

NO NEED FOR VIOLENCE: MEMORY-BASED FORAGING AND CONSPECIFIC RESOURCE COMPETITION CAN EXPLAIN PRIMATE “WAR ZONES”

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“War zones”—under-used areas where the ranges of neighboring groups overlap—have been described in several species including wolves, chimpanzees and humans. All of these species engage in lethal acts of territorial aggression and some suggest that “war zones” arise because shared areas are dangerous. However, under-use of shared areas is not restricted to species with lethal territorial aggression and is wide-spread in primates, suggesting that a more generalizable explanation is needed. To investigate the causes of primate space-use heterogeneity, we built a spatially explicit, agent-based foraging model, which we validated using high resolution movement data from four *Cebus capucinus* groups, collected using an automated radio-telemetry system in Panama. Memory about the location and availability of food plays an important role in primate ranging decisions, and greater knowledge about centrally located resources might increase their value relative to resources in rarely visited areas, making foraging in peripheral areas unprofitable. Conspecific resource depletion may further lower the profitability of foraging in shared areas. We used our model to test if memory-based foraging rules could reproduce capuchin space-use patterns, and whether including territorial aggression and/or conspecific resource depletion increased the model fit. Models including only memory and conspecific resource depletion yielded home ranges with “war zones”, but incorporating territorial aggression improved the model fit. These results suggest that all three factors contribute to capuchin space-use behavior, but demonstrate that foraging economics can create “war zones”, even in the absence of territorial aggression.

Keywords: space-use, movement models, territorial aggression, capuchins