CORRIGENDUM


White storks are obligatory soaring gliding migrants that utilize thermals to minimize costly flapping flight. In Rotics et al. (2016), stork flapping ratio was estimated to be 18.6% ± 4.9 (mean ± SD, for juveniles and adults together) based on body acceleration (ACC) data. This is relatively high compared to other migrants of similar body size (Spaar, 1997). The source of this discrepancy is related to the method used to assess flapping ratio. An ACC record consisted of a 3.8 second burst of acceleration measurements and it was classified as ‘flapping’ (using a machine learning algorithm) if it contained any flapping, thus, for example, one second of flapping was enough to mark the whole flight record as ‘flapping’, which augmented the flapping ratio estimate. The authors have thus re-calculated the flapping ratio for the same dataset using a more sensitive method by identifying each flap in the ACC signal (see Methods). The updated stork flapping ratio was 11.1% ± 2.5 (mean ± SD) but the core conclusion stated in Rotics et al. (2016) of lower juvenile flight efficiency is not affected by reevaluating the flapping ratio (juveniles flapping ratio: 12.3 ± 2.6, adults: 10.6 ± 2.5, $F_{1,78} = 6.81$, $p = .01$; GLMM with Gamma error distribution and random factors: individual, year and family ID).

METHODS

During a flapping flight, a bird’s vertical body acceleration changes greatly from high upwards acceleration (peak) to downwards acceleration (valley) with each wing stroke, whereas gliding produces almost no differences in vertical body acceleration, which makes flapping easily distinguishable from gliding in acceleration data. White stork flapping was found by first visually examining acceleration bouts of 20 gliding and 20 flapping records and measuring the difference in vertical acceleration between each pair of subsequent peak and valley. Then, a threshold was defined to distinguish a peak-valley pair resulting from a flap and a pair occurring during gliding. Using this threshold, an algorithm was built that finds all peaks and valleys in every ACC measurement and identifies whether they represent flapping. The total time of flapping was then calculated and divided by the total measurement time, for all flight records per bird, to give the flapping ratio. The method was validated by visually examining 150 ACC measurement profiles of flight.

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REFERENCES
