

How human population came from our ability to cooperate

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Humans may owe their place as Earth's dominating species to their ability to share and cooperate with each other, according to a new study published in the *Journal of Anthropological Research*.

In "How There Got to Be So Many of Us: The Evolutionary Story of Population Growth and a Life History of Cooperation," Karen L. Kramer explores the deep past to discover the biological and social underpinnings that allowed humans to excel as reproducers and survivors. She argues that the [human](#) tendency to bear many children, engage in [food](#) sharing, division of labor, and cooperative childcare duties, sets us apart from our closest evolutionary counterparts, the apes.

In terms of population numbers, few species can compare to the success of humans. Though much attention on population size focuses on the past 200 years, humans were incredibly successful even before the industrial revolution, populating all of the world's environments with more than a billion people. Kramer uses her research on Maya agriculturalists of Mexico's Yucatan Peninsula and the Savanna Pumé hunter-gatherers of Venezuela to illustrate how cooperative childrearing increases the number of children that mothers can successfully raise and—in environments where beneficial—even speed up maturation and childbearing. Kramer argues that intergenerational cooperation, meaning that adults help support children, but children also share food and many other resources with their parents and other siblings, is at the center of humans' demographic success. "Together our diet and life history, coupled with an ability to cooperate, made us really good at getting food on the table, reproducing, and surviving," Kramer writes.

During her time with the Maya, Kramer constructed a demographic model that considered how much household members consume, as the family grows and matures across a mother's reproductive career, balanced against how much a mother, father, and their children contribute. She found that Maya children contributed a substantial amount of work to the family's survival, with those aged 7-14 spending on average 2 to 5 hours working each day, and children aged 15-18 spending as much as their parents, about 6.5 hours a day. Labor type varied, with [younger children](#) doing much of the childcare, older

children and fathers fill in much of the day-to-day cost of growing and processing food and running the household. "If mothers and juveniles did not cooperate, mothers could support far fewer children over their reproductive careers," Kramer writes. "It is the strength of intergenerational cooperation that allows parents to raise more children than they would otherwise be able to on their efforts alone."

Kramer's second research population were the Savanna Pumé, hunter-gatherers in west-central Venezuela. The Savanna Pumé live in a high-mortality environment, with challenges such as seasonal undernutrition, high immunological stress, chronic intestinal parasite loads, endemic malaria, and no access to healthcare or immunization. Despite all this—or perhaps, in part, because of it—Savanna Pumé girls mature quickly and begin childbearing in their mid-teens. This pattern conforms with theoretic predictions that fast maturation optimizes fitness in a high-mortality environment. Early childbearing is also, however, associated with a higher probability of mothers losing their firstborn.

Kramer found that intergenerational cooperation mitigated these risks. "In this challenging environment, young Pumé females are buffered against seasonal fluctuations because food is shared with them, she writes. "If young Pumé mothers relied solely on their own efforts, they would have to delay childbearing until they matured as foragers and caretakers.

Humans' ability to reproduce more successfully than other great apes can be traced to differences in evolutionary strategy: humans bear more children, at a faster rate. They also provision food for juveniles, whereas other great apes stop helping [children](#) find food as soon as they have been weaned. Humans are able to shoulder the greater childcare burden through cooperation.

"Combined, these fertility parameters mean that if a natural fertility

mother survives her reproductive career, she can have almost twice as many offspring as nonhuman [great ape mothers](#)," she writes. "Humans are an astonishingly successful ape."

More information: Karen L. Kramer, How There Got to Be So Many of Us: The Evolutionary Story of Population Growth and a Life History of Cooperation, *Journal of Anthropological Research* (2019). [DOI: 10.1086/705943](#)

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