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## SIBLICIDE, SPLAYED-TOES-FLIGHT DISPLAY, AND GRAPPLING IN THE SAKER FALCON

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Here we report three types of novel aggressive behavior for the Saker Falcon (*Falco cherrug*). The first concerns siblicide, never before directly witnessed for the genus *Falco* (see Newton 1979:117). The remainder concern aggressive behavior of adults, including a new social display we call Splayed-toes-flight and observations of Grappling (wherein two birds lock feet) and Whirling.

On 16 June 1997, we visited a Saker Falcon nest in an elm tree (*Ulmus* spp.) containing three nestlings in Sookhbaatar Aimag (Axe Hero Province), eastern Mongolia. When we went back the next day, we saw one young tearing at prey. Upon climbing to the nest, we discovered that the healthy-looking nestling (age ca. 14 d; compared with photographs of known-aged Prairie Falcons [*F. mexicanus*]: Moritsch 1983) had both feet locked onto its still alive but bloodied and emaciated sibling (Fig. 1). The aggressor repeatedly tore at the wing of its sibling and the whole lateral surface of the right wing was tattered and sodden with blood. After the larger sibling delivered a long series of blows and tugs, it rested, but its feet remained clutching its nestmate. Its lack of responsiveness to our nearness was a surprise and likely reflected that it was starving.

After a few moments, the victim gave a series of hoarse, quiet peeps, then lay silent. It seemed very near death and the tattered condition of its wing evidenced that the larger sibling had already consumed a small portion of it.

We were unable to find remains from the third sibling observed on the previous evening. Holthuijzen et al. (1987) and Court et al. (1988) concluded for their study areas, that missing falcon chicks had likely been consumed. Based on the difficulty the older sibling was having tearing at its nestmate, we concluded that, if the third

nestling was consumed since the previous night, it must have been with the assistance of an adult. After about 15 min, we left the nest with the older sibling still locked onto its victim.

Although siblicide is common in the family Accipitridae (Ingram 1959), Newton (1979) concluded that it was unknown for the genus *Falco*. The best substantiation (but no eye witness account) of siblicide for a falcon is by Ristow et al. (1983), Ristow and Wink (1985), and Wink et al. (1993) for Eleonora's Falcon (*F. eleonorae*). They reported many cases of the youngest nestling (in broods of three) being wounded or killed and partly eaten. They clearly documented cannibalism, but they never saw the actual killing. They were confident that the wounds they observed were due to sibling attacks rather than rat (*Rattus rattus*) predation or adult attacks (i.e., infanticide). Cade (1960:208) recorded a probable case of siblicide and cannibalism in the Gyrfalcon (*F. rusticolus*), and Tordoff and Redig (1998) reported a possible case of Peregrine Falcon (*F. peregrinus*) siblicide. We hasten to state that the behavior we observed, and what we believe these authors inferred in other falcons, is probably not the Cainism common in Accipitridae, but rather the concerted attempt of hungry young to eat their nestmates.

Cannibalism is also apparently rare (or seldom reported) for species in the genus *Falco*, except for the Eleonora's Falcon and the American Kestrel (*F. sparverius*) (Bortolotti et al. 1991). A small number of clear records of cannibalism exist for the Peregrine Falcon and Prairie Falcon (Ratcliffe 1980:142, Holthuijzen et al. 1987, Court et al. 1988).

Another novel observation of aggressive behavior occurred on 23 June 1997, also in Sookhbaatar Aimag. Our observations began when a lone adult male Saker Falcon performed a ledge-display bout, including the saker homolog of the Eechup-call (Herbert and Herbert 1965),



Figure 1. Two-week-old Saker Falcon in process of killing and eating its sibling.

at a nest that had failed earlier that year. Later, this bird performed various courtship displays at a larger cliff about 1.5 km away from the failed nest and within the crater of a dormant volcano. There followed a 23-min aggressive encounter between this bird and a pair of adults within the crater.

Deciphering the interactions that follow was possible because all three sakers were physically very different. The two males were conspicuously smaller than the female. The lone male was extremely light and was also readily distinguished from the paired male by its different molt pattern. The female exhibited spot-belly plum-

age, very unlike the males. Our first observations were made unconcealed about 60 m from the 1997 nest. The later observations were made from about 400 m away.

The social encounter began at about 1335 H when the lone male saker flew to an old eagle nest on the crater wall and Eechup-called (the saker version is a monosyllabic Chup; T.J. Cade pers. comm.) while watching the adult female flying away. As the female continued flying away, the lone male began Cliff-racing (Nelson 1977), flying very fast back and forth in front of the cliff and periodically landing on the cliff. After about 3 min, the lone male perched, watched westward, and then flew rapidly up and west as the second male stooped from the west and dove three times at it.

At 1340 H, the two males Grappled (i.e., locked feet) about 10 m from the ground, Whirled two revolutions, then separated just before or just as they hit the ground. They then immediately flew off in different directions. About 500 m from the eagle nest, the lone male settled on a grassy hillside, still within the crater. Next began a 4-min attack wherein the paired sakers stooped many times at the lone male on the hillside. The frequency and high velocity of the stoops effectively kept it grounded. In response to many of the stoops, the lone male would leap into the air, flip upside down, and thrust its feet upwards to ward off the attacks. No exact count was made of the number of stoops during this flurry of activity, but we estimate that the lone male flipped up about 20 times to fend off about 30 stoops. About half of the stoops were by the female, but it appeared that each time contact was made, it was the paired male that had stooped. Contact between the two males probably occurred about five times and definitely occurred twice (i.e., once when they Grappled and Whirled and once when feathers were dislodged).

At 1344 H, the lone male flew rapidly toward the eagle cliff, but was immediately attacked by the pair. In response, the lone male sought refuge amidst boulders at the mouth of a small cave about 50 m below the lower eagle nest. At this juncture, the pair circled many times about 50–100 m above the cave. During this low-level soaring bout, both members of the pair performed an obvious social display which we called Splayed-toes-flight. This display differed from normal soaring flight in that the feet were held about 3 cm below the ventral contour feathers and the toes were spread apart and held slightly below horizontal. From careful, but distant, scrutiny, we estimated that the angle between the outer and inner toes was about 45°.

At 1350 H, the male of the pair flew into the upper eagle nest and Chup-called several times. At 1353 H, the lone male flew up the slope a short distance to some large caves below the lower eagle nest. This action prompted more stoops by the pair, but at 1356 H, the male of the pair circled higher and drifted over the rim of the crater. At 1357:30 H, the lone male flew from the big cave. At 1358 H, the pair stooped very fast and pur-

sued the lone male over the crater rim and east out of sight. At 1406 H, the female returned and circled in the crater. Then at 1408 H, the female landed high on the cliff, then flew west out of sight. At 1420:30 H, the male of the pair returned, circled, landed on the upper cliff, Chup-called and then circled with the female. Both performed Splayed-toes-flight but for neither bird were the legs so conspicuously down as at 1344 H.

By 1426 H, all birds were gone from the crater. At 1427 H, both members of the pair returned, circled in the crater and again performed the less intense form of Splayed-toes-flight. After a few moments, we left the crater.

Talon Grappling has previously been observed in at least six species of falcons (Herbert and Herbert 1965, Simms 1975, Balgooyen 1976:12, Nelson 1977:35–36, 121–122, Newton 1979:153, Ellis 1992). We know of no previous record of talon Grappling for the saker.

Splayed-toes-flight has been observed for two other sakers, both in central Mongolia. On 2 July 1998, an adult female performed two bouts of this display, each about 10 sec in duration, while circling about 200 m from us as we approached a nest containing four nestlings. The display was initiated when a fifth, and already fledged, young flew from the vicinity of the nest to the female's position. The first observation of Splayed-toes-flight was made 22 May 1997 when an adult female saker dangled one leg and repeatedly circled our team during our climb to the nest that contained four young about 12 d of age.

To our knowledge, Splayed-toes-flight has never been previously reported as a social display for any raptor. Lowered flight may serve a thermoregulatory (cooling) function in some raptors (T. Fleming and an anonymous reviewer pers. comm.), but cooling fits the context of only one of our saker bouts. Splayed-toes-flight is very different from the leg-dangle displays found in the Common Buzzard (*Buteo buteo*; Weir and Picozzi 1975) and others of Accipitridae. The only published falcon display involving lowered legs is the Mutual-floating-display described by Platt (1989), wherein mated Gyrfalcons, with wings partly furled and tails spread, perform a slow, parallel descent. Nothing like Splayed-toes-flight was mentioned by either Monneret (1974), Weick (1989), or Nelson (1970, 1977) in their ethograms for the Peregrine Falcon.

RESUMEN.—Proveemos información sobre un pichón de dos semanas de *Falco cherrug* matando a su compañero de nido, siendo este el primer reporte de fratricidio en el género *Falco*. También reportamos combates aéreos entre tres adultos de *Falco cherrug*. Se incluyen observaciones de aferramientos, volteretas y talones extendidos, un comportamiento social previamente no descrito.

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