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24 A sociobiological analysis of human infanticide

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All organisms, including people, are products of the historical process of differential survival and reproduction that Charles Darwin called *natural selection.* This selective process is creative, producing attributes that appear to have been designed to achieve adaptive functions: digestion, clear vision, circulation of the blood, escape from predators, and so forth. But attributes are naturally selected only if they eventually contribute to reproduction, or more precisely to genetic replication, hereafter called "fitness." In evolutionary theoretical perspective, then, species-characteristic attributes must be explained in terms of their contributions to fitness. This is the "adaptationist program" that has guided most advances in biological understanding (Mayr, 1983).

This adaptationist approach is relatively straightforward when the attributes in question are morphological structures: A first question about a newly discovered organ or skeletal structure is, "What is it for?" Applying the same perspective to behavioral control mechanisms ("psyche"), however, is more problematic since a structural description of species-characteristic psyche (the thing to be explained) remains elusive. An adaptationist ("sociobiological") approach can shed considerable light on the human psyche, and we shall consider the motives and circumstances surrounding infanticide as a case in point.

Our emphasis on a psychological, rather than behavioristic, level of description is intentional and, indeed, essential. The specific act of infanticide may or may not benefit the actor's fitness, whether in

an individual case or on average, but the act need not contribute to fitness for a sociobiological analysis to be illuminating. Infanticide can be viewed as one (rare) manifestation of variations in more abstract motivational states such as child-specific parental love and solicitude. Adaptation may then be sought at the level of these more abstract states. Thus, in this chapter, we shall use the proposition that parental inclination varies adaptively to generate a series of testable hypotheses about human infanticide, hypotheses that in no way demand that infanticide per se contribute to fitness.

Two very different sources of data will be used to test our hypotheses. The first is the ethnographic record, which contains descriptions of circumstances in which infanticide is allegedly common, acceptable, sometimes even obligatory, in various human societies. Scrimshaw (Chapter 22, this volume) reviews several examples. These ethnographic accounts will enable us to test whether the circumstances in which infanticide is alleged to occur in different societies correspond to circumstances in which mitigation of parental inclination can be predicted from evolutionary theory. (These predictions presuppose that there is a cross culturally consistent human psyche at some level of abstraction, in contrast to an hypothesis of extreme cultural relativism we do not expect that motives of people in one society will be totally alien to people from another.) A limitation of ethnographic sources is that they are almost devoid of quantitative information that would permit the test of more specific predictions about the probability of infanticide under different circumstances. For this purpose, we shall examine recent data on children as homicide victims in Canada.

INFANTICIDE IN THE ETHNOGRAPHIC RECORD

The adaptive functions of parental solicitude toward offspring seem obvious. Parental care makes a clear and direct contribution to parental fitness. But each episode of parental care in animals such as ourselves also involves an enormous commitment of time and resources that might have earned higher fitness returns elsewhere. Evolved mechanisms of parental motivation are therefore unlikely to be indiscriminate: Natural selection would be expected to favor those individuals whose parental effort is best allocated so as to contribute to their own fitness. Parental inclination to care for a particular child is thus expected to be determined in part by available predictors of that child's eventual contribution to parental fitness. In Richard Alexander's (1979:109) words:

> Selection should refine parental altruism as if in response to three hypothetical cost–benefit questions: (1) What is the relationship of the putative offspring to its parents? (Is the juvenile really my own offspring?) (2) What is the need of the offspring? (More properly, what is its ability to translate parental assistance into reproduction?) (3) What alternative uses might a parent make of the resources it can invest in the offspring?

We predict here that the typologically described circumstances of infanticide in different societies will reflect parental sensitivity to each of these cost–benefit questions. A still stronger adaptationist hypothesis is this: Parentally instigated infanticide that does not make reproductive strategic sense within this framework will nowhere be described as normal or typical.

In order to test these hypotheses, ethnographic materials in the Human Relations Area Files (HRAF) for the "Probability Sample" of 60 societies described by Lagacé (1974) were examined. The HRAF consist of ethnographic materials arranged on microfiche according to various topics, one of which is infanticide (Murdock, 1976). The Probability Sample has been devised by cultural anthropologists to be independent and representative of the world's cultures, according to several criteria including geographic region and mode of subsistence. The files which we consulted contained ethnographic source material published up to 1971.

Infanticide was reported in these sources for 39 of the 60 societies in the sample, and circumstances in which infanticide allegedly occurs were described in the HRAF materials for 35 of these 39 (Table I). Often, several circumstances were noted for a single culture; Dogon (Africa), for example, were said to kill deformed infants, those conceived in adultery, those born to unwed mothers, and those whose mothers died in childbirth. Counting each such rationale in each society separately, 112 infanticidal circumstances to be noted in the sample of HRAF material (Table I) were found. Most of these are clearly related to one or more of Alexander's three cost–benefit questions.

Question 1: Is the infant the putative parent's own?

Twenty of the 112 infanticidal circumstances were explicit matters of nonpaternity. In 15 societies, adulterous conception was offered as grounds for infanticide. In three, tribal males were said to insist upon the death of any child whose features suggested a nontribal sire. And in two societies—Tikopia (Oceania) and Yanomamö (South America)—men acquiring wives with children were said to demand that those children be put to death.

Question 2: What is the infant's fitness potential?

Alexander (quoted previously) translated offspring "need" as capacity to convert parental assistance into fitness, and it is important to note this nonintuitive translation. A hopelessly deformed infant, for

Table I. Circumstances of alleged infanticide in society[a]

Society	Inappropriate paternity			Poor infant quality	Inadequate parental resource circumstance					
	Adulterous conception	Nontribal sire	Sired by mother's first husband	Deformed or very ill	Twins	Birth too soon or too many	No male support	Mother dead	Mother unwed	Economic hardship
Africa										
Dogon	X			X				X	X	
Twi	X			X		X				
Tiv										
Baganda				X						
Masai				X			X			
Pygmies				X	X					
Azande									X	
Bemba				X						
Lozi					X					
Asia										
Central Thai				X						
Andaman		X		X	X					
Europe										
Serbs	X								X	
Lapps										
Middle East										
Somali				X					X	
North America										
Tlingit	X				X	X			X	
Copper Eskimo				X	X	X				
Blackfoot				X						
Ojibwa	X						X		X	
Iroquois								X		
Klamath	X			X	X				X	
Tarahumara							X		X	
Oceania										
Iban	X							X	X	
Toradja	X			X	X	X		X	X	
Aranda	X	X			X	X				X
Trobriands										
Lau										
Truk				X		X	X			
Tikopia	X		X		X	X			X	X
Russia										
Yakut										X
Chukchee				X				X		
South America										
Cuna	X	X		X			X		X	
Cagaba										
Aymara	X			X	X	X				
Ona										
Mataco	X			X	X		X	X	X	
Guarani				X	X					
Bororo						X				
Yanomamo	X		X	X	X	X				
Tucano	X			X	X	X			X	
Number of Societies	15	3	2	21	14	11	6	6	14	3

[a] Circumstances in which infanticide allegedly occurs in 39 out of 60 societies in a representative sample drawn from the Human Relations Area File. Listed are 95 infanticidal circumstances that make clear reproductive strategic sense for the parents; other miscellaneous rationales are discussed in the text. (A bibliography of ethnographic materials from which this table was compiled is available on request from the authors.)

example, while extremely "in need" in ordinary parlance, is not "in need" in this special evolutionary theoretical sense: Parental care is of no utility to such an infant because "utility" is here considered only with respect to fitness potential. One prediction, then, is that children of demonstrably poor phenotypic quality will be common victims of infanticide.

The killing or abandonment of deformed or very ill children at birth was noted for 21 of the 35 societies. In only one of these cases—Blackfoot (North America)—was it suggested that this practice was disapproved by the society-at-large. In several societies, deformed children were described as ghosts or demons, with the rationale for infanticide expressed in terms of a struggle with hostile supernatural forces. Whatever the expressed rationale, however, choosing not to raise a deformed child obviously serves the parents' fitness interests by avoiding the squandering of prolonged effort upon a child with poor reproductive prospects.

Question 3: What are the parent's alternatives?

This third cost–benefit consideration is perhaps the most broad-ranging of the three and must interact with the others in influencing parental inclination in any given situation. For example, an older mother with little reproductive future may be relatively willing to raise a deformed child. In general, an individual might be expected to be reluctant to invest parentally in a particular child when other channels promise better returns, whether these be already in existence or future reproductive opportunities.

Present maternal incapacity to cope with the demands of child-rearing is a prevalent class of rationales for infanticide and one that may be said to reflect sensitivity to some combination of cost–benefit Questions 2 and 3: Question 2 because poor prospects for the present child may be due to circumstance rather than to poor offspring quality; Question 3 because attempts to raise children with inadequate parental resources presumably diminish one's capacity to contribute to fitness elsewhere.

Of the 112 circumstances listed, 56 fit this category of maternal overburdening. In 14 societies, the birth of twins was cited as a circumstance necessitating infanticide. The child to be killed may be prescribed to be the second born, the weaker, the female. In only two cases—Aranda (Oceania) and Lozi (Africa)—was it claimed that both twins were killed; and in the latter case, different ethnographers contradicted one another on this point. Granzberg (1973:411) has shown that "twin infanticide is typically found in societies where mothers have a heavy workload and where they have a minimum amount of help" and is rare elsewhere. Similarly, in 11 societies in the sample, it was noted that the newborn

may be killed at birth if it arrived too soon after the last child or the mother had too many children already. A different problem of timin arises among the Copper Eskimo (North America), where children bor at the wrong time of year cannot conveniently be transported an were said to have been killed at birth. In six societies, infants wer said to be killed when no man would acknowledge paternity or accep an obligation to provide for the child. Perhaps similar is a case (Ba ganda) in which women were said to kill their infants to spite thei husbands when they had quarreled severely. In another three instances infanticide was attributed simply to poverty or hard times. And i six societies, infants were put to death when the mother herself ha died in childbirth. In 14 societies, the unwed status of the mother wa offered as grounds for infanticide; unwed mothers lack paternal suppor for their infants, but more than this, they may find the child an impedi ment to future marriage prospects.

Other Rationales

To this point, we have summarized 97 of 112 alleged infanticida circumstances within the rubric of adaptive variation in parental incli nations. We predicted that considerations of parental reproductiv strategy would predominate, and the prediction is clearly supported But 15 of the 112 descriptions of alleged infanticidal circumstance remain to be enumerated.

Four (Yanomamö, Mataco, Trobriands, Tikopia) of these fifteen are cases in which the infant's sex was offered as distinct grounds for infanticide (and in four other societies—Copper Eskimo, Tlingit Aranda, Tucano—sex was remarked as relevant to the decision in the event of twins or short birth intervals). Female-selective infanticide is, at first sight, perplexing, since daughters offer just as great a contribution to parental fitness as sons (or even more if female-selective infanticide has had the consequence of biasing population sex ratios so that the average surviving female must have more children than the average surviving male). Proximate economic goals often dictate a preference for sons (see Johansson, Chapter 23, this volume), and it is not clear whether this preference generally enhances or diminishes parental fitness. The preference for sons may yet prove to contribute to parental fitness in certain cultural milieus and certain social classes (see Chagnon, Flinn, and Melancon, 1979; Dickemann, 1979a; Hartung, 1982; Hughes, 1981).

Another possibly surprising circumstance is that of the killing of children conceived in incest, as was noted in three societies (Tarahumara, Aymara, Cuna); this might reflect an apprehension of poor offspring quality, but we might then have expected the decision to rest on overt defects. One plausible hypothesis is that these infanticides

are not parental decisions but, instead, are imposed from without so that interests other than those of the parents are served. We have hitherto been concerned with variations in parental inclinations, but distantly related or unrelated individuals sometimes advance their interests by disposing of babies. Baganda (Africa) chiefs, for example, ordered the death of collateral male kin at birth with the express purpose of eliminating rival claimants to the succession (Roscoe, 1911). A more perplexing case is that of the Lau Islanders (Oceania): according to Hocart (1929:168), "the people of Wathiwathi used to destroy the children of all their women who married into Tumbou so that they should have no *rasu,* that is sister's sons to be a burden upon them." It would be interesting to know the actual genealogical links between these "mother's brothers" and their victims. Tiv (Africa) men reputedly killed babies for ritual purposes (Akiga, 1939), although nothing is reported about how the kidnapped victims were selected.

Besides the Tiv case, there were two others in which infanticide of healthy children was alleged to occur for purely magical reasons. According to Galaal (1968:30), Somali (Africa) parents used to dispose of babies born under inauspicious astrological signs "in the days before Islam came to the Somali lands." Similarly, infanticide of healthy children as "ghosts" (in contrast to such treatment of deformed babies) is said by the Trukese (Oceania) to have characterized an unspecified past (Fischer, 1963). These tales refer to a bad old time before modern morality took hold and have the air of myth. Neither report provides a convincing exception to the strong adaptationist hypothesis that parentally instigated infanticide that does not make reproductive strategic sense will nowhere be described as normal or typical.

Three cases remain. One is the Baganda chiefs who reportedly killed not just collateral kin but even their own first child if a son, stating that the birth of a boy indicated that the father would die; perhaps the concern here was again to delay a successional bid in this highly stratified and polygynous society. Another surprise is Karsten's (1932) assertion that "a Toba ['Mataco', South America] man may kill the newborn child of his married daughter if his son-in-law has incurred his dislike."

Of all the rationales for infanticide described in this ethnographic sample, the one that seems most clearly contrary to parental fitness interests comes from the Yanomamö:

> Young couples do not relish the prospect of a long period of celibacy that pregnancy and lactation taboos impose on them. From the time a woman discovers she is pregnant until the time she weans her child, she is not allowed to have sexual relations. Faced with this prospect, young couples may decide to kill their child, irrespective of its sex [Chagnon 1967:53–55].

This last rationale for infanticide is the only one that clearly contravenes the strong adaptationist hypothesis: The parents are reported to damage their own fitness in pursuit of incompatible hedonic goals. It should be noted that Chagnon cited no particular cases to illustrate this motive, in contrast to the specific infanticidal incidents he attributed to the motives of a too short birth interval and inappropriate paternity. But if this motive is genuine, then one must ask how Yanomamö society has come to be one in which the ordinary fitness-promoting human motives of sexual desire and parental love are so at odds. Who enforces such unpopular taboos and are the interests of the powerful in any way served? Certainly, the general conclusion from the ethnographic record must be that infanticide in most human societies is considered appropriate in circumstances in which it happens to be reproductively adaptive for the parties involved. We do not find accounts of infanticide according to arbitrary cultural rules or descriptions of parents willingly suffering fitness costs by sacrificing their children to some higher good. In those few cases where the parents' interests seem not to be served, we would suggest that the most promising analytic approach will be to ask, Whose are? In some cases, for example, the mothers' interests may be violated by female-selective infanticide, a practice imposed by a larger social group demanding the production of warriors. In general, the ethnographic record suggests that the goals pursued by infanticidal individuals are consistent with their fitness interests.

CHILDREN AS HOMICIDE VICTIMS IN CANADA

Contrast the situation in modern North American society with those just considered. The ethnographic record provides numerous typological descriptions of circumstances legitimizing infanticide, but there is seldom any evidence on its actual frequency. Our own society is one in which killing children for any reason is decried and is likely to bring severe punishment. Faced with these sanctions, some adults kill children anyway, and various public bodies collect information on such cases. So instead of having a prescriptive set of circumstances legitimizing infanticide and little case information, we have a general condemnation of the practice and a great deal of case information.

Statistics Canada maintains a data bank on all homicides investigated by any of the country's police departments. During the years 1961–1979, 8032 homicides were investigated; 1153 victims were minors (under the age of 18), and 1059 of these cases were solved. Of these victims, 158 were infants (less than 1 year old), and 148 of these cases were solved. (See Rodenburg [1971] for some earlier analyses of a

portion of this data set.) These case reports might have permitted a further test of the correspondence between infanticidal circumstances and Alexander's "cost–benefit questions," but information on "motives" is extremely sketchy, and no tabulation of cases attributable to dubious paternity, deformity, short birth intervals or the like is possible. Instead, the data permit the testing of some more specific hypotheses about factors affecting the risk of child homicide.

Prediction 1: *The probability of child homicide by parents will be maximal with infants and will rapidly decline with the child's age, in contrast to child homicide by nonparents.* This prediction follows from the consideration that an inclination to terminate investment in dependent offspring, if adaptive, would be expected to occur early, when the child had consumed relatively little of the nurture that a complete rearing demands. Translating the hypothesis into proximate psychological terms, we would expect parents to value their children increasingly over the first few years. On the same basis, several sociobiologists have suggested that willingness to incur costs of parental activity should rise as helpless offspring approach independence, a prediction that has found support in several animal studies (e.g., Greig-Smith, 1980; Patterson, Petrinovich, and James, 1980).

Test. A major decrease in parental homicides occurs in the first year: 137 infants and 49 one year olds. (And there is reason to suspect that improved detection of infanticides among infant deaths would further elevate this difference.) Parental homicides continue to decline with increasing child age (Fig. 1). The pattern with respect to child age is very different for homicides committed by nonparents, whose "valuation" of the victims was not expected to follow parental patterns. Here, the frequency increases with age (Fig. 1). In part this difference must be attributable to increasing access of nonparents to older children, but it is noteworthy that parental and nonparental homicides differ even between infants and 1 year olds: Infants were significantly ($\chi^2_{1df} = 36.0$, $p < 0.0001$) more likely to have been killed by parents (93% of solved cases) than were 1-year-old victims (59%). Note, too, that the decline in parental homicide with child's age cannot easily be dismissed as due to a generalized decline in the child's vulnerability or annoyance value, because toddlers (still relatively defenceless in their own right) are at greater risk from nonparents than are infants and yet are at lesser risk from parents.

Prediction 2. *Infanticidal mothers will be relatively often unmarried.* As in the ethnographic sample, we suggest that a lack of paternal support damages a child's prospects, thus contributing to maternal despair and disinclination to embark on the possibly lost cause of rearing the child.

Test. Infanticidal mothers were indeed often unmarried: Birth registration data for Canada from 1977 to 1979 reveal that 88.3% of babies were born to legally married mothers, but only 39.5% of 38 mothers committing infanticide during that period were legally married. The difference is highly significant ($\chi^2_{1df} = 74.6$, $p < 0.0001$).

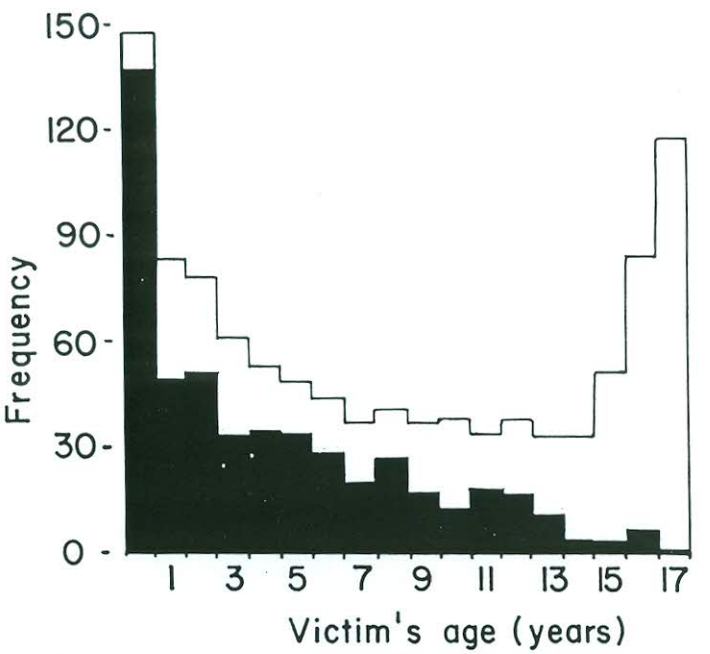

Figure 1. Children as homicide victims in Canada, 1961–1979. The histogram includes all victims under 18 years of age excluding unsolved cases. The black portion represents those children who were killed by their natural parents. (Data supplied by Statistics Canada.)

Prediction 3. *Infanticidal mothers will be relatively young.* This prediction follows from the consideration that parental willingness to invest in present offspring, other things being equal, should increase as the parent's own expectation of future reproduction (the parent's "residual reproductive value") decreases with age (see, e.g., Pugesek, 1981).

Test. Infanticidal mothers were indeed younger than mothers in the Canadian population-at-large as is shown in Fig. 2. Of infanticidal mothers, 15.7% were 17 years old or less compared to 3.1% of all new mothers in Canada in the same period.

Prediction 4. *Children will be at greater risk of homicide in stepparent households than in natural parent households.* As noted earlier, parents may be expected to be sensitive to the biological reality of the parent–offspring relationship and to resent "parental" obligation to children not their own. We have elsewhere reported a substantial

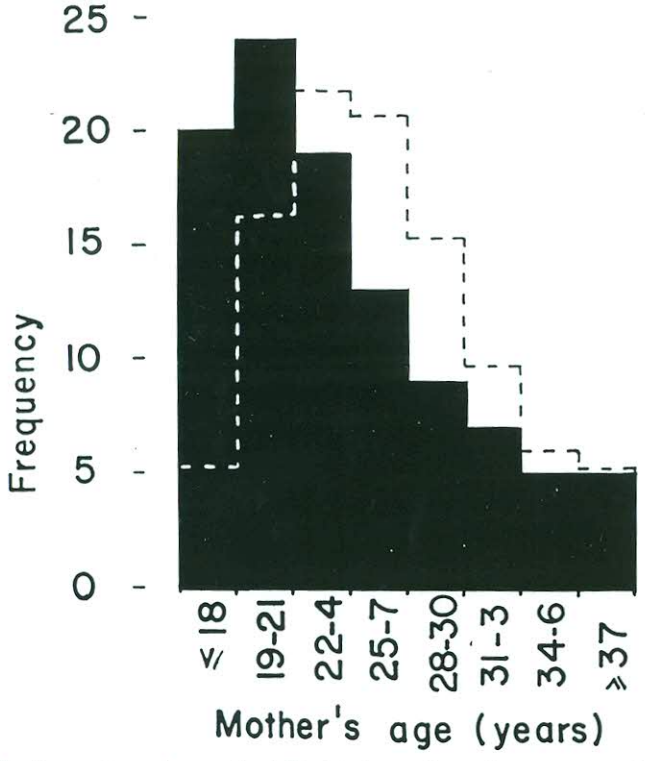

Figure 2. Ages of mothers who killed infants (less than 1 year of age) in Canada, 1961–1979. The black histogram represents the actual distribution of ages of infanticidal mothers. The dotted histogram represents the expected distribution given the age distribution of women giving birth in the population-at-large. The infanticidal mothers are significantly ($X^2_{7df} = 50.7$, $p < 0.0001$) younger than new mothers generally. (Data supplied by Statistics Canada.)

elevation of the risk of child abuse in stepparent households (Wilson, Daly, and Weghorst, 1980) and that four of seven preschool-age homicide victims in Detroit in 1972 lived with stepfathers (Daly and Wilson, 1982a). Similarly, Scott (1973) reported that 15 of 29 British "fathers" who killed their children under 5 years of age were not the putative biological fathers.

Test. Table II shows that substitute parents are indeed prevalent among "parental" homicide offenders in Canada. Of 63 cases in which substitute parents killed minors, 15 cases were included where stepparents legally married to the natural parent were the offenders (14 stepfathers and 1 stepmother), 43 cases in which the natural parent's common-law mate killed the stepchild (42 cases with stepfathers, in 6 of which

Table II. Children killed by parents or parent substitutes in Canada, 1961–1979

Victim's age	(A) Number of children killed by persons "in loco parentis" to them	(B) Percentage of A in which offender was an unrelated substitute parent
0	139	1.4
1	64	23.4
2	62	17.7
3	42	21.4
4	43	18.6
5	38	9.5
6–8	79	5.1
9–11	50	4.0
12–14	37	13.5
15–17	14	21.4

the natural mother was also charged, and 1 stepmother case), and 5 cases involving foster parents (3 men, 1 woman, and 1 case in which both were charged).

We cannot say precisely how the percentages in Table II compare with the prevalence of substitute-parent situations for children in the population-at-large. Like its American counterpart (see Wilson, Daly, and Weghorst, 1980), the Canadian census bureau does not distinguish step from natural relationships. Only two infants under 1 year of age were killed by stepparents, but of course infants will rarely *have* stepparents. The probability of living with a stepparent increases as a child grows older, because the time in which marital dissolution and reconstitution might have occurred increases. In the United States in 1967, for example, Sweet (1974) estimated from survey data that 1.6% of children under 3 years of age lived with one parent and one stepparent (including common-law) compared to 5.2% of children aged 3–5, 8.3% of those aged 6–9 and 9.5% of those aged 10–13. The corresponding figures for Canada over the period covered by our homicide data must be substantially lower. The 1967 divorce rate was five times higher in the United States than in Canada (United Nations, 1977), and the Canadian rate only approached the 1967 United States rate by the late 1970s (the end of the period for which homicide data are analyzed). We surmise that overall rates of marital dissolution and reconstitution were also lower in Canada, and hence that step-relationships were less prevalent in Canada. These considerations, together with the data in Table II, strongly suggest that preschool-age children are at much higher risk of homicide by substitute parents than by natural parents.

Interestingly, this elevation of relative risk at the hands of parent

substitutes appears to decline as children grow older, perhaps beyond the age of 1 and certainly beyond the age of 5 (Table II; recall that the chance expectancy for Column B, if natural and substitute parents presented equal threats to children, would rise monotonically). Perhaps the resentment of pseudoparental obligation is greatest when a prolonged period of dependency and investment is anticipated. Conflict between older children and stepparents is, of course, well known and undoubtedly severe, but it leads stepparents to homicide relatively rarely. Of course, children are more formidable in self-defense as they grow, but the important point is that the extent to which stepparents are likelier than natural parents to kill children declines. Similarly, in a study of physical abuse of American children (Wilson, Daly, and Weghorst, 1980), children under 3 years of age were 6.9 times as likely to be abused in a natural-parent–stepparent home as in a two-natural-parent home; this ratio of relative risk declined to 5.1 for ages 3–5, 3.3 for ages 6–9, 3.0 for ages 10–13, and 2.2 for ages 14–17.

Some Other Characteristics of Child Homicide

Several other aspects of the Statistics Canada data warrant discussion from a sociobiological perspective. Although information on motives is sketchy, it is interesting to note the varying prevalence of cases attributed by the reporting agency to "mental illness or retardation." Of cases with adult victims, 5.6% were attributed to this cause between 1961–1979. By contrast, 46% of parents who killed their children were so categorized (compared to 12% of other people who killed minors), including 45% of mothers and 18% of fathers who killed infants, and 84% of mothers and 26% of fathers who killed older children. If these figures can be taken at face value, the implication would seem to be that a loss of reason is more often characteristic of those who kill children than those who kill adults, of those who kill own as opposed to others' children, of those who kill their older children as opposed to their infants, of homicidal mothers than of homicidal fathers. All of these contrasts are readily predicted on sociobiological grounds, if "loss of reason" is interpreted as a breakdown of adaptive function, that is to say, a collapse (for whatever reason) of a normal, species-characteristic recognition of where one's self-interest lies (see, e.g., Essock-Vitale and McGuire, 1979).

However, it is important to note the possibility that it is the nature of the offense that is directly responsible for the diagnosis: those people who damage their own fitness may be likeliest to be called mad, more as a result of some general cultural definition of what is rational than because of any independently manifested symptoms. But even if diagnosis is indeed biased in this way, then the coincidence of culturally defined rationality with nepotistic self-interest is itself revealing. In

any case, there is some evidence that those who kill close relatives exhibit delusions and other psychiatric symptoms more often than those who kill nonrelatives (Gillies, 1976; Wong and Singer, 1973; Guttmacher, 1962).

Besides the many cases of child homicide by stepfathers, it is likely that uncertain paternity is relevant to other cases in which the offender is the victim's putative father. (This need not be a matter of conscious suspicion of nonpaternity; see Daly and Wilson, 1982b.) Some differences in homicide by mothers versus fathers may be interpreted in this light. Paternal homicides decline in frequency with increasing age of victim much less sharply than do maternal homicides. This general decline was noted in parental homicides in Fig. 1 and interpreted as reflecting a growing valuation of growing offspring. In the case of mothers, this change over time is uncomplicated by changes in perceived probability of relatedness; in the case of fathers, grounds for suspicion of nonrelatedness may sometimes increase over time as the child's phenotype develops.

There are other striking differences between homicides committed by fathers and those committed by mothers, particularly with respect to multiple homicides (Table III). Fathers who killed one of their children were more than twice as likely (32.7%) as mothers (15.1%) to have killed more than one child. And whereas 54 men killed their wives and one or more children, there was not a single case of a woman killing her husband and one or more children. Women certainly killed their own children and often killed more than one. And women killed husbands too: Of the total sample of 8032 homicides, 1205 men killed their wives and 311 women killed their husbands (including common-law). What women did not do was to destroy spouse and children together. This appears to be a peculiarly male crime, and one which we suggest may be psychologically linked to men's proprietary attitude toward women and their reproductive capacity (cf. Daly, Wilson, and Weghorst, 1982). It would be most interesting to know in what propor-

Table III. Multiple victim cases among parental homicides in Canada, 1961–1979

	Victims			
Offender	One child only	More than one child (and not spouse)	One child and spouse	More than one child and spouse
Mother	203	36	0	0
Father	93	19	22	32

tion of these cases—and indeed in all paternal homicides—the putative father was not the actual sire.

CONCLUSION

Human infanticide is widespread, and a sociobiological model of the human psyche helps to make it intelligible. Ethnocentric commentators have often vilified infanticidal practices as lunatic savagery, but the ethnographic record makes clear that infanticide is nowhere taken lightly. It is condoned primarily where it makes adaptive sense for one or both parents—where the mother is overburdened, for example, or where the child is of poor quality or inappropriate paternity. In societies such as our own, where infanticide is condemned in all circumstances, cases occur nonetheless, and it appears that the infanticidal parties are sensitive to these same predictors of fitness. The act of infanticide is unlikely to enhance the fitness of a Canadian parent. The psychology that occasionally permits such drastic failures of parental inclination nevertheless exhibits an adaptive logic and is interpreted readily, therefore, as a product of natural selection.

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25 Ayoreo infanticide: A case study

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INTRODUCTION

The Ayoreo are tribal people who live in southwestern Bolivia a northern Paraguay. Until recently infanticide was an accepted practi among them (Pérez Diez and Salzano, 1978; Bórmida and Califa 1978; Sebag, 1964). Since the time of Carr-Sanders (1922), theoreti views of infanticide among tribal people have focused on its populati regulation function and have explained infanticide from a group adap tion perspective. However, beginning with the important critique group adaptation by Williams (1966; see Introduction) there has be a growing trend to view infanticide in terms of its effect on the reprodu tive interests of individuals. The issue of whether infanticide is be viewed from a group or individual adaptation perspective cannot resolved in the absence of empirical data. However, as Daly and Wils (Chapter 24, this volume) note, there is little quantitative informati on infanticide among tribal people. During field research among t Ayoreo, from January 1980 to March 1981, we collected such informati on infanticide. Our data are detailed enough to allow for the testi of some hypotheses based on these two perspectives on infanticid Obviously, Ayoreo infanticide can only be understood in terms of t environment in which it occurred; thus before presenting our analys of reproductive histories we will discuss some pertinent aspects Ayoreo history and culture.