

Chapter 4

Murder by Manual and Ligature Strangulation Profiling Crime Scene Behaviors and Offender Characteristics

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Summary

This chapter is based on a number of research projects on offender profiling and homicidal crime scene behavior carried out at the Finnish National Bureau of Investigation. This specific study investigated homicidal strangulation in Finland during a 7-year period and analyzed and compared offense and offender characteristics in manual and ligature strangulation cases. The results diverge in many respects from the previous research findings attributed to homicidal strangulation and emphasize the need to identify possible culture-specific patterns and psychopathological offender characteristics in homicidal behavior.

INTRODUCTION

Homicidal strangulation accounts for approximately 10–20% of all homicidal deaths in various countries (1–4). In strangulation, the cause of death is cerebral hypoxia secondary to compression and thereby an occlusion of the vessels supplying blood to the brain (5). It has been estimated that applying pressure on the neck causes unconsciousness in approximately 5–15 seconds (6–8). Homicidal strangulation can be made manually or by using a ligature. In ligature strangulation, pressure on the neck is applied by a constricting band (e.g., belt, electric cord, rope) that is tightened by some force other than the

From: *Criminal Profiling: International Theory, Research, and Practice*
Edited by: R. N. Kocsis © Humana Press Inc., Totowa, NJ

body weight. In manual strangulation, pressure is applied by hand, forearm, or other limb. Research results regarding which one of the homicidal strangulation methods is more frequent are mixed (6,9–11).

Research on homicidal strangulation has shown that in a high percentage of cases, the offender and the victim have a family relationship (1,9,12) and that as much as 75% of the victims are females and infants (1,9,11–13). In previous studies, the most frequent motives for homicidal strangulation have been rape (6), sexual jealousy, and personal rivalry (9,11).

Predomination of female victims in homicidal strangulation has been explained by quarrels in relationships and unrehearsed violence applied by bare hands as well as by physical disadvantage and incapability of resistance of female victims (9,11,14). The latter rationale has been explicated relative to homicides by firearms. Fisher et al. (14) cite Dotzauer and Jarosch (15), who suggest that firearms are more frequently used against male victims, because they permit the offender to keep a greater distance from the victim, whose physical strength may be feared.

It has also been suggested that females predominate as victims in homicidal strangulation, because they are more likely to be targets of sexual assaults, and strangulation may occur to overcome their resistance during the sexual act (1). In previous studies, strangulation has been firmly associated with sexual and sadistic murders (16–19). Strangulation has been found to be the cause of death in 67% of sexual murders (20), 63% of sexual murders of elderly females (21), 61% of sexual sadistic murders (22), and 59% of serial sexual murders (19). Furthermore, Gratzler and Bradford (23) studied three samples of sexual offenders, and their results indicated that strangulation, particularly by a ligature, is more frequent in sexual sadistic than nonsadistic murders. However, ligature strangulation accounted only for 20% of the causes of death in sexually sadistic murders; blunt force trauma and stabbing were both more frequent causes of death. In a study on sexual murder, Kocsis et al. (24) analyzed crime scene behavior and provided an empirical model with distinct behavior clusters. Their study suggested that in sexual murders, ligature strangulation is associated with deliberate and cruel crime scene behavior, suggesting a “predator” murder pattern.

Predomination of strangulation as a cause of death in sexual and sadistic murders has been interpreted in various ways. Based on his clinical work with sexual murderers, Brittain (25) suggested that for the sadistic murderer, the method of killing is almost always asphyxial. It may be due to the positions of the murderer and his victim in a sexual attack, which, according to Brittain, makes strangulation an “easy and convenient” way of killing and prevents the victim from crying out. Furthermore, both Brittain (25) and Gratzler and

Bradford (23) concluded that the offender is able to exert greater control and power over the victim by strangulation.

The prevalence of strangulation has also been studied in relation to serial murders. In previous studies, strangulation has been present in approximately 35% of serial murders (26,27). Furthermore, it has been shown that compared with single homicide offenders, serial offenders are more likely to use strangulation as a method of killing (28). In his study on serial murderers, Godwin (27) suggested that ligature strangulation represents the killer's expressive rage that has a personal focus toward the victim. Dietz (29) associated strangulation in serial killings with the need of psychopathic sexual sadists to have greater intimacy with the victim than projectile weapons would allow.

Very few studies on the specific method of killing or cause of death have been undertaken in the study of homicide made for the purpose of criminal psychological profiling. Previous research on homicidal behavior and offender characteristics has focused on analyzing crime scene behaviors in clusters (30–32). This is meaningful, for example, when the purpose is to classify offense styles thematically. In these studies, however, strangulation as a method of killing or cause of death has not been analyzed independently of other manual methods of killing (30–32) or the sample has been selected (24,27). Owing to these limitations, very little is known of homicidal strangulation. Furthermore, previous research from the field of legal medicine has emphasized demographic characteristics of homicidal strangulation victims instead of focusing on the offenders.

The present research adopts an approach focusing on the manifestation of offender psychopathology on a single, rarely occurring homicidal crime scene behavior (e.g., strangulation, mutilation, penetration). These are behavioral characteristics that may be considered by investigators as “bizarre,” “grotesque,” “horrible,” and as being beyond the realm of common sense or lay knowledge. The ground for focusing on offender psychopathology is a body of research showing that violence in psychiatric patients is related to the underlying psychopathology (33). For example, the relationship between psychotic homicide offenders and their victims is more likely to be intra-familial (34–37), although there seems to be a gender effect, as both psychotic and nonpsychotic females kill mostly inside their families (38). Furthermore, females with a personality disorder or psychosis differ from each other in relation to the age of their victims: women with a personality disorder kill more adults, whereas psychotic women kill more children (39). Males, psychotic or nonpsychotic, rarely kill children (38). Extending the research from the victim–offender relationship to the homicidal crime scene behavior, Steyru and Choinski (36) showed that psychotic offenders frequently used knives and other

sharp instruments and that they were less frequently intoxicated and rarely used excessive violence. Petursson and Gudjonsson (40) suggested that mentally ill offenders might exhibit “abnormal” behavior (unfortunately the authors did not define this in more detail) after the killing. Furthermore, a previous study showed that mentally ill men are more frequently arrested at the crime scene, especially schizophrenics who often reported themselves to the police (41).

In all, previous studies on the relationship between a mental illness and a homicide have focused mostly on finding a statistical relationship between a mental illness *per se* and violent behavior. These studies contribute little to police investigators, because they do not offer any information on how offenders with different mental illnesses differ from each other in terms of crime scene behavior. In our recent studies, we have shown that offenders with different mental illnesses and also offenders, who do not have a mental illness, differ from each other in their homicidal crime scene behavior and offender characteristics (42–44). This kind of information can be used as a tool in prioritizing suspects in unsolved homicide cases.

In this study, a different approach was purposefully selected in terms of analyzing a single crime scene behavior contrary to analyzing clusters of behavior. However, a specific caution was taken not to analyze any behavior that was very situation specific (e.g., analyzing differences in victim’s injuries across the body as it is highly dependent on the victim’s ability to resist and fight back). The reason for taking the present approach is that the focus in investigative work is often on single crime scene behavior. As every homicide case is unique, and there may be a variety of motives (varying from financial gain to the psychotics’ fear of aliens from outer space), the investigator may be more likely in practice to focus on details of the case than on the general offense style. What is occasionally needed is an advice on whether the case includes any behavior prone to offenders with a mental illness. The need of this study derived from a request for a behavioral analysis (i.e., an offender profile) of an unsolved homicide case where the victim was strangled with a ligature. When findings of previous studies were assessed, no consistent patterns were found in the characteristics associated with homicides by ligature strangulation. Furthermore, there was nothing to indicate that the particular case would be part of a homicide series or a sexual homicide. Previous studies on homicidal strangulation have focused on the prevalence and victim characteristics. The offense or offender characteristics have been very little examined, and the results are somewhat inconclusive. A systematic study of homicidal strangulation is therefore warranted, although the cases are rare. This study investigated homicidal strangulation in Finland during a 7-year period from 1996 to 2002 and analyzed specific offense and offender characteristics.

PRESENT RESEARCH

The research was designed to address the following questions:

1. What is the offender–victim relationship in strangulation cases?
2. Do manual and ligature strangulation cases differ from each other in terms of offense or offender characteristics?
3. Is homicidal strangulation associated with sexual and sadistic crime scene behavior?

The research is empirical and descriptive. Information available in existing police records and forensic psychiatric examination reports was used. Information concerning homicides was obtained from the Finnish National Authority of Medicolegal Affairs (NAMA) organizing forensic psychiatric evaluations. In Finland, roughly 90% of homicide cases are solved by the police and approximately 85% of homicide offenders go through a forensic psychiatric evaluation as a part of the trial procedure (45). According to Finnish law, courts decide whether a forensic psychiatric evaluation should be conducted. Both the prosecutor and the defense are allowed to request the evaluation. After deciding on the evaluation, the court asks the NAMA to arrange it. Forensic psychiatric evaluations include data gathered from various sources (family members, relatives, medical and criminal records, school and military), psychiatric evaluation, standardized psychological tests, interviews by a social worker and a psychologist, evaluation of the offender’s physical condition, and observation of the offender by the hospital staff. The overall quality and reliability of Finnish forensic psychiatric evaluations is considered high by both courts and scientists (46).

The NAMAs’ archives were searched for all homicide cases for the period from 1996 to 2002. Cases where strangulation occurred were identified and collected for data analysis. Possible cases of homicide-suicide were excluded. The Finnish police’s computerized criminal index file was searched for additional information on the selected cases. The criminal index file includes both quantitative data (e.g., the age and sex of the victim and the offender) and an open-ended narrative appendix. All cases were retrospectively analyzed for the offender–victim relation and several variables regarding the offense and offender characteristics. The list of variables was the same that has been used and tested on our earlier studies on similar issues (43,44). The relation between victim and offender was divided into the following groups: (blood) related, (ex)intimate, acquaintance, stranger, and other. A case was referred to the “acquainted” group, if the parties knew each other at least by name or by sight, and the “stranger” group, if they did not know each other at all. The NAMA and the Ministry of Interior approved the study.

RESULTS

Victim Characteristics

There were altogether 59 strangulation cases, of which 39 (66%) were manual and 17 (29%) ligature and 3 (5%) both. The three cases with both of the strangulation methods were classified as “ligature” strangulation for further analysis. Of the victims, 27 (48%) were female and 29 (52%) men. The method of strangulation was not significantly associated with the gender of the victim, although a higher percentage of women than men were manually strangled (75 vs. 58% respectively). The mean victim age was 35.6 years (SD = 18.0, minimum = 1, maximum = 72 years). Ten of the victims (17%) were under 15 years of age. The victim age was not significantly associated with the method of strangulation. In all, 56% of the victims were either females or under 15 years of age.

Table 1 summarizes the results regarding the method of strangulation and victim–offender relationship. Nearly half (46%) of the victims were acquaintances. Compared with the other groups, ligature strangulation was more frequent in cases where the victim and the offender were acquainted (48 vs. 22% respectively, $\chi^2 = 4.551$, $df = 1$, $P \leq .05$).

Offender Characteristics

There were co-offenders in six cases. However, co-offenders had been subjected to forensic psychiatric examination only in one of these cases (all three offenders took actively part in the strangulation). Therefore, the number of offenders in this sample is 61. Nine offenders (15%) were female, of whom four killed their own child. Compared with men, a larger proportion of female offenders used a ligature (56 vs. 30%), although the difference only approached a statistically significant level ($P < .14$). A further examination of the victims of the female offenders revealed that three of the four victims strangled manually were children (1–6 years old), whereas four of the five victims strangled with

Table 1
Method of Strangulation by Victim–Offender Relationship

	<i>n</i> (%)	Manual (%)	Ligature (%)
Stranger	1 (1.7)	100.0	
Family member	15 (25.0)	80.0	20.0
(Ex)intimate	16 (27.1)	75.0	25.0
Acquaintance	27 (45.8)	51.9	48.1
Total	59 (100.0)	66.1	33.9

a ligature were adults (one woman and three men). The mean age of all the offenders at the time of the killing was 34.11 years ($SD = 11.32$, minimum = 15, maximum = 66 years). Four offenders were under 18 years of age. The offender age was not significantly related to the offender gender or to the method of strangulation.

Nine of the offenders (15%) were psychotic, and five of them had a secondary diagnosis of a personality disorder. Of the remaining offenders, 61% had a personality disorder, 12% had some other disorder (mental handicap, severe depression etc.), and only 12% of the offenders were considered not to have a mental illness. The proportion of ligature strangulation cases was 39% among the offenders with a personality disorder, 22% among the schizophrenics, and 29% among the others. Although the type of a mental illness was not significantly associated with the method of strangulation, it was significantly associated with the victim-offender relationship. Compared with others, a significantly larger proportion of the schizophrenic offenders killed relatives (56 vs. 10%, $P < .01$, Fisher's exact test).

In all, 66% of the offenders were diagnosed as having alcohol dependence and 14% drug dependence. At the time of the killing, 72% of the offenders were intoxicated and 10% were under the influence of drugs. There was a tendency to ligature strangulation being more frequent among offenders with drug dependency (63 vs. 31%, $P < .12$) and offenders who were under the influence of drugs during the killing (67 vs. 29%, $P < .08$), but the differences only approached a significant level.

A substantial proportion of the offenders had experienced severe problems in their childhood environment. Twenty percent of them had been subjected to institutional care, 36% had parents with alcohol problems, and 41% had experienced physical violence at home. In all, 54% of the offenders scored positive for at least one of these developmental variables. The presence of early developmental problems was not related to the method of strangulation, but these problems were related to the mental illness category, being more frequent among offenders with a personality disorder (65 vs. 33%, $\chi^2 = 5.195$, $P < .05$). Fifty-eight percent of the offenders had a criminal history: 39% had been convicted of thefts, 36% of drunken driving, 34% of aggravated assaults, and 11% of homicides. Only two offenders had a previous conviction of rape. Criminal history of violent crimes (homicides, aggravated assaults, and rape) was not significantly related to the method of strangulation.

Offense Characteristics

The victim was found at the scene of the killing in 86% of the cases. In 71% of the cases, the victim was found in an apartment and in 22% of the cases, outdoors. The location of the body was independent of both the

method of strangulation and the victim–offender relationship. In 17% of the cases, the offender stole something from the victim. There was no significant association between the method of strangulation and stealing from the victim, but stealing was significantly more frequent when the victim was a stranger or acquaintance, when compared with (ex)intimates and family members (33 vs. 3% respectively, Fisher's $P \leq .004$).

Sadistic features and desecration of the body were rare. None of the cases involved taking the victim as a hostage, tying the victim up, penetration with an object, or urinating on the victim. The body was mutilated in two cases. In all, 63% of the cases involved multiple forms of violence. Of the victims, 39% were also hit or kicked, 25% were stabbed, 14% were hit by a blunt instrument, and 5% were suffocated. The use of multiple forms of violence was more frequent in manual strangulation cases (72 vs. 45%, $\chi^2 = 4.059$, $P < .05$). This was because the victim was more frequently hit and kicked, in particular, in cases with manual strangulation compared with ligature strangulation (49 vs. 20%, $\chi^2 = 4.584$, $P < .05$). In three cases (5%), all involving acquaintances, the killing was preceded by (an attempted) rape. In one case, the victim and offender, who were intimates, had intercourse before the killing.

Of the offenders, 23% could not self-report any motive for their killing. Of the remaining cases, 25% were classified as drunken quarrels, 28% as jealousy or disputes between intimate partners, 13% as serving an instrumental need (e.g., robbery), and 12% as family conflicts. When the victim was a female, in 71% of the cases the motive was jealousy or a dispute between intimate partners, and when the victim was a male, in 68% of the cases the motive was a drunken quarrel. Compared with the other motive groups, ligature strangulation was more frequent than manual when the motive was “drunken quarrels” (53 vs. 23%, $\chi^2 = 4.050$, $P < .05$).

DISCUSSION

The present results diverge in many respects from the previous research findings attributed to homicidal strangulation. First, compared with the overall annual Finnish homicide data, in which approximately 30% of the victims are female, the proportion of female victims in the present data (48%) was higher, but not outstanding (47). In accordance with previous studies (9,11), the prevalent motive of the female homicidal strangulation was jealousy or attempted homicide-suicide. Second, the present results, contrary to the results by DiMaio (6), suggest that female homicidal strangulation is usually not motivated by rape in Finland. Only one offender self-reported rape as the motive for the killing. Neither is the homicidal strangulation related to sexual

murders or sexual sadism. Only 11% of the female homicidal strangulation cases were sexually related, which corresponds to the findings in other Scandinavian countries (9). Furthermore, none of the cases implicated sadism.

Third, the present results suggest that in Finland, homicidal strangulation cases are usually not part of a serial murder. Although the proportion of homicide recidivists in the present data is larger than the proportion of homicide recidivists in a 13-year follow-up study of 1584 Finnish homicide offenders (11 vs. 2% respectively) (48), only three offenders had been convicted for a minimum of two homicides. The number of victims required for an offense to be classified as a serial homicide varies in previous studies from two to 10 (29,49,50), but according to the official FBI definition at present, it is a question of serial murder when the number of victims is at least three (51). Furthermore, the typical motivation for serial homicide has been described as being either sexual or internal psychological gratification (52,53). The motives for the three serial offenders in the present sample were drunken quarrel, robbery, and delusions related to psychosis.

In this study, nearly a half of the homicidal strangulation victims were acquaintances of the offender. Many of these homicides can be characterized as impulsive acts occurring in boozing societies of marginalized males. At the time of the killing, 72% of the offenders were intoxicated. These results correspond with the previously found characteristics in Finnish homicides (42). Furthermore, 61% of the offenders were diagnosed as having a personality disorder, and 15% were psychotic. These results are accordant with previous results concerning the prevalence of these types of mental illnesses among homicide offenders (38,40,45,54–58).

The comparison between the strangulation methods suggested that homicidal strangulation cases are rather homogenous, in terms of the offense and offender characteristics. In over half of the cases, strangulation occurred in combination with other forms of violence, usually hitting and kicking. This is in line with previous results (14), and probably because in contrast to stabbing and shooting, strangling is more likely to result in a physical struggle. Bivariate analyses suggested that the use of a ligature in homicidal strangulation may be associated with the offender being a female, drug user, the offender and victim being acquaintances rather than family members or intimate partners, and the motive being a drunken quarrel. In addition, in ligature strangulation cases, other forms of violence were less frequent. It is interesting to note that previous research has suggested that because of the predomination of female victims, homicidal strangulation may be associated with the physical disadvantage of the victim. This is, however, in contrast with a previous study showing that death by strangulation comprises only 4% of elderly homicide victims (59).

Thus, on the basis of the present results, it is interesting to hypothesize that the use of a ligature in homicidal strangulation may be due to the perceived physical disadvantage of the *offender*.

Like all research, the present research has its share of limitations. The sample size was smaller than ideal, although it covered all homicidal strangulation offenders who had received an exhaustive forensic psychiatric examination within the time period. The system of extensive forensic psychiatric evaluation in Finland makes reliable data collection possible. Unfortunately, however, not all perpetrators accused of a homicide go through the forensic psychiatric evaluation. At present, there is no systematic procedure in Finnish courts of law ordering forensic psychiatric evaluation. The district courts decide independently whether a detailed forensic psychiatric evaluation should be made. If the courts decide that there is any possibility that the offender is not fully criminally responsible owing to a mental disorder, a full-scale forensic psychiatric evaluation will be ordered. Usually, in cases where the forensic psychiatric evaluation is not ordered, the offender has recently participated in such an evaluation as a part of another, previous trial procedure. It is not easy to determine whether the present sample consisted of all homicidal strangulation cases within the time frame or whether there were some cases where the offender did not go through a forensic psychiatric evaluation and, therefore, was not included in our sample. In Finland, there is no detailed uniform register within the police, district courts, forensic pathologists, or national "death statistics" which allows one to estimate the number of cases where specifically homicidal strangulation occurred within a given time period. For the purposes of the present study, the death certificates of all the homicidal asphyxia cases within the time frame were ordered from Statistics Finland. However, even the narrative parts of the death certificates do not state exclusively how the asphyxia death occurred. It can be assumed, however, that as strangulation cases are rare events, a forensic psychiatric evaluation of the offender is more likely to be ordered in these cases.

Another limitation of the research to be considered is that there was no comparable data on the general population or other homicidal offender group. Therefore, the results regarding offender characteristics need to be interpreted cautiously. In general, however, the present results are in accordance with the previous studies on Finnish homicide offender characteristics (43).

Finally, as this study contradicts some of the previous traditional assertions present in the homicidal strangulation literature, it supports the need for empirically based comparative analyses. For example, in previous case studies, homicidal strangulation has also been associated with ritual homicides (60) and sadomasochistic sexual activity (61). In time, there will be sufficient

information on homicidal strangulation to permit researchers, investigators, and other criminal justice practitioners to advance beyond case studies and conclusions unsupported by empirical evidence thus bringing scientific rigor to this field of study. Good science can inform and shape the practice of profiling, as much as other research has supported the predictive superiority of actuarial over unstructured clinical predictions (62,63). Furthermore, it is essential to acknowledge possible culture-specific patterns in homicidal behavior. The previous research on homicidal strangulation derives mostly from the crime data collected by the FBI, leading to a bias in the sample.

To my knowledge, reports on the putative association between specific mental disorders and homicidal crime scene behavior have not been published with the exception of results concerning psychopathy (64). More attention should be paid to the role of offenders' psychopathology regarding the way they behave in their crimes. With the help of unselected birth cohorts, it has been well established that offender psychopathology is associated with the risk of criminal behavior (48,57,65,66) and specifically, homicidal behavior (67). It has also been acknowledged that offenders' psychopathology affect their explanations about their crimes (68–71) better than criminologic variables such as age and number of arrests. Furthermore, information regarding victim injury has been used in the previous studies to predict the inter-relationship between the victim and the offender (72–74). However, a systematic exploration of the relationship with regard to crime scene behavior and offender psychopathology has only begun.

The idea of violence being qualitatively different in regard to the type of a mental illness has been relatively ignored in the studies of homicide made for the purpose of criminal psychological profiling. However, Woodwort and Porter (75) suggested in their review that a profile of the perpetrator may include psychopathological conditions, personality traits, behavioral patterns, and demographic characteristics, and they suggested further that the research should begin to focus on possible differences between individuals, who commit the same type of crime in different ways. However, the empirical studies with an emphasis on offender profiling on homicides have with the occasional exception (24) focused exclusively on demographic characteristics.

Although criminal profiling is often used as an investigative tool, the empirical foundations of profiling and its assumptions remain controversial. This study concludes that a holistic approach integrating aspects of empirical methods and psychopathology may represent a promising approach to criminal profiling. This is in line with the previous research suggesting that psychopathy may be one of the most empirically validated and potentially useful psychopathological constructs for criminal profiling (76,77). The

construct of psychopathology has the potential to assist criminal investigators in a number of ways. In line with Jackson et al. (78) and Woodworth and Porter (75), it is emphasized that the usefulness of forensic psychology and criminal profiling should be considered globally, for example, in generating additional investigative suggestions and strategies, and providing advice on interviewing techniques and information on offender psychopathology.

REFERENCES

1. Abder-Rahman, H.A. & Abu-Alrageb, S.Y. (1999). Killing tools in mechanical asphyxia. *Leg Med (Tokyo)*, 1, 2–5.
2. Canadian Centre for Justice Statistics. (2000). Homicide statistics. *The Daily*, October 18. Available at <http://www.statcan.ca/start.html>.
3. Hougen, H.P., Rodge, S. & Poulsen, K. (1999). Homicides in two Scandinavian capitals. *Am J Forensic Med Pathol*, 20, 293–299.
4. Scottish Executive. (2003). Homicide in Scotland – Statistics Published. Available at <http://www.scotland.gov.uk/stats/bulletins/00377-00.asp>.
5. Di Maio, D.J. & Di Maio, V.J.M. (2001). Asphyxia. *Forensic Pathology* (2nd ed.) (pp. 245–269). Boca Raton, FL: CRC Press.
6. DiMaio, V.J.M. (2000). Homicidal asphyxia. *Am J Forensic Med Pathol*, 21, 1–4.
7. Ikai, M., Ishiko, T., Ueda, G., Yamakawa, J., Toyoda, A., Ogawa, S., Hirai, J., Katsumura, R., Seki, T., Minami, M., Akutsu, K., Masuda, M., Inoue, O., Sakai, T., Suzuki, K., Morikawa, M., Watanabe, T. & Matsumoto, Y. (1958). Physiological studies on “Choking” in Judo. Part 1, Studies in general. *Bull Assoc Sci Stud Judo*, Tokyo: Kodokan Report I 1–12.
8. Rossen, R., Kabat, H. & Anderson, J.P. (1943). Acute arrest of cerebral circulation in man. *Arch Neurol Psychiatry*, 50, 510–528.
9. Rogde, S., Hougen, H.P. & Poulsen, K. (2001). Asphyxial homicide in two Scandinavian capitals. *Am J Forensic Med Pathol*, 22, 128–133.
10. Scott, K.W. (1990). Homicide patterns in the West Midlands. *Med Sci Law*, 30, 234–238.
11. Srivastava, A.K., Das Gupta, S.M. & Tripathi, C.B. (1987). A study of fatal strangulation cases in Varanasi (India). *Am J Forensic Med Pathol*, 8, 220–224.
12. Kominoto, Y., Shimada, I., Hata, N. & Takizawa, H. (1997). Homicide patterns in the Toyama prefecture, Japan. *Med Sci Law*, 37, 316–320.
13. Kellermann, A.L. & Mercy, J.A. (1992). Men, women, and murder: gender-specific differences in rates of fatal violence and victimization. *J Trauma*, 33, 1–5.
14. Fisher, J., Kleemann, W.J. & Troger, H.D. (1994). Types of trauma in cases of homicide. *Forensic Sci Int*, 68, 161–167.
15. Dotzauer, G. & Jarosch, K. (1971). Tötungsdelikte. In *Schriftenreihe des Bundeskriminalamtes*, 1–3. Wiesbaden, Germany: Bundes Kriminalamt.
16. MacCulloch, M.J., Snowden, P.R., Wood, P.J. & Mills, H.E. (1993). Sadistic fantasy, sadistic behavior and offending. *Br J Psychiatry*, 143, 20–29.
17. Meloy, J.R. (2000). The nature and dynamics of sexual homicide: an integrative review. *Aggress Violent Behav*, 5, 1–22.

18. Simonsen, J. (1989). A sadistic homicide. *Am J Forensic Med Pathol*, 10, 159–163.
19. Warren, J.I., Hazelwood, R.R. & Dietz, P.E. (1996). The sexually sadistic serial killer. *J Forensic Sci*, 41, 970–974.
20. Grubin, D. (1994). Sexual murder. *Br J Psychiatry*, 165, 624–629.
21. Safarik, M.E., Jarvis, J.P. & Nussbaum, K.E. (2002). Sexual homicide of elderly females. *J Interpers Violence*, 17, 500–525.
22. Dietz, P.E., Hazelwood, R.R. & Warren, J. (1990). The sexually sadistic criminal and his offences. *Bull Am Acad Psychiatry Law*, 18, 163–178.
23. Gratzner, T. & Bradford, J. (1995). Offender and offence characteristics of sexual sadists: a comparative study. *J Forensic Sci*, 40, 450–455.
24. Kocsis, R.N., Cooksey, R.W. & Irwin, H.J. (2002). Psychological profiling of sexual murders: an empirical model. *Int J Offender Ther Comp Criminol*, 46, 532–554.
25. Brittain, R.P. (1970). The sadistic murderer. *Med Sci Law*, 10, 198–207.
26. Hickey, E. (1997). *Serial Murderers and Their Victims* (2nd ed.). Belmont, CA: Wadsworth.
27. Godwin, G.M. (2000). *Hunting Serial Predators. A Multivariate Classification Approach to Profiling Violent Behavior*. Boca Raton, FL: CRC Press.
28. Kraemer, G.W., Lord, W.D. & Heilbrun, K. (2004). Comparing single and serial homicide offences. *Behav Sci Law*, 22, 325–343.
29. Dietz, P.E. (1986). Mass, serial and sensational homicide. *Bull N Y Acad Med*, 62, 477–490.
30. Salfati, C.G. (2000). The nature of expressiveness and instrumentality in homicide. Implications for offender profiling. *Homicide Studies*, 3, 265–293.
31. Salfati, C.G. & Canter, D. (1999). Differentiating stranger murders: profiling offender characteristics from behavioural styles. *Behav Sci Law*, 17, 391–406.
32. Santtila, P., Häkkinen, H., Canter, D. & Elfgrén, T. (2003). Classifying homicide offenders and predicting their characteristics from crime scene behavior. *Scand J Psychol*, 44, 107–118.
33. Krakowski, M., Volavka, J. & Brizer, D. (1986). Psychopathology and violence: a review of literature. *Compr Psychiatry*, 27, 131–148.
34. Daly, M. & Wilson, M. (1988). *Homicide*. New York: Aldine de Gruyter.
35. Gillies, H. (1976). Homicide in the west of Scotland. *Br J Psychiatry*, 128, 105–127.
36. Steury, E. & Choinski, M. (1995). “Normal” crimes and mental disorder: a two-group comparison of deadly and dangerous felonies. *Int J Law Psychiatry*, 18, 183–207.
37. Wong, M. & Singer, K. (1973). Abnormal homicide in Hong Kong. *Br J Psychiatry*, 123, 295–298.
38. Gottlieb, P., Gabrielsen, G. & Kramp, P. (1987). Psychotic homicides in Copenhagen from 1959 to 1988. *Acta Psychiatr Scand*, 76, 285–292.
39. Putkonen, H., Collander, J., Honkasalo, M. & Lönnqvist, J. (2001). Personality disorders and psychoses form two distinct subgroups of homicide among female offenders. *J Forensic Psych*, 12, 300–312.

40. Petursson, H. & Gudjonsson, G.H. (1981). Psychiatric aspects of homicide. *Acta Psychiatr Scand*, 64, 363–372.
41. Robertson, G. (1988). Arrest patterns among mentally disordered offenders. *Br J Psychiatry*, 153, 313–316.
42. Häkkänen, H. & Laajasalo, T. (2006). Homicide crime scene actions in a Finnish sample of mentally ill offenders. *Homicide Studies*, 10, 33–54.
43. Laajasalo, T. & Häkkänen, H. (2004). Background characteristics of mentally ill homicide offenders – a comparison of five diagnostic groups. *J Forensic Psychiatry Psychol*, 15, 451–474.
44. Laajasalo, T. & Häkkänen, H. (2005). Offence and offender characteristics among two groups of Finnish homicide offenders with schizophrenia: comparison of early- and late-start offenders. *J Forensic Psychiatry Psychol*, 16, 41–59.
45. Eronen, M., Hakola, P. & Tiihonen, J. (1996). Mental disorders and homicidal behavior in Finland. *Arch Gen Psychiatry*, 53, 497–501.
46. Eronen, M., Repo, E., Vartiainen, H. & Tiihonen, J. (2000). Forensic psychiatric organization in Finland. *Int J Law Psychiatry*, 23, 541–546.
47. Lappi-Seppälä, T. (2001). *Homicide in Finland: Trends and Patterns in Historical and Comparative Perspective*. Publication Number 181. The National Research Institute of Legal Policy. Helsinki, Finland.
48. Eronen, M., Hakola, P. & Tiihonen, J. (1996). Factors associated with homicide recidivism in a 13-year sample of homicide offenders in Finland. *Psychiatr Serv*, 47, 403–406.
49. Hickley, E. (1997). *Serial Murderers and Their Victims* (2nd ed.). Belmont, CA: Wadsworth.
50. Ressler, R.K., Burgess, A.W. & Douglas, J.E. (1988). *Sexual Homicide: Patterns and Motives*. New York: The Free Press.
51. Protection of Children from Sexual Predators Act of 1998, 28 U.S.C. § 540B (2). 2000.
52. DeHart, D.D. & Mahoney, J.M. (1994). The serial murderer's motivations: an interdisciplinary review. *Omega – J Death Dying*, 29, 29–45.
53. Egger, S. (1998). *The Killer Among Us: An Examination of Serial Murder and Its Investigation*. Englewood Cliffs, NJ: Prentice-Hall.
54. Erb, M., Hodgins, S., Freese, R., Muller-Isberner, R. & Jöckel, D. (2001). Homicide and schizophrenia: maybe treatment does have a preventive effect. *Crim Behav Ment Health*, 11, 6–26.
55. Hodgins, S., Mednick, S.A., Brennan, P.A., Schulsinger, F. & Engberg, M. (1996) Mental disorder and crime. Evidence from a Danish Birth Cohort. *Arch Gen Psychiatry*, 53, 489–496.
56. Taylor, P.J. & Gunn, J. (1984). Violence and psychosis. I. Risk of violence among psychotic men. *Br Med J (Clin Res Ed)*, 288, 1945–1949.
57. Tiihonen, J., Eronen, M. & Hakola, P. (1993). Criminality associated with mental disorders and intellectual deficiency. *Arch Gen Psychiatry*, 50, 917–918.
58. Wilcox, D.E. (1985). The relationship of mental illness to homicide. *Am J Forensic Psych*, 6, 3–15.
59. Fox, J. & Levin, J. (1991). Homicide against the elderly: a research note. *Criminology*, 29, 317–327.

60. Fineschi, V., Dell'Erba, A.S., Di Paolo, M. & Procaccianti, P. (1998). Typical homicide ritual of the Italian Mafia (incaprettamento). *Am J Forensic Med Pathol*, 19, 87–89.
61. Baik, S.O. & Uku, J.M. (1988). Ligature strangulation of a woman during sadomasochistic sexual activity. *Am J Forensic Med Pathol*, 9, 249–251.
62. Borum, R. (1996). Improving the clinical practice of violence risk assessment. *Am Psychol*, 51, 945–956.
63. Grove, W.M. & Meehl, P.E. (1996) Comparative efficiency of informal (subjective, impressionistic) and formal (mechanical, algorithmic) prediction procedures: the clinical-statistical controversy. *Psychol Pub Pol'y & L*, 2, 293–323.
64. Woodworth, M. & Porter, S. (2002). In cold blood: characteristics of criminal homicides as a function of psychopathy. *J Abnorm Psychol*, 111, 436–445.
65. Hodgins, S. (1992). Mental disorder, intellectual deficiency and crime: evidence from a birth cohort. *Arch Gen Psychiatry*, 49, 476–483.
66. Tiihonen, J., Isohanni, M., Rasanen, P., Koironen, M. & Moring, J. (1997). Specific major mental disorders and criminality: a 26-year prospective study of the 1966 Northern Finland Birth Cohort. *Am J Psychiatry*, 154, 840–845.
67. Tiihonen, J. & Hakola, P. (1994). Psychiatric disorders and homicide recidivism. *Am J Psychiatry*, 151, 436–438.
68. Gudjonsson, G.H. (1984). Attribution of blame for criminal acts and its relationship with personality. *Personal Individ Differ*, 5, 53–58.
69. Gudjonsson, G.H. & Singh, K.K. (1984). Attribution of blame for criminal acts and its relationship with type of offence. *Med Sci Law*, 28, 301–303.
70. Harry, B. (1992). Criminals' explanation of their criminal behavior, part I: the contribution of criminologic variables. *J Forensic Sci*, 37, 1327–1333.
71. Harry, B. (1992). Criminals' explanation of their criminal behavior, part II: a possible role of psychopathy. *J Forensic Sci*, 37, 1334–1340.
72. Karlsson, T. (1998). Sharp force homicides in the Stockholm area, 1983–1992. *Forensic Sci Int*, 94, 129–139.
73. Karlsson, T. (1998). Multivariate analysis (“forensiometrics”) – a new tool in forensic medicine: differentiation between sharp force homicide and suicide. *Forensic Sci Int*, 94, 183–200.
74. Ormstad, K., Karlsson, T., Enkler, L. & Rajs, J. (1986). Patterns in sharp force fatalities – a comprehensive forensic medical study. *J Forensic Sci*, 31, 529–542.
75. Woodworth, M. & Porter, S. (2000). Historical foundations and current applications of criminal profiling in violent crime investigations. *Expert Evid*, 7, 241–264.
76. Porter, S., Woodworth, M., Earle, J., Drugge, J. & Boer, D. (2003). Characteristics of sexual homicides committed by psychopathic and nonpsychopathic offenders. *Law & Hum Behav*, 27, 459–470.
77. Porter, S., Fairweather, D., Drugge, J., Hervé, H., Birt, A. & Boer, D.P. (2000). Profiles of psychopathy in incarcerated sexual offenders. *Crim Justice Behav*, 27, 216–233.
78. Jackson, J.L. & Bekerian, D.A. (1997). *Offender Profiling: Theory, Research and Practice* (1st ed.). West Sussex, UK: John Wiley & Sons.