Mother’s voice recognition by seal pups
Newborns need to learn their mother’s call before she can take off on a fishing trip.

In gregarious mammals, mother and pup need to be able to recognize each other’s voices in order to be reunited in a crowd, a skill that has only been studied in domesticated species where mother and young stay together during the rearing period. In otarids, females have to leave their newborn to feed at sea, but offspring nevertheless develop long-term recognition of their mother’s voice. Here we show that pups of the subantarctic fur seal (Arctocephalus tropicalis) can acquire this ability when they are just 2–5 days old, and that the mother times her departure accordingly.

On Amsterdam Island in the Indian Ocean, fur seals are born from late November to early January. The rearing period lasts for an average of 10 months and consists of foraging trips at sea that last for 2–3 weeks at a time, interspersed with suckling periods ashore lasting for 3–4 days. After parturition, mothers usually stay with their young for about a week before leaving the colony on their first feeding trip. When she returns, a female must relocate her own pup among the many similar ones in the rookery. This reunion depends mainly on vocalizations because pups respond specifically to their mother’s voice.

We investigated the age at which this specific response develops in pups. By using playback experiments for several days after birth, we assessed the evolution of pups’ behavioural responses to their own mother’s calls and to those of strange females. As the pup needs to be able to recognize its mother when she comes back from foraging at sea, its response to her voice should have developed before her first departure, which is presumably delayed by the mother until her pup can recognize her.

Responses to playback tests revealed that pups (n = 9) react vocally to any female’s calls a few hours after birth, but after 2–5 days they can respond specifically to their mother’s voice. This response was always established before the female’s departure, which occurred 2–10 days after parturition. Moreover, the departure date depends on the timing of this voice recognition by the pup (n = 9; regression analysis, reciprocal-X model: departure date is 10.9–11.9/specific-response date (days after birth); P < 0.05).

To test the efficiency of the pups’ learning, we measured the time taken by pups to find their mother after her return from her first sea trip. Of the monitored mother-pup pairs (n = 15), 66% met up within 7 min, and the remaining pairs were united within 11 min (regression analysis, double-reciprocal model: percentage of successful meetings calculated as 1/(−0.000356 + 6.45/time required); P < 0.01).

In colonial mammals, the ability of pups to recognize their mother’s voice is crucial for their survival as, in most species, females only feed their offspring. Mother-young recognition must therefore develop as soon as it is needed, before the first separation. In several bird species, vocal identification between parents and young generally coincides with offspring mobility. In A. tropicalis, factors other than call recognition may be involved — for instance, females may leave the shore when pups stop sucking.

Our results show that, in spite of the variable duration of ontogeny, the mother’s departure date is linked to the pup’s ability to recognize her voice. This supports the idea that recognition of a mother’s call by her pup is an important factor in allowing her to go to sea.

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Palaeontology

The beaks of ostrich dinosaurs

Primitive ornithomimids, a ubiquitous group of specialized Cretaceous dinosaurs nested within a clade of predominantly carnivorous theropods, are known to have had teeth, whereas derived ornithomimids had an edentulous beak, which has prompted speculation about their dietary habits. Here we describe two new ornithomimid specimens in which soft-tissue structures of the beak have been preserved. These creatures probably used their beaks to strain food sediment in an aquatic environment, rather than for predation on large animals.

Specimen RTMP (Royal Tyrrell Museum of Palaeontology) 95.110.1 is an almost complete skeleton of the Campanian ornithomimid Ornithomimus edmontonicus from Dinosaur Provincial Park, Alberta, Canada (Fig. 1a). This specimen preserves traces of the keratinous covering (rhamphotheca) on the beak on the tips of the right premaxilla and dentary. As preserved, the soft tissue extends up to 3.5 mm from the rostral and mandibular margins, and fills a gap left by the anterior divergence of the premaxilla and dentary. The rhamphotheca on each jaw tapers posteriorly and terminates just behind the midpoint of the right naris. The upper rhamphotheca extends about 1 mm farther than the lower.

Figure 1 A subantarctic fur seal (Arctocephalus tropicalis) mother on her return from a foraging sea trip. The mother starts calling soon after arriving ashore and her pup calls in reply to indicate its position within the colony. As they approach one another, they continue to emit vocalizations until they are reunited.