

# The bipedal walking of the olive baboon, *Papio anubis*: a kinematic study from infancy to adulthood

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**ABSTRACT** During human development, children gradually acquire independent walking by strongly experiencing this behaviour. Contrary to humans, extant non-human primates (NHP) are not habitual bipeds, yet, they occasionally walk bipedally in a non-erratic way and this behaviour is performed since an early age. In this context, one can wonder whether the bipedal gait of NHP changes and improves during development, while they mainly experience other locomotor modes such as quadrupedal walking. We conducted a study on the bipedal walking of olive baboons, at the Primatology Station of the CNRS (UAR 846). We provide detailed information on the sagittal plane gait kinematics and how it changes from early infancy to adulthood. Our results show that the average pattern of the joint and segment angles ("bent-hip, bent-knee" posture) is generally alike across the age-classes, but the modulation of the bipedal gait with speed is different between infants and older baboons. While adults and adolescents adjust their kinematics predominantly at the ankle joint, infants adjust the range-of-motion of all the joints of their hind limb. The various kinematic adjustments observed are likely to highlight important differences in the motor strategies of balance control between infants and older baboons. We suggest that these differences arise from the degree of maturity (neuromotor control) and also from the differences in morphology (e.g. body proportions). While our study suggests a change in the control strategy with age, baboons appear to be capable of stabilising their upper body in a bipedal posture very early. Fundings: IRN-GDRI0870 & HoBiS-ANR-18-CE27-0010-01