

## This Week's Citation Classic®

**Hrdy S B.** Infanticide among animals: a review, classification, and examination of the implications for the reproductive strategies of females. *Ethology Sociobiol.* 1:13-40, 1979. [Peabody Museum, Harvard University, Cambridge, MA]

Infanticide among animals is a protean phenomenon. This paper proposed five different explanatory hypotheses and discussed predictions generated by each model. Evidence on inter- and intraspecific variation in infanticide among primates was reviewed. The possibility that infanticide acted as a selective pressure in shaping female reproductive physiology and primate social organization was examined. [The *SCI*® indicates that this article has been cited in more than 140 publications, making it the most-cited article published in this journal.]

### Infanticide As a Reproductive Strategy

Sarah Blaffer Hrdy  
Department of Anthropology  
University of California  
Davis, CA 95616

In January 1979, the Smithsonian Institution sent my husband, Dan, and me, to the International Congress of the Primatological Society, held in Bangalore, India. After the meeting, we were to travel to Jodhpur to work out details for collaborative Indo-American research on langur monkeys, the species we had been studying on our own since 1971. For the conference, I prepared a brief paper on different hypotheses for explaining infanticide in langurs and other primates. I had already begun working on an article about infanticide in animals generally but did not feel ready to publish on the implications that flowed from my idiosyncratic views.

It was quite novel at the time to start with the assumption that infanticide was a natural and widespread phenomenon. The existing evidence was sketchy. I considered my interpretations speculative, particularly the idea that the need to forestall infanticide could have served as an important selective pressure promoting certain kinds of male-female associations and possibly contributing to the evolution of such features of female reproductive physiology as situation-dependent sexual receptivity.

As it happened, several participants in my session did not make it to the conference in Bangalore, and the question section after my paper extended into the succeeding empty slots. In response to the questions asked, I went far beyond my prepared talk and presented in rough form the arguments for the long article. I was surprised and encouraged by the amount of interest in these topics.

As soon as I returned to the States, I wrote out the paper. Not knowing where else to place an article

that was so long and speculative, I submitted it to a fledgling journal in the field of sociobiology, and it was published in the first issue.

I can think of three reasons why colleagues would be interested in this paper. First there was the controversy that had been sparked in 1974 when I proposed that infanticide by male langurs entering a breeding system from outside was adaptive behavior, advantageous for those males who succeeded in eliminating unweaned infants and then inseminating their mothers. This interpretation was hotly contested on the grounds that (1) there was insufficient evidence and (2) that such behavior could only be regarded as pathological brought about through disturbance of the population. When I extrapolated from langurs to explain infanticide by males in more than a dozen species of prosimians, Old and New World monkeys, and Great Apes, describing infanticide as a widespread primate reproductive strategy,<sup>1</sup> the debate grew more heated.<sup>2,3</sup> At the heart of the controversy was an ongoing paradigm shift from a group perspective—which in anthropology was epitomized by Radcliffe-Brownian functionalist paradigms in which every individual contributes to continued survival of the group—to a focus on individual interests.<sup>4</sup> Infanticide provided an unusually clear example of how selection at the level of the individual could prevail—even to the detriment of the group or species.

A second reason for interest in the article had to do with the recognition that if we were to understand reproductive strategies, we had to consider female as well as male interests and to view females as active strategists. This was one of the first articles to do that. Finally, the paper provided a convenient classification for the different types of infanticide to be found in nature, and in fact, the classification presented here eventually provided the framework for the volume on infanticide edited by Glenn Hausfater and myself in 1984.<sup>5</sup>

In retrospect, what stands out for me about this paper is how much was correctly interpreted on the basis of evolutionary theories. Data on infanticide in animals were still very sketchy, as were data on the phenomena that some of us viewed as female counter-strategies to infanticide (e.g., spontaneous abortion in response to novel males). Since then, more extensive research by Butynski, Labov, Packer, Parmigiani, Pusey, Sommer, Struhsaker, vom Saal, and others have supported the evolutionary interpretations.<sup>6</sup>

1. Hrdy S B. *The langurs of Abu: female and male strategies of reproduction*. Cambridge, MA: Harvard University Press, 1977.
  2. Dolhinov P. Normal monkeys? *Amer. Sci.* 65:266-8, 1979.
  3. Schubert G. Infanticide by usurper human langur males: a sociobiological myth. *Biology and social life. Soc. Sci. Inform.* 21:199-244, 1982.
  4. Williams G. *Adaptation and natural selection*. Princeton, NJ: Princeton University Press, 1966.
  5. Hausfater G & Hrdy S B, eds. *Infanticide: comparative and evolutionary perspectives*. New York: Aldine, 1984.
  6. Parmigiani S, Svare B & vom Saal F, eds. *Protection and abuse of infants*. London: Harwood Academic. (In press.)
- Received May 28, 1991