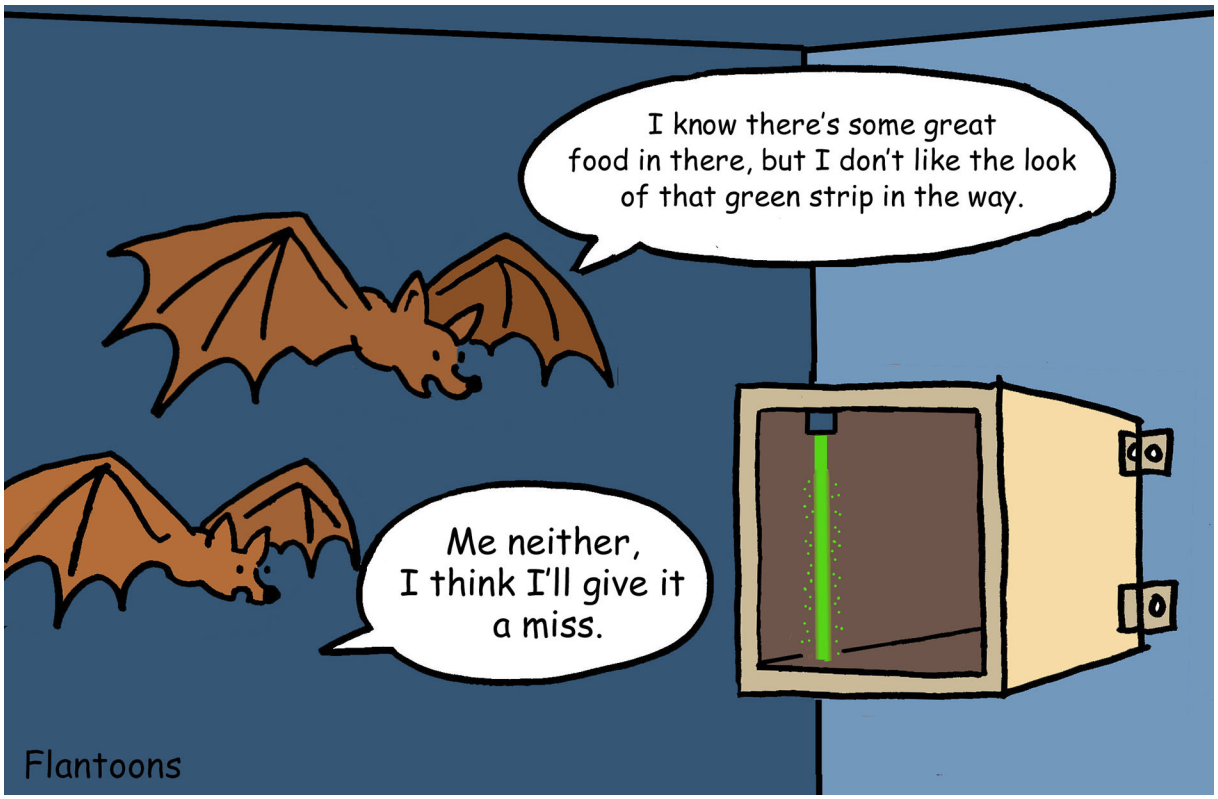
INSIDE JEB

Two senses better than one for bats



Only a select band of creatures see the world through sound. Whales and dolphins click, while bats squeal at pitches above our hearing. Although bats are mostly seen out after dark, many emerge from their roosts in search of insects around sundown. However, echolocation calls only travel so far, in which case bats can rely on their vision when viewing distant objects. But how much do bats depend on sight when they have the choice between either sense?

To answer this question, Te Jones and Cynthia Moss from Johns Hopkins University, USA, had to come up with a way of producing a visual obstacle with no substance, so they turned to an old circus trick: smoke and lights. Substituting a mist of water droplets for the smoke, the duo shone a laser through the fog to reveal the beam of light and create the illusion of an obstacle, which the bats could not detect by echolocation. The duo also produced an obstacle that the bats could not see but could detect with echolocation, by wrapping a string of unlit lights around a thin strip of rubber; and when they switched on the lights, the bats were able to see and 'hear' the object. After checking to make sure that the bats could see the laser beam, Jones and Moss alternately placed each of the three obstacles across the front of a box that the bats had been trained to swoop inside and filmed the animals' manoeuvres.

Impressively, the bats avoided flying inside the box ∼17% of the time when the laser beam or the unilluminated rubber strip blocked a section of the entrance. Seeing the obstacle alone was sufficient to deter some of the animals from entering. However, almost 50% of the bats avoided entering the box when the entrance was obstructed by the illuminated rubber strip; the combined information from both senses seemed to present an even greater deterrent to them entering the box. However, when the bats did swoop inside, they sometimes clipped the beam of light with their wings, suggesting that they may have realised that the laser beam was not solid.

10.1242/jeb.242521

Jones, T. K. and Moss, C. F. (2021). Visual cues enhance obstacle avoidance in echolocating bats. *J. Exp. Biol.* **224**, jeb241968. doi:10.1242/jeb.241968

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