

How female wisdom in old age helps elephants survive

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Elephants in Amboseli National Park. Credit: Graeme Shannon

(PhysOrg.com) -- The value of mature female experience may be something that human society needs to be reminded of from time to time but elephants, it seems, have good reason never to forget.

Experiments conducted by University of Sussex behavioral ecologists Dr. Karen McComb and Dr. Graeme Shannon among the wild African [elephants](#) of Amboseli National Park in Kenya show how elephant groups are guided by the wisdom of a female leader or matriarch, accrued through a long lifetime of experience.

The older and more experienced the matriarch, the researchers found, the more attuned she was to potential danger to the group, and the better able to distinguish between higher and lower levels of threat posed by predators.

The findings of the experiment are published today (Wednesday 16 March) in the journal [Proceedings of the Royal Society B](#).

The research team used novel experiments to determine how good elephants were at making crucial decisions about predators - playing back recorded lion roars to family groups (related females and young led by the matriarch) and monitoring their reactions.

While elephants are relatively impregnable to most predators due to their size and aggressive group defence, male lions present a very real threat. A male lion is more than capable of bringing down and killing a young elephant even when hunting alone, whereas female lions generally only succeed when hunting in large groups.

The team found that the oldest matriarchs (in particular the 60 plus age class) were more likely to engage in prolonged periods of listening and greater defensive behaviour when exposed to male lion roars (as opposed to female roars). This resulted in more intense bunching behaviour among the family group (where adult elephants bunch together to protect young calves) and mobbing approaches, where the elephants actively move towards the source of the roars, sometimes even mounting an aggressive charge.

The researchers conclude that this ability to discern subtle threat levels from differences in acoustic cues is accrued over time and through the experience of the matriarchs of previous encounters.

The study provides the first direct evidence that individuals within a social group may benefit from the influence of an older leader because of their enhanced ability to make crucial decisions about predators - a key element of ecological knowledge.

Dr. McComb has previously identified how elephant matriarchs build a

"social memory" of friendly faces or foes over a long lifetime - vital to operating successfully in complex social networks.

This latest research on identifying potential predators adds to our understanding of an older leader's pivotal role in elephant society, even after their reproductive capabilities have ended. It highlights the vital importance of the oldest individuals in natural populations of elephants and other mammals with long lifespans and advanced cognitive abilities such as whales and primates.

More information: 'Leadership in elephants: the adaptive value of age', Karen McComb, et al. *Proceedings of the Royal Society B* (March 2011).

Provided by University of Sussex

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