

HAND PREFERENCE IN TREE SHREWS AND PROSIMIAN PRIMATES: A COMPARATIVE APPROACH

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The evolution of manual lateralization in primates is controversially debated and several theories have been put forth. According to the postural origins hypothesis of MacNeilage et al. (1987), hand preference for grasping an object is influenced by the postural demand. We established a comparative framework using the same methodology to explore this hypothesis in prosimian primates and tree shrews, mammals genetically close to primates. We tested tree shrews (29 to 36 subjects) and mouse lemurs (26 to 53 subjects) in a standardized test battery with 4 different forced food grasping tasks where subjects were forced to grab mealworms in different postural demands (sit, biped, triped, cling). For each task, we recorded whether the subjects used the right or the left paw/hand to grasp mealworms. We performed binomial tests and calculated handedness indices (HI) to quantify the individual laterality bias and its strength (absolute HI) in each task. We got similar results for tree shrews and mouse lemurs. Most subjects showed an individual hand preference across all tasks, but there was no hand preference at a group level. We found no influence of the postural demand on hand preference direction and strength. According to our results, the postural origins hypothesis was not supported. Ongoing experiments will investigate the influence of task complexity and visual guidance on handedness for direct comparison with anthropoid primates.

Keywords: hand preference, postural demand, mouse lemurs, tree shrews