

Chimpanzee movement patterns and social ecology in the Taï National Park, Côte d'Ivoire.

Dean P. Anderson, Julia Lehmann, Christophe Boesch, Hawthorne Beyer, James D. Forester

Abstract

Chimpanzee mental maps of habitats should allow them to choose direct paths between food sources. However, daily paths are often very sinuous. The movements of individuals are the foundation of grouping patterns in social groups, therefore it is important to understand the factors that influence movement decisions. The abundance and distribution of food fluctuates seasonally, and chimpanzee movement patterns are expected to adapt to such changes. We analyze three years of data from the Taï National Park, Côte d'Ivoire to address two inter-related questions. One, is the relative sinuosity of daily movement paths of chimpanzees influenced by the abundance and distribution of food, the gender or reproductive status of the individual, or the presence of estrous females in the social community? Direct paths are expected between large but widely separated food patches; whereas more sinuous paths are expected when food is found in small and uniformly distributed patches. However, movement patterns may be affected by the reproductive status of the individual or by the presence of estrous females in the community. Males may exhibit more direct daily paths, as they are more frequently involved in territorial defense than females. Two, is there a relationship between party size and the sinuosity of daily paths? Large parties have an increased number of individuals that could potentially influence movement decisions, which may result in more sinuous movement patterns. Alternatively, the increased foraging competition experienced by large parties may result in direct paths between food patches. We quantify movement sinuosity by examining the distribution of turning angles of daily paths, and by calculating the ratio of net daily displacement to daily path length. Day-long-observation follows were conducted for adult males, non-estrous females, and estrous females. Monthly estimates of the abundance and spatial distribution of food were calculated from extensive data collection on the size, density, and phenology of food-producing trees. This analysis will examine factors that influence individual movement patterns, and unravel the interactions between movement, food availability, estrus, and social grouping.