

Wild chimpanzee orphans recover from the stress of losing their mother

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More resilient than previously thought: chimpanzees who lose their mother at a young age overcome the trauma after a couple of years and their stress hormone levels return to normal. Credit: Cédric Girard-Buttoz / Taï Chimpanzee Project

The death of a mother is a traumatic event for immature offspring in species in which mothers provide prolonged maternal care, such as in

long-lived mammals, including humans. Orphan mammals die earlier and have less offspring compared with non-orphans, but how these losses arise remains under debate. Clinical studies on humans and captive studies on animals show that infants whose mothers die when they are young are exposed to chronic stress throughout their lives. However, such chronic stress, which has deleterious consequences on health, can be reduced or even canceled if human orphans are placed in foster families young enough. How stressed orphans are in the wild and whether wild animal orphans are exposed to chronic stress over decades like in humans, remains unknown, especially in species where infants are dependent on their mother for at least the first 10 years of life, like in chimpanzees.

Young chimpanzees who lose their mother are highly stressed

Researchers at the Max Planck Institute for Evolutionary Anthropology in Leipzig and the Institute of Cognitive Sciences, CNRS in Lyon investigated over 19 years the short- and long-term effects of maternal loss on the stress of orphan wild [chimpanzees](#). Their study shows that immature orphan chimpanzees are highly stressed, especially when they were orphaned at a young age. However, orphans who lost their mother more than two years previously, or were now adult, were not more stressed than other individuals whose mother did not die.

"Our study provides an important test of how relevant theories are that try to explain the impact of early life adversity when they are drawn from human [clinical studies](#). In particular we wanted to know how relevant they are for wild long-lived primates whose young, as in humans, are dependent on their mother for over a decade," says the first author Cédric Girard-Buttoz.

Adult chimpanzees often care for or even adopt orphans

"Our findings nicely contrast to human studies and show that young orphan chimpanzees recover over time from the initially stressful loss of their mother. Tai chimpanzees often care for or adopt orphans. They may carry orphans, share their food and their nest at night with them, or protect them from aggression. Whether orphan chimpanzees show stress recovery because of the support offered by other chimpanzees remains to be studied," Roman Wittig, a senior author and head of the Tai Chimpanzee Project points out.

"The stress experienced by orphan chimpanzees compared with non-orphans does not directly explain their shorter lives and fewer offspring, but may have an effect on other [important factors](#) such as growth during critical periods in development," says senior author Catherine Crockford. "In long-lived species where offspring stay with their mothers for many years, the next step is to unpick what mothers provide offspring that helps them get ahead of orphans. It might be that a [mothers'](#) presence results in nutritional gains or social advantages, such as providing buffering against aggression from others, or a mix of the two."

More information: Cédric Girard-Buttoz et al, Early maternal loss leads to short- but not long-term effects on diurnal cortisol slopes in wild chimpanzees, *eLife* (2021). [DOI: 10.7554/eLife.64134](https://doi.org/10.7554/eLife.64134)

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