

## POWER RELATIONS AMONG NEIGHBORING COMMUNITIES AFFECT PARTY SIZE AND COMPOSITION IN GOMBE CHIMPANZEES: A REMOTE SENSING AND GIS ANALYSIS

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Chimpanzees live in fission-fusion communities, in which party size and composition changes depending on factors including food availability, the presence of sexually receptive females, and proximity to neighboring communities. Most studies examining these factors have focused on limited temporal periods of one to three years. Here we use 25 years of long-term data from the Kasekela community in Gombe National Park, Tanzania. We used demographic records to determine power relations between the Kasekela community and its neighbors to the north and south. To examine the distribution and abundance of vegetation, we used NDVI derived from 1972 and 1999 radiometrically normalized and calibrated Landsat MSS and ETM+ imagery. We overlaid a fishnet grid over the Kasekela range, and calculated for 1974-1978 and 1997-2001 time periods the number of adult male chimpanzee feeding points, number of females with full sexual swellings, NDVI, elevation, slope, distance from streams, the size of neighboring communities and percent canopy cover for each square. Simple and multiple regressions were conducted on randomly selected grids to minimize spatial autocorrelation. We found that NDVI was positively correlated with the time chimpanzees spent feeding but did not affect the average number of adult males in the party. Instead, male party size was positively correlated with the distance from the center of the community home range. However, in more recent years, as the size of neighboring communities has decreased, the proximity to neighboring communities has shown a corresponding decrease in its effect on male party composition ( $p < .0001$  (1974-78);  $p = .0318$  (1997-01)).

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