
<td>62.2</td>
<td>97.6</td>
<td>85.7</td>
<td>66.7</td>
<td>82.5</td>
<td>166</td>
<td>*<strong>3 &gt; 2, 5; 1 &gt; 2</strong></td>
</tr>
<tr>
<td>Has children***</td>
<td>39.0</td>
<td>31.0</td>
<td>78.6</td>
<td>66.7</td>
<td>35.7</td>
<td>52.0</td>
<td>175</td>
<td><strong>1, 2, 5 &lt; 3; 2 &lt; 4</strong></td>
</tr>
<tr>
<td>Current alcohol abuse***</td>
<td>95.3</td>
<td>48.8</td>
<td>88.4</td>
<td>27.0</td>
<td>85.7</td>
<td>67.8</td>
<td>180</td>
<td><strong>1, 3 &gt; 2, 4; 5 &gt; 4</strong></td>
</tr>
<tr>
<td>Adult (&gt;18) psychiatric contacts***</td>
<td>23.3</td>
<td>85.7</td>
<td>54.8</td>
<td>19.4</td>
<td>78.6</td>
<td>49.2</td>
<td>177</td>
<td>*<strong>2 &gt; 1, 3.3 &gt; 1.4</strong></td>
</tr>
<tr>
<td>Self-destructive/suicidal behaviour**</td>
<td>11.9</td>
<td>42.9</td>
<td>37.5</td>
<td>18.9</td>
<td>38.5</td>
<td>28.7</td>
<td>174</td>
<td><strong>2, 3, 4 &gt; 1</strong></td>
</tr>
<tr>
<td>Ongoing psychiatric contact***</td>
<td>7.0</td>
<td>46.3</td>
<td>14.0</td>
<td>2.7</td>
<td>14.3</td>
<td>17.4</td>
<td>178</td>
<td><strong>2 &gt; 1, 3, 4, 5</strong></td>
</tr>
<tr>
<td>Current psychiatric medication***</td>
<td>2.4</td>
<td>38.9</td>
<td>17.1</td>
<td>5.7</td>
<td>15.4</td>
<td>15.6</td>
<td>167</td>
<td><strong>2 &gt; 1, 4</strong></td>
</tr>
<tr>
<td>Self-destructive/suicidal behaviour**</td>
<td>11.9</td>
<td>42.9</td>
<td>37.5</td>
<td>18.9</td>
<td>38.5</td>
<td>28.7</td>
<td>174</td>
<td><strong>2, 3, 4 &gt; 1</strong></td>
</tr>
<tr>
<td>Paranoia***</td>
<td>11.6</td>
<td>100.0</td>
<td>20.5</td>
<td>10.8</td>
<td>42.9</td>
<td>37.0</td>
<td>181</td>
<td><strong>2 &gt; 1, 3, 4, 5</strong></td>
</tr>
<tr>
<td>Depression***</td>
<td>9.3</td>
<td>67.7</td>
<td>23.3</td>
<td>29.4</td>
<td>35.7</td>
<td>30.3</td>
<td>165</td>
<td><strong>2 &gt; 1, 3, 4</strong></td>
</tr>
<tr>
<td>Current alcohol abuse***</td>
<td>95.3</td>
<td>48.8</td>
<td>88.4</td>
<td>27.0</td>
<td>85.7</td>
<td>67.8</td>
<td>180</td>
<td><strong>1, 3 &gt; 2, 4; 5 &gt; 4</strong></td>
</tr>
</tbody>
</table>

**p ≤ .01, *** p ≤ .001
likely to have biologic children, personality disordered and offenders with schizophrenia differed from each other at 0.01 level.

Psychiatric contacts and medication
Offenders with personality disorder were significantly more likely to have had a psychiatric contact during childhood or adolescence (37%, p < 0.01), whereas offenders with schizophrenia or drug dependency were significantly more likely to have had at least one psychiatric contact as adults (p < 0.001). The age at first psychiatric contact did not differ significantly between the groups (mean = 23.61, SD = 12.33). Nearly half of the offenders with schizophrenia had an ongoing psychiatric contact at the time of the offense (p < 0.001), and, as could be expected, they were on psychiatric medication significantly more often compared to other groups (39 %, p < 0.001). It is noteworthy that the number of offenders with schizophrenia who had a prescription for psychiatric medication is much greater, since medical non-compliance and missing out on check-ups were common.

Psychiatric symptoms
At the time of the offense all but one of the offenders with schizophrenia were psychotic. Hallucinations, delusions or both were present at the time of the offense in 37 (90.2%) cases. Offenders with schizophrenia, personality disorders and drug addicts were significantly more likely to have exhibited self-destructive or suicidal behaviour compared to alcoholics (p < 0.01). Symptoms of depression were evident in 30 % of the offenders (either according to the psychologists statement or chart diagnosis).

Criminal history
The total number of previous convictions reported ranged from zero to 87 (mean = 13.72, SD = 18.03). The number of previous convictions for those with a criminal history differed significantly between the groups (Kruskall-Wallis H = 38.60, p < 0.01). Offenders with no diagnosis had the fewest convictions (mean = 1.68, SD = 4.20), whereas among personality disordered (mean = 13.77, sd = 16.82) and drug addicts (mean = 13.79, SD = 12.48) the number was the highest. Age at the first conviction (mean = 24.78, SD = 6.04) or age at the time of the first conviction for any violent offense (mean = 27.9, SD = 8.62) did not differ significantly between the groups. A significantly higher proportion of personality disordered and drug addicts had committed thefts, assaults, drunk driving, and other crimes, a variable which included various felonies grouped to one variable, were likewise more prevalent in these groups. As can be expected, drug addicts had committed significantly more drug related crimes.
Results of the multivariate analysis

Logistic regression analysis was used to find the best predictors of offender’s future psychiatric or substance abuse diagnosis. Variables chosen for the analysis were related to the offenders’ childhood environment and included “living with both parents until age 16”, “any institutional placements”, “school problems”, “special education”, “(step)parental alcohol abuse”, “(step)parental psychopathology”, “psychopathology in another family member”, “criminal history of a (step)parent”, and “criminal history of another family member”. The decision to include these variables was based on the results of chi-square tests and pairwise comparisons as well as the body of research regarding the etiology of psychiatric disorders. Summary of results is presented in Table 2.

Table 2. Significant predictor variables of the diagnosis in logistic regression analysis

<table>
<thead>
<tr>
<th>Alcohol dependence</th>
<th>Schizophrenia</th>
<th>Personality disorder</th>
<th>No diagnosis</th>
<th>Drug addiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental alcohol abuse</td>
<td>Parental alcohol abuse (-)</td>
<td>Institutional placement</td>
<td>Parental alcohol abuse (-)</td>
<td>Parental alcohol abuse</td>
</tr>
<tr>
<td>School problems</td>
<td>Familial psychopathology</td>
<td>Parental alcohol abuse</td>
<td>School problems (-)</td>
<td>School problems</td>
</tr>
<tr>
<td>Familial criminal history (other than parents’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- = negative association

Parental alcohol abuse was negatively associated with the offender later having schizophrenia, whereas psychopathology of a family member other than a parent increased the odds of having schizophrenia five times higher compared to the situation where no mental illness was detected in the family (n = 23, $\chi^2 = 28.729$, p < 0.001, $R^2 = 0.218$, overall correct percentage 76.6%). Among offenders who had experienced institutional placement(s) in childhood the odds of a personality disorder were nearly three times higher, school problems increased the odds 2.3 fold. Parental alcohol abuse was even more strongly associated with personality disorder, increasing the odds to 4.5 fold (n = 55, $\chi^2 = 40.034$, p < 0.005, $R^2 = 0.276$, overall correct percentage 77.3%). School problems increased the odds of future drug dependence diagnosis up to 5.3-fold and parental alcohol abuse to 2.7-fold (n = 20, $\chi^2 = 23.909$, p < 0.01, $R^2 = 0.246$, overall correct percentage 89.6%). With regard to alcoholism, school problems, and parental alcohol abuse were again significant predictors of the diagnosis, odds ratios being 2.8 and 3.0. Criminal history of a family member other than parent increased the odds of alcoholism up to 4.7-fold (n = 104, $\chi^2 = 33.521$, p < 0.0005, $R^2 = 0.225$, overall correct...
percentage 71.0%). Finally, school problems and parental alcohol abuse decreased the odds of the offender being without diagnosis, however, the explanatory power of the model was not striking \((n = 37, \chi^2 = 18.106, p < 0.05, R^2 = 0.148, \text{overall correct percentage 79.8%})\).

4.3 STUDY II

Results of the univariate analyses

Summary of significant results found in the univariate analysis is presented in Table 3.

Victim-offender relationship

In the analysis of the victim-offender relationship it was found that most commonly, in half of the cases, the victim and the offender were acquaintances. In 18% of the cases the relationship was that of relatives (blood related or step-parents, siblings, and children) and in 24% of the cases the offender and the victim were (ex)intimate partners. Finally, in 8% of the cases the victim and the offender were strangers. Offenders with drug addiction and offenders with schizophrenia were less likely to kill an (ex)intimate partner (i.e. husband, wife, girl/boyfriend) compared to the other offender groups. The difference in the percentage of offenders who killed an intimate partner was statistically significant \((p < 0.01)\) between drug addicts and alcoholics. Offenders with schizophrenia and those without a diagnosis were significantly more likely to kill a relative compared to personality disordered or drug addicts \((p < 0.01)\). Killing an acquaintance was most frequent among drug addicts (87%), followed by personality disordered (59%), significant difference existed when these two groups were compared to the offenders without a diagnosis \((p < 0.01)\).

Crime Scene Behaviors

With regard to the general offense characteristics, there were multiple offenders in 12% of the cases. This was more common among drug addicts compared to other groups. In 39% of the cases another crime (usually the possession of an illegal gun) occurred in association with the killing. This was significantly \((p < 0.01)\) more frequent among the drug addicts, especially when compared to the alcoholics. None of the victims of drug addicts were found from the shared household of the offender and the victim. The difference was statistically significant \((p < .001)\) in relation to offenders with schizophrenia and offenders with no diagnosis. This probably relates to the fact that the victims of drug addicts were, for the most part, acquaintances and to a lesser extent
Table 3. Summarized results of Study II: significant differences in crime scene behaviors in relation to the five diagnostic groups (%).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim (ex-) intimate partner</td>
<td>34.9</td>
<td>9.3</td>
<td>29.5</td>
<td>29.7</td>
<td>-</td>
<td>23.6</td>
<td>34.9</td>
<td>** 1 &gt; 5</td>
</tr>
<tr>
<td>Victim blood related***</td>
<td>11.6</td>
<td>32.6</td>
<td>4.5</td>
<td>32.4</td>
<td>-</td>
<td>18.1</td>
<td>11.6</td>
<td>*** 2 &gt; 3, 5; 4 &gt; 3, 5</td>
</tr>
<tr>
<td>Multiple offenders</td>
<td>7.0</td>
<td>9.3</td>
<td>11.4</td>
<td>13.5</td>
<td>33.3</td>
<td>12.1</td>
<td>182</td>
<td>** 1 &lt; 5</td>
</tr>
<tr>
<td>Additional crime</td>
<td>23.8</td>
<td>41.9</td>
<td>39.5</td>
<td>43.2</td>
<td>64.3</td>
<td>39.1</td>
<td>179</td>
<td>** 1 &lt; 5</td>
</tr>
<tr>
<td>Victim found from a shared household</td>
<td>20.9</td>
<td>25.6</td>
<td>15.9</td>
<td>27.0</td>
<td>-</td>
<td>20.3</td>
<td>182</td>
<td>** 5 &lt; 2, 4</td>
</tr>
<tr>
<td>Knife</td>
<td>18.6</td>
<td>27.9</td>
<td>13.6</td>
<td>8.1</td>
<td>13.3</td>
<td>17.0</td>
<td>181</td>
<td>* 2 &gt; 4</td>
</tr>
<tr>
<td>Rifle or shotgun**</td>
<td>18.6</td>
<td>-</td>
<td>11.4</td>
<td>22.2</td>
<td>-</td>
<td>11.6</td>
<td>181</td>
<td>* 4 &gt; 2</td>
</tr>
<tr>
<td>Handgun</td>
<td>2.3</td>
<td>9.3</td>
<td>13.6</td>
<td>27.0</td>
<td>13.3</td>
<td>12.6</td>
<td>182</td>
<td>** 4 &gt; 1; * 4 &gt; 2</td>
</tr>
<tr>
<td>Blunt weapon</td>
<td>11.6</td>
<td>31.0</td>
<td>20.5</td>
<td>8.1</td>
<td>33.3</td>
<td>19.3</td>
<td>182</td>
<td>* 2, 5 &gt; 1, 4</td>
</tr>
<tr>
<td>Kicking or hitting</td>
<td>19.0</td>
<td>13.9</td>
<td>35.7</td>
<td>14.3</td>
<td>41.7</td>
<td>22.8</td>
<td>167</td>
<td>** 5 &gt; 2; * 3 &gt; 2; 3 &gt; 4; 5 &gt; 4</td>
</tr>
<tr>
<td>Weapon taken to scene</td>
<td>17.5</td>
<td>30.2</td>
<td>31.0</td>
<td>41.7</td>
<td>50.0</td>
<td>31.4</td>
<td>175</td>
<td>* 4, 5 &gt; 1</td>
</tr>
<tr>
<td>Injuries to victim’s face</td>
<td>36.4</td>
<td>67.9</td>
<td>54.3</td>
<td>32.0</td>
<td>60.0</td>
<td>48.9</td>
<td>131</td>
<td>** 2 &gt; 4; * 2 &gt; 1</td>
</tr>
<tr>
<td>Steals from the victim</td>
<td>7.3</td>
<td>7.3</td>
<td>14.3</td>
<td>5.9</td>
<td>38.5</td>
<td>11.1</td>
<td>171</td>
<td>* 5 &gt; 1, 2, 3, 4</td>
</tr>
<tr>
<td>Preceding argument</td>
<td>71.1</td>
<td>41.2</td>
<td>71.1</td>
<td>63.6</td>
<td>53.8</td>
<td>61.5</td>
<td>156</td>
<td>** 1, 3 &gt; 2</td>
</tr>
</tbody>
</table>

* p ≤ .05, **p ≤ .01
relatives or intimate (ex-)partners. In total, 21% of the offenders moved the body and 12% covered it.

The most common method of inflicting death was with a sharp weapon other than a knife (33%), usually an axe. The mean number of wounds inflicted using a sharp weapon was 6.88 (SD = 11.65, range 1-80). The use of a sharp weapon was most frequent among the alcoholics (62%). This may be due to the fact that their crimes are often impulsive killings that occur in relation to a drinking quarrel. Therefore the weapon is usually taken from the scene. Firearms were used in 24% of the killings. The mean number of shot wounds with a firearm was 2.22 (SD = 1.55, range 1-6). Compared to the other groups, using a firearm was relatively more frequent among offenders without a diagnosis. In terms of using a rifle or a shotgun, a significant difference across the diagnostic groups appeared: none of the offenders with schizophrenia or drug addicts used a rifle or a shotgun, whereas 22% of those with no diagnosis and 19% of the alcoholics did so. In addition, compared to alcoholics, offenders without a diagnosis used handguns significantly more frequently (27% vs. 2%).

Blunt weapons, such as stones, hammers, or furniture, were most often used as a method of killing among offenders with schizophrenia and drug addicts. Use of a blunt weapon was less frequent among offenders with no diagnosis and alcoholics. Strangulation occurred in 14% of the cases, but no differences appeared across the groups. Kicking and hitting the victim occurred in 23% of the cases. Hitting and kicking was most frequent among the drug addicts (42%), followed by the personality disordered (36%). A significant difference appeared between the drug addicts and offenders with schizophrenia (of whom 14% hit and kicked the victim).

Altogether in 62% of the cases an argument preceded the killing. This was significantly more frequent among the alcoholics (71%) and personality disordered (71%), compared to the offenders with schizophrenia (41%). In 31% of the cases the weapon was brought to the scene. This was most frequent among the drug addicts. Nearly half of the offenders injured the victims’ face. Injuring the face was significantly more frequent among offenders with schizophrenia (68%), compared to offenders with no diagnosis (32%). Stealing one or more of the victim’s possessions occurred in 11% of the homicides. Stealing was most frequent among the drug addicts (39%), and less frequent among the offenders with no diagnosis (6%).

Of all the offenders 74% had been intoxicated during the offense. This was most frequent among the offenders with alcohol dependency (100%), followed by drug...
addicts (86%), personality disordered (84%), and those without a diagnosis (65%). Compared to these groups offenders with schizophrenia were intoxicated significantly less often (42%). In all, 18% of the offenders were under the influence of drugs during the offense. As could be expected, this was most frequent among drug addicts (75%) and compared to other groups there was a significant difference (p ≤ 0.001). Only 12% of alcoholics and personality disordered, 24% of offenders with schizophrenia and 5% of those without a diagnosis were under the influence of drugs during the offense.

**Multivariate analysis**

Dependent variables for logistic regression analysis were selected on the basis of the results of the pairwise comparisons. Also, emphasis was placed on selecting dependent variables that are not very situation specific, i.e. that are as independent as possible from victim or situation influence. Independent variables that were forced into the model were offender’s age, gender, victim-offender relationship, and diagnostic group. Summary of the results is presented in Table 4.

<table>
<thead>
<tr>
<th>Victim female</th>
<th>Victim kicked or hit</th>
<th>Handgun</th>
<th>Blunt Weapon</th>
<th>Sharp weapon</th>
<th>Injuries to the face</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim an intimate partner</td>
<td>Age (-)</td>
<td>Alcoholism (-)</td>
<td>Schizophrenia</td>
<td>Alcoholism</td>
<td>Offender female (-)</td>
</tr>
<tr>
<td>Offender female (-)</td>
<td>Offender female (-)</td>
<td>Schizophrenia (-)</td>
<td>Schizophrenia</td>
<td>Schizophrenia</td>
<td></td>
</tr>
<tr>
<td>Personality disorder</td>
<td>No diagnosis</td>
<td>Personality Disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim blood related or an acquaintance</td>
<td>Offender and victim strangers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- = negative association

The odds of the victim being a female were 29.7 times higher when the offender and victim were intimate partners compared to the victim-offender relationship "stranger", which was the reference category (n = 54, \( \chi^2 = 90.237, p < 0.0005, R^2 = 0.551, \) overall percentage 87.2%). Furthermore, an offender’s female gender decreased the odds by 96.5%. The offender’s diagnostic group as a whole did not reach a statistically significant level in the model, however, it is noteworthy that the odds of the victim being a female were 3.7 fold when the offender suffered from schizophrenia. The following variables were strong predictors of the victim being kicked or hit: offender age, offender gender and offender’s personality disorder (n=38, \( \chi^2=18.585, p < \).
0.05, $R^2 = 0.150$, overall percentage 80.5%). Offenders who kicked and hit the victim were significantly younger compared to others (mean = 35.3 years vs. 39.5 years, $t_{183} = 2.003$, $p< 0.05$). Odds of kicking or hitting were 87.6% lower when the offender was a female. An offenders’ personality disorder increased the odds of kicking or hitting by 3.5, compared to offenders with no diagnosis.

The diagnostic group was a strong predictor of a handgun being used as a weapon. Compared to offenders without a diagnosis, alcoholics and offenders with schizophrenia were significantly less likely to use a handgun. Using a handgun was 4.6 times more likely among offenders without a diagnosis compared to all others. Compared to offenders who attacked strangers, blood related offenders and acquaintances were less likely to use a gun ($n = 23$, $\chi^2 = 18.150$, $p < 0.05$, $R^2 = 0.177$, overall percentage 87.6%).

Logistic regression analyses were also performed for the dependent variables "blunt weapon" and "sharp weapon". These analyses showed that compared to offenders without diagnosis blunt weapons were more 4.9 times likely to be used by the offenders with schizophrenia. Compared to offenders without a diagnosis, a sharp weapon was 3.2 times more likely to be used by alcoholics and 2.3 times more likely to be used by offenders with schizophrenia. Finally, injuries to the face were 82.5% less likely to occur when the offender was a female ($n = 65$, $\chi^2 = 18.656$, $p < 0.05$, $R^2 = 0.132$, overall percentage 65.9%), although the explanatory power of the model was modest. The offenders’ schizophrenia and personality disorder both increased the odds of the victim sustaining injuries to the face up to more than 2.5 fold, whereas the dependent variable was less likely to occur when the victim and the offender knew each other.

**4.4 Study III**

**Offense Characteristics**

Regarding the offense characteristics, there were few differences between the early and late starters. The offender and the victim were most often acquaintances (53 cases or 45%) or relatives (41 cases or 32%). Compared to the early starters, late starters’ victims were significantly more often related to the offender ($p < 0.01$). An argument preceded the homicide significantly more often when the offender was an early starter, compared to a late starter (14 or 67% vs. 18 or 28%, $p < 0.01$). In relation to the method of inflicting death the only statistically significant difference between the groups was that the early starters strangled their victim with an object significantly more often compared to the late starters (5 cases or 19% vs. 5 cases or 5%).
**Background Characteristics**

Several results suggested that compared to the late starters, early starters had experienced more frequent psychosocial problems in their childhood environments. Compared to early starters, a significantly larger proportion of late starters had lived with both parents until the age of 20 (51 or 65% vs. 10 or 37%, $p < 0.01, \chi^2 = 6.621$). In conjunction, the percentage of early starters who had experienced at least one institutional placement was significantly higher than that of the late starters (11 or 41% vs. 4 or 5%, $p < 0.001, \chi^2 = 22.013$). Substance abuse and psychopathology in a family member were more common in the childhood families of the early starters. However, psychopathology in another family member was more common among late starters than early starters (37 or 66% vs. 7 or 39%). In 11 (22%) cases one or both parents had a criminal history. As much as 20 (90%) of the early starters showed signs of conduct disorder compared to only six (10%) of the late starters. As could be expected, a significantly larger proportion of early starters, compared to late starters, were known to have behaved violently at school age.

Out of all male offenders, 55 (55%) had gone through military service. Compared to early starters, the figure was significantly higher among late starters (7 cases or 27%, compared with 48 cases or 65%). Compared to late starters, early- starters significantly more often had at least one contact with the mental health services prior to age 18 (13 or 50% vs. 11 or 14%, $p < 0.001, \chi^2 = 14.156$). Thus, also the age at the time of the first psychiatric contact was significantly younger for early starters than for late starters (mean = 16.83, SD = 6.62, vs. mean = 24.20, SD = 10.45, t(91) = -3.229, p < 0.01). It is noteworthy that as many as 92 (87%) offenders had had at least one contact with psychiatric services as an adult. However, only 44 (42%) of the offenders had an ongoing psychiatric contact and 37 (38%) were on current psychiatric medication at the time of the homicide. Delusions/hallucinations at the time of the homicide were present in 93 (91%) of the cases and in the majority of these cases paranoid symptoms were present. Contrary to the hypothesis, no significant differences between the groups emerged. In total 12% of the offenders had an additional personality disorder, either antisocial (n = 7), mixed-type (n = 3), or borderline (n = 2). Compared to the late starters, early starters were significantly more often given a diagnosis of personality disorder (5% vs. 33%, $p < 0.001, \chi^2 = 15.420$).

**Criminal history**

Mean age at the first conviction was 14.63 years (SD = 2.54) for early starters and 25.65 years (SD = 5.93) for late starters (Mann-Whitney U-test = -6.261 $p < .0005$). Early starters had also committed their first violent offense at a younger age than the late starters (mean = 21.89 years, SD = 5.79 years compared with mean = 28.34 years, SD = 5.86 years, Mann-Whitney U-test = -3.356, $p < 0.001$). Half (54%) of the late-start
group had not been convicted of any offense prior to the homicide. As could be expected, the total number of previous convictions also differed between the two groups: early starters, despite their younger age, had significantly more convictions than late starters (Mann-Whitney U-test = -5.297, p < 0.001, mean = 31.50, SD = 33.20 compared with mean = 6.80, SD = 11.96). Robbery, assault, theft, drug related crimes and drunk driving were more commonly committed by early than late starters.

A standard discriminant function analysis was performed using six background variables as predictors of membership in the two groups (early and late start offenders), which suggested that the best predictors for distinguishing between early and late start offenders were symptoms of conduct disorder and institutional placement.

4.5 STUDY IV

Psychotic symptoms at the time of the index offense
Altogether 110 offenders (88.0%) had delusions and 53 (42.4%) had hallucinations at the time of the offense. In total 116 offenders (92.8%) had either delusions or hallucinations at the time of the offense and 47 offenders (37.6%) had both delusions and hallucinations. Only delusions (without hallucinations) were present in 63 cases (50.4 %). Hallucinations without delusions were present in six (4.8%) cases.

Persecutory delusions were the most common type of delusions (n = 100, 80.0%), followed by bizarre delusions (n = 45, 36.0%), and delusions of being controlled (n = 34, 27.2%). With regard to hallucinations, auditory hallucinations were the most common (n = 46, 36.8%) and in 20 cases (16.0%) command hallucinations were present. Among those with positive psychotic symptoms, the mean number of different types of delusions and hallucinations experienced was 2.89 (range = 1-7, SD = 1.74). In two-thirds of the cases the symptoms evoked anger, anxiety or fear in the offender immediately prior to the offense (n = 83, 66.4%).

Excessive violence
For further analysis, cases containing excessively violent behaviour were identified. 38 cases (28.4%) were considered to include excessive violence. Since multiple injuries may partly be explained by victim resistance, a conservative criteria was employed: a case was classified as containing excessive violence if it contained sadistic or sexual features (e.g. binding or penetration), mutilation, or if it contained more than 15 stab wounds (which was the mean number of stab wounds on the victims, median = 5, SD = 27.18, min = 1, max = 106 wounds).
In univariate analysis, ‘multiple offenders’ was the only variable significantly related to the case involving excessive violence. Although only approaching statistical significance, psychotic motivation was more frequent in cases that did not include excessive violence (40.5% vs. 24.1%, p = 0.056). In addition, there was a nonsignificant trend towards more frequent excessive violence among those with a history of (attempted) homicide. Also, compared to late starters early starters used excessive violence more often, but the difference was not significant.

In logistic regression analysis ‘two offenders’ was the most significant predictor variable of excessive violence and increased the OR to almost seven-fold (n = 125, $\chi^2 = 19.837$, p < .001, $R^2 = .209$, overall percentage correct 74.4%). In addition, compared to offenders with no homicidal offense history, offenders with a previous history of (attempted) homicide were five times more likely to commit an act containing gratuitous violence. When the 83 offenders who were rated as motivated by their psychotic symptoms were analysed separately, none of the symptom-related independent variables emerged as a significant predictor of excessive violence in multivariate analysis, although there were some significant associations in univariate analysis.
5. DISCUSSION

5.1 MAIN FINDINGS

The main aim of the present thesis was to further the understanding of how differences in homicide offenders backgrounds and crime scene behaviors are associated with differences in these offenders’ psychopathology. The results show that homicide offenders are heterogeneous in their offense characteristics as well as their background characteristics depending on their mental status. With regard to statistics, the $R^2$ values in the multivariate analyses were moderate and, in this respect, the findings must be interpreted cautiously. As a whole, however, these results go some way toward supporting the notion that there is a link between crime scene behaviors and an offender’s mental status. Next, summaries of main findings in each substudy are presented.

The main findings from study I

A main contribution of this study is to compare homicide offenders with different diagnoses using a unique sample due to the fact that almost all persons accused of a homicide go through a forensic psychiatric examination. Although much is already known about the background characteristics of violent offenders, relatively few studies have specifically investigated mentally ill offenders. Also, the lack of diagnostic precision is common for many of these studies. For example, heterogeneous groups such as “mentally disordered versus non-disordered” have been studied.

Cornell et al. (1996) proposed that impulsive, expressive aggression is a more pervasive form of aggression, whereas instrumental, goal-oriented aggression is a characteristic of smaller subgroups of offenders, indicating a more pathological development. In this study schizophrenic, alcoholic, and offenders with no diagnosis showed less signs of adopting an antisocial lifestyle or use of instrumental aggression. Offenders with personality disorder or drug dependence, however, corresponded to Cornell’s view of criminals capable of using aggression in a goal-oriented way. These groups had the most extensive lists of previous convictions and had committed more both instrumental crimes, such as thefts, as well as impulsive crimes, such as assaults. Following are descriptions of findings in each of the five groups.
Offenders with schizophrenia

Background characteristics of offenders with schizophrenia differed from those of other offenders. The main finding being that offenders with schizophrenia seemed to be relatively well-adjusted in childhood. A similar finding has previously been obtained by Nijman, Cima and Merckelbach when comparing psychotic and non-psychotic violent offenders (2003). Offenders with schizophrenia had less school problems and special education attendance. This was a rather unexpected finding, since previous studies have found poor school performance among preschizophrenic children (e.g. Cannon, Jones, Gilvarry, Rifkin, McKenzie et al., 1997). A study on Finnish children’ school performance, however, supports our results: no differences in academic or behavioral factors between preschizophrenics and others occurred (Cannon, Jones, Huttunen, Tanskanen, Huttunen et al., 1999). The finding of this study also corresponds to that made by Pajuoa (1995): most seriously psychiatrically disturbed Finnish homicide offenders exhibited less problems at school compared to others. It has been suggested that the Finnish school system was very structured in the past decades, and as such may have been a environment were preschizophrenic children were able to perform well academically (Cannon et al., 1999).

Psychopathology in the childhood family, other than parents, was positively associated with the offender having schizophrenia and was far more common than in any other group. This result partly concurs with the body of research associating schizophrenia and psychopathology in both first-degree and second-degree relatives (e.g. Karlsson, 1982; Varma & Sharma, 1993). However, this study failed to find the well-documented association between parental mental illness and offender’s schizophrenia. One possible explanation for this discrepancy is the data source. Since data on parental psychiatric illnesses was based on offenders’ and relatives’ reports and not on official records, all incidences of parental psychopathology may not have been detected. For example, less severe symptoms of schizophrenia spectrum disorders, such as social withdrawal, are very common among first-degree relatives of schizophrenia, but are perhaps too subtle to be perceived as psychiatric problems by the family members. Not surprisingly, in adulthood difficulties attributable to these offenders’ illness became evident. For example, social isolation and withdrawal were reflected by the fact that the majority of schizophrenics lived alone. They had also been less often married and had less children than offenders in any other diagnostic group. Even though almost 90% of the schizophrenic offenders in the present study had had a psychiatric contact in adulthood, a similar figure obtained in a Dutch study (Nijman, Cima and Merckelbach, 2003), only half had an ongoing psychiatric contact at the time of the offense. Failure to use treatment services is probably mostly due to these offenders reluctance to participate in treatment (e.g. Hodgins & Jansson, 2002). However, it should be noted that a large proportion of the sample of this study is from 1990’s, when major cuts were made in the
public sector and mental health services due to the general recession. This might have effected the amount of sufficient care available.

**Offenders with personality disorder**

In general offenders in this group had experienced multiple difficulties in their early environments. As much as one third had experienced at least one institutional placement. They had also witnessed more parental alcohol abuse. Several previous studies associate maltreatment and neglect from primary caregivers with personality disorders (Johnson, Cohen, Brown, Smailes & Bernstein, 1999; Johnson, Cohen & Smailes, 2001). Furthermore, child maltreatment and neglect may compromise the acquisition of a mentalizing capacity: violent crime and anti-social personality disorder thus follow from incapacity to reflect upon the mental states of other people, the victim included (Fonagy, 1999). Moreover, at least one psychiatric contact during childhood was common among these offenders. Problematic behaviour was evident from an early age. School problems and special education were frequently observed. As adults, these offenders had been married and had biological offspring more frequently than offenders in the other groups, however, they were also more commonly divorced. In addition, these offenders were likely to have engaged in aggressive, violent acts before, since they frequently had previous physical assault convictions. Overall, this pattern of results is consistent with the assumption that especially the criminality of persons with personality disorders arises in the context of weak bonding with individuals and social institutions (Fonagy, 1999).

**Offenders with drug addiction**

Offenders with drug addiction showed the most similarities with personality disordered offenders. Multiplicity of both family and individual problems, such as parental alcohol abuse and school problems were typical. This similarity is at least partly explained by the fact that the majority of the drug addicts (75 %) also had a diagnosis of personality disorder. The early beginning of a drug abusers’ problematic, antisocial behaviour is reflected by the fact that they were significantly younger at the time of the index offense. More than half had also interrupted their occupational education, a significantly larger percentage than in any other group.

**Alcoholics**

In several aspects alcoholics resembled offenders with no diagnosis in relation to their background variables in that these offenders seemed to have less problems with adjustment compared to other groups. For example, offenders in these two groups were significantly more likely to have gone through military service and had less often had adult psychiatric contacts. In addition, alcoholic offenders were least likely to be on psychiatric medication and less frequently had some form of psychiatric contact in
childhood. Correspondingly, alcoholics seldom exhibited self-destructive behaviour. Compared to offenders with no diagnosis, however, alcoholics were less likely to have biologic children and were most often unemployed. Not surprisingly, parental alcohol abuse was positively associated with the offender’s alcoholism.

Offenders with no diagnosis
In general, offenders with no diagnosis had less problematic early surroundings than other groups. Also in adulthood these offenders were socially well adjusted, for example in terms of employment. Of all the groups these offenders had committed the least crimes of every type except rape, which is in contrast to some results according to which "normal" offenders more often have a criminal history (Gillies, 1976). It should be noted, as Pajuoja (1995) points out, that homicide offenders despite their degree of sanity probably have more difficult childhood surroundings and poorer socio-economical status than the general population. Even though the offenders with no known diagnosis were less problematic than the other offenders in the sample it does not mean that they are necessarily comparable to general, non-offending population.

The main findings from study II
The second substudy offers some unique results, since to our knowledge there have been no studies yet seeking to identify the differences in crime scene behaviors of violent offenders with various psychiatric diagnoses. There were differences in methods of inflicting death as well as other crime scene behaviors, e.g. in the choice of a weapon, premeditation (in terms of taking the weapon to the scene), as well as post-offense behaviors.

Offenders with schizophrenia
Steury and Choinski (1995) argue that a psychotic offender’s choice of weapon reflects the impulsive nature of their homicides in that sharp weapons are used more frequently than guns since they are immediately and easily available at the moment of killing. This was supported by the results of the present study: compared to the other diagnostic groups offenders with schizophrenia used guns less frequently than sharp and blunt weapons. An additional reason for this might be that weapon permits are often denied from persons with known psychiatric problems. The impulsiveness of these homicides was further highlighted by the fact that schizophrenic offenders inflicted injuries to the victim’s face more frequently. Injuring the victim’s face has previously been associated with expressive, impulsive homicides and the desire to hurt the core representation of the person (Salfati & Canter, 1999). Thus, although the face is most commonly considered to be the focal point of attention during any interaction with another person, it can also be seen to serve to symbolically represent the person as a whole (Fritzon &
It is also possible that these offenders perceive the victim’s face as especially threatening, since severe deficits in the ability to make social judgements from facial expressions have been found among persons with schizophrenia. For example, they may be highly sensitive to expressions of negative emotions (e.g. Mandal, Pandey & Prasad, 1998; Manor, Gordon, Williams, Rennie, Bahramali et al., 1999) and especially individuals experiencing positive psychotic symptoms (like the majority of the subjects in this study) may be impaired in recognizing even basic facial emotions (Hall, Harris, Sprengelmeyer, Sprengelmeyer, Young et al., 2004). This result may also be influenced by the weapon used: the head (and consequently also face) may be more typically injured when using blunt weapons compared to guns, the former of which were commonly used by offenders with schizophrenia.

Compared to the other groups, schizophrenic offenders’ acts were less often preceded by arguments. Nearly all of these offenders suffered from hallucinations and delusions at the time of the offense, which in previous studies have been found to have significant importance as triggers of psychotic offenders’ homicides (Lanzcron 1963; Steury & Choinski, 1995; Taylor, 1985.) However, examination of post-offense behavior related variables did not reveal “abnormal” behaviours compared to other groups, contrary to some suggestions (Petursson and Gudjonsson, 1981). Also contrary to previous findings (Robertson, 1988), these offenders were not more likely to stay at the crime scene after the offense.

Offenders with schizophrenia were more likely to kill a blood related victim compared to other groups. This finding is consistent with many previous studies on the victim-offender relationship in the homicides committed by the mentally ill (e.g. Gillies, 1976; Nijman, Cima & Merckelbach, 2003; Steury & Choinski, 1985; Wilson & Daly, 1988; Wong & Singer, 1973), although it should be noted that many of these studies do not properly distinguish offenders with schizophrenia, psychosis, or even ”abnormal” offenders from each other. The finding that offenders suffering from schizophrenia are less often intoxicated at the time of the offense (Gottlieb et al., 1987; Steury & Choinski, 1995) was only partly supported by the present study, as the proportion of offenders under the influence of drugs was higher among schizophrenics than in any other group except the group with drug addiction.

**Personality Disordered**

Crime scene actions of personality disordered offenders mostly resembled those of alcoholics or offenders without a diagnosis. Guns, blunt weapons and sharp weapons were all equally used as a method of inflicting death and kicking and hitting was
positively associated with the offender’s personality disorder. It should be noted that the overall validity of personality disorder diagnoses is considered to be lower than those of, for example, schizophrenia and alcoholism (e.g. Hodgins & Müller-Isberner, 2000; Pajuoa, 1995; Putkonen et al, 2001), which might be one reason for the fact that there were few significant differences between offenders without a diagnosis and personality disordered offenders. Also, even though the majority of the offenders in this group had either antisocial or mixed-type personality disorder, this group consisted of offenders with heterogeneous disorders, possibly differently associated with offending (Hodgins & Müller-Isberner, 2000). Investigating different personality disorders or even subgroups of offenders with similar diagnosis separately with a larger sample might reveal more differences. For example, recently it has been found that crime scene behaviors of offenders with ASPD differ depending on whether they are classified as controlled or impulsive (Wahlund & Kristiansson, 2006).

**Drug Addicts**
Killing in association with another crime was significantly more prevalent among drug addicts. They also stole from the victim more often. Although these results were not statistically significant, they reflect the more instrumental nature of the offenses. In many cases the aim of these offenders was probably to finance their addiction. Altogether 75% were under the influence of narcotics at the time of the index offense. Covering the body was most frequent among the offenders with drug addiction, who in Study I were found to have the highest number of previous convictions. Thus, their criminal history may, through criminal sophistication, explain the result. None of the drug addicts surrendered within the first 24 hours following the offense, a feature also previously associated with instrumental crime scene themes (Santtila et al, 2003). There were some similarities between drug addicts and offenders with schizophrenia in their crime scene actions, for example in their choice of weapons. These groups’ homicides were similar also in that they were not so much a response to situational factors, such as an explosive quarrel. It could be hypothesized that these homicides were often a way to avoid anxiety associated with either withdrawal symptoms or psychotic states. In other words, addicts were driven by the need to satisfy their craving for drugs, schizophrenics by the symptoms of their illness.

**Alcoholics**
All alcoholics were intoxicated at the time of the offense, although it should be noted that reliable evaluation of offender’s intoxication at the time of the offense has been found to be difficult (Hodgins & Jansson, 2002). These offenders most often used a weapon taken from the scene and their homicides were also most often preceded by arguments. Although these results were not significant at the 0.01 level, it is noteworthy
that they are behavioural constituents of expressive crime scene action themes (Salfati & Canter, 1999). Furthermore, after the offense these offenders were most likely to surrender, a variable also associated with expressive homicides (Santtila et al, 2003). The likelihood of the offender using a handgun was significantly smaller when the offender was an alcoholic. In summary, homicides committed by alcoholic offenders could be characterised as impulsive acts occurring after a drunken quarrel, after which the offender does not try to escape.

No Diagnosis
These offenders were more likely to kill a blood relative and less likely to kill an acquaintance. Further, these offenders most often used guns as weapon, a finding that has been reported before (Steury & Choinski, 1995). Inflicting injuries to the victim’s face was least common in this group. No significant differences in the crime scene actions between personality disordered and offenders without a diagnosis could be found. Alcoholics differed from these two groups only in that they were more likely to surrender within 24 hours following the offense. In sum, homicides committed by all of these three groups of offenders can often be characterized as impulsive acts where expressive aggression is used in reaction to frustration, ego threats, and insult.

Overall, the present results suggest that the five groups should not be identified as having exclusively expressive or instrumental features in their killings. For example, it could be hypothesized that drug addicts would more frequently have an instrumental motivation for their killing in terms of obtaining financial gain and thus being able to finance their addiction. Although this was evident in terms of stealing more frequently from the victim, a large proportion of this group nevertheless also displayed behaviors (such as arguing and injuring the victim's face), that have previously been defined as having an expressive character (Salfati & Canter, 1999; Santtila et al. 2003). Thus, these results are not directly in line with the recent theoretical proposals in which homicides can be interpreted to exhibit either an expressive or an instrumental theme (e.g. Salfati & Canter, 1999; Salfati & Dupont, 2006). This might be because this study investigated specific subgroups of offenders, whereas previous studies have aimed to classify homicides at a more general level. Another reason for this discrepancy might lie in the methodology used. Due to the nature of the sample it was not analyzed with the same statistical procedure previous studies have utilized. In previous studies the smallest space analysis (SSA), a nonmetric multidimensional scaling procedure, has been used. This study deliberately used methods where individual behaviors were analyzed independently of each other, since in the investigative work the focus is often on individual behaviors. With regard to the victim-offender relationship, the differences found between the five groups are likely to correspond to the offenders’ life situation. For example, in general offenders with schizophrenia are less likely to live in an
intimate relationship and therefore their victims constitute of other people around them (e.g. acquaintances and relatives).

The main findings from study III

The main outcome of study III, in which all the subjects had diagnosis of schizophrenia, was the finding that the offense characteristics of early- and late-start offenders differ only modestly. This might be because deducing offender characteristics based on crime scene behaviours is likely to be more difficult when small subgroups with overlapping features are investigated. A comparison of studies II and III shows that investigation of five subgroups with substantially different diagnosis revealed several differences in the crime scene behaviours of these groups (Study II), whereas narrowing the study’s focus to two subgroups with significantly overlapping clinical features revealed only a few differences between the two groups investigated (Study III).

Strangulation with an object was used in the killing more often when the offender was an early starter, these offenders also took the weapon away from the crime scene more often. The latter type of crime scene behaviour has previously been associated with an antisocial, violent lifestyle (Salfati & Canter, 1999). It can also be seen as a “cognitive” element, reflecting the offender’s attempt to hide the crime to prevent detection. It has been argued that psychotic offender’s choice of weapon reflects the impulsive nature of their homicides: rather than guns, they use weapons that are immediately and easily available at the moment of killing (Steury & Choinski, 1995). All in all, in the present study offenders rarely used guns to kill the victim. Instead, both early and late start offenders chose methods that often take more time and require more personal involvement with the victim, for example sharp or blunt weapons or kicking and hitting. It should be noted, however, that a part of this result might be due to the fact that psychiatric problems are a reason to deny the granting of a weapon permit to a person. With regard to substance abuse, early starters were intoxicated significantly more often at the time of the index offense compared to the late starters, the percentages were similar to those found by Tengström, et al. (2001).

Homicides committed by early starters were significantly more often preceded by arguments. This result might be due to the early starters’ interpersonal histories. They come from more criminogenic environments compared to the late starters, for example, the majority of the early start offenders in this sample had committed at least one violent offense prior to the homicide. Thus, it could be hypothesized that they have been exposed to frequent violence and situations where physical aggression is commonly used in conflict situations. They may also have been victimized themselves, as mental
illness combined with substance abuse and comorbid personality disorder significantly increase the risk of being a victim of violent crime (Hiday, Swartz, Swanson, Borum & Wagner, 1999).

Late starters, as compared to early starters, were significantly more likely to victimize a relative, a similar result was obtained in Joyal et al. (2004). The result might reflect differences in the social networks of these groups: schizophrenic early starters have been found to be more adjusted than late starters in terms of sociability/withdrawal, peer relationships, and social-sexual aspects (Schanda, Födes, Topitz & Knecht, 1992). Alternatively the present result might reflect the fact that the early starters have less contact with their relatives, at least in their childhood environment: as the results show, early starters frequently grow up outside the family.

Several significant differences between the groups were found in the offender characteristics. Overall, our findings concerning the background variables of the offenders largely replicated the results of the large-scale birth-cohort study by Tengström et al. (2001): Behaviour problems and psychiatric contacts in childhood were more common among early-start offenders with schizophrenia. Early starters had experienced several problems of varying nature in their childhood surroundings, both at home and in school. Results are in line with the “cumulative risk hypothesis,” according to which the increasing number of environmental stressors is associated with an increase in behavioural problems both in childhood and later in life (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Rutter et al., 1975a, 1975b; Sameroff, Seifer, Zax, & Barocas, 1987). The co-occurrence of problems is further mirrored by the fact that early starters had also been in contact with mental health services at a younger age than the late starters. Even though violent patients in general contact psychiatric service agencies at an earlier age than non-violent patients, this is particularly true for patients showing persistent violence and comorbidity with personality and substance abuse disorders (Volavka & Citrome, 2000). Finally, the results of this study mirror those of Shaw et al., (2006) who found that in Great Britain most mentally ill homicide perpetrators are not under mental healthcare at the time of the offense.

The main findings from study IV

Nearly all offenders in this sample had either delusions or hallucinations at the time of the offense. Regarding the symptomatology of the offenders, the results of this study are in line with previous studies suggesting that delusions are frequently observed when examining homicides committed by people with schizophrenia, whereas hallucinations alone are rarely so (e.g. Marleau et al., 2003; Taylor et al.. 1998). In further accordance with previous research persecutory delusions were the most common type of delusions.
(e.g. Bjorkly, 2002a). However, the symptoms experienced by the offenders were diverse and other delusions in addition to persecutory were also common. Bizarre delusions and delusions of control were apparent in more than a quarter of the cases.

Over half of the offenders were at least partly motivated by psychotic symptoms, which is in accordance with Joyal et al. (2004). Unlike in their study, however, the frequency of psychotic motivation did not differ between early- and late-start offenders. This discrepancy might be due to differences in the subgroup definitions: unlike the present study, Joyal et al. (2004) investigated offenders with antisocial personality disorder and not early start offenders per se.

Nearly a third of the cases in this sample involved multiple and severe violence, including features such as sadism, mutilation, sexual components, or extreme stabbing. The number of cases classified as containing excessive violence was rather high, however, very similar to a previous study on non-psychotic adolescent homicide offenders (Hagelstam & Häkkänen, 2006). The similarity of these numbers is somewhat surprising since, unlike homicides committed by psychotic offenders (Haefner & Boeker, 1982; Steury & Choiniski, 1995), murderous acts by adolescents are generally considered to be highly violent (Bailey, 1996). Acts where the offender did not commit the offense alone or had previous homicidal history were predictive of excessive violence. Positive psychotic symptoms did not predict the use of excessive violence as hypothesized. Overall the results of this study suggest that delusions or hallucinations are not associated with higher rates of excessive violence among homicide offenders with schizophrenia, even when the type of symptom and the motivation (psychotic vs. “conventional”) are taken into consideration. The only significant predictors of excessive violence were the presence of multiple offenders and homicidal history of the offender.

The results suggest that, among this highly marginalized subgroup of homicide offenders, situational variables and a prior history of serious violence rather than psychopathology are associated with the use of gratuitous violence. Interestingly, multiple offender homicides but not mental illness were associated with the use of excessive violence also in the sample of non-psychotic adolescent offenders (Hagelstam & Häkkänen, 2006). It is possible that in cases involving multiple offenders the other offender encouraged or reinforced the use of excessive violence. Psychotic offenders may be more susceptible to suggestion from others due to lack of judgment caused by the psychotic state. It is also likely that homicidal history and involvement in a multiple offender homicide reflect involvement with criminogenic social environment, where use of brutal violence may be more common. Contrary to previous results, in the present study the use of excessive violence was not related to intra-familial homicides (Green,
1981; Marleau et al. 2003). Previously the use of excessive violence in homicide offenders has also been associated with psychopathy (Woodworth et al. 2003). Unfortunately psychopathy could not be assessed in the present study.

5.2 Methodological Considerations

5.2.1 Strengths

The data
One of the strengths of the present study is the exceptional sample due to high solving rate of Finnish homicides as well as the fact that most of the homicide offenders are examined with a thorough forensic psychiatric examination. Examination statements are a unique source of information and provide information not only on proximal factors associated with offending, but also on variables related to psychopathology and psychosocial factors over individual’s entire life-span. Since there is usually a considerable time lag between early individual and environmental risk factors and outcome in terms of adult mental illness and criminality, information covering the individual’s life-span is highly valuable (Långström et al., 1999). Availability of the criminal index file data is another strength of the study design as one emphasis was to investigate the nature of the acts and the behaviors displayed by the offender at the crime scene. While forensic psychiatric examination statements include a description of the homicidal act, the Criminal Index File contains even more detailed information about the offense. Another strength of the present study is the wide range of variables that were being assessed. As factors contributing to the occurrence of homicidal violence are complex, it is important to include factors from several domains (e.g. clinical, contextual, historical).

Individual substudies
The main strength of the third and fourth substudy is that the samples are “exhaustive”: All homicide cases where the offender was sent to the forensic examination and given the diagnosis of schizophrenia during the study periods are in the material. Since the established practice is that all homicide offenders are evaluated by a psychiatrist to help the court to decide whether a full-scale examination is necessary (Eronen, Hakola & Tiihonen 1996), it is likely that these cases contain all or nearly all homicides committed by persons with schizophrenia during these periods.

Rather than focusing solely on the offender, the focus in these studies (II, III, IV) was set on the crime related behaviours and the way the homicide had been carried out.
Although research on the behavioural structures found in homicides has begun to accumulate over the past few years, a majority of the studies so far have been general classifications and actions of specific subgroups of offenders, such as offenders with mental disorder, have previously not been investigated. Occasionally those investigating violent crimes may need advice on whether or not a case includes behaviors that are prone to offenders with a mental disorder. Also, previous studies have mainly focused on analyzing clusters of crime scene behaviors, whereas in practice the homicide investigation often focuses on the details of the cases rather than on the general offense style.

5.2.2 LIMITATIONS

The data and the study design
There are some limitations in the present study. First, the data relied solely on patient records and the police Criminal Index File and, since it was collected retrospectively, no definite conclusions about a cause-effect relationship can be derived. Some of the data such as self-reports and reports from relatives may be incomplete or biased especially on putative risk factors such as family history of neglect during the offender’s early years. Examinees and parents might be reluctant to correctly report adverse conditions or odd behaviours from the offender’s childhood (Långström et al., 1999) This might lead to underdetection of, for example, incidences of mental illness or criminality in the family. On the other hand, there might be a problem with recall bias when using retrospective data such as a mother’s knowledge of child’s early development. The knowledge of child’s adult outcome may influence memories of childhood behaviour (Cannon et al., 1997). Also, missing data on some of the variables might have influenced the results. For example, the effects of psychotropic medications on aggression may be both escalatory or inhibitory depending on the drug (e.g. Gillet, Polard, Mauduit & Allain, 2003; Haggard-Grann, Hallqvist, Langstrom, & Moller, 2006; Walsh & Dinan, 2001). Due to the nature of the data, the effects of medications on crime scene behaviors could not be fully accounted for. However, even though not written for research purposes, the assessment is always based on information given by numerous sources and in most cases forensic psychiatric examination statements are able to give detailed descriptions of the offender’s mental state and associated factors prior to the assessment.

Finland is a racially homogeneous country with a relatively low homicide rate compared to the United States, for example. Also, alcohol abuse is strongly associated with Finnish homicide, whereas organized crime and drug abuse are not (Lehti, 2006). Thus, the possibility that the patterns of homicidal behaviour described in these studies
are to some extent culture specific should be born in mind. Further, the reliability and validity of the presented diagnoses can also be questioned. However, the diagnoses made on the basis of the Finnish forensic psychiatric examinations should at least be as accurate as general clinical diagnoses and are given only after extensive clinical examinations (Putkonen et al., 2001). It has also been reported that there have been no significant changes in the diagnostic procedures of the forensic psychiatric examinations during the last decades (Putkonen, et al., 2001). Information on psychopathy of the offenders was not available, which is another limitation. Studies have shown that psychopathy is overrepresented among homicide offenders and the construct of psychopathy may be a useful tool for understanding homicide and planning the treatment of these offenders (Laurell & Dådermann, in press). Also, information on subjects who committed homicide-suicide is lacking. It has been estimated that as many as 8%–16% of homicide offenders in Scandinavia commit suicide at the time of their offense (Lindqvist, 1986), the most typical Finnish homicide-suicide being a male shooting a family member during a separation process (Saleva, Putkonen Kiviruusu & Lönnqvist, in press). Finally, the sample sizes were moderate and therefore the studies should be replicated with larger samples.

**Individual substudies**

With regard to the individual studies, a limitation in the first two substudies is the fact that the sample of personality disordered offenders consisted of individuals with heterogeneous disorders, possibly differently associated with offending (Hodgins & Müller-Isberner, 2000). Also, not all perpetrators accused of a homicide go through the forensic psychiatric evaluation, even though the percentage is very high. At present there is no systematic procedure in the Finnish court of law for ordering the forensic psychiatric evaluation. As Eronen et al. (1996) points out, there are occasions when Finnish courts do not assign offenders who obviously suffer from alcohol problems or antisocial personality disorder, for example, to thorough forensic psychiatric evaluation as these disorders are not necessarily reasons to consider an offender to be not guilty by reason of insanity. However, lack of a systematic procedure reduces the possibility that the sample of these studies would be severely biased.

A limitation in the third substudy is the fact that some early starters may have been misclassified as late starters. Minor crimes with short penalties are deleted from the Finnish Central Criminal Registers after five years if there are no new offenses during that period, thus leaving the data on the examinee’s criminal convictions incomplete. Even though in many cases additional information on criminality was available from self- and informant reports given during the forensic psychiatric examination, all early onset offending may not be reported in the statements. All incidences of criminal
behaviour do not lead to arrest and prosecution, which might also lead to the misclassification of the early-start offenders as late starters. Misclassifying an early starter as a late starter would lead to underestimation of the strength of the effects. Additionally, because of the small sample size, the study described the general features of the homicides and only bivariate analyses were used. Identifying the interactions of the variables, i.e. combinations of offenders’ crime scene behaviours as well as victim and offender background characteristics might reveal more differences.

The main limitation of the fourth substudy was the data source used, namely the study relied solely on forensic examination statements and criminal index file. The data did not allow using special instruments developed for assessing delusions and hallucinations. Thus, the information on positive psychotic symptoms was less detailed than would be desired. For example, the frequencies reported here do not reveal the relative impact or intensity of individual symptom subtypes. Although time consuming and complex to undertake, future studies should investigate the association of psychotic symptoms and the nature of violence with a dimensional approach, using in-depth interviews and instruments such as Maudsley Assessment of Delusions Schedule (Taylor et al, 1994). Also, symptoms of psychosis other than delusions or hallucinations were not assessed in the present study. Investigating interaction of positive symptoms with other symptoms of psychosis, such as affective symptoms or social withdrawal, might give different results. Further, even though the forensic psychiatrist is advised to estimate the mental state of the offenders at the time they committed the act, the forensic psychiatric examinations are conducted after a time lag from the index offense. The effects of this delay cannot be completely eliminated and determining the exact symptoms present prior to and at the time of the index offense is occasionally difficult. This is probably especially true when symptoms such as delusions and hallucinations are assessed. Finally, it should be born in mind that operationalizing excessive violence is difficult and there is no uniform definition for what constitutes “overkill” (Bell & Vila, 1996). Compared to some previous studies (e.g. Marleau et al., 2003) the definition of excessive violence used in this study was quite conservative. In the future, new measures for quantifying the degree of homicidal injury are needed, after which similar principles of classification can be utilized across studies. Some promising injury scales adapted from trauma studies have recently been introduced (Safarik & Jarvis, 2005).
5.3 CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Contribution

The foundations for understanding the link between crime scene behaviours and the offender’s background and personality are just beginning to be established. This thesis includes a first attempt to link two distinct areas of research: namely, research on the association of mental illness with violence and research on homicide crime scene behaviours. Because of differences in methodology, no direct statistical comparisons can be made across studies on psychological offender profiling. However, this study offers some promising results. On another hand, these studies also highlight the challenges of deducing offender characteristics based on crime scene behaviours. These challenges are likely to be caused by the dynamic nature of homicide. Violent crimes are social events where the offender is forced to make several decisions e.g. about whether to modify his/her behaviour, abandon the offense, or maintain the same pattern of behaviour (Fritzon & Ridgway, 2001). Therefore, it is difficult to estimate which crime scene behaviours occur due to the offenders’ characteristics such as mental state and which are due to victim reaction and resistance, other situational factors or a combination of these. Despite these difficulties, however, in the future examination of variables related to offender’s mental status and personality (as opposed to demographic characteristics) may prove to be a more fruitful path when investigating differences in individuals’ crime scene behaviors. For example, differences in homicide crime scene behaviors related to offenders’ antisocial or autistic personality traits have also been found (Wahlund & Kristiansson, 2006).

With regard to police work, the results of these kinds of studies may be useful in order to prioritise suspects during police investigation. Offenders with different psychiatric diagnosis differ in their crime scene actions and these differences can be utilised, for example, in predicting offender characteristics such as mental status. However, when communicating the findings of this study to those solving violent crimes in practice as well as to the general public, it is important to situate the phenomenon in the wider context: the proportion of violent crimes committed by people suffering from serious mental illnesses such as schizophrenia is small, and (as the victims are most often relatives) few cases remain unsolved for long periods of time. Overall, there are several ways in which the police could benefit from mental health professions, however, compared to other countries, the resources and knowledge of mental health professionals are currently used very sparsely by the Finnish police (Häkkänen, 2006).

The results of the present study may also have implications when planning situational violence prevention strategies. For example, it is generally assumed that number of homicides as well as the severity of assault injuries may be decreased if lethality of
weapons is diminished. It has recently been suggested that in order to lower the Finnish homicide rate, permits to use firearms should be more consistently denied from individuals who are known to have a drinking problem (Henkirikosraportti, 2004). Based on the results of this study, however, it seems that at least persons with alcohol dependence are not more likely to kill with firearms compared to other homicide offenders and are actually less likely to kill with handguns compared to other diagnostic groups. This is not to say policies such as the one suggested would be futile, however, the results suggest that broader strategies are needed in order to accomplish a significant decrease in Finnish firearm homicides. Furthermore, with regard to the victims of homicides, since the offenders with schizophrenia attack family members more frequently than other offenders, it is essential for the people in the patient’s social and treatment network to take notice of changes in patient’s behavior, such as threats or minor acts of aggression, in order to decrease the likelihood of serious violence against them. Also, psychiatric healthcare professionals must be active in informing, educating, and supporting family members of mentally ill persons that have already engaged in violent behaviour, as they commonly experience strong guilt, fear, disappointment and anger (Nordström, Kullgren & Dahlgren, 2006).

Dividing offenders into "mentally disordered versus non-disordered" is not sufficient when investigating mentally ill offenders’ backgrounds, since offenders with different disorders differ substantially in their background variables. However, it should also be noted that frequency of some of the variables indicating adverse childhood conditions, e.g. parental alcohol abuse, was rather high in all the five groups. Overall, the results of this study are roughly in line with previous studies indicating that family adversity and childhood deprivation are important factors in violent offending, especially of those who do not have major mental illness (Hodgins, Kratzer & McNeil, 2001; Hodgins, Kratzer & McNeil, 2002). It has been proposed that violence is a socially maladaptive form of resolving trauma and abuse (Fonagy, 1999). The results of this study, along with those of many other studies, emphasise the importance and need for early interventions for problem families and children at risk of antisocial behaviour.

These results concur with studies suggesting that effective treatment for violent prone persons with schizophrenia requires careful attention to availability of mental health treatment, treatment compliance, and medication adherence. These factors are perceived as important also by the seriously mentally ill homicide offenders. When asked which problems should have been addressed by mental health personnel in order to prevent the offense, factors such as difficulty acknowledging need for medication, hiding or minimizing difficulties, lack of understanding of mental illness, and loss of control in the context of illness are identified (Stanton & Skipworth, 2005). In this study, less than half of the schizophrenic subjects had an ongoing psychiatric contact at the time of the
index offense and even less were on current psychiatric medication. In the majority of the cases this was related to not acknowledging the need for medication and poor insight of the illness, however, there were a few offenders whose mental disorder had been undetected by the mental health services, usually when the offender suffered from a multitude of problems and symptoms, including alcohol or drug dependence.

Implications for future research
This thesis relies heavily on quantitative methods, as evident from the many frequency tables and statistical comparisons it includes. Further, content analysis as a method can be criticized for removing content from its context (e.g. McKee, 2003), and some important nuances (e.g. on situational factors such as offender-victim interaction) are necessarily lost when a complex, dynamic event such as homicide is reduced into defined categories as was done in the present study. To build an even more comprehensive picture of homicidal violence future studies should, as suggested by Salfati (2006), start to link qualitative information such as in-depth narrative explorations of the offenders’ own explanations and justifications of the homicide to the statistically orientated research on homicidal behaviour. Also, this thesis was influenced by the traditional theory of aggression: the instrumental/expressive dichotomy informed especially the selection of some of the variables and the interpretation of the results. However, although proven to be relevant in classifications of homicides, this strict dichotomy is conceptually somewhat problematic and in many domains of aggression research has given way to a more dimensional approach. It has been suggested that knowledge structure models based on scripts and schemas would further our understanding of the complex nature of human aggression (Bushman & Anderson, 2001). It is likely that in the future these second-generation aggression paradigms will also be applied to research on homicidal behavior in some form. Finally, the relationship between particular mental disorders and violence may be mediated by different configurations of relevant personality dimensions, such as impulse control or affect regulation (Nestor, 2002). In the future, the role of these personality dimensions in crime scene behaviors should be further examined.

General discussion
Previous convictions, many for violent offenses, were common among the offenders. These encounters with the criminal justice system should be seen as opportunities for prevention and interventions since treatment for substance abuse and mental health problems can be given in conjunction with criminal justice sanctions (Cole & Glass, 2005). Research on effective treatment is needed. The existing evidence suggests that in order to prevent criminal recidivism treatment programs need to be highly structured, intense, and include multiple treatment components for multi-problem individuals
It should be kept in mind, however, that treatment provided by the criminal justice system does not reach all individuals at risk for violent or homicidal behavior, as especially among late start offenders with schizophrenia previous violence was less common and a minority had criminal history. How can these violence-prone individuals be identified when they contact general mental health services? Moreover, since a large proportion of them do not receive adequate care for their illness, how to involve them into treatment at first place? Also, treatment provided by general psychiatry is not likely to be effective in reducing aggressive behaviors unless specifically targeted to reduce antisocial behaviors (Hodgins, 2002). Some promising results exist from community-based biopsychosocial treatment programmes designed to diminish aggressive behaviour, where patients as well as their caregivers are helped with a range of problems such as substance abuse, disruptive behaviour, and lack of intimate relationships (Economou, Palli & Falloon, 2005).

It is likely that effective mental health treatment is different for early- and late-start offenders with schizophrenia. Although no direct clinical implications can be made from these findings, it has previously been suggested that compared to late starters, early starters are less likely to comply with treatment and their antisocial behaviour will not be reduced by antipsychotic medications (Hodgins & Jansson, 2002). After discharge early starters are likely to return to criminogenic environments where their stable pattern of antisocial behaviour is positively reinforced. To be effective, their treatment must take into account their delinquent lifestyle including substance abuse, favourable attitudes towards violence and weak bonds to society, as well as their major mental disorder.

On a general note, after involuntary treatment is over, forensic psychiatric patients currently return to voluntary general mental health care and, as for now there is no outpatient treatment designed specifically for these offenders in Finland. Internationally, there are some encouraging findings where involuntary outpatient treatment has shown positive effects on violent behavior (Torrey & Zdanowicz, 2001). This is an important area to work on, not only because of high recidivism rates, but also since being a perpetrator of a violent crime is associated with violent victimization (Honkonen et al., 2004). Especially a subgroup of deinstitutionalized patients with schizophrenia may need additional care and protection from the danger posed to them from other members of the society (Honkonen et al., 2004).

It should be kept in mind that accepting the association of violence with mental illness does not entail any kind of moral judgment upon those who are mentally ill (Harper, 2005). Furthermore, a label of dangerousness should not be attached to a person solely because he or she is mentally ill. In the rare occasions when a person with serious
psychiatric illness is violent, the mental disorder is not necessarily the reason. Stigmatization of persons with mental illness is a major concern for the patients as well as people close to them and studies have shown that the single largest cause of the stigma is violent acts committed by mentally ill persons (Thornton & Wahl, 1996; Angermayer & Matschiger, 1996). Unfortunately anti-stigma campaigns that include educating the public about psychiatric disorders and violence have been shown to be rather ineffective in reducing the stigma against mentally ill individuals (Corrigan et al., 2004; Crisp, 2000). One effective way to reduce the stigma against the mentally ill would be a reduction in violent crimes committed by them, which requires better understanding of the mechanisms underlying this phenomenon.
APPENDIX I: DSM-IV-TR definitions of Key Terms

**Delusion**: An erroneous belief usually involving a misinterpretation of perceptions or experiences. Content may include a variety of themes (e.g. persecutory, referential, somatic, religious or grandiose). Delusions are deemed bizarre if they are clearly implausible and not understandable and do not derive from ordinary life experiences.

**Hallucination**: A distortion in perception. May occur in various sensory modality (e.g. auditory, visual, gustatory, olfactory or tactile). The most common are auditory hallucinations, which are often experienced as voices that are perceived as distinct from the person’s own thoughts.

**Negative symptoms**: Symptoms reflecting a loss of normal functions (i.e. affective flattening, alogia, avolition, anhedonia). Negative symptoms account for substantial degree of morbidity associated with schizophrenia.

**Positive symptoms**: Symptoms that reflect an excess or distortion in normal functions (e.g. delusions, hallucinations, disorganized speech and disorganized or catatonic behavior).

**Personality disorder**: An enduring pattern of inner experience and behavior that deviates markedly from the expectations of the culture of the individual who exhibits it. These patterns are inflexible and pervasive across many situations. The onset of the pattern can be traced back at least to the beginning of adulthood. To be diagnosed as a personality disorder, a behavioural pattern must cause significant distress or impairment in personal, social, and/or occupational situations.

**Schizophrenia**: Characteristic symptoms involve a range of cognitive and emotional dysfunctions that include perception, inferential thinking, language, and communication, behavioral monitoring, affect, fluency and productivity of thought and speech, hedonic capacity, volition, and drive and attention. No single symptom is definitive for diagnosis. The diagnosis involves the recognition of a constellation of signs and symptoms associated with impaired occupational and social functioning.
## APPENDIX II: Coding Scheme

**Variables coded in all studies (I-IV)**

### A. Crime scene action variables

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murder</td>
<td>Offense classified as murder</td>
</tr>
<tr>
<td>Manslaughter</td>
<td>Offense classified as manslaughter</td>
</tr>
<tr>
<td>&gt;1 victim</td>
<td>Multiple victims</td>
</tr>
<tr>
<td>&gt;1 offender</td>
<td>Multiple offenders</td>
</tr>
<tr>
<td>Assother</td>
<td>Killing occurred in association with another crime (type of crime written down).</td>
</tr>
<tr>
<td>Vfoundhome</td>
<td>Victim found at his/her home</td>
</tr>
<tr>
<td>VfoundOhome</td>
<td>Victim found at offender’s home.</td>
</tr>
<tr>
<td>Boutside</td>
<td>Body found outside not in a building.</td>
</tr>
<tr>
<td>Bcovered</td>
<td>Body covered (whole body or part(s) of it) by something but not inside an object.</td>
</tr>
<tr>
<td>Bodymoved</td>
<td>Body moved (even slightly) after the killing</td>
</tr>
<tr>
<td>Handgun</td>
<td>Handgun used in the killing</td>
</tr>
<tr>
<td>Shotgun</td>
<td>Shotgun used in the killing</td>
</tr>
<tr>
<td>Rifle</td>
<td>Rifle used in the killing</td>
</tr>
<tr>
<td>Bluntweapon</td>
<td>Blunt weapon, e.g. furniture, used in the killing.</td>
</tr>
<tr>
<td>Kitchenk</td>
<td>Kitchen knife or other type of knife used in the killing</td>
</tr>
<tr>
<td>Axe</td>
<td>Axe or other sharp weapon used in the killing</td>
</tr>
<tr>
<td>Strangleobj</td>
<td>Strangulation with an object, eg. a rope, used in the killing</td>
</tr>
<tr>
<td>Wfromscene</td>
<td>Murder weapon taken from scene prior to the killing</td>
</tr>
<tr>
<td>Wtoscene</td>
<td>Murder weapon taken to the scene</td>
</tr>
<tr>
<td>Wtakenaway</td>
<td>Weapon taken away from the crime scene after the killing</td>
</tr>
<tr>
<td>Stranglehands</td>
<td>Strangulation with hands used in the killing</td>
</tr>
<tr>
<td>Manualkick</td>
<td>Victim kicked, hit or both by the offender.</td>
</tr>
</tbody>
</table>
Ifaces  Victims had sustained injuries to the face (from the ears forwards excluding the neck).

Steal  The offender steals item(s) from the victim.

Weekday  Assault occurred on a weekday, which is classified as being between 00:01 on a Monday and 16:59 on a Friday.

Night  Assault occurred at night, i.e. midnight to 5.59 am.

Argument  An argument with the victim prior to the assault.

Post-offense behavior

Toldpeople  Offender told about his involvement to somebody other than the police.

Stay at scene  Offender was found and apprehended at the scene.

C<24h  Caught in less than 24 hours following the offense.

Iconfessed  Confessed (by and large) to the killing.

Relationship to the victim

Stranger  Offender did not know the victim before the fatal encounter.

Relative  Offender related to the victim (stepchildren or -parents included).

Relationship  Offender in an intimate or dating relationship at the time of the killing with the victim.

Exrelation  Offender previously in an intimate or dating relationship with the victim.

Acquaintances  Offender and victim acquaintances.

B. Offender background variables

Criminal history

CH robbery  Offender had one or more previous convictions of robbery or attempted robbery.

CH rape  Conviction(s) of rape or attempted rape.

CH homicide  Conviction(s) of homicide or attempted homicide.

CH assault  Conviction(s) of assault or attempted assault.

CH arson  Conviction(s) of arson.

CH theft  Conviction(s) of theft or attempted theft.

CH drugs  Conviction(s) of drug related crimes.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH drunk driving</td>
<td>Conviction(s) of drunk driving (or driving under the influence of drugs)</td>
</tr>
<tr>
<td>CH other</td>
<td>Variable was coded present if the offender had convictions of other crimes not specified above</td>
</tr>
<tr>
<td>agecrime</td>
<td>The age of the offender when the first offense was committed</td>
</tr>
<tr>
<td>agevcrime</td>
<td>The age of the offender when the first violent offense was committed (assault, robbery, homicide)</td>
</tr>
</tbody>
</table>

**Family & Childhood**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with parents</td>
<td>Variable was coded present if the offender lived in the same household with both parents until the age 20.</td>
</tr>
<tr>
<td>Foster home</td>
<td>Any foster home placements</td>
</tr>
<tr>
<td>Institution</td>
<td>Any institutional placements</td>
</tr>
<tr>
<td>School problems</td>
<td>Any difficulties with e.g. hyperactivity, attention, or concentration, truancy etc.</td>
</tr>
<tr>
<td>Specialedu</td>
<td>Any special education (observations class, remedial education)</td>
</tr>
<tr>
<td>Known to be violent</td>
<td>Offender was known to have behaved violently at school age (&lt; 16 years)</td>
</tr>
<tr>
<td>Conduct disorder</td>
<td>Was coded as present if the offender had received the diagnosis at some point or if the data suggested that several of the behaviors stated in the DSM-IV criteria for conduct disorder were fulfilled, causing significant problems in the person's life.</td>
</tr>
<tr>
<td>Psychchildcont</td>
<td>Any child or adolescent psychiatry contact</td>
</tr>
<tr>
<td>Parent alcohol abuse</td>
<td>(Step)Parental alcohol abuse in the family</td>
</tr>
<tr>
<td>Parent psychopathology</td>
<td>(Step)Parental psychopathology in the family</td>
</tr>
<tr>
<td>Fampsypat</td>
<td>Psychopathology in other family member</td>
</tr>
<tr>
<td>Famsuicide</td>
<td>Suicidal history in the family</td>
</tr>
<tr>
<td>Chparent</td>
<td>Criminal history of a (step)parent</td>
</tr>
<tr>
<td>Chhistory</td>
<td>Criminal history of another family member</td>
</tr>
<tr>
<td>Chhomhist</td>
<td>Homicide history of a family member or a friend</td>
</tr>
<tr>
<td>Army</td>
<td>Military service conducted. Coded only for male offenders over 18 years old.</td>
</tr>
<tr>
<td>Alcohol</td>
<td>The offender had been under the influence of alcohol during the attack</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Drugs</td>
<td>The offender had been under the influence of drugs or medicines during the attack</td>
</tr>
<tr>
<td>Oceducation</td>
<td>The offender had an occupational education at index offense</td>
</tr>
<tr>
<td>Occeduterm</td>
<td>Occupational education interrupted</td>
</tr>
<tr>
<td>Student</td>
<td>The offender was a student/pupil/conscript at index offense</td>
</tr>
<tr>
<td>Unemployed</td>
<td>The offender was unemployed at index offense</td>
</tr>
<tr>
<td>Sickness pension</td>
<td>The offender was on a sickness pension at index offense</td>
</tr>
<tr>
<td>Divorced</td>
<td>The offender was divorced at index offense</td>
</tr>
<tr>
<td>Relhistory</td>
<td>Ever married or had live-in relationship</td>
</tr>
<tr>
<td>Children</td>
<td>The offender has biological children</td>
</tr>
<tr>
<td>Psyadult</td>
<td>Any adult (&gt;18 years) psychiatry contact</td>
</tr>
<tr>
<td>Psycurr</td>
<td>An ongoing psychiatric contact at index offense</td>
</tr>
<tr>
<td>Psymed</td>
<td>Current psychiatric medication</td>
</tr>
<tr>
<td>Self-destructive</td>
<td>Documented self-destructive or suicidal behaviour not related to the homicide under investigation</td>
</tr>
<tr>
<td>Homeless</td>
<td>No accommodation at index offense</td>
</tr>
<tr>
<td>Alone</td>
<td>Offender lives alone at index offense</td>
</tr>
<tr>
<td>Together</td>
<td>Offender lives with an intimate partner at index offense</td>
</tr>
</tbody>
</table>

**Psychological evaluation**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAISTotal</td>
<td>Total score from Wechsler Adult Intelligence Test.</td>
</tr>
<tr>
<td>WAISverbal</td>
<td>Verbal score from Wechsler Adult Intelligence Test.</td>
</tr>
<tr>
<td>WAISmanual</td>
<td>Manual score from Wechsler Adult Intelligence Test.</td>
</tr>
<tr>
<td>Depressed</td>
<td>Offender depressive at the time of the offense (coding of this item was not based solely on chart diagnosis given at the statement; information given in the psychologist’s report was also taken into account).</td>
</tr>
<tr>
<td>Paranoid</td>
<td>Paranoid features</td>
</tr>
</tbody>
</table>

**Symptomatology and diagnosis**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hallucinations/delusions</td>
<td>Hallucinations or delusions at the time of the offense (evident either in the motive, method of inflicting death or post-offense behaviour)</td>
</tr>
</tbody>
</table>
Psychotic: One or more of the following symptoms present at the time of the offense: delusions/hallucinations/disorganized behavior or speech.

Alcohol dependence: Offender given the diagnosis of alcohol dependence in the forensic psychiatric evaluation.

Alcohol abuse: Offender given the diagnosis of alcohol abuse/harmful use.

Drug dependence: Offender given the diagnosis of drug dependence.

Drug dependence: The offender presented with current abuse/dependence to alcohol.

Drug dependence: The offender presented with current drug/medicine abuse/dependence.

Schizophrenia: Offender given the diagnosis of schizophrenia.

Personality disorder: Offender given the diagnosis of personality disorder (subtype written down).

Criminal responsibility:
- Fully criminally responsible
- Diminished criminal responsibility
- Criminally irresponsible
- Assigned to involuntary care

Variables coded for study III-IV:
- Early-start offender: An individual who had been convicted of a crime at the age of 18 or before.
- Late-start offender: An individual who had not been convicted of a crime before the age of 18.

Variables coded for study IV:
- Excessive violence: A case was classified as containing excessive violence if it contained sadistic or sexual features (e.g. binding, penetration, necrophilia), mutilation or if it contained more than 15 stab wounds.

Delusions (immediately) prior to the act (if present, the subtype(s) coded as follows):
- Persecutory delusions
- Delusions of being controlled
- Bizarre delusions
- Grandiose delusions
- Delusions of reference
- Somatic delusions
- Delusions of jealousy
- Delusions related to religion
Sexual delusions
TCO-symptoms (= threat-control-override –symptoms, i.e. feelings of personal threat or intrusion of thoughts)
Delusional misidentification syndrome

**Hallucinations (if present, the subtype(s) coded as follows)**

**Auditory hallucinations**

Command hallucinations (auditory hallucinations commanding someone to do something or a perceived message to act a certain way)

**Visual hallucinations**

**Olfactory or gustatory hallucinations**

**(Somatic/)tactile hallucinations**

Symptoms evoked
  a) fear
  b) anger
  c) anxie
References


83


85


