

# When new males take over, these female primates hurry up and mature

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A young female gelada grooming the dominant breeding male of her group.  
(Credit: Rachel Perlman)

Most mammals—including humans and other primates—reach sexual maturity early or late depending on lots of different factors, such as how much food there is to eat. Now, researchers studying close primate relatives of baboons known as geladas have shown for the first time that females of this species suddenly hurry up and mature when a new male enters the picture. Their findings are reported in the journal *Current Biology* on November 5th.

"We found that prepubertal [females](#) are more likely to mature right after a new breeding male arrives in the group—even if it means maturing earlier than expected," said senior author Jacinta Beehner, a Professor of Psychology and Anthropology at the University of Michigan. "We also noticed that some of these maturing females were maturing much later than expected."

Many of those late bloomers were the daughters of the primary breeding male prior to the new male's arrival, the researchers report. Their observations suggest that females can both speed up and slow down their maturity to avoid inbreeding with their fathers.

"Once their father is ousted by the new male, they appear to lift this suppression and immediately mature," Beehner said. "Taken together, we see that a new male causes a really obvious increase in the number of maturations in a group—whether early, on-time, or late."

The findings have been a long time coming, the research team says. About a decade ago, they started to notice that—right after a new male arrived—a few females would suddenly mature, all at the same time.

That was striking because the researchers typically see only half a dozen or so females mature in any given year. But getting enough data to prove that the timing of maturation was tied to the arrival of a new male took some time.



When there is a new dominant male in a gelada group, even females as young as 3.5 years old (pictured here) can mature. Credit: Jacinta Beehner

In the *Current Biology* study, Beehner along with first author Amy Lu of Stony Brook University and their colleagues kept track of the age at maturity for 80 females over 14 years of research in the highlands of Ethiopia, the only place geladas are found in nature. It's easy to tell when a gelada matures because they have very conspicuous "sexual swellings" surrounding a patch of skin on their chest and neck.



To understand better how this was happening, the researchers looked at the females' [estrogen levels](#), which they can measure in their feces. They knew that estrogen levels rise just before the females visibly mature. Surprisingly, however, their data showed that estrogen levels surged in immature females of all ages just after a new male took over. In fact, that estrogen boost occurred even in females far too young to mature.

"Females usually mature around 4.5 years old, but we saw that even females as young as one year old exhibited a temporary surge in estrogen," Beehner said. "We suspect that this boost in [estrogen](#) causes females to mature, but that some females are just too young for this boost to actually work."

The findings suggest that maturation in many primates is a lot more sensitive to social environments than scientists had thought before. The discovery may even have implications for humans, according to the researchers.



In this photo, a dominant gelada male and his group of females sit on the edge of a cliff in the Simien Mountains National Park, Ethiopia. Credit: Jacinta Beehner

"Many New World monkeys such as the marmosets and tamarins have long been known to be highly sensitive to social variables—with a dominant female suppressing the reproduction of all of the other females in the group," she says. "But, until now, we had no evidence that Old World monkeys or apes were similarly sensitive to the presence or absence of particular individuals. If an Old World monkey, like geladas, can suppress maturation in response to the presence of their biological fathers and lift this suppression in response to the arrival of a novel male, it's possible that such a process could be present in apes, and possibly even in humans."

However, they caution against taking the results in geladas too far in terms of what they might mean for humans since there are so many additional factors at play. In future studies, they hope to identify the costs and benefits associated with maturing early, on-time, or late for their gelada population.

"Once again," Beehner says, "this means we have to be patient and wait until these females, now matured, live out their reproductive lives. So, stay tuned, and we'll get back to you on that in another 14 years."

**More information:** *Current Biology*, Lu et al.: "Male-Mediated Maturation in Wild Geladas" [www.cell.com/current-biology/f...](http://www.cell.com/current-biology/fulltext/S0960-9822(20)31507-4)  
[0960-9822\(20\)31507-4](http://www.cell.com/current-biology/fulltext/S0960-9822(20)31507-4) , [DOI: 10.1016/j.cub.2020.10.003](https://doi.org/10.1016/j.cub.2020.10.003)

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