

Burying beetles: Could being a good father send you to an early grave?

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New research shows beetles that received no care as larvae were less effective at raising a large brood as parents. Males paired with 'low quality' females - those that received no care as larvae - paid the price by dying younger, researchers found.

When a good insect father pairs with a bad mother, he risks being exploited by her for childcare and could bear the ultimate cost by dying

young.

A new study carried out with burying beetles also shows that bad parenting creates bad [parents](#)-to-be, while well-cared for [larvae](#) mature into high quality parents.

The research is published today in the open access journal *eLife*.

"Parents obviously play a huge role in determining the characteristics of their offspring," said lead researcher Professor Rebecca Kilner from the Department of Zoology at the University of Cambridge.

"The aim of our study was to investigate non-genetic ways that parents achieve this."

This is important because non-genetic inheritance could speed up the rate at which animal behaviour evolves and adapts in a rapidly changing world

Whether examining mothers or fathers, the research team found that individuals that received no care as larvae were less effective at raising a large brood as parents, and died younger. In contrast, high quality care not only produces a larger brood, but individual offspring with a higher mass. This is consistent with previous studies.

"We found that parental care provides a mechanism for non-genetic inheritance. Good quality parents produce offspring that become good parents themselves, while offspring that receive poor parenting then become low quality parents. Our experiments show how parental care allows offspring to inherit characteristics of their parents, but non-genetically," Kilner said.

However, the team also found that offspring pay a cost for receiving

[high quality care](#), because it makes them vulnerable to exploitation if they pair up with a lower quality partner. This may explain why animals often choose a mate that is willing to put in a similar amount of effort as them as a parent. In this way, they are less vulnerable to exploitation.

The burying beetle, *Nicrophorus vespilloides*, uses the carcass of a small vertebrate such as a mouse as an edible nest for its young. As its name suggests, a breeding pair buries the carcass and preserves it with an antibacterial secretion. The mother lays eggs nearby in the soil, and the larvae crawl to the carcass when they hatch. Although the larvae can feed themselves, they also beg both parents for partly-digested food from the carcass.

In the current study, when males were paired with females that had received no post-hatching care as larvae, they had significantly shorter lives than those whose partners had received more care. The most likely explanation is that males with low quality partners put more effort into parental duties to compensate for the shortcomings of their mate, and paid the price by dying younger.

More information: *eLife*, [dx.doi.org/10.7554/eLife.07340](https://doi.org/10.7554/eLife.07340)

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