# Brown and Munger 1981 Competition in Desert Rodents: An Experiment with Semipermeable Exclosures

* The OG Portal experiment paper
* Framing: **Competition**; does competition occur in the real world and does it structure communities
* “Our experiment was designed to determine whether the presence of large granivorous rodents limits the abundance of small rodents…if this effect is due to competition for food, small granivores should show greater increases in density than small omnivores.”
* **Densities** (abundance N) of small rodents remained similar to those on control plots for 8 months. Then increase.
* Highlight two aspects of interest
  + 8 month time lag. Suggest a) lack of juveniles (experiments implemented in September) to disperse or b) need for a new seed crop.
    - Later papers, as I recall, suggest low absolute abundance as well.
  + Densities are **higher** on exclosures but **not high enough to compensate in N or biomass for missing Dipo.** Suggest a) increased intra and inter specific aggression, b) species being constrained by inflexible morphology and behavior, c) other groups, like birds or ants, taking some of the available seeds.
    - I think now we tend to lean towards b) – that there are some resources the littles won’t get to because they have to forage in risky areas. But not sure what the evidence is for that.

# Brown and Munger 1985 Experimental Manipulation of a Desert Rodent Community: Food Addition and Species Removal

# Heske et al 1993 Effects of kangaroo rat exclusion on vegetation structure and plant species diversity in the Chihuahuan Desert

# Heske et al 1994 Long-Term Experimental Study of a Chihuahuan Desert Rodent Community: 13 Years of Competition

* Second set of exclosures instituted in 1988

# Valone et al 1994 Interactions between Rodents and Ants in the Chihuahuan Desert: An Update

# Ernest and Brown 2001 Delayed Compensation for Missing Keystone Species by Colonization

* Bailey’s compensation paper
* “Until recently, other rodents have been unable to consume more than a small fraction of the food resources that were made available by removing kangaroo rats. For nearly 20 years, from 1977-96, E on kangaroo rat exclosure plots was consistently very low, averaging 14% and never exceeding 33% of the energy use by krats on control plots”
* “Small seed-eating rodents maintained densities on kangaroo rat removal plots that averaged almost two times higher than on control plots. Nevertheless, their collective seed consumption failed to compensate for that of the missing kangaroo rats.”
* “Compensation for missing kangaroo rats increased from about 33% before 1996 to more than 80% after 99. Since 1998, PB on average accounted for 66% of the energy used by krats.”
* “PB is sufficiently similar to krats that it was able to compensate almost completely when krats were experimentally removed from our study site. However, kangaroo rats also had large effects on the composition of the plant and rodent communities. It is too soon to know what effects PB will have.”
  + Refs for effects on composition of plant and rodent communities: Brown and Munger *Ecology* 1985; Heske, Brown, and Mistry *Ecology* 1994; Valone and Brown *Science* 1995; Brown and Heske *Science* 1990.

# Ernest et al 2008 Zero Sum, the Niche, and Metacommunities: Long-Term Dynamics of Community Assembly

* Frames as species sorting
  + Species turnover to match shifting niches due to grassland 🡪 shrubland transition
* Not sure I have it in me to read this closely, but might be some interesting conceptual framing

# Thibault et al 2010 Redundant or complementary? Impact of a colonizing species on community structure and function

* Framing as Eltonian and Grinnellian niches
  + Grinnellian == environmental req’s
  + Eltonian == includes impact on environment (incl. other species)
  + “how nearly identical in Eltonian niche or ecological impact are superficially similar species?” “The dearth of experimental work on animal communities makes it unclear whether this concept should be applied in the conservation and management of higher trophic levels [than plants]”
* Summary of history
  + “Beginning in 1977, we removed all krats. Insectivorous and folivorous rodents did not respond to krat removal, but small granivores increased approximately 3x in abundance and most species had higher colonization and/or lower extinction rates on removal plots. Despite increased abundance, small granivores did not compensate in **resource use**, accounting for only 14% on average, and never more than 33% of the energy used by the krats on the adjacent control plots.”
    - I often have a question – is that 33% of **all** energy on controls or 33% of **krat** energy on controls?
  + “Ernest and Brown compared energy use of PB on removal plots to that of Dipo on control plots, documenting a significant increase in compensation through 1999. The abundance of PB hs continued to increase since then.”
  + “Here we compare total plot-level energy use of all granivores across treatments, not just compensation of krat energy use, with an additional seven years of data. **In addition** we ask whether the original structure of the community, measured as species richness and relative abundances of species, on control plots, was restored on removal plots after the colonization of PB. Finally, we ask whether PB and Dipo had different impacts on the other granivorous rodent species by comparing abundances and colonization/extinction rates of the individual species through time and across treatments.”

# Kelt 2011 Comparative ecology of desert small mammals: a selective review of the past 30 years [not Portal only]

# Kelt et al 2015 Energetic compensation is historically contingent and not supported for small mammals in South American or Asian deserts [not Portal only]

# Christensen et al 2018 Long-term community change through multiple rapid transitions in a desert rodent community

# Christensen et al 2019 Established rodent community delays recovery of dominant competitor following experimental disturbance