

Study reveals new insight into how Cheetahs catch their prey

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This image shows a cheetah photographed during the Queen's University Belfast-led study into hunting tactics of the animal. Credit: Johnny Wilson

A new research study has revealed that the cheetah, the world's fastest land animal, matches and may even anticipate the escape tactics of different prey when hunting, rather than just relying on its speed and agility, as previously thought.

The study, which has just been published in the Royal Society Journal *Biology Letters* was carried out by a team of researchers from Queen's University Belfast, in collaboration with other Institutions in the UK (University of Aberdeen, University of Swansea, Institute of Zoology, Zoological Society of London, University of Oxford), and elsewhere (North Carolina State University, The Lewis Foundation, South African National Parks, Earth and OCEAN Technologies, Kiel, Germany).

The research team used GPS and accelerometer data loggers deployed on cheetahs, along with traditional observation methods. The study was funded by a Royal Society International Joint Project grant, a NERC New Investigator award and the Lewis Foundation.

Explaining the team's findings, lead researcher Dr Michael Scantlebury, from the School of Biological Sciences at Queen's University Belfast, said: "The more we understand, about the physiology and the hunting tactics of this charismatic animal, the more we are able to ensure its continuing existence".

"Our study found that whilst cheetahs are capable of running at exceptionally high speeds, the common adage that they simply 'outrun' their prey does not explain how they are able to capture more agile animals. Previous research has highlighted their incredible speed and acceleration and their ability to turn after escaping prey. We have now shown that hunt tactics are prey-specific.

"In other words, we now know that rather than a simple maximum speed chase, cheetahs first accelerate towards their quarry before slowing

down to mirror prey-specific escaping tactics. We suggest that cheetahs modulate their hunting speed to enable rapid turns, in a predator-prey arms race, where pace is pitted against agility. Basically, cheetahs have clear different chase strategies depending on prey species."

The research suggests that cheetah chases comprise two primary phases, the first an initial rapid acceleration resulting in high speed to quickly catch up with prey, followed by a second, which is a prey-specific slowing period, five to eight seconds before the end of the chase, that enables the cheetah to match turns instigated by prey as the distance between them closes.

Dr Scantlebury added: "We have discovered that [cheetahs](#) first accelerate rapidly to get them close to the prey but then have to actively slow down to be able to match prey escape manoeuvres. It is like a deadly tango between the hunter and the hunted, with one mirroring the escape tactics of the other."

"The time spent in the initial and second phase differs according to prey species, with some species such as ostriches, hares and steenbok attempting to escape by executing sudden changes in direction, whilst other species such as wildebeest, gemsbok and springbok attempt to run fast in a more or less straight line. It almost seems as if the amount of power or effort put into a chase is decided at the beginning of the chase depending on the prey species."

Dr Gus Mills, from the Lewis Foundation, South Africa and Oxford University's WildCRU said: "Modern technology has given us the opportunity to record and measure facets of animal behaviour we have never been able to do. However, too often this is used without the essential backup of simultaneously observing the animals in the wild to validate what is being measured. We have been fortunate to be able to do both."

Prof Rory Wilson from Swansea University added: "One critical feature about the sports machine that is the cheetah is that we are not just talking about a dragster that achieves incredible speeds in a straight line. This beast has to corner magnificently as well. It's a Formula One car, but with a small tank."

The researchers also found that that there are clear differences between successful and non-successful hunts. Non-successful hunts involve less turning at the end of the chase, probably as the cheetah realised it was not going to catch up with the prey, and seemed to involve less energy than successful hunts of the same species.

Dr Scantlebury concluded: "One thing is certain, and that is that our previous concept of cheetah hunts being simple high speed, straight line dashes to catch prey is clearly wrong. They engage in a complex duel of speed, acceleration, braking and rapid turns with ground rules that vary from prey to [prey](#). These exciting findings are an important foundation for ensuring the preservation of these magnificent animals and for future studies in this area."

More information: The paper Cheetahs, *Acinonyx jubatus*, balance turn capacity with pace when chasing prey is published in the Royal Society Journal *Biology Letters*.

Provided by Queen's University Belfast

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