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**Victim, perpetrator, and offense characteristics in filicide and
filicide-suicide**

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Abstract

The purpose of this paper is to provide a critical review of most recent studies of parental and stepparental filicide. A detailed review of the literature revealed the importance of certain demographic, environmental, and psychosocial factors in the commission of child homicide. Our findings indicate that filicides perpetrated by genetic parents and stepparents differ considerably in terms of underlying motivational factors. Data in the literature suggest that biological parents are more likely to choose methods of killing which produce quick and painless death, whereas stepparents frequently kill their wards by beating. Research results demonstrate the victims of maternal filicides to be significantly younger than the victims of paternal filicides. Additionally, filicide-suicide is most often associated with parental psychopathology. Genetic fathers are at the greatest risk of death by suicide after the commission of familicide. These findings are discussed in relation to theoretical frameworks explaining the occurrence of child murder. Further, limitations of reviewed studies and directions for future research are presented.

Keywords

Maternal filicide; Paternal filicide; Stepparental filicide; Filicide-suicide

1. Introduction

Child homicide - the intentional killing of a child or infant - is a rare yet highly disturbing occurrence which commands community and media attention. The terms *filicide*, *infanticide*, and *neonaticide* have been used interchangeably in child homicide studies. Even though infanticide refers to the killing of an infant (under the age of one year), it has frequently been used to denote the killing of a child of any age by a parent. Neonaticide corresponds to the killing of a child in the first 24 hours after birth, while filicide refers to the killing of a child over the age of 12 months (Bourget, Grace, & Whitehurst, 2007; Stanton & Simpson, 2002).

Although rates of child murder have decreased in developed countries, it remains an important cause of children's mortality (Koenen & Thompson, 2008). Homicide statistics in England and Wales have consistently identified children under one year old as the group with the highest victimization rate (Brookman & Nolan, 2006; Paulozzi & Sells, 2002). Homicide rates for children aged one to four are reported to be higher than for those aged five to 15 years, suggesting that the risk of a child being killed decreases with age. In 2012-2013, 551 homicides were recorded, of which 67 were child homicides (victims aged under 16 years) (Office for National Statistics, 2014). The low recorded rates of child homicide may be due to some crimes being undetected (Haapasalo & Petäjä, 1999). The most difficult to estimate the prevalence of may be neonaticide. This is because some women give birth unassisted, kill the neonate, and dispose of the body immediately after birth (Beyer, Mack, & Shelton, 2008). Additionally, some filicide cases are miscategorized as death by another cause (UNICEF, 2003).

The majority of child homicides recorded in 2012-2013 were committed by genetic parents or stepparents (60%; $n = 40$) (Office for National Statistics, 2014). Bourget and Bradford (1990) asserted that mothers commit filicides at a greater rate than fathers; however,

more recent evidence suggests that fathers are equally (e.g., Adelson, 1991; Marks & Kumar, 1993) or more likely to murder their offspring (Bourget & Gagné, 2005). Younger children are at a greater risk of fatal harm from mothers (Adinkrah, 2003; Holden, Burland, & Lemmen, 1996), whereas older children are more often killed by their fathers and unrelated household members (Smithey, 1998; Strang, 1996). Research also suggests that more men than women committed homicides in which the victims were their biological children, rather than stepchildren (Brookman & Nolan, 2006).

1.1. Classification systems of filicide

Several classification systems of filicide have been advanced, most of which use motivational factors and sources of impulse as the basis for categorization. Resnick (1969), for instance, based on a review of 131 cases of child homicide, argued for the adoption of a motivational classification of filicide. The following categories were distinguished: *altruistic*, *acutely psychotic*, *unwanted child*, *accidental*, and *spouse revenge*. Altruistic filicide is performed to relieve child's real or imagined suffering and is usually followed by parental suicide. The acutely psychotic category includes parents who, at the time of the commission of murder, were experiencing severe mental illness. Some parents were also found to kill their unwanted offspring, especially those that were illegitimate or of uncertain paternity. Accidental filicide results from prolonged and severe child abuse. Finally, filicide as a spousal revenge is committed to punish the child's other parent, such as, in cases of adultery. Alternatively, Scott (1973) suggested a classification model based on the origin of the stimulus to kill (either the child itself or displaced onto the child). The system is composed of five categories: *battering mothers*, *mentally ill mothers*, *retaliating mothers*, *unwanted children*, and *mercy killing*. This framework has not been widely used, but the newly suggested focus on impulse has been reflected in other theoretical systems.

Child homicide in both Resnick (1969) and Scott's (1973) models is interpreted using psychodynamic terms. The murderer's original aggression is seen as displaced from a partner, sibling, or parent, and directed towards a more vulnerable target. This is reminiscent of the displaced aggression theory (Anderson & Bushman, 2002), which posits that if aggression cannot be expressed directly against the source of provocation, it might be transferred onto an innocent person or object. Therefore, consideration of the family dynamics may be crucial for understanding processes which may lead to filicide.

Bourget and Bradford's (1990) classification of homicidal parents is composed of different qualities of information, such as motivational factors, clinical situation, and victim age. The framework distinguishes five types of filicide: *pathological* (incorporating altruistic motives, homicide-suicide, and psychotic suicide), *accidental* (child's death as an unwanted result of maltreatment and abuse), *retaliating* (filicide committed out of revenge on the partner), *neonaticide* (including the unwanted child motive), and *paternal*. By creating the final category, Bourget and Bradford were the first to highlight the importance of differentiating between maternal and paternal child murder.

Bourget and Gagné (2002), in a study with 27 women, proposed five categories of maternal filicide: *mentally ill*, *fatal abuse*, *retaliating*, *mercy*, and *other/unknown*. The origins of the system, however, are unclear as only two out of these categories were used to classify the investigated cases. Further, the maternal filicide theoretical framework (MFTF; Mugavin, 2008) attempts to elucidate the role of certain psycho-social variables in child homicide. Mothers are thought to become violent towards their children because they are the only ones with less power than women (Cole, 1985). Moreover, consistent with the cycle-of-violence hypothesis, emotional and physical abuse may arise from unhealthy family processes, which are often maintained and repeated across the generations (Kerr & Bowen, 1988). This is also

in line with Bandura's (1965) social learning theory which highlights the importance of past learning experiences on aggressive behavior.

Although classification systems aim to systematize the current understanding of risk factors involved in filicide, they are not free from limitations. First, the categories are descriptive, mostly based on motives, and tend to overlap, which renders case classification a challenging task (Bourget & Gagné, 2002). Second, most frameworks do not distinguish between maternal and paternal filicides, nor between those committed by genetic and stepparents. Finally, the majority of research studies in the area of child homicide were conducted with genetic mothers, which significantly undermines the usefulness of classification models in instances where fathers or stepparents are perpetrators.

1.2.Explanations of filicide

The main area of inquiry in the field of child homicide is the identification of risk factors related to the commission of filicide. A systemised examination of the characteristics which can lead to the murder of a child may allow for the early detection and implementation of successful prevention strategies (Barone, Bramante, Lionetti, & Pastore, 2014).

Attachment theory has provided a useful framework for explaining the occurrence of filicide (e.g., Barone et al., 2014; McKee & Egan, 2013). Bowlby's (1969, 1997) research on the nature of criminal behavior suggested that aggressive children are more likely to have a history of early maternal deprivation. Insecure attachment was reported as a cause of violent offending. Disrupted childhood attachment patterns may be transferred onto relations with significant others, such as romantic partners and children, in adulthood. The fear of loss or separation experienced by insecurely attached individuals may result in rage which can then lead to overtly aggressive behaviours (Adshead, 2002). Consequently, filicide appears to originate from frustration building up as a response to the inability to bond with a child. This

is reminiscent of the frustration-aggression hypothesis which posits that people who feel frustrated, thwarted, or threatened are likely to become violent (Dollard, Doob, Miller, Mowrer, & Sears, 1939).

Fathers, and especially stepfathers, who kill their offspring are seen as more antisocial, have more criminal convictions, and a history of substance abuse (Hicks & Gaughan, 1995; Kasim & Cheah, 1995), suggesting that aggression towards children may be rooted in parents' psychopathic tendencies. It has been indicated that psychopathy provides an important conceptual framework for studying violent crime (Vaughn & Howard, 2005). Psychopaths are characterised by severely disturbed personality patterns, with a deep lack of empathy (Hare, 1991) and increased levels of aggression, both reactive and instrumental (Blair, 2007). Characteristics, such as callousness, impulsivity, and grandiosity, appear to be genetically influenced and significantly increase the likelihood of engaging in criminal behavior (Debowska, Boduszek, Hyland, & Goodson, 2014; Dhingra & Boduszek, 2013; Hart & Hare, 1997). Indeed, empirical research revealed a strong positive association between psychopathy and violence (e.g., Dolan & Doyle, 2000; Salekin, Rogers, & Sewell, 1996; Skeem & Mulvey, 2001). Psychopaths were also described as sensation seekers driven by sadistic impulses (Porter & Woodworth, 2007). Therefore, it appears that when individuals with psychopathic traits perpetrate filicide, their offences may be marked by greater brutality.

Although it is speculative at this stage, filicide may also be triggered by certain genetic vulnerabilities (Ertem, Leventhal, & Dobbs, 2000). Lösel and Bender (2006) reported that roughly 40% of the inter-individual differences in antisocial demeanor could be attributed to genetic factors. To date, a number of studies have provided an insight into how certain genetic characteristics may interact with environmental variables so that a child grows up to be impulsive and aggressive (Bernet, Vnencak-Jones, Farahany, & Montgomery, 2007).

Caspi et al. (2002) found that males with a low MAOA enzyme activity and childhood abuse experiences had an increased likelihood of engaging in antisocial behavior. Two follow-up studies (Foley, Eaves, & Wormley, 2004; Nilsson et al., 2006) replicated these findings. In comparison, the long allele of MAOA-LPR gene in association with psychosocial variables was found to increase the risk for aggression in girls (Sjöberg et al., 2007).

According to evolutionary theory, the killing of offspring may be an adaptive strategy, which increases an individual's reproductive fitness (Trivers, 1985). In certain species of animals (e.g., rats, horses, monkeys), mothers are likely to abandon or kill children whose life expectancy is reduced in order to dedicate their resources to the healthy offspring or future pregnancies (Bruce, 1960; Roberts, Lu, Bergman, & Beehner, 2012). Daly and Wilson (1988) argued for the existence of similar behavioral patterns in human mothers. However, this evolutionary perspective on child killing appears to hold true only for neonaticide (Spinelli, 2001). The murder of older offspring has been more often associated with mother's psychopathology (Bourget & Gagné, 2002; Resnick, 1970). Furthermore, it was suggested that parents invest more in their genetic offspring because they carry copies of their genes (Hamilton, 1964). According to selectionist theories, stepparents tend to be more abusive toward children than biological parents (Daly & Wilson, 1998). However, research on stepparental filicide is still scarce and hence these findings are inconclusive.

Pitt and Bale (1995) highlighted the importance of investigating mental health risk factors leading to child homicide. Researchers have noted the presence of serious mental illness, especially psychosis and depression, as one of the main factors leading to maternal (Gottlieb, 1996; McKee & Shea, 1998; Resnick, 1969; Sadoff, 1995) and paternal filicide (Farooque & Ernst, 2003). Social isolation and inability to maintain healthy relationships were found to further strengthen this association for female offenders (Simpson & Stanton, 2000). Mentally ill mothers appear to kill older children more often than mothers not affected

by psychopathology (Stone, Steinmeyer, Dreher, & Krischer, 2005). A history of substance abuse was often found in filicidal fathers (Mensah, 2003; Somander & Rammer, 1991). It was also reported that female filicide perpetrators are more likely to be referred to psychiatric hospitals for treatment, whereas male offenders are mostly imprisoned or executed (Pitt & Bale, 1995).

1.3.Filicide followed by suicide

In 2012, there were 5,981 suicides in the UK among people aged 15 or over. Of the total number of suicides, 4,590 were committed by males and 1,391 by females. The highest suicide rate was reported for men aged 40 to 44 (Statistical Bulletin, 2014). Risk factors for suicide include previous suicide attempts, schizophrenia, depression, hopelessness, serious medical illness, substance abuse, and relationship problems (Canetto & Lester, 2002; Graham et al., 2000; Hendin, Maltsberger, Lipschitz, Pollinger Haas, & Kyle, 2001; Kleespies, Hughes, & Gallacher, 2000; Linn & Lester, 1997; O'Connor & Nock, 2014). According to Beautrais (2000), one of the strongest predictors of suicide is psychopathology. Marriage and feelings of responsibility to the family serve as protective factors against suicide (Malone et al., 2000; Qin, Agerbo, Westergård-Nielsen, Eriksson, & Mortensen, 2000).

Filicidal parents were reported to have increased rates of suicide attempts. Maternal filicide-suicide was associated with extreme psychiatric disturbances (Alder & Polk, 2001). Other researchers found an association between depression and maternal filicide-suicide (Meszaros & Fischer-Danzinger, 2000). Maternal child homicides categorized as 'fatal maltreatment' or 'unwanted child', on the other hand, were very unlikely to be followed by self-killing (Holden et al., 1996). In a Canadian sample of filicidal mothers, women who murdered older children were at a greater risk of death by suicide, compared with mothers

who killed infants (Daly & Wilson, 1988). Additionally, maternal filicide-suicide was associated with killing multiple victims (Alder & Polk, 2001; Meyer & Oberman, 2001).

Research revealed that paternal filicide-suicide can occur in conjunction with *uxoricide* (i.e., killing one's wife). These acts are referred to as *familicide* and appear to be motivated by vengeful anger. Risk factors for such killings include marital disharmony or separation and sexual jealousy (Adinkrah, 2003, Smithey, 1998; Strang, 1996). Wilson, Daly, and Daniele (1995) found that more paternal familicides than filicides were followed by suicide. Additionally, the killing of genetic offspring, compared with the killing of stepchildren, more often led to subsequent suicide of a male perpetrator.

1.4. Current study

Research into filicide and related factors is still in its infancy. This is partly due to limited data and restricted access to them. Theoretical models and empirical studies conducted to date, however, have revealed the importance of numerous demographic, motivational, environmental, and psychosocial variables in child homicide. The purpose of this paper is to review, summarize, and critically engage with the findings of research into filicide in Western societies. The reason for conducting an updated review was to achieve more information about the most recent research findings in the field of maternal, paternal, and stepparental filicide as well as filicide followed by self-destructive acts.

2. Methodology

2.1. Search Strategy

A search in PubMed, PsychInfo, Scopus, Web of Science, and Science Direct was performed in September, 2014. The following keywords were used in order to identify relevant articles: *parent, parental, mother, maternal, father, paternal, stepparents, stepparental, stepmother,*

stepfather combined with *filicide*, *child murder*, and *child homicide*. Google Scholar was searched for complementary literature to ascertain that all relevant materials were found. Cited published research not generated in the search was also accessed.

2.2.Selection process

Articles reviewed in the current study met the following selection criteria:

1. The study contained data on genetic mothers and fathers as well as stepparents who committed filicide.
2. The study assumed a quantitative approach to data description and/or analysis.
3. The total number of cases examined was 10 or greater.
4. The studies were written in English and published in peer-reviewed journals over the last 14 years (2000-2014).
5. The studies were conducted in Western societies.

The abstracts of 43 studies were inspected in order to ascertain whether they contained relevant information and that they met all the inclusion criteria. Next, the methodological quality of the studies was assessed by two independent reviewers. A consensus method was used to resolve disagreements regarding inclusion of a study. Finally, 17 relevant empirical studies were identified.

2.3.Data extraction and analysis

Relevant information was extracted into a summary table. The following data from the studies were retrieved: author, year of publication, study population, measures, methods of data collection, and study findings (see Table 1). Due to the heterogeneity of selected studies, quantitative analysis of data was not feasible. Therefore, the results were presented as a narrative review.

Table 1

Description of 17 studies included in review

Study	Study population	Method of data collection	Findings
Barone et al. (2014)	<ul style="list-style-type: none"> - Total of 121 women - NPM – 61 - MIM – 37 - FM – 23 	<ul style="list-style-type: none"> - Clinical information - Attachment Mental Representations (AAI) questionnaire 	<ul style="list-style-type: none"> - MIM and FM, in comparison with NPM, had lower socioeconomic status and more traumatic experiences - FM were more insecure, unresolved, and had higher levels of HH attachment patterns than NPM and MIM
Bourget & Gagné (2002) ¹	<ul style="list-style-type: none"> - 27 mothers (34 victims) who committed filicide from 1991 to 1998 in Québec, Canada 	<ul style="list-style-type: none"> - Retrospective clinical study based on the examination of coroners' files 	<ul style="list-style-type: none"> - Mothers ranged in age from 19 to 49 years ($M = 32.25$) - Family violence recorded in six cases (22.2%) - The majority of offences occurred in the family home (70.6%) - Method of murder: carbon monoxide poisoning (23.5%), the use of firearm (17.6%), strangulation (14.7%), drowning (14.7%), stabbing (11.8%), beating (5.9%), and other (11.8%) - 23 mothers (85.2%) found to have mental health problems - 11 mothers committed suicide after murder
Bourget & Gagné (2005) ^{1,2}	<ul style="list-style-type: none"> - 60 fathers who killed their children from 1991 to 2001 in Québec, Canada 	<ul style="list-style-type: none"> - Retrospective clinical study based on the examination of coroners' files 	<ul style="list-style-type: none"> - Fathers ranged in age from 20 to 76 years ($M = 39$) - Marital problems were reported for 24 (40%) men - Psychopathology reported for 36 (60%) men - Multiple murder recorded for 14 men, 12 of them committed or attempted suicide and 11 had mental health problems - Case classification: mentally ill filicide ($n = 49$, 64%), fatal abuse

Study	Study population	Method of data collection	Findings
Camperio Ciani & Fontanesi (2012)	<ul style="list-style-type: none"> - A total of 110 cases of mothers killing 123 of their own children from 1976 to 2010 in Italy - 39 cases of neonaticide - 28 cases of infanticide - 43 cases of filicide 	<ul style="list-style-type: none"> - Data collected from lawyers' archives and the archives of the Forensic Psychiatric Hospital of Mantova 	<ul style="list-style-type: none"> - filicide ($n = 19, 25\%$), retaliating filicide ($n = 2, 4\%$), and other/unknown ($n = 6, 8\%$) - The common profile of infanticidal and filicidal mothers includes psychopathology, suicide or attempted suicide after homicide, violent killing of victims, no attempt to conceal victims' bodies
Farooque & Ernst (2003) ^{1,2}	<ul style="list-style-type: none"> - 11 men and 8 women who underwent forensic psychiatric evaluation for filicide at the Middle Tennessee Mental Health Institute (Forensic Service) from 1993 to 2001 	<ul style="list-style-type: none"> - Data gathered using retrospective case review methodology 	<ul style="list-style-type: none"> - Psychiatric diagnosis common among offenders - An association between offender's mental retardation and child neglect - Offenders with impaired cognitive functioning murdered younger children than offenders with normal intelligence
Friedman et al. (2008) ²	<ul style="list-style-type: none"> - A total of 49 filicidal women - 10 FS mothers - 19 FAS mothers - 20 FO mothers 	<ul style="list-style-type: none"> - Data collected by retrospective review of coroner's (Cleveland, OH) and court (Michigan, OH) records 	<ul style="list-style-type: none"> - FS mothers – most likely to be married and to murder older children, less likely than the remaining groups to be delusional - FAS mothers – most likely to have a substance abuse history - FS and FAS mothers were more likely to have an altruistic motive for filicide than FO mothers - No group differences for employment, domestic violence victimization, history of neglect/abuse of the child, custody disputes, or depression - The majority of mothers in each group had previous mental health treatment
Harris et al. (2007) ²	<ul style="list-style-type: none"> - 378 cases of parental and 	<ul style="list-style-type: none"> - Data obtained from the 	<ul style="list-style-type: none"> - Genetic mothers had mental health problems,

Study	Study population	Method of data collection	Findings
Kauppi et al. (2010) ^{1,3}	<p>stepparental filicide</p> <ul style="list-style-type: none"> - Sample 1: 200 cases of child murder in Finland (56 neonaticides, 75 filicide-suicides, 69 other filicides) - Sample 2: Other filicides ($n = 65$) sample studied more closely. This included 42 maternal (committed by 38 mothers) and 23 paternal (18 fathers, 2 stepfathers) filicides. 	<p>Violent Crime Linkage Analysis System (ViCLAS) in Canada</p> <ul style="list-style-type: none"> - Retrospective case review of data obtained from Statistics Finland, and medical and forensic records (including forensic psychiatric evaluation) 	<p>killed their children for altruistic reasons, attempted suicide, and killed the youngest victims</p> <ul style="list-style-type: none"> - Genetic fathers were motivated by marital discord and killed out of anger - Stepparents were more likely to kill than genetic parents - Stepfathers' killings were characterised by sexual motives and antisociality - Stepmothers represented the greater risk of filicide and tended to severely abuse their stepchildren prior to homicide <p>Sample 1:</p> <ul style="list-style-type: none"> - Victims significantly younger in maternal than paternal filicides - Most neonaticides committed by mothers - Most paternal filicide-suicides committed with the use of firearm - Maternal filicide-suicides were perpetrated by poisoning, drowning, or stabbing <p>Sample 2:</p> <ul style="list-style-type: none"> - Mothers more often experienced mental health distress - Men were motivated by jealousy and were reported to abuse alcohol - Psychosis and psychotic depression were more common among mothers - More men had a personality disorder, usually with borderline features - More women were found not responsible for their actions by reason of insanity <p>Neonaticidal mothers</p>
Krischer et al.	- A total of 57	- Data collected	- Neonaticidal mothers

Study	Study population	Method of data collection	Findings
(2007)	mothers - 8 cases of neonaticide - 12 cases of infanticide - 37 cases of filicide	through a retrospective chart review of women who killed their offspring admitted to the Mid-Hudson Forensic Psychiatric Hospital in New York State (MHFPC) between 1976 and 2000	troubled by psychosis, had low IQ levels, had no partner, and low socioeconomic status - Infanticidal mothers were young, and motivated by the feeling of anger - Filicidal mothers were severely depressed, had a history of physical or sexual abuse, and a high rate of suicide attempts following the murder
Léveillé et al. (2007) ²	- A total of 75 filicidal genetic parents who killed their children between 1986 and 1994 in Québec, Canada - Filicide-suicidal mothers ($n = 17$), filicidal mothers ($n = 22$), filicide-suicidal fathers ($n = 21$), and filicidal fathers ($n = 15$)	- Data collected from the coroners' investigation reports	Filicide-suicide as a function of perpetrator's sex: - Men killed more than one child and their spouse, had a history of family violence, their killings were motivated by revenge - Women killed for altruistic reasons and were more likely to live with their children Filicide as a function of perpetrator's sex: - Men were more likely to maltreat children - Women more often suffered from depressive disorders Paternal filicide by presence or absence of filicide: - Filicide-suicidal men were older, killed more than one child, went through marital separation, and suffered from depression - Filicidal men were more likely to maltreat children Maternal filicide by presence or absence of suicide: - Filicidal mothers were more likely to maltreat and live without their

Study	Study population	Method of data collection	Findings
Lewis & Bunce (2003) ²	<ul style="list-style-type: none"> - 55 women evaluated from 1974 to 1996 at the Center for Forensic Psychiatry (CFP) in Ann Arbor, Michigan - Sample divided into psychotic ($n = 29$, 52.7%) and non-psychotic ($n = 26$, 47.3%) groups 	<ul style="list-style-type: none"> - Clinical data gathered through retrospective chart review 	<ul style="list-style-type: none"> children - Filicide-suicidal mothers were more often motivated by altruistic reasons - Psychotic mothers – older, more likely to be married and educated - Non-psychotic women – more likely to be first-time parents, more aggressive towards children (e.g., beating, use of weapon) - Psychotic group membership was predicted by homicidal ideation toward child, voiced concerns about child before offense, and no past involvement with Children’s Protective Services
Liem & Koenraadt (2008) ²	<ul style="list-style-type: none"> - 79 men and 82 women detained in a forensic psychiatric observation hospital in Utrecht, Netherlands, between 1953 and 2004 for filicide ($n = 132$) or attempted filicide ($n = 29$) - The sample included biological, step, foster, and adoptive parents 	<ul style="list-style-type: none"> - Retrospective study based on the examination of clinical records of filicidal men and women 	<ul style="list-style-type: none"> - Paternal filicides – use of weapon, classed as accidental or retaliating - Maternal filicides – categorized as neonaticides or pathological - More women suffered from psychosis, but no gender differences for depression - Stepparents more likely to kill after maltreating the child
Lysell et al. (2014) ²	<ul style="list-style-type: none"> - Sample 1: 82 female and 69 male ($N = 151$) filicide offenders who killed 184 children in Sweden 1973-2008; 64 were filicide-suicide cases - Sample 2: 3,979 	<ul style="list-style-type: none"> - A nationwide matched cohort study - Longitudinal data obtained from national registry 	<ul style="list-style-type: none"> - Filicide perpetrators had lower education, were more often diagnosed with a psychiatric disorder, and were more likely to have a history of suicide attempts and violent crime than controls - Paternal filicide associated with affective

Study	Study population	Method of data collection	Findings
Mariano et al. (2014) ²	<ul style="list-style-type: none"> - convicted homicide offenders - Sample 3: general population controls (matched individually by age and sex) - 94,146 cases of filicide committed by genetic and stepparents in the USA between 1976 and 2007 	<ul style="list-style-type: none"> - Data derived from the U.S. Federal Bureau of Investigation's (FBI) Supplementary Homicide Reports (SHR) 	<ul style="list-style-type: none"> - disorders - Maternal filicide associated with psychotic disorders and prior violent crime - Substance misuse and prior violent crime was predictive of homicide, whereas prior suicide attempt predicted filicide - Infants (defined as children aged less than 12 months) were as likely to be killed by a mother as a father - Mothers younger than fathers - Parents mostly used personal weapon (killing with own hands or feet) - Stepparents more likely to use firearms - The most common stepparental filicide event was stepfather killing stepson, followed by stepfather killing stepdaughter - 92% of stepparental filicides were committed by stepfathers - Most offenses carried out at home (no gender differences) - Fathers were most likely to offend at night or in the morning - More mothers than fathers tried to hide their crime - Victims killed by mothers were younger than those of fathers - In a subgroup of employed offenders, fathers, compared with mothers, were more often motivated by marital discord or separation and were more likely to commit suicide after the offense
Putkonen et al. (2011) ²	<ul style="list-style-type: none"> - 75 female and 45 male filicide perpetrators from Austria and Finland 1995-2005 	<ul style="list-style-type: none"> - Data obtained from national registers in Austria and Finland 	<ul style="list-style-type: none"> - Most offenses carried out at home (no gender differences) - Fathers were most likely to offend at night or in the morning - More mothers than fathers tried to hide their crime - Victims killed by mothers were younger than those of fathers - In a subgroup of employed offenders, fathers, compared with mothers, were more often motivated by marital discord or separation and were more likely to commit suicide after the offense

Study	Study population	Method of data collection	Findings
Vanamo et al. (2001) ¹	<ul style="list-style-type: none"> - 70 child homicide victims (42 boys and 28 girls) from Finland between 1970 and 1994 - 26 were victims of infanticide and 44 of filicide - Perpetrators were mothers ($n = 43$), fathers ($n = 23$), and stepfathers ($n = 3$), and unspecified parent ($n = 1$) 	<ul style="list-style-type: none"> - Data gathered from Statistics Finland, forensic autopsy reports, police and court records 	<ul style="list-style-type: none"> - The victims of mothers were younger than those of fathers - The most frequent cause of death in maternal filicide was drowning, while in paternal filicide – head injuries
Weekes-Shackelford & Shackelford (2004) ²	<ul style="list-style-type: none"> - 3,925 filicide cases in which a child less than 5 years old was killed by genetic or stepparent 	<ul style="list-style-type: none"> - Data gathered using Supplementary Homicide Reports (SHRs) for the years 1976 through 1994 in the US 	<ul style="list-style-type: none"> - Children aged less than 5 years are more likely to be killed by stepparents than genetic parents - Genetic parents kill by suffocation, drowning, strangling, and shooting - Stepparents kill by beating or bludgeoning

Note. ¹=Descriptive study; ²=Neonaticide included in the sample and not analyzed separately; ³=Neonaticide included in one study sample only; FAS=Nonfatal suicide attempt; FO=No suicide attempt; FS=Filicide followed by suicide; NPM=Mothers from normative population; MIM=Mothers with mental illness; FM=Filicidal mothers; SES=Socioeconomic status; HH=Hostile/helpless

3. Results

3.1. Maternal filicide

3.1.1. Characteristics of perpetrators, victims, and offences

Empirical research suggested significant age differences between mothers who commit neonaticide, infanticide, and filicide. Camperio Ciani and Fontanesi (2012), in an analysis of 110 cases of maternal filicide in Italy, found neonaticidal mothers ($M = 26.5$, $SD = 7.5$) to be significantly younger than infanticidal ($M = 32.3$, $SD = 5.3$) and filicidal mothers ($M = 36.3$, $SD = 5.0$). No statistically significant differences in terms of age were found between the

infanticidal and filicidal groups. In direct contrast, Krischer, Stone, Sevecke, and Steinmeyer (2007), who studied the motives for maternal child homicides, found infanticidal mothers ($M = 23.7$, $SD = 4.8$) to be significantly younger than filicidal ($M = 32$, $SD = 6.8$) and neonaticidal women ($M = 29.9$, $SD = 9.3$). Based on a hierarchical cluster analysis, Krischer et al. suggested that filicidal mothers form the most distinctive group in regards to socio-demographic characteristics and psychopathology. Given the discordant results, more studies examining the differences between the three groups of female child killers are needed before final conclusions can be reached.

Some researchers looked at victim characteristics in order to determine whether certain groups of children are more likely to be murdered. In regards to gender, Camperio Ciani and Fontanesi (2012) reported equal victimization rates across male and female victims. Similar results were obtained by Bourget and Gagné (2002) in a retrospective clinical study within a sample of 27 filicidal women. Of the 34 victims, 55.9% were male and 44.1% were female, suggesting no victim gender bias. They ranged in age from four weeks to 13 years, with the majority of victims being younger than six years. This is consistent with statistical reports demonstrating that the risk of a child being killed decreases with age (Office for National Statistics, 2014).

Congruent with earlier empirical findings, genetic mothers posed the greatest risk of fatal harm to the youngest children (Harris, Hilton, Rise, & Eke, 2007). Kauppi, Kumpulainen, Karkola, Vanamo, and Merikanto (2010) reported the mean age of maternal victims ($M = 1.6$, $SD = 2.7$) to be significantly lower than the mean age of paternal victims ($M = 5.6$, $SD = 4.0$). The majority of infanticides (90%) and neonaticides (93%) were perpetrated by mothers. In most neonaticidal cases, women concealed pregnancy, gave birth at home, and killed the infant immediately after birth. Nevertheless, Mariano, Chan, and Myers (2014), in an analysis of 94,146 cases of filicide committed in the US, indicated that

infants (defined as children aged less than 12 months) were as likely to be killed by a mother as a father.

Bourget and Gagné (2002) found that the majority (70.6%) of offenses perpetrated by mothers occurred in the family home. The most common method of murder was carbon monoxide poisoning (23.5%), followed by strangulation (14.7%), drowning (14.7%), and stabbing (11.8%). It was unusual for mothers to beat their children to death (5.9%). Drowning and suffocation were also presented as the most frequent causes of death in maternal filicide (43%) in a study by Vanamo, Kauppi, Karkola, Merikanto, and Räsänen (2001). Krischer, Stone, Sevecke, and Steinmeyer (2007) suggested that neonaticide was most often committed by suffocation, while filicide was strongly associated with shooting and stabbing. Moreover, Léveillé, Marleau, and Dubé (2007) argued that maternal filicide was frequently perpetrated for altruistic reasons.

According to Putkonen et al. (2011), attempts at hiding the crime were more common among female than male offenders. However, this finding should be tempered by the inclusion of 23 neonaticide perpetrators in the study sample ($N = 120$). Given that prior research demonstrated neonaticidal mothers to be most likely to try to conceal their offense, it remains to be verified whether these findings hold true for filicidal women.

3.1.2. Psychiatric history and cognitive functioning

The presence of serious mental illness was previously noted as one of the main factors leading to maternal filicide (McKee & Shea, 1998; Resnick, 1969). Research studies chosen for the current review confirm the earlier findings. The most common psychiatric diagnoses for filicidal mothers appear to be schizophrenia, major depressive disorder, and personality disorder (Bourget & Gagné, 2002; Kauppi et al., 2010; Krischer et al., 2007; Léveillé et al., 2007; Lewis & Bunce, 2003). Lysell, Runeson, Lichtenstein, and Langstrom (2014), in a

comparison study between filicide and homicide perpetrators, found strongest associations between psychotic disorders and maternal filicide.

According to Bourget and Gagné (2002), the consideration of offender's mental health is crucial in accounting for filicidal acts. In the new classification framework for maternal filicide proposed by the authors, mental illness constitutes a separate category. The majority (85%) of filicidal mothers examined by Bourget and Gagné were classed as mentally ill. Similar results were reported by Liem and Koenraadt (2008). In a comparative study of maternal and paternal child homicide, the researchers found that a large proportion of maternal child homicides (65%) could be classed as neonaticides or pathological filicides. Moreover, women were significantly more likely to suffer from psychosis than men, however, no gender differences were found for depressive disorders. Conversely, Léveillé et al. (2007) suggested the prevalence of depression to be significantly greater in women than in men.

Harris et al. (2007), in an examination of 378 cases of parental and stepparental filicide, found that mental illness was most often associated with maternal filicide. Factors increasing the risk of serious mental health problems were poverty and lack of social support. By the same token, Kauppi et al. (2010) found that 74% of filicides perpetrated by females were preceded by mental health distress. Child homicide, therefore, may be a direct consequence of perpetrator's untreated mental illness. For example, psychotic filicidal mothers may act on paranoid delusions which make them believe their children to be possessed or dangerous (Lewis & Bunce, 2003).

Studies included in the current review reported significant differences between filicidal mothers with and without mental illness in relation to demographic variables, maternal history, offense characteristics, and behavioral patterns before and after murder.

Lewis and Bunce (2003) found that psychotic women ($n = 29$), in comparison with non-psychotic women ($n = 26$), were older, more likely to have been married (i.e., married, separated, or divorced), had a higher level of education, were less likely to be employed, and more often had a history of suicide attempts and substance abuse. Non-psychotic women, on the other hand, were more likely to be first-time parents.

In terms of offense characteristics, psychotic women were more likely than non-psychotic women to kill multiple victims, attempt suicide immediately after homicide, and confess to murder. Additionally, filicidal and infanticidal mothers, in comparison with those who committed neonaticide, were more often troubled by psychopathology (Bourget & Gagné, 2002; Camperio Ciani & Fontanesi, 2012; Lewis & Bunce, 2003). These findings are consistent with earlier research which demonstrated that mentally disturbed mothers kill older children (Stone et al., 2005). Contrastingly, Krischer et al.'s (2007) hierarchical cluster analysis revealed psychosis to be common among neonaticidal mothers, whereas filicidal mothers tended to be severely depressed. Women in the filicidal group were also more likely to have a history of physical or sexual abuse and reject the child prior to the killing. Correspondingly, Putkonen et al. (2011) asserted that mothers more often than fathers were victims of abuse; however, this study did not distinguish between different groups of female offenders. This may imply that filicide is strongly affected by childhood trauma and the inability to cope with it. Nevertheless, due to a relatively small sample size (eight neonaticides, 12 infanticides, 37 filicides) used by Krischer et al. (2007), these findings should be treated with caution.

Non-psychotic women, compared with those suffering from psychosis, were also demonstrated to be more aggressive towards their children (e.g., beating to death, use of weapons) and to be more often reported to Children's Protective Services. Psychotic women who had contact with Children's Protective Services were usually referred for child neglect,

rather than abuse. Multiple logistic regression analysis revealed that psychotic group membership was best predicted by homicidal ideation towards children, voiced concerns about children before the offence, and no past involvement with Children's Protective Services (Lewis & Bunce, 2003).

Three studies included in the present review inquired into filicidal parents' cognitive functioning. Farooque and Ernst's (2003) research with 11 fathers and eight mothers aimed to verify whether intellectual impairment can affect filicide. Four of the study participants were reported to have mental retardation in the borderline range (70-84) and four in the mild range (55-70). Findings revealed an association between mental retardation and child neglect of the offender. Perpetrators with impaired cognitive functioning were more likely to kill younger victims than offenders with normal intelligence. Due to the study sample selection and approach to data analysis, however, the conclusions must be treated with caution. Maternal and paternal filicides were analysed together and no distinction between neonaticidal, infanticidal, and filicidal offenders was made. Furthermore, Krischer et al. (2007) reported lower IQ levels for neonaticidal mothers, compared with infanticidal and filicidal mothers. In a study by Kauppi et al. (2010), most offenders were reported to be of average intelligence; yet, these results were reported for perpetrators of both genders together.

3.1.3. Attachment patterns

Barone et al.'s (2014) study investigated the role of descriptive factors (such as psychiatric diagnosis, socioeconomic status, past traumatic experience) and attachment state of mind in filicide. The sample consisted of 23 filicidal mothers (FM) and two control groups - 37 mothers with mental illness (MIM) and 61 mothers from a normative population (NPM). Results demonstrated that MIM and FM, in comparison with NPM, had lower socioeconomic status, more traumatic experiences, were more insecure (more likely to focus on negative

emotions and anger in relation to past attachment relationships), unresolved (more likely to have an unconscious attachment traumatic memory), and displayed increased levels of Hostile/Helpless (HH) attachment pattern.

Although MIM and FM groups were similar on the background characteristics, FM were more likely to demonstrate disrupted attachment mental representations, suggesting that unresolved attachment conflicts may play an important role in filicide. Individuals with helpless attachment pattern were explained to feel unworthy and fearful in the caring task. Moreover, multinomial regression analyses revealed that background variables were less able alone than in combination with attachment variables to predict assignment to NPM, MIM, and FM groups. Only HH attachment was found to contribute significantly to predict filicide. Psychiatric diagnosis was a significant predictor of filicide only in association with HH states of mind.

To date, only Barone et al. (2014) have investigated multiple variables in relation to filicide. Although the results provided a significant contribution to the current understanding of child homicide, further examinations within a larger sample of filicidal mothers are needed in order to confirm the preliminary results. In addition, previous studies reported different risk factors for maternal and paternal filicide (Flynn, Shaw, & Abel, 2013). Therefore, research with fathers is warranted in order to verify whether disrupted attachment patterns are a significant predictor of paternal filicide.

3.2. Paternal filicide

3.2.1. Characteristics of perpetrators, victims, and offences

Bourget and Gagné (2005), in a retrospective study within a sample of 60 male offenders, inquired into demographic, social, and clinical risk factors in paternal filicide. Findings revealed that the majority of offenses (90%) took place in the perpetrator's home. In 18% of

cases, child murder occurred in conjunction with uxoricide, and in 46% of cases the offender committed suicide after murder. Most common methods of filicide included the use of firearm (34%) and battery (22%). Vanamo et al. (2001), on the other hand, reported head injuries as the most frequent cause of death among paternal filicide victims.

Furthermore, one-fourth (27%) of the sample examined by Bourget and Gagné (2005) had a history of repeated aggressive behavior. Filicidal fathers were mostly motivated by marital problems (40%). Similar results were reported by Harris et al. (2007), who found strong associations between paternal filicide and marital discord. Additionally, Kauppi et al. (2010) asserted that 50% of men were motivated by jealousy. Anger, impulsivity, and revenge were also listed as most common motives in paternal child killing in a study by Putkonen et al. (2011). This implies that filicidal fathers act out of strong negative emotions which are directed against the partner, rather than the child. Anger and impulsive reactions may arise from the lack of parenting skills and coping mechanisms, or the sense of personal inadequacy (Palermo, 2002). Male perpetrators were also noted for their antisocial behavior in adolescence and adulthood (Kauppi et al., 2010), which, in conjunction with adverse life experiences, may lead to homicidal acts.

As mentioned earlier, the mean age of paternal victims was statistically significantly higher than the mean age of maternal victims (Liem & Koenraadt, 2008; Putkonen et al., 2011; Vanamo et al., 2001). Male offenders were also found to be older than their female counterparts (Mariano et al., 2014). Moreover, in 30% of paternal filicides, the child was separated from the perpetrator soon after birth. The death of those children was mostly caused by battering (Kauppi et al., 2010). Additionally, men were reported to be more likely to have a history of maltreatment towards their children and paternal filicide was often a result of fatal abuse (Léveillé et al., 2007). Support for this was provided by Liem and Koenraadt's (2008) research in which paternal child killings were most often categorized as

accidental or retaliating. However, one important limitation of the study is that the sample consisted of biological, step, foster, and adoptive fathers.

Men were found to be overrepresented in the commission of familicide (Putkonen et al., 2011). All instances of familicide studied by Harris et al. (2007) were perpetrated by fathers, on most occasions by genetic fathers. By the same token, Liem and Koenraadt (2008) reported that familicides were predominantly committed by men and motivated by marital conflicts or financial problems.

3.2.2. Psychiatric history and cognitive functioning

In a study by Bourget and Gagné (2005), psychopathology was reported for as many as 60% of fathers included in the sample. The most common psychiatric diagnoses included major depressive disorder, psychosis, and acute substance intoxication. The use of drugs and/or alcohol during the commission of offense was uncommon; however, fathers, compared with mothers, were more likely to be intoxicated when perpetrating filicide (Putkonen et al., 2011). Correspondingly, Farooque and Ernst (2003) suggested that parents who kill their children were likely to suffer from substance abuse/dependence, psychosis, and mental retardation. Nevertheless, this study analysed male and female offenders as one group.

In a retrospective review of filicides in Finland, Kauppi et al. (2010) found that 20% of fathers, compared with 50% of mothers, were diagnosed with psychosis or psychotic depression. Personality disorder, usually with borderline features such as immaturity, impulsiveness, and poor control of affect, was diagnosed in 67% of males and 41% of females. This may explain why paternal filicides are often committed out of vengeful anger. Unsurprisingly, 76% of mothers and 18% of fathers were found not responsible for their actions by reason of insanity. Finally, based on their study results, Bourget and Gagné (2005) proposed a classification framework for paternal filicide with the following categories:

mentally ill filicide, fatal abuse filicide, retaliating filicide, and other/unknown. Most of the participants (64%) were classed as mentally ill, which indicates a significant role of psychopathology in paternal child homicide.

3.3.Filicide by stepparents

There has been a dearth of research on stepparental filicide. Four studies in the current review aimed to differentiate between filicidal acts committed by genetic and stepparents. Harris et al. (2007) examined 378 cases of parental and stepparental filicide which occurred in Canada prior to 2003. Data were obtained from the Violent Crime Linkage Analysis System (ViCLAS) and included information on perpetrator's age, sex, relationship to the victim, criminal history, and offense characteristics. Results revealed that stepparents posed a significantly greater risk of filicide than genetic parents. Stepfathers, compared with biological fathers, were more likely to fatally harm children. Child homicides by stepfathers appeared to be characterized by sexual motives and antisociality. Indeed, history of antisocial behavior among filicidal fathers was also reported to be common in a study by Kauppi et al. (2010). However, although Kauppi and colleagues' study sample included cases of stepparental filicide, offenses committed by biological and stepparents were not analyzed separately. As such, it is difficult to verify to what extent genetic and stepfathers who murdered their wards differ on antisocial tendencies.

Furthermore, the victims of stepfathers were unexpectedly young (Harris et al., 2007). A similar behavioral pattern was found in non-human primates, whereby a newly dominant male kills offspring fathered by his predecessor (Wrangham & Peterson, 1996). The greatest risk of filicide, however, was represented by stepmothers. They were frequently found to beat and injure a child, and were usually known to child abuse services prior to the homicide. The risk of abuse and maltreatment significantly increased with the presence of stepmother's

genetic offspring. This suggests that women are unlikely to invest feelings and resources in children to whom they did not give birth (Harris et al., 2007). In direct contrast, Mariano et al. (2014) indicated that the most common stepparental filicide event was stepfathers killing stepsons, followed by stepfathers killing stepdaughters. Out of all stepparental child homicides, 92% were perpetrated by males. Additionally, stepparents, when compared with biological parents, were significantly more likely to kill using firearms.

Working from the evolutionary perspective, the purpose of Weekes-Shackelford and Shackelford's (2004) research was to compare patterns of filicides committed by genetic and stepparents. The researchers extracted information on 3,925 filicide cases using Supplementary Homicide Reports (SHRs) for the years 1976 through 1994 in the US. Results showed that children aged less than five years had a greater chance of being killed by stepparents than genetic parents. Genetic parents mostly chose methods of killing which produce quicker and less painful death, such as suffocation, drowning, strangling, and shooting. Stepparents, on the other hand, killed their wards by beating and bludgeoning. Correspondingly, according to Liem and Koenraadt's (2008) research findings, stepparents were more likely to kill after maltreating the child. These results appear to support the hypothesis of motivational differences between parental and stepparental child homicide.

3.4. Filicide followed by suicide

As mentioned in the introduction, increased suicide rates have been reported among filicidal parents. Bourget and Gagné (2002) identified a psychiatric motive for all mothers who committed or attempted suicide after the commission of murder. Camperio Ciani and Fontanesi (2012), in a study comparing mothers who committed neonaticide, infanticide, and filicide, discovered that infanticidal and filicidal women were most likely to be characterized by psychopathology. Those mothers were also older and their killings were often followed by

suicide or attempted suicide. Neonaticidal women, on the other hand, never committed suicide after murdering a child. In a similar investigation by Krischer et al. (2007), filicidal mothers were found to be severely depressed and to have a history of previous suicide attempts. When compared with neonaticidal and infanticidal mothers, they were more likely to attempt suicide immediately after homicide.

Friedman, Holden, Hrouda, and Resnick (2008) sought to investigate maternal filicide and its intersection with suicide. The research sample consisted of 49 filicidal women: 10 of whom committed suicide (FS), 19 who made non-fatal suicide attempt (FAS), and 20 with no suicide attempt (FO). Data were collected by retrospective review of coroner's and court records. The results revealed that FS mothers were most likely to be married and murder older children. Out of the three groups, they were also least likely to be delusional. FAS mothers frequently had a history of substance abuse. FS and FAS women, when compared with FO mothers, more often had an altruistic motive for child murder. No group differences were reported for employment, domestic violence, history of child abuse/neglect, custody disputes, or depression. The majority of mothers in each group had previous mental health treatment. Conversely, Harris et al. (2007) suggested that depressed mothers killed their children in order to protect them from an uncaring world and committed suicide immediately after.

Another study examining motivational differences between filicidal parents with and without self-destructive behaviour was conducted by Léveillé et al. (2007). Mothers who committed filicide-suicide were more often reported to be acting out of altruistic motives. As for paternal child homicide, men who committed suicide were older, killed more than one child, had gone through conjugal separation, and suffered from depressive disorders more often than filicidal men without suicide attempt. Filicidal parents without self-destructive behavior were more likely to maltreat their children prior to the offense.

Furthermore, maternal filicide-suicide was associated with the killing of multiple victims. Bourget and Gagné (2002) found that in all six cases of multiple murder incorporated in the study sample, mothers committed suicide immediately after homicide. Five of these mothers left suicide notes, which suggests premeditation. As for the method of killing, carbon monoxide poisoning was used in three cases, the use of firearm was noted in two cases, and in one case children were stabbed to death. Lewis and Bunce (2003) indicated that psychotic women were more likely than non-psychotic women to kill multiple victims and attempt suicide immediately after homicide.

In a later study, Bourget and Gagné (2005) examined 60 instances of paternal filicide in Québec in order to gain a better understanding of demographic, social, and clinical risk factors in paternal child homicide. Their findings suggested that multiple child murder is mostly followed by suicide or attempted suicide. Fathers who committed filicide-suicide were also noted for their mental health problems (major depressive disorder or psychosis). Interestingly, Putkonen et al. (2011) suggested an increased likelihood of suicide among filicidal fathers whose crimes were motivated by marital discord or separation.

4. Discussion

A detailed review of the literature has confirmed the importance of certain demographic, environmental, and psychosocial variables in the commission of filicide. Research indicates that younger children are at a greater risk of being killed by a parent (Bourget & Gagné, 2002). This finding is in line with statistical reports, which reveal highest victimization rates for children under one year old (Brookman & Nolan, 2006; Paulozzi & Sells, 2002), and previous empirical research findings (e.g., Adinkrah, 2003; Holden et al., 1996). It was also noted that fathers more often killed by battery and were more likely to have a history of maltreatment towards their children (Léveillé et al., 2007). Additionally, the mean age of

paternal victims was found to be significantly higher than the mean age of maternal victims (Kauppi et al., 2010; Liem & Koenraadt, 2008; Putkonen et al., 2011; Vanamo et al., 2001). One possible explanation of this is that fathers' relationships with older offspring, especially with sons, tend to be characterized by greater tension. Mothers, on the other hand, were reported to be more accepting of young adolescents (Updegraff, Delgado, & Wheeler, 2009). Older children manifest more behavioural problems and may be punished physically by fathers, especially those who lack parenting skills. Such 'justified' violence may prove excessive and eventually result in fatal harm.

Genetic parents were generally more likely to choose methods of killing which produce quick and relatively painless death, compared with stepparents who killed their wards by beating and bludgeoning (Liem & Koenraadt, 2008; Weekes-Shackelford & Shackelford, 2004). These results lend credence to the supposition that child homicides perpetrated by biological and stepparents differ significantly in terms of underlying motivational factors. Consistent with selectionist theories, stepparents may be more likely to maltreat and kill children due to greater reproductive costs associated with raising unrelated offspring. Stepparents' tendency to choose more brutal means of homicide is revealing of more feelings of bitterness and resentment than witnessed in offenses perpetrated by genetic parents (Daly & Wilson, 1998).

In order to advance the current understanding of maternal child murder and related factors, some researchers introduced filicide classification systems (e.g., Bourget & Bradford, 1990; Bourget & Gagné, 2002; Mugavin, 2008; Resnick, 1969; Scott, 1973). Nevertheless, the models have proved limited in their application to real-life child homicide cases. Maternal filicide was most often presented as a result of psychopathology (Kauppi et al., 2007; Léveillé et al., 2007; Lewis & Bunce, 2003). In the eyes of a mother suffering from psychiatric problems, killing her children means rescuing them from the cruel world, rather

than causing them harm. Therefore, present findings reveal that the categories of altruism and mental illness, proposed as two distinct entities within some classification models (e.g., Bourget & Gagné, 2002; Resnick, 1969; Scott, 1973), are highly associated and should not be studied in separation. This is congruent with Bourget and Bradford's (1990) framework, in which the pathological category incorporated altruistic motives.

Consistent with earlier speculations, mothers who did not meet the inclusion criteria for mercy/pathological killing were mostly those who committed neonaticide. Indeed, research demonstrated that most maternal child homicides could be classed as neonaticides or pathological filicides (Liem & Koenraadt, 2008). Neonaticidal women were noted for their lucidity and purposeful behaviour (Bourget & Gagné, 2002; Camperio Ciani & Fontanesi, 2012; Lewis & Bunce, 2003). As such, their actions are better understood in evolutionary terms, whereby children whose life expectancy is reduced are killed in order to allow for the relocation of valuable resources (Bruce, 1960; Daly & Wilson, 1988; Roberts et al., 2012; Spinelli, 2001). Mothers who killed newborns were younger and, hence, had a greater reproductive potential than women who killed older offspring (Camperio Ciani & Fontanesi, 2012). The distinct nature of neonaticide was also highlighted in Bourget and Bradford's (1990) classification system through the inclusion of neonaticide as an individual category. These findings suggest that neonaticide differs significantly from infanticide and filicide in regards to underlying motivational and psychosocial factors and, therefore, should be studied as a separate phenomenon.

Previous studies demonstrated that victims of abuse may become violent themselves. According to the current review, filicidal women more often experienced victimization in childhood than their male counterparts and other maternal child killers (Krischer et al., 2007; Putkonen et al., 2011). Some earlier empirical research found a relationship between childhood maltreatment experiences and adult violent crime and homicide convictions

(Haapasalo & Petäjä, 1999; Heide & Solomon, 2006; Widom, 1989), suggesting that childhood abuse may increase an individual's risk for future homicidal behavior. This is in line with Bandura's (1965) social learning theory which stresses the importance of past learning experiences on the emergence violence. Children are most likely to acquire aggressive behavior when they witness acts of violence, if their own aggression is positively reinforced, or when they are subject to violence themselves (Huesmann, 1988). Moreover, consistent with the cycle-of-violence perspective, it may be that abused women grow to believe that being violent toward their children is morally right (Mugavin, 2008). Consequently, critical cognitive structures that support the act of killing may be formed. Offering tentative support for this, earlier research revealed that childhood exposure to violence can result in cognitive distortions pertaining to rape (Debowska, Boduszek, Dhingra, Kola, & Meller-Prunski, 2014), which can then lead to overtly aggressive behavior (Hersh & Gray-Little, 1998; Lonsway & Fitzgerald, 1994). However, it may also be that certain in-born vulnerabilities in interaction with environmental factors lead to the emergence of criminal behavior (Ertem et al., 2000). Future research into filicide should consider the findings of most recent studies examining the role of genetic predispositions in violent behavior.

Another possible explanation of filicide has been offered by attachment theory. Although only one study selected for the current review inquired into attachment patterns in child killers, results indicated that filicidal women tend to be more insecure than mothers without filicidal ideations. They were also more likely to focus on negative emotions and expressed more anger. The increased level of Hostile/Helpless attachment pattern was predictive of child homicide (Barone et al., 2014). It may be that mothers insecurely attached to their children transferred this disrupted pattern of bonding from their childhood relationships (Adshead, 2002; Boduszek, Hyland, & Bourke, 2012). In line with the frustration-aggression hypothesis, the feeling of being threatened or abandoned experienced

by such individuals may result in overt aggression (Dollard et al., 1939). Furthermore, hostility was found to manifest itself in the willingness to hurt another person and, eventually, may evolve into violence (Smith, Glazer, Ruiz & Gallo, 2004; Ramírez & Andreu, 2006).

Biological and stepfathers were noted for their antisociality, repeated aggressive behavior, criminal convictions, and substance abuse history (Bourget & Gagné, 2005; Kauppi et al., 2010). Another study revealed anger and impulsivity as most common motives in paternal child killing (Putkonen et al., 2011). Previous research showed that psychopathy is positively correlated with reactive and instrumental aggression (Debowska & Zeyrek Rios, in press; Porter & Woodworth, 2007), indicating that filicide may be a function of psychopathic tendencies. Filicidal fathers were found to act out of revenge (Putkonen et al., 2011) and kill through battery (Bourget & Gagné, 2005; Kauppi et al., 2010), which is congruent with the finding that psychopaths are motivated by external goals (Williamson, Hare, & Wong, 1987) and their acts of violence tend to be “impulsively instrumental” (Hart & Dempster, 1997). However, studies revealed a strong influence of callous/unemotional traits (Factor 1), which constitute the core of psychopathy, on instrumental aggression. Reactive aggression appears to be a function of both Factor 1 and Factor 2 (lifestyle/antisocial) psychopathy (Snowden & Gray, 2011). Given that studies in the area child homicide did not inquire directly into parents’ psychopathic tendencies, the proposed relationship between psychopathy and filicide remains speculative at this stage. More studies are needed in order to determine whether different facets of psychopathy are significant predictors of filicidal behavior. Moreover, it appears that patterns of offending may differ across individuals scoring higher on emotional deficits or antisocial tendencies, with callous/unemotional characteristics being more closely related to crimes characterized by greater brutality.

According to the displaced aggression theory, aggression which cannot be expressed directly against the source of provocation may be transferred onto an innocent person

(Anderson & Bushman, 2002). Therefore, the consideration of family dynamics appears crucial in accounting for filicidal behavior. Indeed, the current review revealed that child homicide may be a function of disrupted family relations. Paternal child killing was reported to be motivated by marital problems or separation, suggesting that fathers murder their children in order to retaliate against their partner (Harris et al., 2007; Léveillé et al., 2007; Liem & Koenraadt, 2008). This is consistent with the finding that paternal filicide is frequently committed in conjunction with uxoricide, followed by suicide (Bourget & Gagné, 2005). One possible explanation of this is that men believe women and children to be their property. Lethal violence towards them, therefore, may be seen as an attempt to restore man's patriarchal rights (Daly & Wilson, 1988).

Nevertheless, studies included in the current review are not free from limitations. One fundamental problem observed in the literature regarding parental child homicide relates to the use of small samples. The difficulty of retrieving information on individuals who killed their own offspring is understandable; however, larger samples ought to be used in order to avoid not only the occurrence of Type II errors, but to increase the generalizability of research findings. Additionally, many studies are performed upon samples drawn from correctional and forensic psychiatric settings. Findings based on such samples are inherently biased and lack internal validity. Control samples drawn from the general population have been rarely recruited and, hence, potential risk factors leading to filicide could not be confidently identified. Research utilizing samples composed of treatment participants and matched controls are needed for more reliable comparisons between the groups to be made.

Moreover, the definition of filicide differs across studies. Although the term filicide refers to the killing of a child older than one year of age, it has been often used to denote the murder of child of any age. Studies reviewed here also varied in the choice of upper victim age limit. The lack of a uniform approach in this respect can have a significant effect on study

findings and can result in contradictory evidence. For example, the present review demonstrated that individuals who committed neonaticide should be studied in separation from infanticidal and filicidal offenders due to significant motivational differences underpinning their crimes. Additionally, studies inquiring into filicide and related psychosocial variables are mostly based on retrospective reviews of police, coroners', or court records and are predominantly descriptive. The identified risk factors were rarely analyzed simultaneously, which could result in not detecting important associations between them. Therefore, research with sound methodological designs and with more diverse samples examining the role of psycho-social variables in filicide is still missing and clearly needed.

This review demonstrates that child homicide is a function of perpetrator's socio-demographic characteristics and psychopathology. However, the purpose of this review was to focus on most recent findings in the area of parental child killing and, hence, the paper does not identify and appraise earlier research evidence relevant to filicide.

Research on filicide is still at a very early stage. Yet, there are indications that, in at least some cases, certain genetic, psychiatric, and environmental factors may interact to produce this rare but disturbing occurrence. Further research is urgently required to understand the mechanisms underlying this extreme form of violence, as well as victim characteristics, so that preventative strategies may be developed. It is recommended that, in future, all filicide killers who are apprehended are thoroughly assessed using standardized measures for assessing psychopathic traits, cognitive functioning, and psychopathology. The establishment of an international registry recording such information is another recommendation as this may offer the information that is needed to eventually be able to confidently determine the prevalence and factors associated with maternal, paternal, and stepparent filicide perpetration.

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