

Speed Kills: Effects of Vehicle Speed on Avian Escape Behavior

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ABSTRACT: The avoidance of vehicles is a common challenge for birds in the modern world. Birds generally rely on antipredator behaviors to avoid vehicles, but modern vehicles are faster than predators. We predicted that birds may be unable to accurately estimate the speed of approaching vehicles, which could contribute to miscalculations in avoidance behaviors and cause collisions. We tested our prediction in two studies. In the first (DeVault et al. 2014), we baited turkey vultures (*Cathartes aura*) to roads with animal carcasses and measured flight initiation distance (FID) when driving a truck towards them at 30, 60, or 90 km/h. Despite a wide range of responses, FID of vultures increased by a factor of 1.85 as speed increased from 30 to 90 km/h. At 90 km/h there was no clear trend in FID across replicates; birds were equally likely to initiate escape behavior at 40 m as at 220 m. Seventeen percent of vehicle approaches at 90 km/h resulted in near collisions with vultures, compared to none during 60 km/h approaches and 4% during 30 km/h approaches. In the second experiment (DeVault et al. 2015), we used video playback to investigate escape behaviors of captive brown-headed cowbirds (*Molothrus ater*) in response to virtual vehicles appearing to approach at speeds ranging from 60-360 km/h. Flight initiation distance remained similar across vehicle speeds, indicating that avoidance behaviors in cowbirds were based on distance rather than time available for escape. Cowbirds generally did not initiate flight with enough time to avoid “collision” when virtual vehicle speed exceeded 120 km/h. Although potentially effective for escaping predators, the decision-making processes used by turkey vultures and cowbirds in our experiments appear maladaptive in the context of avoiding vehicles, and may represent important determinants of bird-vehicle collisions.

Key Words: birds, brow-headed cowbirds, escape behavior, speed, turkey vulture vehicle

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