Abstract

Object permanence (OP) is a cognitive ability that enables animals to mentally represent the existence of hidden objects even if they can not be perceived by senses. In humans, OP develops during six qualitative stages, in which the understanding of relationships between objects in space and time changes. Current research shows that primates, some carnivores and several species of birds also acquire various degrees of this ability depending on their social life and foraging strategies. Many studies of OP have focused on food-storing birds but yet only in the Corvidae family. Therefore we decided to test this ability in two species of the Paridae family, food-storing coal tit (*Periparus ater*, N=23) and non-storing great tit (*Parus major*, N=24) to find out which stage they can achieve and whether there is a difference between these species in relation to their caching ability. Our results suggest that food-storing coal tits search for completely hidden objects significantly better than great tits. Most of the great tits were not able to solve this task. However, the upper limit for both species is probably Stage 4 because coal tits probably solved OP tasks with more screens randomly or used alternative strategies rather than mental representation. Substantial interindividual variability in the cognitive performance was correlated with the results of the neophobia test. Our results suggest that individual rate of neophobia strongly correlates with OP performance in coal tits but not in great tits.

Keywords: Paridae, coal tit, great tit, food-storing, neophobia, cognitive functions, novel object test