

NOTES

AMERICAN CROW CRACKS OPEN BIVALVE VIA AUTOMOBILE

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ABSTRACT: There have been many observations of corvids placing a hard-shelled food item onto a roadway, then consuming the food exposed when a passing automobile crushes the shell. However, it has been debated whether corvids perform this behavior intentionally. Our observation of an American Crow (*Corvus brachyrhynchos*) placing a bivalve on a road, then eating the meat exposed when the shell was run over, supports the idea that corvids intentionally use cars to crack shelled foods.

Species in the family Corvidae have been noted to crack open food items, including nuts (Brekke 2014), gastropods (Tanaka et al. 2013), and bivalves (Davenport et al. 2014), by dropping them onto hard substrates. Roadways are one of these substrates, but many observations reveal that the birds appear to wait until automobiles run over dropped food items before retrieving them (Maple 1974, Grobecker and Pietsch 1978), suggesting that they may be deliberately using automobiles as shell-crackers. In addition to dropping food onto roads from a height, Carrion Crows (*Corvus corone*) and a Clark's Nutcracker (*Nucifraga columbiana*) have been observed walking onto roads to place food items such as walnuts (Nihei 1995, Ara et al. 2019) and, in one case, a salamander (Gorman 2021) in lanes of traffic. Adding to this body of observations, we report the first observation of an American Crow (*C. brachyrhynchos*) using an automobile to access the flesh of a bivalve by placing it on a road. While American Crows' deliberate usage of vehicles to access shelled foods has been disputed (Cristol et al. 1997), we provide support here to the idea that they intentionally use automobiles as shell-crackers.

On 11 February 2023 we were at Arrowhead Marsh in Alameda County, California, attending a field trip for a class at the University of California. At 10:15, we noticed an American Crow carrying a dark object in its bill while walking toward the center of a paved secondary road. The crow set the object onto the road before flying up to perch on a nearby fencepost. Less than a minute later, a car driving toward the parking lot narrowly missed the object. Immediately thereafter, another car ran over the object. After the second car passed, the crow flew down onto the road, gathered the crushed object, then returned with it to the fencepost. From later examination of our pictures, we identified the object as a bivalve, probably a ribbed mussel (*Geukensia demissa*), from its large size, dark shell, oblong shape, and yellow-orange flesh. Another American Crow soon flew in and briefly perched on a fencepost next to the first. Both crows flew into a tree, then down into the grass on the other side of the road, where they began to eat the bivalve. There were no agonistic behaviors between the two crows; they appeared to share the food item. The entire observation lasted about 7 minutes.

While reports of corvids using cars as "nutcrackers" has often been ascribed as evidence of their advanced cognition, Cristol et al. (1997) criticized the assumption that American Crows were deliberately using cars to crack nuts when dropping food items onto roads, asserting that they were simply taking advantage of gravity. Yet, the preponderance of observations, including our own, provide evidence that corvids

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are *deliberately* cracking open food via automobiles, as suggested by Caffrey (2001). Though it is possible that our crow incidentally benefited from the automobile crushing the mussel, we believe our observation reflects how American Crows adapt to and exploit an urbanizing world.

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LITERATURE CITED

- Ara, K., Mikami, K., and Mikami, O. K. 2019. Nut-cracking behavior by Carrion Crow (*Corvus corone*): Walnut-cracking behavior using automobiles in Hakodate City. *Japanese J. Ornithol.* 68:43–51; doi.org/10.3838/jjo.68.43.
- Brekke, L. 2014. Bird droppings: Hooded Crows foraging on Persian walnuts. Master's thesis, Norwegian Univ. Life Sci., Ås, Norway.
- Caffrey, C. 2001. Goal-directed use of objects by American Crows. *Wilson Bull.* 113:114–115; doi.org/10.1676/0043-5643(2001)113[0114:GDUOOB]2.0.CO;2.
- Cristol, D. A., Switzer, P. V., Johnson, K. L., and Walke, L. S. 1997. Crows do not use automobiles as nutcrackers: Putting an anecdote to the test. *Auk* 114:296–298; doi.org/10.2307/4089172.
- Davenport, J., O'Callaghan, M. J., Davenport, J. L., and Kelly, T. C. 2014. Mussel dropping by Carrion and Hooded crows: Biomechanical and energetic considerations. *J. Field Ornithol.* 85:196–205; doi.org/10.1111/jofo.12060.
- Grobecker, D. B., and Pietsch, T. W. 1978. Crows use automobiles as nutcrackers. *Auk* 95:760–761; doi.org/10.1093/auk/95.4.760.
- Gorman, P. R. 2021. Do nutcrackers use automobiles as nutcrackers? *W. Birds* 52:87–89; doi 10.21199/WB52.1.8.
- Maple, T., 1974. Do crows use automobiles as nutcrackers? *W. Birds* 5:97–98.
- Nihei, Y. 1995. [Variations of behavior of Carrion Crows (*Corvus corone*) using automobiles as nutcrackers.] *Japanese J. Ornithol.* 44:21–35; doi.org/10.3838/jjo.44.221.
- Tanaka, K. D., Okahisa, Y., Sato, N. J., Theuerkauf, J., and Ueda, K. 2013. Gourmand New Caledonian Crows munch rare escargots by dropping. *J. Ethol.* 31:341–344; doi.org/10.1007/s10164-013-0384-y.

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