Camera-carrying falcons reveal mystery of raptor pursuit

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Raptors are the masters of the aerial dogfight. Intercepting prey on the wing, falcons lock their victims in their gaze before engaging in battle. Intrigued by the raptor's attack strategy, Suzanne Amador Kane recruited falconers from around the planet to mount spy cameras on their birds and discovered that falcons head off their prey by flying so that the target appears stationary in the falcon's visual field.

Hurtling through the air, a falcon locks its sights onto a victim as they engage in mortal combat. Intrigued by how flocks of birds respond to aerial attack, Suzanne Amador Kane from Haverford College, USA, had realised that she couldn't interpret how flocks react to raptors until she understood the predator's hunting strategy. But when she investigated the literature, it was clear that little was known about how falcons pursue their prey. 'There were computational studies […] that simulated this behaviour', recalls Amador Kane, but no one had published any behavioural studies. Amador Kane was stumped until she and her team saw a BBC documentary and realised that she could mount minute cameras on birds of prey to get a falcon's eye view to understand their lethal strategy. They publish their discovery that falcons head off their prey by flying so that the target appears stationary in the falcon's visual field in *The Journal of Experimental Biology*.

Resorting to personal contacts and social networking, Amador Kane linked up with falconers around the globe who were happy to attach miniaturised spy cameras to backpacks and tiny helmets worn by their falcons to film encounters during flights. Then, when the movies rolled

in, Amador Kane and her undergraduate student Marjon Zamani painstakingly located the prey's position on each frame by hand before reconstructing each pursuit from the falcon's perspective. Eventually, the duo simulated three possible strategies that the falcon could use to find out which agreed best with their observations.

In the first strategy, the falcon would simply fly directly after the prey, but this is usually inefficient, wasting the predator's time and valuable energy when the victim takes evasive action. Calculating that the prey would always be found at the centre of each frame in the movie if the birds used this approach, it was clear that the falcons rarely followed the victim's path, ruling out the strategy.

Amador Kane and Zamani then tested the second strategy, which had been proposed by Vance Tucker over a decade earlier. 'Falcons have two regions of very acute vision: one directed almost in the forward direction and the other dramatically off to the side, 30

More information: Amador Kane, S. and Zamani, M. (2014). Falcons pursue prey using visual motion cues: new perspectives from animal-borne cameras. J. Exp Biol. 217, 225-234.
jeb.biologists.org/content/217/2/225.abstract

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