

# Long childhoods and extended parenting help young crows grow smarter

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A wild Siberian jay parent (left) and its retained offspring (right) foraging together. Credit: Michael Griesser

Humans are unusual, even among primates, in the length of our "extended childhood." Scientists think that this period of childhood and adolescence, which gives us lots of time to explore, create, and learn, is a key reason why we are smart enough to learn skills that take years to

master. But humans are not the only species with an extended childhood. Elephants, some bats, whales, dolphins, and some birds—especially corvids—also have them. But does an extended childhood confer higher intelligence for other species, and if so, what is the role of parenting?

A team of scientists from the Max Planck Institute for the Science of Human History, the University of Konstanz and the U.K. tackled these questions by combining the results of their own fieldwork on two corvid species—Siberian jays and New Caledonian crows—with published data from 127 corvid species and several thousand species in the passerine (songbird) order. The study, published in *Philosophical Transactions of the Royal Society B*, offers a groundbreaking new view on the evolution of intelligence in which parenting takes center stage.

## Parenting pays the costs of extended childhoods

Researchers spent years observing two [bird species](#) in the wild to understand how [young birds'](#) learning is related to parenting received during adolescence and survival in adulthood. At a study site in Sweden, researchers used field experiments to test the ability of young Siberian jays to learn crucial life skills: recognizing a dangerous predator and opening a puzzle box to access food. Across the northern Palearctic, Siberian jays live in [family groups](#) that can include not only the young of a breeding pair, but also young that were born in other groups. These young can stay with the family group for up to four years. Young birds that stayed with their parents longer benefited from being with their parents. They learned faster by watching their parents and received more food from their parents. As a consequence, they were more likely to live longer and to start their own family.

At a study site in New Caledonia, researchers followed New Caledonian crows to track how juveniles learn a key survival skill: making tools for food retrieval. It takes about a year to learn this skill, a costly time

investment for the parents who still have to feed the young. Surprisingly, these crows stay with their parents for up to three years, allowing for a much longer "childhood" than most other crows. Parents and other adults are extremely tolerant of young crows. While adults are using a tool to get food, they feed the juveniles, let them watch closely, and even tolerate tool theft and physical contact by juveniles. As a result of this tolerant learning environment, New Caledonian crows have the largest brain size for their body size of all corvids.



Setup of the social learning experiment with Siberian jays. A breeder waits at the feeding board until its offspring has taken food. Parents are tolerant of kin

juveniles even in an experimental setting. Credit: Michael Griesser

## **Extended parenting affects intelligence**

The authors argue that the key role of parenting on the evolution of cognition has been overlooked so far. Often thought of as merely an inevitable chore, parental care is the reason children can spend their childhood learning and making mistakes.

"Extended parenting has profound consequences for learning and intelligence," explains Michael Griesser of the University of Konstanz. "Learning opportunities arise from the interplay between extended childhood and extended parenting. The safe haven provided by extended parenting is critical for learning opportunities. It creates extended developmental periods that feed back into the extended childhood."

In addition to benefiting young learners, extended parenting pays for the costs of an extended [childhood](#). Having to feed extra mouths is costly, but when there is enough food available in the environment, parents can afford to keep feeding their young for longer periods. With a safe haven, young birds have the time to grow a larger brain, learn difficult skills and access vital food resources. These acquired skills lead to better survival, and possibly also allow the species to expand into new environments.



A juvenile wild New Caledonian crow (right) using a tool to probe together with a tolerant adult (left) Credit: Natalie Uomini

### **Corvids are unusual birds, but similar to humans**

The researchers used phylogenetic comparative methods to analyze the differences between corvids and all other passerines. Corvids have much larger brains relative to their body size, like humans. They also have prolonged developmental periods, both in the nest and after they leave—another characteristic of humans.

"Both humans and corvids spend their youth learning vital skills surrounded by tolerant adults that support their long learning process," explains Natalie Uomini of the Max Planck Institute. "Moreover, corvids and humans have the ability for lifelong learning—a flexible kind of intelligence that allows individuals to adapt to changing environments

throughout their lifetime."

In the light of this study, the importance of parenting comes into even greater focus. Parents have a vital role in helping young brains grow smarter. Children, like young birds, cannot learn skills in isolation. Instead, they need a nurturing, supportive environment that allows the full potential of their large brains to develop.

**More information:** *Philosophical Transactions of the Royal Society B* (2020). [DOI: 10.1098/rstb.2019.0495](https://doi.org/10.1098/rstb.2019.0495)

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