

Silk, J.B. and Stanford, C.B. 1999. Infanticide article disputed. *Anthropology News* 40: 27-29.

The December 1998 issue of the *American Anthropologist*, includes an article entitled “Infanticide by male lions hypothesis: a fallacy influencing research into human behavior” by Anne Innis Dagg. Dagg claims to falsify the hypothesis that infanticide is an evolved strategy which enhances the reproductive success of male lions, and by implication to discredit the credibility of adaptive explanations for infanticidal behavior in other species. Dagg’s paper is seriously flawed because it rests on invalid reasoning and profoundly misrepresents the empirical literature on infanticide in lions.

Dagg justifies her focus on lions because “it is critical that the existence of infanticide by male lions be examined, since this is the other group besides primates in which the hypothesis has been widely promulgated” (p. 941). However, there is an even larger literature on infanticide in rodents (including mice, gerbils, and ground squirrels) which provides both naturalistic and experimental evidence in support of the sexual selection hypothesis. Dagg also ignores comparative data on infanticide from a broad range of species, ranging from wattled jacanas to gorillas. These studies, which demonstrate the great strength of the comparative method in biology, provide compelling evidence that males (and occasionally females) selectively kill infants whose deaths will enhance their own immediate mating prospects and reproductive success.

Dagg bases her argument on four premises: (1) members of coalitions who take over prides must be closely related, (2) cubs will be killed after successful overthrows, (3) new residents will mate with females, and (4) infanticidal males will remain in groups until their own offspring become independent. The logic and evidence in support of these four premises are flawed.

Dagg contends that the sexual selection hypothesis predicts that males who take over prides must be closely related to prevent subsequent competition over matings. There are at least two problems with this interpretation. First, kinship may be expected to limit the extent of competition over females, but kinship will not necessarily eliminate competition among males. Second, even if there is competition over access to females, males who committed infanticide when they become residents in new groups might on average have greater reproductive success than males who did not do so. That is, infanticide might enhance males’ prospects of siring offspring, even if it did not guarantee male mating success in every instance.

Dagg argues that the sexual selection hypothesis predicts that cubs will be killed when males take over prides, but infanticide is in fact uncommon. The sexual selection hypothesis does not predict that infanticide will follow *all* takeovers or that *all* infants will be killed when takeovers occur. For example, males are expected to only kill infants whose deaths will influence their mothers’ fertility; therefore, only young cubs are expected to be killed.

Dagg's assertion that infanticide is uncommon among lions is not well-supported by the evidence. Much of the force of Dagg's criticism is based upon the fact that direct observations of infanticide in the field are few. This is true, but Dagg greatly over-emphasizes the probative value of this fact. Behavioral observations on lions are mainly conducted during daylight hours, while lions are primarily active at night. Moreover, infanticidal attacks are brief, lasting only a few seconds, reducing the likelihood that these events will be seen.

The fact that few infanticidal attacks have been observed does not necessarily mean that such attacks are uncommon. After all, very few primate births have been observed even though researchers have spent thousands of hours in the field, but no one questions the fact that females give birth to infants. Packer and Pusey's analysis of cub mortality shows that 100% of all cubs who were less than 3 months old when takeovers occurred died within six months of the takeovers. For cubs who were older than 9 months of age, mortality was less than 50%. Dagg offers no plausible alternative explanation for the temporal association between takeovers and cub mortality, seriously weakening the force of her critique.

The third prediction is that males who commit infanticide will subsequently mate with females. Dagg mentions anecdotal observations of females mating with nonresident males as evidence that males who takeover prides do not subsequently sire offspring within them. But these observations are inconsistent with genetic evidence from the Serengeti which shows that all cubs are fathered by current male residents. Thus, the genetic data clearly indicate that pride males do mate with females and sire cubs, as required by the sexual selection hypothesis.

Finally, Dagg claims that infanticidal males must remain in prides for more than two years in order for the sexual selection hypothesis to be supported. The sexual selection hypothesis does not require that *all* males who commit infanticide must remain in prides until their infants are no longer vulnerable to infanticidal attacks by other males. Instead, the sexual selection hypothesis requires only that male tenure to be long enough on average that infanticidal males reproduce more successfully than other males. The empirical evidence suggests, in fact, that on average males who take over prides do remain long enough to achieve this result. The average tenure of males who are eventually ousted by other males is 21 months. Females conceive on average 4.4 months after takeovers occur and give birth to cubs approximately 3.7 months later. This means that cubs are, on average, 13 months old when their fathers are ousted by a new group of males<sup>1</sup>. For cubs of this age, mortality after takeovers is considerably reduced.

Dagg's evidence contra this prediction is weak. First, she cites evidence that not all males stay near females that they have mated with, although she acknowledges that it is not known whether these matings produced offspring. Second, she notes that males sometimes leave prides of females voluntarily. Although Dagg implies that males' voluntary departure from prides indicates that infanticide does not enhance male reproductive success, the empirical record tells a very different story. When males that control multiple prides relinquish control of one pride, they always give up the pride with

cubs that are *least* vulnerable to infanticide. Males who give up one pride to take over another, typically increase their potential reproductive success by gaining access to more females or reducing the likelihood of mating with their own daughters. Thus, the pattern of males' movements between prides actually supports the sexual selection hypothesis.

Dagg voices concern about the political and ethical implications of applying evolutionary hypotheses to human behavior, and this concern evidently motivates her efforts to undermine adaptive interpretations of infanticide in lions. She writes, "Human studies that emphasize sociobiology and the predominance of biology over culture make the possibility of changes for society seem more difficult" (p. 948). There are many sound reasons to be cautious about applying evolutionary explanations to contemporary human behavior. However, Dagg's effort to discredit all adaptive explanations for human behavior by distorting the empirical record on infanticide in lions is a misguided means to pursue her stated agenda. Even if Dagg's critique of the lion data was cogent, there would be no reason to reject the the sexual selection hypothesis for infanticide. The underlying logic of the adaptive hypothesis is sound, and is well-supported by evidence from a wide variety of animal species, including nonhuman primates.