



Supplementary Figure 13 | Interaction Model. The co-evolution of several unusual traits within marmosets can be explained through a model positing a positive feedback loop triggered initially by external forces of selection. We suggest that early in the evolutionary radiation of New World monkeys, the ancestral callitrichine shifted to an ecological niche consisting of insectivory/gumivory and exploitation of edge habitats. This provided selective advantages to animals that could reproduce rapidly, and hence leave many descendants, whenever new empty habitats were discovered. Selection for rapid reproduction led to twinning and postpartum estrous. Selection for small body size (both in adults and neonates) occurred in parallel with selection for rapid reproduction. These processes led to the origin of callitrichine paternal care and alloparenting, as these behavioral adaptations reduced the energetic demands on breeding females, allowing greater investment in pregnancy and fetal growth. Reproductive suppression of subordinate females facilitated alloparenting and rapid increases in population-level reproductive output as dispersal into newly disturbed edges by subordinates could quickly generate new social groups consisting of reproductively competent individuals that were suppressed in their prior social group. All these processes reinforced this feedback loop, ultimately producing a remarkable suite of behavioral and physiological adaptations that are reflected in the unique molecular traits described in the text.