

FISSION-FUSION DYNAMICS AND COGNITION: SPIDER MONKEYS AS A KEY SPECIES

F. Amici^{1,2,3,4}, F. Aureli¹, I. Capellini⁵, J. Call²

¹Research Centre in Evolutionary Anthropology and Palaeoecology, Liverpool John Moores University, Liverpool, United Kingdom; ²Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany; ³Institute of Cognitive Sciences and Technologies, CNR, Rome, Italy; ⁴Research Group Behavioural Biology, Utrecht University, Netherland; ⁵Evolutionary Anthropology Research Group, Durham University, Durham, United Kingdom

Presenter's Email: abbepu@yahoo.it

Cognitive differences across primate taxa, especially between monkeys and apes, have been explained by different evolutionary hypotheses, although these often are not supported by systematic inter-specific comparisons. Here we directly compared the performance of the four great apes, two New World monkeys (spider monkeys and capuchin monkeys) and One World monkey (long-tailed macaques), differing in their phylogenetic relatedness, feeding ecology and social organization in terms of levels of fission-fusion dynamics. Subjects were tested on their ability to remember object locations, track object displacements and obtain out-of-reach rewards. Although we found differences in the performance at tracking object displacements between monkeys and apes, inter-specific differences in the other two tasks were better explained in terms of differential levels of fission-fusion dynamics. We used phylogenetically independent contrasts to compare the species' performance in these tasks and in tasks on inhibitory skills. This allowed us to account for the species' evolutionary history and use phylogenetically independent data points for statistical comparisons, reducing the effects of unmeasured confounding variables shared through common descent. Results showed no clear-cut distinction between apes and monkeys, but revealed a significant association between fission-fusion dynamics and some of the tested cognitive skills. Our study shows the importance of using multiple tasks across multiple species and phylogenetically controlled methods in order to test different explanations for the enhancement of specific cognitive skills.

Keywords: great apes, capuchin monkeys, long-tailed macaques, comparative cognition