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Detour behaviour in chicks: Spatial and object representation

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Dusk orientation experiments on a transaharian Passerine bird migrant

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Dusk orientation experiments were performed on a trasaharian migrant, the Pied Flycatcher (*Ficedula hypoleuca*), at a spring stopover site in SW Sardinia (S. Pietro Isle), to examine its response at sunset; in other tests (Marchetti & Baldaccini, 1993) the exposure to the sunset point has proved to be non-relevant for a correct orientation of this species in the dark.

Birds were caught during the day by mist nets and kept indoors in closed cardboard cages. At dusk they were put into Emlen funnels for 40 minutes; some were tested under a clear natural sky, others under an artificial overcast created with a frost cover, others in the presence of the moon. Individual birds were kept for two or three days and repeatedly tested, being randomly assigned to the different sky conditions.

The clear-sky groups were oriented towards W (271° and 287° respectively), while the «overcast» were not (288°), though the three distributions are not different from one another. The analysis of individual tests shows high activity values, highest in the moon's presence and lowest under an overcast sky. On the contrary, mean vectors were low. The high activity observed might be the reflex of the tendency of the birds to migrate at the supposed time of departure, or more likely be caused by the still high light levels; the westerly tendency seems to suggest that the performance is far from better at this time than later in the night, and that sunset light could even be a disturbing cue causing some phototaxis effect on caged birds. The activity level of individuals that were subject to successive experiments under a clear sky did not change significantly, but mean vectors became longer ($P = 0.04$), probably because birds became accustomed to captive conditions, ceased escape reactions and were more able to choose non-random directions.

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Detour behaviour in chicks: spatial and object representation

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Previous studies on detour behaviour in chicks used cagemates as a goal placed behind U-shaped barriers (see Scholes, 1965; Regolin *et al.*, 1994). In this condition, when chicks went outside the U-shaped barrier, and lost sight of the goal, acoustic stimuli from cagemates might allow them to orient correctly towards the goal. We have tried to determine whether chicks could identify the goal and its spatial location in the absence of any locally orienting sensory cues. Two-day-old chicks were tested in a detour situation requiring them to abandon a clear view of a desired goal (a small red object on which they had been imprinted) in order to achieve that goal. The chicks were placed in a closed corridor. At one end of it was a barrier with a small window through which the goal was visible. Two symmetrical apertures placed midline to the corridor allowed the chicks to adopt routes passing around the barrier. After entering the apertures, chicks showed searching behaviour for the goal and appeared able to localize it, turning either right or left depending on their previous direction of turn. Thus, in the absence of any local orienting cues emanating from the goal, chicks were aware of the existence of an object that was no longer visible and could represent its spatial location in egocentric coordinates.

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