

Walking tall to protect the species

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The transition from apes to humans may have been partially triggered by the need to stand on two legs, in order to safely carry heavier babies. This theory of species evolution presented by Lia Amaral from the University of São Paulo in Brazil has just been published online in Springer's journal, *Naturwissenschaften*.

For safety, all nonhuman primates carry their young clinging to their fur from birth, and species survival depends on it. The carrying pattern changes as the infant grows. Newborns are carried clinging to their mother's stomach, often with additional support. Months later, infants are carried over the adult body usually on the mother's back, and this carrying pattern lasts for years in apes. However, this necessity to carry infants safely imposes limits on the weight of the infants.

Through a detailed mechanical analysis of how different types of apes - gibbons, orangutans and gorillas - carry their young, looking at the properties of ape hair, infant grip, adult hair density and carrying position, Amaral demonstrates a relationship between infant weight, hair friction and body angle which ensures ape infants are carried safely.

Amaral also shows how the usual pattern of primate carrying of heavy infants is incompatible with bipedalism. African apes have to persist with knuckle-walking on all fours, or 'quadruped' position, in order to stop their young from slipping off their backs.

The author goes on to suggest that the fall in body hair in primates could have brought on bipedality as a necessary consequence, through the

strong selective pressure of safe infant carrying, as infants were no longer able to cling to their mother's body hairs. In the author's opinion, safe carrying of heavy infants justified the emergence of the biped form of movement. Although an adult gorilla is much heavier than an adult human, its offspring is only half the weight of a human baby.

Amaral concludes that this evolution to bipedality has important consequences for the female of the species. Indeed, it frees the arms and hands of males and juveniles, but females have their arms and hands occupied with their young. This restriction of movement placed limits on food gathering for biped females carrying their infants, and may have been at the origin of group cooperation.

Source: Springer

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