

## **Persistence of maternal effects in baboons: Mother's dominance rank at son's conception predicts stress hormone levels in subadult males**

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### **Abstract:**

Dominance status and reproductive experience are maternal characteristics that affect offspring traits in diverse taxa, including some cercopithecine primates. Maternal effects of this sort are widespread and are sources of variability in offspring fitness. We tested the hypothesis that maternal dominance rank and reproductive experience as well as a male's own age and dominance rank predicted chronic fecal glucocorticoid (fGC) concentrations in 17 subadult wild male baboons, *Papio cynocephalus* (median age 6.5 years), in the Amboseli basin, Kenya. Among these variables, maternal dominance rank at a subadult male's conception was the sole significant predictor of the male's fGC and accounted for 42% of fGC variance; sons of lower ranking mothers had higher fGC than did those of high-ranking mothers. This result is striking because subadult male baboons are approximately 4–6 years past the period of infant dependence on their mothers, and are larger than and dominant to all adult females. In addition, many males of this age have survived their mothers' death. Consequently, the influence of maternal dominance rank persisted well beyond the stage at which direct maternal influence on sons is likely. Persistence of these major maternal influences from the perinatal period may signal organizational effects of mothers on sons' HPA axis. Although short-term, acute, elevations in GC are part of adaptive responses to challenges such as predators and other emergencies, chronically elevated GC are often associated with stress-related pathologies and, thereby, adverse effects on fitness components.