Do puffins use tools?

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A recent article by Fayet et al. (1) reports two observations of wild puffins (*Fratercula arctica*) from two geographical locations touching different body parts with a stick. The behaviors are interpreted as unprecedented evidence of tool use in a seabird.

However, there is another existing report of tool use in a wild seabird in a self-directed context as also pointed out in a commentary (2). From close by, Meyerriecks (3) observed a cormorant brushing its wings repeatedly with a loose feather. Each motion was preceded by dipping the feather's tip to its preen gland. Due to its anecdotal nature, this remains a short note in an ornithological bulletin but is mentioned in Shumaker et al.'s (4) summary.

While we believe that the puffin observation, like the above, deserves mention, its impact on the present view of animal tool innovation depends on the strength of its evidence. We fear that the presented observations do not sufficiently exclude simpler explanations.

The two observations are 4 y apart. Similar to Meyerriecks' the first is anecdotal as there is no footage allowing for independent analysis. It would be very interesting if the authors could provide more descriptive details of the behavior.

This stresses the importance of the second observation, which is a video of a bird touching its breast with a stick. As avian beaks are usually adequately adapted for feather care, including scratching an itch or removing a tick (5), we do not find it plausible that a tool should be used on regions such as the breast or parts of the back that are easily reachable (captive parrots typically scratch themselves with tools in the head and neck region that is otherwise inaccessible). Moreover, the stick–breast combination is extremely short (1 s) and unrepeated.

Notably, both observations occurred in a season during which nesting material is collected. The authors argue that nesting material does not include sticks and that the manipulated stick was not carried to a nest. We doubt that puffins generally do not gather sticks, as several unrelated wildlife photographs show wild individuals carrying branches and sticks (e.g., refs. 6 and 7). We render it possible that objects resembling nesting materials are picked up playfully or to display readiness to breed. Interestingly, the bird in the video displays stylized feet movements associated with site ownership (8) while holding the stick.

Likely and more parsimonious explanations for the object behavior are that the bird simply accidentally touched its plumage with the stick while bringing it toward its breast during a breeding display or was simply trying to scratch itself while still holding the object (9). Note here that even reporting an accidental tool innovation requires proof of recurrence.

We do acknowledge case reports as starting points for further detailed investigations. Nevertheless, we believe that the data brought forward do not provide convincing evidence for tool use as strongly suggested in the paper and thus bear a high risk of a false positive record. More detailed and longer observations or further analysis would be necessary to reduce this risk.

1 A. L. Fayet, E. S. Hansen, D. Biro, Evidence of tool use in a seabird. *Proc. Natl. Acad. Sci. U.S.A.* **117**, 1277–1279 (2020).
2 A. M. P. von Bayern, I. Jacobs, M. Osvath, Tool-using puffins prickle the puzzle of cognitive evolution. *Proc. Natl. Acad. Sci. U.S.A.* **117**, 2737–2739 (2020).
3 A. J. Meyerriecks, Tool-using by a double-crested cormorant. *Wilson Bull.* **84**, 482–483 (1972).
4 R. W. Shumaker, K. R. Walkup, B. B. Beck, *Animal Tool Behavior: The Use and Manufacture of Tools by Animals* (The Johns Hopkins University Press, Baltimore, MD, 2011).
5 D. H. Clayton *et al.*, Adaptive significance of avian beak morphology for ectoparasite control. *Proc. Biol. Sci.* **272**, 811–817 (2005).
6 J. Short, A puffin carrying tree branches in its mouth (photograph, 2011). https://www.gettyimages.at/detail/foto/a-puffin-carrying-tree-branches-in-its-mouth-lizenzfreies-bild/126293941. Accessed 20 January 2020.
7 T. Taylor, Puffins in Fame Island Northumberland (photograph, 2019). https://wildimaging.co.uk/puffin#he3057566. Accessed 20 January 2020.
8 M. P. Harris, S. Wanless, *The Puffin* (Yale University Press, New Haven, CT, 2011).
9 B. G. Farrar. Evidence of tool use in a seabird? https://psyarxiv.com/463hk/ (21 January 2020).

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