

Children killed by genetic parents versus stepparents[☆]

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Abstract

Despite many empirical studies of children killed by parents, there has been little theoretical progress. An examination of 378 cases in a national register revealed that circumstances differed for genetic parents versus stepparents. Infants were at greatest risk of filicide, especially by genetic mothers. Genetic mothers who killed offspring, especially older children, disproportionately had a mental illness and received relatively short sentences, if convicted. Filicides by genetic fathers were disproportionately accompanied by marital discord, suicide, and uxoricide. Filicides by stepparents were disproportionately common and likely to involve ongoing abuse and death by beating. Moreover, if parents also had genetic offspring, their stepchildren were at increased risk of ongoing abuse and neglect prior to death. Poor child health appeared to increase the risk of filicide by genetic mothers, especially as remaining opportunities for childbearing diminished. Although each finding might be consistent with existing lay accounts of filicide (depression, socioeconomic stress, etc.), together, they yielded a pattern uniquely consistent with selectionist accounts based mainly on parental investment theory.

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1. Introduction

Few crimes evoke emotions stronger than those evoked by the killing of a child. That an adult would deliberately cause the death of a child strikes many as inexplicable, especially in the case of filicide—killing one's own child. Yet homicide by family members is a common cause of death among children, especially if death due to neglect is included (Adinkrah, 2001, 2003; Boudreaux, Lord, & Jarvis, 2001; Goetting, 1988; Lord, Boudreaux, Jarvis, Waldvogel, & Weeks, 2002; Pritchard & Butler, 2003). The risk of filicide decreases with the age of the child (Adinkrah, 2001; Boudreaux et al., 2001; Finkelhor, 1997; Kunz & Bahr, 1996; Lord et al., 2002). At the youngest ages, mothers represent the greatest risk (Adinkrah, 2003; Boudreaux et al., 2001; d'Orban, 1979; Finkelhor, 1997; Holden, Burland, & Lemmen, 1996; Kung & Bahr, 1996; Lord et al., 2002; Xie & Yamagami, 1995). As

children age, however, they experience a greater risk of fatal harm from fathers and unrelated members of the household (Adinkrah, 2001, 2003; Finkelhor, 1997; Goetting, 1988; Kaplun & Reich, 1976; Kasim & Cheah, 1995; Kung & Bahr, 1996; Lord et al., 2002; Lucas et al., 2002; Lyman et al., 2003; Marleau, Poulin, Webanck, Roy, & Laporte, 1999; Smithey, 1998; Somander & Rammer, 1991; Strang, 1996).

Mothers who kill newborns are often criminally charged with an offense less than murder, which carries considerably milder sanctions. Infanticide is defined in the Canadian Criminal Code as the killing by a mother of her newborn child when she is mentally disturbed due to either lack of recovery from childbirth or the effect of lactation (Criminal Code, R.S., c.C., 1985, Part VIII, 34, s.216). Research suggests that a mother's killing of her infant is also related to youth, lack of experience, and stressors (such as being uncertain as to which sexual partner is the father of the infant, poverty, and lack of interpersonal support) (Adinkrah, 2001, 2003; Boudreaux et al., 2001; Haapasalo & Petaja, 1999; Hicks & Gaughan, 1995). Mothers who kill older children are usually seen as having a severe mental illness (Adinkrah, 2001; Bourget & Gagné, 2002; d'Orban, 1979; Haapasalo & Petaja, 1999; Holden et al., 1996; &

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Kunz Bahr, 1996; Lewis, Baranoski, Buchanan & Benedek, 1998; Silverman & Kennedy, 1988; Strang, 1996; Tuteur & Glotzer, 1959; Wilczynski, 1995, 1997; Xie & Yamagami, 1995). In this context, offense details, although horrific, do not typically imply antagonism towards victims. Indeed, the mother often seems to effect a tragic “rescue” by taking the child with her in ending her own life (Adinkrah, 2001; Silverman & Kennedy, 1988).

Fathers who kill their children also often kill themselves, but often seem to have acted out of vengeful anger (Adinkrah, 2001, 2003; Goetting, 1988; Kaplun & Reich, 1976; Kasim & Cheah, 1995; Lyman et al., 2003; Smithey, 1998). Such homicides seem to be characterized by sexual jealousy, marital discord, marital separation, and even uxoricide (killing one’s wife; Adinkrah, 2001, 2003; Lucas et al., 2002; Marleau et al., 1999; Strang, 1996). Investigators have coined the term “familicide” to describe the killing of children and their mother by the father/husband, often accompanied by a completed or an attempted suicide (Adinkrah, 2001, 2003; Daly & Wilson, 1988a, 1988b). It is almost unheard of for women to commit such mass family murder (Wilson, Daly, & Daniele, 1995). Overall, men who kill their children are reported to have worse histories of criminal, antisocial, and substance-abusing behaviors (Goetting, 1988; Kaplun & Reich, 1976; Kasim & Cheah, 1995; Pitt & Bale, 1995) than the male population at large, especially so for stepfathers (men acting in a paternal role but not genetically related to the victim) (Goetting, 1988; Hicks & Gaughan, 1995; Kaplun & Reich, 1976; Kasim & Cheah, 1995; Lucas et al., 2002; Lyman et al., 2003).

1.1. Explanation

The clinical literature on human filicide lacks a comprehensive explanation. Prevalent professional accounts of filicide emphasize socioeconomic stressors such as poverty and unemployment (e.g., Belsky, 1993; Finkelhor, 1997; Goetting, 1988), mental illness (Bourget & Gagné, 2002; Goetting, 1988; Marleau et al., 1999; Resnick, 1969; Stroud, 1996; Stroud & Pritchard, 2001; Wilczynski, 1995; Xie & Yamagami, 1995), and marital disharmony (Adinkrah, 2003; Stanton & Simpson, 2002; Somander & Rammer, 1991). In a study of laypeople’s explanations of child maltreatment, the prevalent opinions about etiology matched those advanced by experts in the field: poverty and family instability, substance abuse, stressors, moral ignorance, and individual pathology (Korbin, Coulton, Lindstrom-Ufuti, & Spilsbury, 2000). These explanations are insufficiently constrained; how poverty or family breakup induces some parents, but not most, to kill their children is unspecified, for example.

Those unfamiliar with the extensive literature on parent–offspring conflicts across species might wonder, “How could even a slight tendency to kill offspring ever be the result of Darwinian selection?” In mammalian species especially, high levels of parental solicitude represent an obvious and important aspect of reproductive

fitness. Within that general tendency, however, a parent’s reproductive interests are not isomorphic with those of each offspring. Extensive work (Hrady, 1979, 1999; Scrimshaw, 1984) has identified five possible bases (the first four of which represent aspects of adaptive function) for offspring killing by parents: (a) sexual selection—reproductive opportunity produced by killing the offspring of another (e.g., killing a prior male’s offspring, thereby hastening estrus); (b) parental manipulation—killing that directly improves the parents’ reproductive fitness (e.g., killing newborns that would draw resources away from older or future offspring); (c) direct resource competition; (d) resource exploitation (e.g., cannibalism); and (e) pathology. Lay interpretation of human filicide generally implies only the last nonadaptive basis (Hrady, 1999), but natural selection points to the first two of these as relevant to all filicides, including that by humans.

Among humans, data showing that filicide is associated with circumstances related to net ancestral reproductive fitness would argue for interpretations reflecting manipulation or sexual selection. These accounts depend on selectionist concepts of inclusive reproductive fitness and asymmetric parental investment. Selectionist accounts hypothesize that male reproductive fitness has been associated with proprietary behavior towards their mates. That is, some degree of coercion by men towards women and some degree of suspicion regarding their offspring is to be expected on the grounds that ancestral males who engaged in some form of coercion, threat, and even force to discourage their mates from sexual behavior with other men would be less likely to raise offspring who were not their own and, thus, were more reproductively successful. Threats that the perpetrator was demonstrably willing and able to carry out (in contrast to deliberate bluffing) could be expected to be the most potent of all (Daly & Wilson, 1988a, 1994; Wilson et al., 1995). The result is that human male psychology has an evolutionarily based tendency to regard the sexual alienation of a spouse as a catastrophic loss that is to be resisted via aggressive high-stakes tactics that usually succeed but occasionally backfire, resulting in loss of reproductive fitness. As such, an apparently maladaptive behavior could “represent the tail of some motivational distribution” (Daly & Wilson, 1998a, p. 443). Media reports tell us that a father can be so irrationally distraught or angered by his wife’s leaving him for another man that he kills her and her children. The selectionist approach both affords a source for such an extreme emotional reaction and explains why such lethal behavior is so uncommon in response to even the most extreme of life’s other tribulations, or among mothers under any circumstances.

Similarly, filicide by stepparents is unlikely to carry direct adaptive advantages (Forbes, 2005), but the clearest example of parents’ reproductive interests not coinciding with the child’s occurs in stepparenting relationships. Many stepparent relationships are loving; indeed, on selectionist grounds, prospective partners can be expected to exhibit

some stepparental solicitude as a hard-to-fake aspect of mating effort. Nevertheless, selectionist work on infanticide (e.g., [Hrdy, 1999](#); [McCleary & Chew, 2002](#); [Turke, 1996](#)) demonstrates that, in a world of limited resources, stepparental investment entails greater reproductive cost (and smaller reproductive benefit) than genetic–parental solicitude. Despite its widespread representation in folklore, the association between maltreatment of children and stepparenthood has only rather recently been empirically examined ([Wilson, Daly, & Weghorst, 1980](#)). Research motivated by selectionist thinking found that stepparents, compared with genetic parents, represent a much greater risk of violence and death to children, independent of such other risk factors as parental age and poverty ([Daly & Wilson, 1998a](#)). The greater tendency of stepfathers to beat children to death in a rage ([Daly & Wilson, 1988a, 1994](#); [Weekes-Shackelford & Shackelford, 2004](#)) suggests a failure of solicitude (as distinct from a direct adaptive advantage to homicidal behavior) compared to comparatively painless planned filicides by gunshot or asphyxiation by genetic parents ([Weekes-Shackelford & Shackelford, 2004](#)).

There has been very little research on stepmaternal filicide. Because the risks to reproductive success associated with indiscriminant stepparental solicitude are greater for women (who experience much less variability in reproductive success) than for men, women would be expected to exhibit even greater differences in levels of parental solicitude as a function of their status as either genetic mothers or stepmothers. Furthermore, human fatherhood entails more parental uncertainty than motherhood (due to extrapair mating, concealed ovulation, and internal gestation) such that parental solicitude would be expected to be more similar among fathers and stepfathers than between mothers and stepmothers.

Perhaps the most challenging case for laypeople to comprehend—the mother who kills her own child—is most likely to be explained from a selectionist account as having had direct adaptive benefits. Mothers are obliged to invest much in each offspring, through gestation and lactation, and the consequent sacrifice of opportunities to produce other offspring. Thus, they stand to lose much by investing in offspring who would not thrive as well as might later offspring. Occasions on which the mother of an infant elects to let or to cause the child to die are expected to be most common when the child is an infant (relatively few resources have already been expended), the mother is young (she has more prospects for later successful reproduction), her resources are scarce, paternal support is undependable for any reason, or the infant has obvious health problems. These would all be circumstances in which women's ancestral reproductive fitness might have been enhanced by parental manipulation—killing a child in order to devote more resources to older offspring or to delay reproduction until more favorable circumstances are likely to prevail. Thus, this selectionist account can explain the well-established finding that maternal filicides exhibit a

greater inverse relationship with age than child homicides perpetrated by anyone else. The killing of healthy children by genetic mothers after their first year of life is sufficiently rare that one could hypothesize that it is primarily a true pathology or disorder ([Daly & Wilson, 1988a](#)). Following [Wakefield \(1992\)](#), we define a “disorder” as a harmful dysfunction (i.e., the failure of a mechanism to perform the function for which it was designed by natural selection). Compared to all other perpetrators, genetic mothers who kill noninfants are more likely to be diagnosed with serious mental disorders and to be excused on account of insanity.

The explanatory utility of a selectionist account lies on its ability to make sense of the overall pattern of child homicide by humans, including comparisons between male and female perpetrators, between genetic and stepparental perpetrators, and even between maternal perpetrators of infants versus maternal perpetrators of older children ([Janson & van Schaik, 2000](#)). It does not simply account for Cinderella's treatment at the hands of her stepmother ([Daly & Wilson, 1998b](#)), but uniquely predicts how she would be treated differently by her mother, father, or stepfather, or indeed by her stepmother had there been no stepsisters. The issue addressed by the present research is the accommodation of proximal (and often apparently pathological) factors related to individual findings pertaining to filicide by more distal selectionist hypotheses.

1.2. *The present study*

There is limited research on children killed by stepmothers, and little of the research on human filicide has systematically compared all four categories of perpetrators (genetic mothers, genetic fathers, stepmothers, and stepfathers) and cases in which children were killed by nonfamilial adults. As well, few previous studies have examined the circumstances of the offenses in detail, in part because research has relied on general registers containing limited data on the offense. The present study employed detailed materials gathered by police investigators in the form of a standardized investigative database, permitting us to compare the manner of death of children killed by genetic parents and stepparents with that by nonfamilial adults, and to examine three of the hypothetical bases for filicide suggested by selectionist accounts. Specifically, we hypothesized that pathological factors would most characterize filicide by genetic mothers of older victims because those offenses are least likely to serve the perpetrator's reproductive fitness. Thus, consistent with prior research, we expected that mental illness and legal findings of insanity would be most common among genetic mothers killing older children.

We hypothesized that parental manipulation would, however, characterize many other filicides by genetic mothers, especially young mothers of infant victims, or unhealthy older victims. Thus, and consistent with prior research, we expected that sadness or despair, rather than

hostility, would be most common among genetic mothers killing infants and that the manner of causing death would be comparatively painless rather than implying anger or rage. As well, some mental illnesses (especially depression) were expected to be associated with the lack of personal and material resources. We also hypothesized that filicide by fathers, especially genetic fathers, would be characterized by coercive tactics aimed at controlling the reproductive behavior of mates. We regarded this form of filicide as a behavioral “tail end” of parental manipulation. Thus, and consistent with previous research, prior marital discord and conflict, and uxoricide, familicide, and suicide would be most common among fathers, and especially among genetic fathers.

Among stepparents, and especially stepmothers, we hypothesized that evidence of weaker parental solicitude and resource competition would be most common. Thus, and consistent with prior research, stepparents would represent a greater risk of filicide than would genetic parents. In addition, denial of resources (i.e., neglect) and reduced parental solicitude in the form of prior abuse and overt hostility, anger, rage, and beating to death would be most common among filicides by stepparents. In particular, we hypothesized that the reproductive costs of stepparental solitude are greater for women than for men; thus (novel to this study), previous neglect and abuse, anger/rage, and beating to death would be most common among filicides by stepmothers. We further hypothesized that the effect of direct resource competition would be heightened by the presence of offspring genetically related to the perpetrator; thus (novel to this study), genetic offspring would be associated with worse previous abuse and neglect by stepparents.

2. Method

2.1. Subjects and procedure

Cases were drawn from the Violent Crime Linkage Analysis System (ViCLAS), a national police database of serious crimes designed to assist police services across Canada to identify similar cases being investigated across jurisdictions (Collins, Johnson, Choy, Davidson, & MacKay, 1998). The system began its operation in 1996 as an optional police reporting system and became mandatory in February 1997 for all qualifying offenses, including murder and attempted murder. Some cases that occurred prior to 1996 were subsequently entered into ViCLAS, and no cases have been purged. There is an associated audit process to ensure that all police services comply with the submission of qualifying cases. The database is maintained by the Royal Canadian Mounted Police, a national police service with recording centers across the country, including the one used for the present study in the Behavioral Sciences Section at the Ontario Provincial Police headquarters. Investigating officers are

trained to complete ViCLAS reports consisting of over 150 items. Investigators are trained to be complete and comprehensive regarding offense details, and to attend carefully to the temporal sequence of events in a narrative summary. Investigators submit ViCLAS reports during the course of investigations and are not restricted to cases resulting in criminal charges. It was not possible for us to evaluate the reliability of the data in ViCLAS reports, but we did conduct an evaluation of the interrater reliability of coding in the present research as described below.

The details reported about each case reflect the purpose of the system as an aid to crime solving. Nevertheless, many were also relevant to our hypotheses, including detailed descriptions of the victims' age, sex, educational status, premortem health status, and living situation. Investigators reported extensively on perpetrator personal factors and history including physical description, occupation, living situation, marital status, lifestyle, psychological and criminal history, information, and specific offense and post offense behavior. They also recorded details of the fatal offense: location, perpetrator–victim contact, sexual and nonsexual violence, type and method of injury, weapons employed, and the discovery of the body. From this database, we extracted all Canadian cases involving the homicide of a person under the age of 12 years where the perpetrator was believed to be known by police, even if not charged or convicted. This yielded 385 fatal cases prior to 2003.

A limitation inherent in this research is that the case must have been identified as a suspected homicide for it to be recorded. Such ascertainment is a limitation of almost all research studies on forensic samples, but in the present study, ascertainment might have been confounded with perpetrator category. For example, parents who caused the deaths of very young children might not be identified if they disguised the offense as death by accident or by natural causes (e.g., sudden infant death syndrome), which is not required to be recorded in ViCLAS. On the other hand, it might have been more difficult for killers of older children, who we hypothesize to have disproportionately been fathers, stepparents, and extrafamilial perpetrators, to have disguised their crimes. Although not a complete solution, we note that most Canadian jurisdictions apply additional levels of scrutiny to cases of child death, including those by apparent accident or natural causes. For example, in Ontario (Canada's most populous province), a Pediatric Death Review Committee, which reviews all cases of child death that were medically complex, was created in 1991 as part of the Office of the Chief Coroner. In 1997, it was decided that all child deaths (at any age) involving an open child protective service file also be reviewed. Furthermore, cases where the family or caregivers express any concern are also reviewed. In 1997, a new subcommittee was created and, since then, all child deaths under the age of 2 years have been also reviewed by an independent Deaths Under Two Committee, which has the ability to refer cases to the

Table 1
Case characteristics: means or dichotomous percentages $\pm 95\%$ confidence limits

Variable	Genetic relationship		Nongenetic relationship		
	Mother (<i>n</i> = 111)	Father (<i>n</i> = 86)	Mother (<i>n</i> = 16)	Father (<i>n</i> = 62)	Nonfamily (<i>n</i> = 103)
1. Victim's sex (% male)	51 \pm 9	57 \pm 10	50 \pm 25	56 \pm 12	41 \pm 9
2. Perpetrator's age in years	27 \pm 2	34 \pm 2	27 \pm 4	27 \pm 2	26 \pm 2
3. Victim's age in months	26 \pm 7	49 \pm 10	52 \pm 19	33 \pm 8	72 \pm 10
4. Victim lived with single parent (%)	22 \pm 7	33 \pm 10	0	12 \pm 8	9 \pm 5
5. Victim lived with step or half sibling (%)	1 \pm 2	1 \pm 2	38 \pm 24	16 \pm 9	13 \pm 5
6. Homicide had a sexual element (%)	0	0	0	19 \pm 10	50 \pm 10
7. Perpetrator attempted to deny offense (%)	81 \pm 8	78 \pm 9	81 \pm 19	76 \pm 11	66 \pm 9
8. Perpetrator "discovered" the body (%)	13 \pm 6	14 \pm 7	25 \pm 21	13 \pm 8	5 \pm 4
9. Perpetrator committed suicide (%)	11 \pm 6	40 \pm 10	6 \pm 12	6 \pm 6	9 \pm 6
10. Perpetrator reported to be suicidal (%)	37 \pm 9	48 \pm 10	13 \pm 16	15 \pm 9	12 \pm 6
11. Perpetrator's criminal history score	0.89 \pm 0.46	3.7 \pm 1.8	2.3 \pm 3.6	13.4 \pm 7.1	13.3 \pm 5.3
12. Perpetrator's sentence (years; life = 50 years)	10.4 \pm 4.3	10.1 \pm 3.5	15.4 \pm 11.3	14.8 \pm 3.4	18.4 \pm 2.6
13. Perpetrator acquitted due to insanity (%)	26 \pm 8	4 \pm 4	9 \pm 14	0	9 \pm 6

As explained in the text, any mean or percentage lying beyond the confidence limits of another is a statistically significant difference.

Pediatric Death Review Committee. The purpose of all these reviews is to independently scrutinize every death under the age of 2 years (no matter what the apparent cause) and any other complex, suspicious, or incompletely explained death of a child in order to ensure a complete police investigation and to order a coroner's inquest, when required. In addition, to help examine the potential scope of any ascertainment bias in the present study, we coded whether the identified perpetrator made any efforts to disguise the offense. We return to this potential limitation in the Results and Discussion section.

For the present study, research assistants, who were blinded to the study hypotheses but had several years' experience in coding similar police data, translated details directly from the database and coded several variables from narrative summaries. A separate record was derived for each child fatality whether or not more than one child in a family died on a single occasion. A few (*n* = 7) cases in which the perpetrator was a nonparental family member were dropped, leaving a total of 378 cases that met the inclusion criteria. In

18 cases in which a genetic parental perpetrator had an accomplice, seven were nonparents or unknown, eight were the other genetic parent (these were assigned to the genetic mother category), and three were the stepmother and genetic father (assigned to the stepmother category); subsidiary analyses indicated that assigning these to the respective paternal categories resulted in the same results reported. There were no cases in which the victim was recorded as having been adopted as an infant (i.e., under the age of 1 year); so, if any such adoptions occurred, they would have been assigned to a genetic parent category. One older child was recorded as having been killed by an adoptive father and was assigned to the "stepfather" category. Summary data for the qualifying cases are shown in Tables 1 and 2.

Some of the variables shown in the tables require elaboration. An offense was rated as having a *sexual element* (Table 1, Row 6) when the perpetrator sexually assaulted the victim or made some attempt to do so. Perpetrators who "discovered" the body attempted to avoid apprehension by pretending to have found an already dead

Table 2
Comparisons for variables involving familial perpetrator–victim relationships: means or dichotomous percentages $\pm 95\%$ confidence limits

Variable	Genetic relationship		Nongenetic relationship	
	Mother	Father	Mother	Father
1. Beating death score	0.61 \pm 0.21	0.59 \pm 0.17	1.6 \pm 1.0	1.3 \pm .30
2. Perpetrator used weapon or instrument (%)	78 \pm 13	69 \pm 16	50 \pm 28	39 \pm 16
3. Perpetrator's anger/rage score	0.25 \pm 0.12	0.58 \pm 0.17	0.63 \pm 0.35	0.85 \pm 0.15
4. Victim's abuse/neglect score	0.15 \pm 0.13	0.03 \pm 0.04	1.0 \pm 0.9	0.16 \pm 0.12
5. Perpetrator previously injured victim (%)	13 \pm 6	10 \pm 6	38 \pm 19	18 \pm 9
6. Severity of perpetrator's prior injury to victim	0.54 \pm 0.28	0.36 \pm 0.25	1.5 \pm 1.1	0.65 \pm 0.39
7. Marital conflict/problems score	0.18 \pm 0.11	0.73 \pm 0.20	0.31 \pm 0.32	0.21 \pm 0.12
8. "Shaken baby syndrome" (%)	8 \pm 5	19 \pm 7	13 \pm 18	26 \pm 7
9. Perpetrator's serious mental problems score	0.97 \pm 0.20	0.43 \pm 0.16	0.18 \pm 0.30	0.27 \pm 0.15
10. Victim was subject of official concern (%)	6 \pm 5	2 \pm 4	13 \pm 18	5 \pm 7
11. Perpetrator's substance abuse score	0.27 \pm 0.14	0.41 \pm 0.16	0.44 \pm 0.68	1.1 \pm 0.4
12. Perpetrator intoxicated at the time of offense (%)	2 \pm 2	8 \pm 4	13 \pm 18	15 \pm 8

As explained in the text, any mean or percentage lying beyond the confidence limits of another is a statistically significant difference.

victim (Table 1, Row 8). A perpetrator's *criminal history* for violent and nonviolent offenses (Table 1, Row 11) was rated using an expanded version of a well-validated scale capturing the frequency and severity of criminal conduct (the Cormier–Lang scale; Quinsey, Harris, Rice, & Cormier, 2006). *Beating death score* (Table 2, Row 1) was the number of distinct ways reflecting the sole use of the perpetrator's body to cause death (punching, kicking, stomping, manual strangulation, etc.). *Weapon or instrument* (Table 2, Row 2) referred to the use of any implement(s) or agent(s) to cause death (stabbing, shooting, burning, ligature strangulation, drowning, poison, etc.). *Anger/rage score* (Table 2, Row 3) was the number of distinct terms reflecting a perpetrator's anger (revenge, anger, and rage) that was noted by investigators as a motive. *Abuse/neglect score* (Table 2, Row 4) reflected the number of distinct terms (e.g., malnutrition, lack of appropriate care, and failure to provide adequate shelter or clothing) noted by police about fatal offenses or previous incidents, plus injury due to previous physical abuse. The *severity of prior injuries* (Table 2, Row 6) was rated on a 5-point scale ranging from 0=*none* to 6=*life-threatening injuries or those resulting in disability*. *Marital conflict/problems score* (Table 2, Row 7) was the number of distinct terms (e.g., sexual jealousy, marital separation, perpetrator or spouse with extramarital sexual relationship, child custody or access dispute, etc.) noted by police investigators as a relevant circumstance or motive. *Serious mental problems score* (Table 2, Row 9) was the number of distinct terms (e.g., depression, psychosis, delusion, hallucination, and extreme stress) used to describe the perpetrator's condition. The victim was rated as having been the *subject of prior official concern* (Table 2, Row 10) if the police investigators noted any report to formal child protective service agencies by anyone. *Substance abuse score* (Table 2, Row 11) was the number of distinct terms (e.g., alcoholic, drug addiction, intoxication, drug dealer, solvent abuse, etc.) police investigators used to characterize the lifestyle of the perpetrator.

The reliability of coding was assessed by having two researchers independently code 20 randomly selected cases on all variables. Items whose interrater reliability correlation coefficients did not exceed .80 were dropped, except for the dichotomous items “death by beating,” “death by suffocation,” and “death by gunshot,” each of which yielded $\kappa=0.643$ and was combined into composite variables, as described in the previous paragraph.

2.2. Parent-related denominators

We were able to find few Canadian data about children living with genetic (or adoptive) parents versus children living with stepparents (North American census agencies do not ask about this). According to one source, in 1995, 9% of Canadian children under 12 years who were living with a parent lived in a stepfamily (<http://www.divorcemag.com/statistics/statsCAN.shtm>, retrieved on January 10, 2006), and 16% lived with a single parent. Slep and O'Leary

(2005) reported that, among 453 representatively sampled couples (95% married) with 3- to 7-year-old children, 99% of the women were the genetic mother and 95% of the men were the genetic father. Assuming that all children living in a family lived with at least one genetic parent (i.e., ignoring the small proportion living with adoptive parents or with a stepparent only), Canadian children were at least 10 times as likely to live with genetic parents as with stepparents. Other sources indicated that living with a stepfather is at least 10 times as common as living with a stepmother (Weekes-Shackelford & Shackelford, 2004). US data indicate that at least 2% of children are adopted (www.adoptioninstitute.org/FactOverview.html, retrieved on February 8, 2006; <http://www.geocities.com/capitolhill/9606/statistic.html>, retrieved on February 8, 2006; Stolley, 1993) and that over a third of adoptions are by stepparents. Thus, we expect two or three cases in the present sample in which a child was erroneously coded as a genetic offspring. However, this would have had the effect of working against the present study hypothesis.

3. Results and discussion

There were 111 children killed by their genetic mothers, 86 killed by their genetic fathers, 16 killed by their stepmothers, 62 killed by their stepfathers, and 103 killed by nonkin. Except as noted below and in accordance with usual practice, we accept as statistically significant those differences in Tables 1 and 2 in which one perpetrator group mean lies outside the 95% confidence interval (95% CI) of another group mean. It is noteworthy (not shown in Table 1) that 23 parents killed more than one child, including 9 genetic mothers (two children killed), 12 genetic fathers (two to five children killed), and 2 stepfathers (two to four children killed). All the stepmother cases were single victims. Seven genetic mothers and 17 genetic fathers killed as many as five children and attempted to kill up to three more who survived. Nine homicides by nonfamilial perpetrators had multiple victims, including one in which six children were killed.

Overall, the most commonly recorded motives for killing the child were anger or revenge (40%), serious mental disorder (36%), substance abuse or intoxication (25%), poverty or other low resources (21%), or some kind of marital discord (21%). Comparisons among the groups for these circumstances are shown in Table 2. In 38% of cases, the child was beaten (punched, smashed, bashed, shaken, stomped, kicked, crushed, and/or manually strangled) to death. Ten children were starved. Among the remainder, the most common fatal methods were stabbing/slashing (28%), gunshot (22%), suffocation (20%), drowning (15%), fire (13%), ligature strangulation (12%), and poisoning (7%) (some perpetrators used more than one method). Table 2 (Rows 1 and 2) also shows the comparison among the groups with respect to beating homicides and those in which some instrument or weapon was used.

Fig. 1 shows the distribution of perpetrator relationships as a function of victims' ages, and Table 1 reports the average victim age (Row 3) for each perpetrator category. Children killed during the first few days of life whose exact date of birth was unclear were assigned the arbitrary age of 0.1 month. Consistent with previous findings, the youngest children were at greatest risk especially from genetic mothers, as hypothesized (Fig. 1). Nearly half of the victims of filicide by genetic mothers were less than a year old. The victims of genetic mothers were significantly younger than the victims of all other perpetrator categories combined [mean=36.3 vs. 53.2 months, $t(321)=3.14, p<.01$]. Fig. 1 also shows that the risk presented by genetic mothers declined until about the age of 6 years when it was approximately one sixth that for the first year of life and then remained relatively constant. Genetic fathers posed a higher risk than genetic mothers as the victims got older, but by the age of 12 years, about 65% of child homicides were perpetrated by nonfamily members.

There were 29 cases in which a mother (mean age=21.2 years, S.D.=5.4) killed a child within the first week after birth in an apparent attempt to conceal the birth. Examination of individual cases revealed many instances where the suicidal mother of older victims was acting in a deranged attempt to rescue the victims or to ensure they were not left

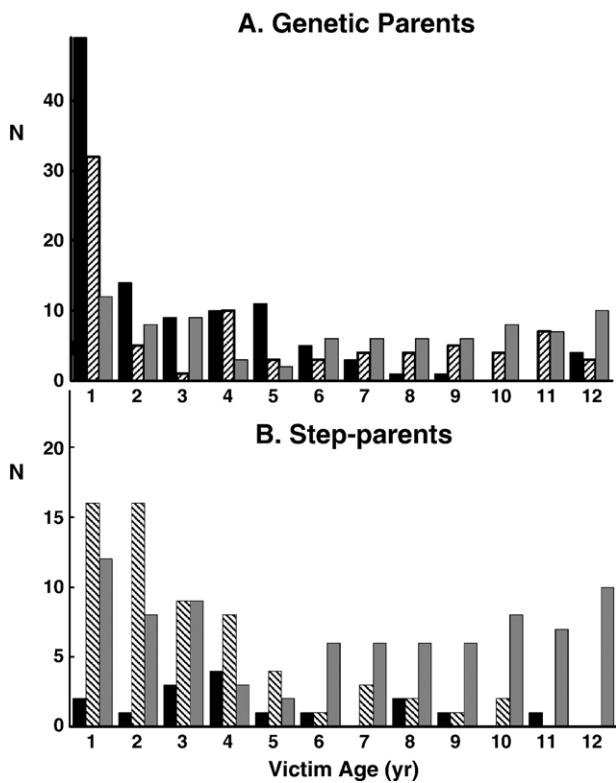


Fig. 1. Number of children killed during each year of life as a function of the victim–perpetrator relationship. Data for mothers are shown in solid black bars, and data for fathers are shown in cross-hatched bars. Data for nonfamilial killers (in gray bars) are shown in (A) and (B). Note the ordinate scale difference between (A) and (B).

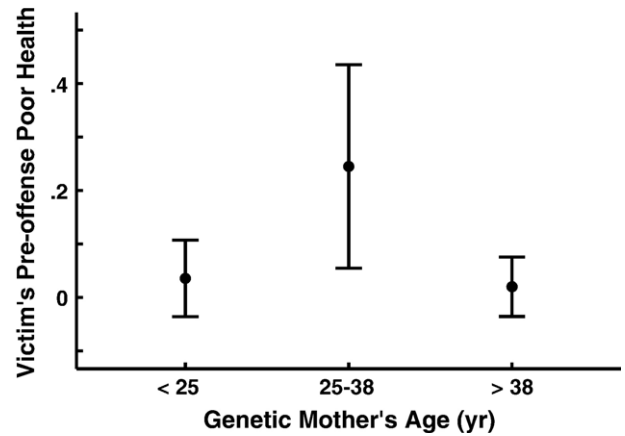


Fig. 2. Children killed by their genetic mothers. Victim health problems (95% CI) as a function of the genetic mother's age.

behind uncared for. For example, a severely depressed and suicidal genetic mother set herself and her two small children on fire; the children died but she survived. She reported later that she mainly had wanted to kill herself but could not bear to leave her children in an uncaring world. Genetic maternal perpetrators were especially unlikely to have previously abused and neglected their victims (Table 2, Row 4). Filicides by genetic mothers showed a significant curvilinear relationship between the victim's preoffense health and the mother's age (Fig. 2) such that the victim's poor health tended to be a factor in the latter half of the childbearing years; poor health increased the risk of filicide by genetic mothers as the remaining chances of becoming pregnant again waned. Once the opportunity for childbearing became very low, the risk of homicide unique to children in poor health declined.

As expected, serious mental problems and legal findings of insanity were highest among genetic mothers (Table 2, Row 9; Table 1, Row 13); furthermore, when convicted, these women received sentences shorter than those of all other groups, except genetic fathers (Table 1, Row 12). Mental illness, and especially depression, were associated with lack of personal and material resources among genetic mothers. For example, among genetic mothers, poverty or lack of social support (e.g., isolation from relatives or friends) was related to serious mental disorder [$r(111)=.25, p<.01$] and depression specifically [$r(111)=.22, p<.02$].

Based on our estimates under *parent-related denominators* above, we conclude that the prevalence of filicides by stepfathers and stepmothers was consistent with previous empirical findings and with the expectation that stepparents represented a greater risk of filicide than genetic parents. Group comparisons (Table 2, Rows 1 and 2) showed that stepparents overall were less likely than genetic parents to use a weapon or instrument and had higher beating death scores. Thus, anger, rage, ongoing abuse, and death by beating (Table 2, Rows 1, 3–6, and 10)—rather than quicker and more intentional means of causing death (e.g., weapon,

drowning, and poison; Table 2, Row 2)—characterized filicides by stepparents. Children killed by stepmothers experienced much worse ongoing abuse and neglect than any other victims (Table 2, Row 4). Among children killed by stepmothers, those who lived with the genetic children of that stepmother experienced much (and statistically significantly) more abuse and neglect before death than those who did not live with half-siblings [mean abuse score=2.0 (S.D.=2.2), 95% CI=±2.2; mean neglect score=0.4 (S.D.=.97), 95% CI=±0.69].

As noted above, a significant minority of killings by stepmothers occurred with the active assistance or complicity of the victim's genetic father. Whether this represented a paternal decision to trade parental investment for mating effort was unclear. It was clear from the case material, however, that it would be nearly impossible for a filicide characteristic of stepmother perpetrators (involving protracted physical abuse and neglect) to occur without every adult in the household being aware of it. While the beating deaths perpetrated by stepfathers were also characterized by considerable prior hostility or indifference towards the victims, such filicides by stepfathers did not exhibit the extreme ongoing abuse and severe neglect of stepmaternal filicides. Rows 1 and 4 of Table 2 indicate greater differences between the two mother categories than between the two father categories in beating deaths, abuse, and neglect. Genetic mothers and stepmothers also showed greater differences in the presence of severe mental disorder, prior official concern, and intoxication. The only notable exception was the previously noted extreme score for genetic fathers on marital conflict.

Table 2 (Row 7) shows that suicide and high levels of marital discord and conflict especially characterized filicide by genetic fathers. Consistent with the presence of extreme marital conflict, genetic fathers, like stepparents, were often scored as acting out of anger or vengeance (Row 3). Post hoc examination of the case material indicated that the rage of genetic fathers, but less often that of stepparents, was most often directed towards the victims' mother as opposed to the child. There were 22 cases of "familicide"—all perpetrated by fathers, most by genetic fathers. Among the 86 cases in which a genetic father killed one or more of his children, there were 16 cases in which the children's genetic mother was also killed, and there were six such cases among the 62 cases in which a stepfather killed one or more of his stepchildren (a nonsignificant trend towards more familicide by genetic fathers).

As shown in Table 1 (Rows 6 and 12), sexual motives and antisociality characterized child homicides by nonfamilial perpetrators and stepfathers. As might be expected (because their actions could be seen as advancing their own interests at the cost of others'), stepparental and especially extrafamilial perpetrators received more severe punishment than genetic parents (Table 1, Row 13). Unexpected was the young age of stepfathers' victims (Table 1, Row 3). This was reminiscent of sexually selected filicide among nonhuman primates,

whereby a newly dominant male kills infants sired by previous males, facilitating the impregnation of the mother by the new male (Watts, 1989; Wrangham & Peterson, 1996).

4. Summary, limitations, and conclusions

Extrapolating from available data, the results indicated a considerably greater risk represented by stepfathers than by genetic fathers. At least five times as many children live with genetic fathers, while the raw frequencies of filicide were roughly equal in the two groups. A most liberal estimate for the prevalence of stepmothering (5%) also suggested that stepmothers represent a substantially greater risk of filicide. Stepparents, especially mothers, were more likely to have exhibited anger, beaten the child, previously injured the child, and come to the attention of authorities for child abuse. The presence of a stepmother's genetic offspring increased the severity of prior abuse and neglect. Filicides by genetic mothers were more distinct in form and circumstance than filicides by stepmothers, compared with filicides by genetic fathers versus filicides by stepfathers. The expected relationship between victim's age and perpetrator category was observed; genetic mothers posed the greatest risk to infants. As age increased, paternal and nonfamilial perpetrators represented greater risk. Noninfant filicide by genetic mothers was characterized by mental pathology. Serious mental disturbance among genetic mothers was also associated with low material resources and social support. Poor child health increased the risk of filicide by genetic mothers during the latter half of the childbearing years. Genetic parents were more likely than stepparents to use an instrument or an agent to hasten death. When child killing was part of the killing of one's family, the perpetrator was always a father, usually a genetic father. Such offenses commonly involved marital conflict, and the perpetrator often killed himself.

We contend that selectionist approaches uniquely account for the entire set of findings. Poverty and social stress could explain infanticide by young genetic mothers, but cannot account for such findings as greater mental illness and legal insanity of genetic mothers versus other perpetrators; or greater anger, rage, hostility, and beating to death by stepparents versus genetic parents. Mental illness is consistent with many present findings, but cannot account for the observation that suicide, spousal homicide, familicide, and high levels of marital discord and conflict uniquely characterize filicide by fathers, or that death by beating would especially characterize filicides by stepparents. Marital disharmony could be a proximal cause of familicide especially, but cannot account for the finding that quicker methods of killing were used by genetic parents than by stepparents. The present findings are most consistent with human filicide as a form of parental manipulation (parental actions designed to seize control of reproduction by affecting resource allocation among offspring or by affecting the reproductive behavior of mates).

Rarer cases of filicide of older children by genetic mothers do imply a role for pathology.

There were several limitations to this study. First, we could find no good Canadian normative data on the age-related proportion of children living with nongenetic (adoptive or step) parents. Nevertheless, the very liberal estimates we did use would yield rates entirely consistent with other studies showing a greater risk associated with stepparenthood (Daly & Wilson, 1988a, 1988b, 1994). The strongest present test of the relative risks posed by genetic parents lies in the details of offenses and circumstances. Second, Fedorowycz (2002) reported a lower proportion of stepparental perpetrators in a survey of Canadian cases covering a similar time frame as that of the present study. Fedorowycz, however, did not count as stepparents those who had adopted a partner's children, and as domestic partners those who were not spouses. Furthermore, unlike the present procedure, Fedorowycz required that perpetrators could have been charged with homicide; did not require that investigating officers complete the survey; provided no training for respondents; did not perform audits of data quality; did not provide service to respondents in relation to the solving of cases; and, finally, handled multiple perpetrator cases to minimize the likelihood of identifying a stepmother.

Third, our use of the ViCLAS register did not completely rule out the risk of ascertainment bias—the possibility of a confound between case groups, the likelihood that the authorities accurately identified a child's death as a homicide, or the likelihood that the authorities accurately identified the true perpetrator. The ViCLAS authorities, criminal justice officials, and public health officials went to considerable lengths to prevent such errors, however. As well, our data indicated that equivalent proportions of the perpetrators in all parental groups attempted to avoid being identified as the culprit and employed similar unsuccessful tactics to misdirect the attention of the authorities (Table 1, Rows 7 and 8). Fourth, some offense details relevant to selectionist or nonselectionist hypotheses were unavailable (e.g., paternity uncertainty, income, and financial reverses). We did not have much detail on whether victims' health problems were due to abuse and neglect, necessitating caution in interpreting the finding that mothers' filicides of older children were associated with victims' ill health. Future research supplementing police information with child protection files and health records could overcome some of these limitations. Fifth, the data came from a single Western society, and research in other societies might uncover other forms of adaptive parental manipulation and additional evidence of sexually selected filicide by men or even by women (Hausfater & Hrdy, 1984; van Shaik & Janson, 2000).

4.1. *Prevention and future research*

An intriguing result pertained to high levels of criminal history among extrafamilial and stepfather perpetrators. The age of steppaternal perpetrators' victims was also

unexpectedly young; in this group, there was an inverse correlation between the victim's age and the perpetrator's criminal history score ($r = -.13$, ns). We speculate that some stepfathers were psychopaths (i.e., a condition marked by extensive criminality; Harris, Skilling, & Rice, 2001; Lalumière, Harris, Quinsey, & Rice, 2005; Lalumière, Harris, & Rice, 2001) who "joined" a family to secure victims or whose filicides exhibited remnants of sexual selection (enhancing reproductive capacity by killing the offspring of prior males) as an aspect of general mating effort. Elsewhere, we have provided evidence suggesting that psychopathic men do not suffer from a true disorder but, rather, that they have been designed by natural selection to pursue a life history strategy different from that of other men—one based on high mating effort and sexual coercion, cheating, impulsivity, and callousness. Adding to this characterization, we predict that psychopaths would exhibit especially low parental solicitude and that men who kill stepchildren are especially likely to be psychopaths.

In this context, we wondered whether the high-stakes life strategy associated with psychopathy was associated with the high-stakes tactics characteristic of familicide. Comparing fathers who killed children only with those who also committed uxoricide led to a surprise—the familicide perpetrators had less serious criminal and antisocial histories [mean = 2.11 (S.D. = 4.95) vs. 12.64 (S.D. = 27.77), $t(190) = 1.66$, $p < .10$]. Criminal history is not an ideal measure of psychopathy, and future research could specifically assess the construct. Nevertheless, it appeared that the callous and impulsive lifestyle characteristic of psychopathy does not include the extreme emotional reactivity associated with familicide.

Previous research suggests that men who commit uxoricide yield high scores on actuarial assessments for the general risk of domestic violence (Hilton & Harris, 2005; Hilton et al., 2004), and that many paternal filicides are occasioned by domestic conflict and marital discord. However, because of their general lack of criminal history, the present results suggested that genetic fathers who also kill their children might not exhibit high scores on such standardized assessments for domestic violence. Future research might profitably examine the perpetrators of familicide in more detail with a view to enhancing the validity of available risk assessments, especially with potential predictors informed by selectionist hypotheses. Moreover, another fruitful avenue for subsequent research could be the application of the existing methods of psychological test construction to the development of formal risk assessments for use by professionals in cases of child abuse and neglect, especially research in which variables informed by selectionist thinking are entertained as potential empirical predictors of recidivism. Present and previous findings indicate that the youngest children are most at risk, especially from genetic mothers, and that such filicides are often occasioned by lack of material and

personal resources, attempts to hide the birth, and mental illness, especially as children get older. These results point to the importance of prenatal and postnatal care for expectant and new mothers, and mental health care for all.

4.2. Final comment on explanation

The present findings were remarkably consistent with the prior research and selectionist analysis provided by Daly and Wilson (1984, 1988b) two decades earlier. Regarding the five possible bases for child killing, which were discussed in the Introduction, the present findings are most consistent with human filicide as reflecting various forms of parental manipulation (parental actions designed to seize control of reproduction by affecting resource allocation among offspring or by affecting the reproductive behavior of mates). Rarer cases of filicide by genetic mothers of older children do imply a role for pathology. We also note that some aspects of filicide by stepfathers resemble sexually selected infanticide by nonhuman males (Hrdy, 1999). More generally, we note that much apparently aberrant human conduct can be usefully understood as aspects of intrasex (e.g., sexually selected filicide) or intersex (e.g., parental manipulation) reproductive competition (Lalumière et al., 2005). A research challenge is empirically disentangling these two fundamental sources of explanatory power.

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References

- Adinkrah, M. (2001). When parents kill: An analysis of filicides in Fiji. *International Journal of Offender Therapy and Comparative Criminology*, 45, 144–158.
- Adinkrah, M. (2003). Men who kill their own children: Paternal filicide incidents in contemporary Fiji. *Child Abuse & Neglect*, 27, 557–568.
- Belsky, J. (1993). Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin*, 114, 413–434.
- Boudreaux, M. C., Lord, W. D., & Jarvis, J. P. (2001). Behavioral perspectives on child homicide. *Trauma, Violence & Abuse*, 2, 56–78.
- Bourget, D., & Gagné, P. (2002). Maternal filicide in Québec. *Journal of the American Academy of Psychiatry and the Law*, 30, 345–351.
- Collins, P. I., Johnson, G. F., Choy, A., Davidson, K. T., & MacKay, R. E. (1998). Advances in violent crime analysis and law enforcement: The Canadian Violent Crime Linkage Analysis System—ViCLAS. *Journal of Government Information*, 25, 277–284.
- Daly, M., & Wilson, M. (1988a). Evolutionary social psychology and family homicide. *Science*, 242, 519–524.
- Daly, M., & Wilson, M. (1988b). *Homicide*. Hawthorne (NY): Aldine de Gruyter.
- Daly, M., & Wilson, M. (1994). Some differential attributes of lethal assaults on small children by stepfathers versus genetic fathers. *Ethology and Sociobiology*, 15, 207–217.
- Daly, M., & Wilson, M. (1998a). The evolutionary social psychology of family violence. In C. Crawford, & D. L. Krebs (Eds.), *Handbook of evolutionary psychology* (pp. 431–456). Mahwah (NJ): Lawrence Erlbaum Associates.
- Daly, M., & Wilson, M. (1998b). *The truth about Cinderella: A Darwinian view of parental love*. New Haven, CT: Yale University Press.
- d'Orban, P. T. (1979). Women who kill their children. *British Journal of Psychiatry*, 134, 560–571.
- Fedorowycz, O. (2002). *Homicide in Canada—2000 (Report 85-002-XPE, Vol. 21, no. 9)*. Ottawa, ON: Statistics Canada.
- Finkelhor, D. (1997). The homicides of children and youth. In G. Kaufman Kantor, & J. Jasinski (Eds.), *Out of the darkness: Contemporary perspectives on family violence* (pp. 17–34). Thousand Oaks, CA: Sage Publications.
- Forbes, S. (2005). *A natural history of families*. Princeton (NJ): Princeton University Press.
- Goetting, A. (1988). When parents kill their young children: Detroit 1982–1986. *Journal of Family Violence*, 3, 339–346.
- Haapasalo, J., & Petaja, S. (1999). Mothers who killed or attempted to kill their child: Life circumstances, childhood abuse, and types of killing. *Violence and Victims*, 14, 219–239.
- Harris, G. T., Skilling, T. A., & Rice, M. E. (2001). The construct of psychopathy. In M. Tonry (Ed.), *Crime and justice: An annual review of research* (pp. 197–264). Chicago: University of Chicago Press.
- Hausfater, G., & Hrdy, S. B. (1984). *Infanticide*. New York: Aldine.
- Hicks, R. A., & Gaughan, D. C. (1995). Understanding fatal child abuse. *Child Abuse and Neglect*, 19, 855–863.
- Hilton, N. Z., & Harris, G. T. (2005). Predicting wife assault: A critical review and implications for policy and practice. *Trauma, Violence & Abuse*, 6, 3–23.
- Hilton, N. Z., Harris, G. T., Rice, M. E., Lang, C., Cormier, C. A., & Lines, K. J. (2004). A brief actuarial assessment for the prediction of wife assault recidivism: The Ontario Domestic Assault Risk Assessment. *Psychological Assessment*, 16, 267–275.
- Holden, C. E., Burland, A. S., & Lemmen, C. A. (1996). Insanity and filicide: Women who murder their children. In E. Benedek (Ed.), *Emerging issues in forensic psychiatry: From the clinic to the courthouse* (pp. 25–34). San Francisco: Jossey-Bass Publishers.
- Hrdy, S. B. (1979). Infanticide among animals: A review, classification, and examination of the implications for the reproductive strategies of females. *Ethology and Sociobiology*, 1, 13–40.
- Hrdy, S. B. (1999). *Mother nature: A history of mothers, infants, and natural selection*. Toronto, ON: Random House.
- Janson, C. H., & van Schaik, C. P. (2000). The behavioral ecology of infanticide by males. In C. P. van Schaik, & C. H. Janson (Eds.), *Infanticide by males and its implications* (pp. 469–494). Cambridge, MA: Cambridge University Press.
- Kaplun, D., & Reich, R. (1976). The murdered child and his killers. *American Journal of Psychiatry*, 133, 809–813.
- Kasim, M. S., & Cheah, I. (1995). Childhood deaths from physical abuse. *Child Abuse & Neglect*, 19, 847–854.
- Korbin, J. E., Coulton, C. J., Lindstrom-Ufuti, H., & Spilsbury, J. (2000). Neighborhood views on the definition and etiology of child maltreatment. *Child Abuse & Neglect*, 24, 1509–1527.
- Kunz, J., & Bahr, S. J. (1996). A profile of parental homicide against children. *Journal of Family Violence*, 11, 347–362.
- Lalumière, M. L., Harris, G. T., Quinsey, V. L., & Rice, M. E. (2005). The causes of rape: Understanding individual differences in the male propensity for sexual aggression. Washington, DC: American Psychological Association.
- Lalumière, M. L., Harris, G. T., & Rice, M. E. (2001). Psychopathy and developmental instability. *Evolution and Human Behavior*, 22, 75–92.
- Lewis, C. F., Baranoski, M. V., Buchanan, J. A., & Benedek, E. P. (1998). Factors associated with weapon use in maternal filicide. *Journal of Forensic Sciences*, 43, 613–618.

- Lord, W. D., Boudreaux, M. C., Jarvis, J. P., Waldvogel, J., & Weeks, H. (2002). Comparative patterns in life course victimization. *Homicide Studies*, 6, 325–347.
- Lucas, D. R., Wezner, K. C., Milner, J. S., McCanne, T. R., Harris, I. N., Monroe-Possey, C., et al. (2002). Victim, perpetrator, family, and incident characteristics of infant and child homicide in the United States air force. *Child Abuse & Neglect*, 26, 167–186.
- Lyman, J. M., McGwin, G., Malone, D. E., Taylor, A. J., Brissie, R. M., Davis, G., et al. (2003). Epidemiology of child homicide in Jefferson County, Alabama. *Child Abuse & Neglect*, 27, 1063–1073.
- Marleau, J., Poulin, B., Webanchk, T., Roy, R., & Laporte, L. (1999). Paternal filicide: A study of 10 men. *Canadian Journal of Psychiatry*, 44, 57–63.
- McCleary, R., & Chew, K. S. (2002). Winter is the infanticide season. *Homicide Studies*, 6, 228–239.
- Pitt, S. E., & Bale, E. M. (1995). Neonaticide, infanticide, and filicide: A review of the literature. *Bulletin of the American Academy of Psychiatry and the Law*, 23, 375–385.
- Pritchard, C., & Butler, A. (2003). A comparative study of children and adult homicide rates in the USA and the major western countries 1974–1999: Grounds for concern? *Journal of Family Violence*, 18, 341–350.
- Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. A. (2006). *Violent offenders: Appraising and managing risk*. (2nd ed.). Washington, DC: American Psychological Association.
- Resnick, P. J. (1969). Child murder by parents: A psychiatric review of filicide. *American Journal of Psychiatry*, 126, 73–82.
- Scrimshaw, S. C. M. (1984). Infanticide in human populations: Societal and individual concerns. In G. Hausfater, & S. B. Hrdy (Eds.), *Infanticide* (pp. 439–502). New York: Aldine.
- Silverman, R. A., & Kennedy, L. W. (1988). Women who kill their children. *Violence and Victims*, 3, 113–127.
- Slep, A. M., & O'Leary, S. G. (2005). Parent and partner violence in families with young children: Rates, patterns, and connections. *Journal of Consulting and Clinical Psychology*, 73, 435–444.
- Smithy, M. (1998). Infant homicide: Victim/offender relationship and causes of death. *Journal of Family Violence*, 13, 285–297.
- Somander, L. K. H., & Rammer, L. M. (1991). Intra- and extrafamilial child homicide in Sweden 1971–1980. *Child Abuse and Neglect*, 15, 45–55.
- Stanton, J., & Simpson, A. (2002). Filicide: A review. *International Journal of Law and Psychiatry*, 25, 1–14.
- Stolley, K. S. (1993). Statistics on adoption in the United States. *The Future of Children*, 3, 26–42.
- Strang, H. (1996). Children as victims of homicide. *Australian Institute of Criminology*, 1–6.
- Stroud, J. (1996). Mental disorder and the homicide of children: A review. *Social Work and Social Sciences Review*, 6, 149–162.
- Stroud, J., & Pritchard, C. (2001). Child homicide: Psychiatric disorder and dangerousness: A review and an empirical approach. *British Journal of Social Work*, 31, 249–269.
- Turke, P. W. (1996). Hypothesis: Menopause discourages infanticide and encourages continued investment by agnates. *Evolution and Human Behavior*, 18, 3–13.
- Tuteur, W., & Glotzer, J. (1959). Murdering mothers. *American Journal of Psychiatry*, 116, 447–452.
- van Schaik, C. P., & Janson, C. H. (2000). *Infanticide by males and its implications*. Cambridge, MA: Cambridge University Press.
- Wakefield, J. C. (1992). Disorder as harmful dysfunction: A conceptual critique of DSM-III-R's definition of mental disorder. *Psychological*, 99, 232–247.
- Watts, D. P. (1989). Infanticide in mountain gorillas: New cases and a reconsideration of evidence. *Ethology*, 81, 1–18.
- Weekes-Shackelford, V. A., & Shackelford, T. K. (2004). Methods of filicide: Stepparents and genetic parents kill differently. *Violence and Victims*, 19, 75–81.
- Wilczynski, A. (1995). Child killing by parents: A motivational model. *Child Abuse Review*, 4, 365–370.
- Wilczynski, A. (1997). Prior agency contact and physical abuse in cases of child homicide. *British Journal of Social Work*, 27, 241–253.
- Wilson, M., Daly, M., & Daniele, A. (1995). Familicide: The killing of spouse and children. *Aggressive Behavior*, 21, 275–291.
- Wilson, M. I., Daly, M., & Weghorst, S. J. (1980). Household composition and the risk of child abuse and neglect. *Journal of Biosocial Science*, 12, 333–340.
- Wrangham, R., & Peterson, D. (1996). *Demonic males: Apes and the origins of human violence*. Boston, MA: Mariner Books.
- Xie, L., & Yamagami, A. (1995). How much of the child murder in Japan is caused by mentally disordered mothers? *International Medical Journal*, 2, 309–313.