ScienceWatch – Me or My Children

Parents commonly make sacrifices for children, but they also consider the trade-offs for themselves. Birds must also consider risks and benefits of caring for nestlings in the face of predators. However, their choice is one of life or death. What do they consider when making such a choice?

In the April 20, 2001 issue of *Science* two population ecologists, Cameron Ghalambor and Thomas Martin, have presented a study comparing the choices made by birds in North and South America. The study supports the theory that parents weigh the risks and benefits of protecting their young, and are sometimes willing to sacrifice their nestlings so they may breed again. Earlier studies indicated northern birds tend to lay more eggs and exhibit lower adult survival than their counterparts in the south. Ghalambor and Martin used preexisting data on survivorship of young and adults of almost 200 species from Europe and North America with those from Australia, New Zealand, and South Africa. Both the preexisting data and their own from Arizona and Argentina confirm that northern birds lay more eggs per season.

Next Ghalambor and Martin compared risk-taking of birds in the Northern Hemisphere (Arizona) with those in the Southern Hemisphere (Argentina). They tested whether differences in the size of the brood will also result in differences in the risks northern and southern birds will take to protect either themselves or their offspring. They compared five Arizona species, a wren, a thrush, a flycatcher, a sparrow, and a warbler (see Table below) with their closest counterparts in Argentina. In each case they tested parental response to recordings of calls from local predators, which attack either adults (hawks) or chicks (jays) or a non-threatening stuffed tanager. They found no change in the rate with which parents visited nests during control (tanager) presentations. In contrast, parents greatly reduced feeding visits to nests when presented with either a nestling (jay) or adult (hawk) predator.

Species pairs tested for risk-taking in North and South America

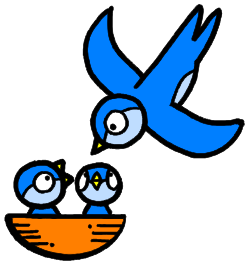
North America	**Mean clutch size**	**South America**	**Mean clutch size**
Cordilleran flycatcher (*Empidonax occidentalis*)	3.8	Euler's flycatcher (*Lathrotriccus euleri*)	2.3
American robin (*Turdus migratorius*)	3.4	Rufous-bellied thrush (*Turdus rufiventris*)	2.6
House wren (*Troglodytes aedon*)	5.8	House wren (*Troglodytes aedon*)	3.7
Dark-eyed junco (*Junco hyemalis*)	3.9	Saffron-billed sparrow (*Arremon flavirostris*)	2.8
Orange-crowned warbler (*Vermivora celata*)	4.4	Two-banded warbler (*Basileuterus bivittatus*)	2.9

The reduction in nest visits was different for northern birds as compared to southern birds, and also depended on which predator was presented. In response to a nestling predator, northern birds reduced their visits more than southern birds. In response to an

adult predator, southern birds showed a greater drop in visits. In other words, North American species reacted more strongly to reduce risk to their offspring, whereas South American species reacted more strongly to reduce risk to themselves.

These differences in parental response are consistent with the theory that the southern birds can survive to breed again while the northern species may not. Hence, the southern species do not invest as much in a brood. They lay fewer eggs at a time and are more willing to abandon them when their own survival is threatened. These data also show that birds can and do act in ways that trade off the costs associated with reduced food delivery to their young against a reduction in the risk of mortality to themselves or their offspring.

Evolutionary theory says that individuals act to promote species survival. Therefore, parents with many nestlings should tolerate greater risk for themselves especially when their own probability of surviving to breed in the future is low. In contrast, parents of species with fewer nestlings and a higher probability of adult survival should tolerate fewer risks to themselves, even sacrificing their small brood, because they are very likely to produce another one in the future. The data collected by Ghalambor and Martin demonstrate that clutch size and adult survival in birds determine the extent to which parents will risk their lives to protect their young.



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