

Imagine that an Alpha Centauran scientist came to Earth 150,000 years ago. She might note, in passing, that the newly evolved homo sapiens were just a little better at tool use, cooperation, and communication than their primate relatives. But, as a well-trained evolutionary biologist, she would be far more impressed by their remarkable and unique “life history”.

“Life history” is the term biologists use to describe how organisms change over time --how long an animal lives, how long a childhood it has, how it nurtures its young, how it grows old. Human life history **is** weird. We have a much longer childhood than any other primate – twice as long as chimps, and that long childhood is related to our exceptional learning abilities. Fossil teeth suggest that that this long childhood evolved in tandem with our big brains - we even had a longer childhood than Neanderthals. We also rapidly developed special adaptations to care for those helpless children – “pair-bonding” and “alloparents”. Fathers and unrelated kin help take care of human children, unlike our closest primate relatives.

And we developed another very unusual life history feature – post-menopausal grandmothers. The killer whale is the only other animal we know for that outlives its fertility. The human lifespan was expanded at both ends – longer childhood and a longer old age. In fact, anthropologists have argued that those grandmothers were a key to the evolution of learning and culture. They were crucial for the survival of those helpless children and they also could pass on two generations worth of knowledge.

Natural selection often operates on “life history” characteristics, and life history plays an important role in evolution, in general. Biologists have long distinguished between “K” species and “R” species. K species, most fish, for example, may produce thousands of offspring, but most of them die and the rest live only a short time. In contrast “R” species like primates and whales, have only a few babies, invest a great deal in their care, and live a long time. Generally speaking, an “R” life history strategy is correlated with a larger brain and higher intelligence. We are the ultimate “R” species.

“Life history” is also important because it is especially responsive to information from the environment, not only over evolutionary time but also in the lifetime of a single animal. Tiny water fleas develop a helmet when they mature to protect them from certain predators. When the babies, or even their pregnant mothers, detect more predators in the environment they speed up the developmental process – they grow helmets earlier and make them larger, even at cost to other functions. In the same way, in other animals, including human beings, early stress triggers a ‘live fast, die young” life history. Young animals who detect a poor and risky environment grow up more quickly and die sooner.

Our unique human developmental trajectory has cumulatively led to much bigger differences in the way we live and behave. 150,000 years ago the Alpha Centauran biologist wouldn't have seen much difference between adult humans and our closest

primate relatives – art, trade, religious ritual, and complex tools were still far in the future, not to mention agriculture and technology. Our long childhood, and our extended investment in our children, allowed those changes to happen-- think of all those grandmothers passing on the wisdom of the past to a new generation of children. Each human generation had a chance to learn a little more about the world from their caregivers, and to change the world a little more themselves. If the Alpha Centaurian biologist made a return visit now, she would record the startling human achievements that have come from this long process of cultural evolution.

Evolutionary psychologists have tended to focus on adult men – hunting and fighting got a lot more attention than caregiving. We've all seen the canonical museum diorama of the mighty early human hunters bringing down the mastodon. But the children and grandmothers lurking in the background were just as important parts of the story.

You still often read psychological theories that describe both the young and the old in terms of their deficiencies, as if they were just preparation for, or decline from, an ideal grown-up human. But new studies suggest that both the young and the old may be especially adapted to receive and transmit wisdom. We may have a wider focus and a greater openness to experience when we are young or old than we do in the hurly-burly of feeding, fighting and reproduction that preoccupies our middle years.

“Life history” is an important idea in evolution, especially human evolution. But it also gives us a richer way of thinking about our own lives. A human being isn't just a collection of fixed traits, but part of an unfolding and dynamic story. And that isn't just the story of our own lives, caregiving and culture link us both to the grandparents who were there before we were born and the grandchildren who will carry on after we die.