

Brain size and fertility in mammals may depend on who cares for offspring

May 30 2019



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The evolution of larger brain size in offspring is associated with the amount of paternal care in mammals, whereas higher fertility in the mothers is correlated with additional care support from individuals that are not the offspring's biological parents (alloparents), according to a

study published in the journal *Behavioural Ecology and Sociobiology*.

Researchers at the University of Zurich investigated the possible effects of energy inputs from different care givers on the brain size and fertility of different species, comparing data on 478 [mammal species](#), including lions, mice, meerkats, and monkeys and apes. Species data included information on care behaviours, brain size and fertility.

Dr. Sandra Heldstab, corresponding author of the study, said: "Both reproduction and [brain tissue](#) are energetically very expensive, and one way for females to reduce their cost is by distributing that cost over other individuals by sharing the burden of care. Unlike previous studies, we distinguished between paternal and alloparental care because we expected there to be a difference between how reliable they are and in the effect they may have on brain size and fertility."

The authors based their assumption on the expensive brain hypothesis, which predicts that increased brain size only evolves if the increase in additional energy available to females, from help with looking after offspring, is predictable and constant.

Dr. Sandra Heldstab said: "Paternal care is both reliable and stable; therefore we'd expect it to be associated with brain size. Additional care from individuals who are not the offspring's parents often fluctuates as they adjust their caring effort depending on both food availability and their own reproductive needs. This unpredictable type of care doesn't provide enough stable energy to affect [brain size](#), but our findings suggest that the additional energy it does provide is associated with a significant increase in fertility, as females readily respond through litter size adjustments to variable amounts of [energy](#) inputs."

The researchers related their findings to the evolution of the human brain. Humans differ from other mammals in having both an extremely

large [brain](#)—the largest relative to body size across the whole animal kingdom—and a relatively high reproductive output, which may be explained by an unusual form of multi-family cooperative parenting, involving stable and reliable care by both parents and alloparents.

More information: Sandra A. Heldstab et al. Allomaternal care, brains and fertility in mammals: who cares matters, *Behavioral Ecology and Sociobiology* (2019). [DOI: 10.1007/s00265-019-2684-x](https://doi.org/10.1007/s00265-019-2684-x)

Provided by Springer

Citation: Brain size and fertility in mammals may depend on who cares for offspring (2019, May 30) retrieved 24 April 2024 from <https://phys.org/news/2019-05-brain-size-fertility-mammals-offspring.html>

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