

Death and Taxa

time-invariant differences in mammal species durations

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The Paleobiology Database
revealing the history of life



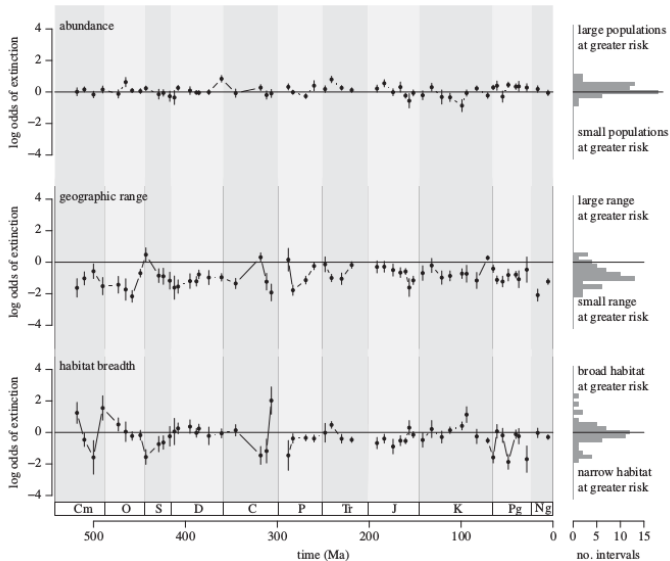
Question

Why do taxa go extinct at different rates?

Motivating questions

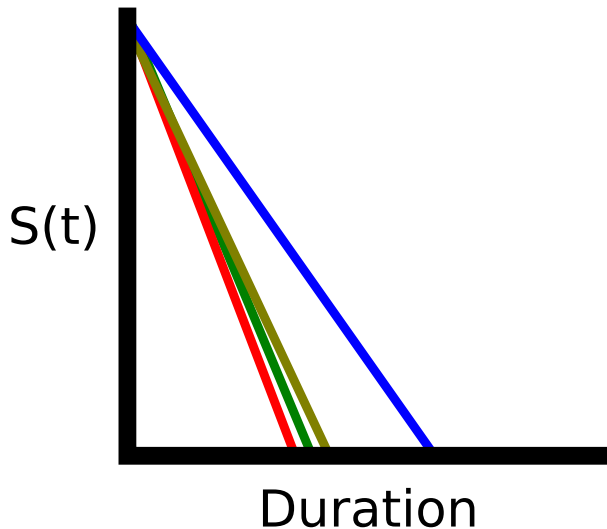
- ▶ How do mammal species traits affect extinction risk?
 - ▶ How do shared time of origination or evolutionary history relate?
- ▶ How do my findings compare to current risk factors?
- ▶ Is species extinction risk age-independent?

Relationship between range size and extinction risk

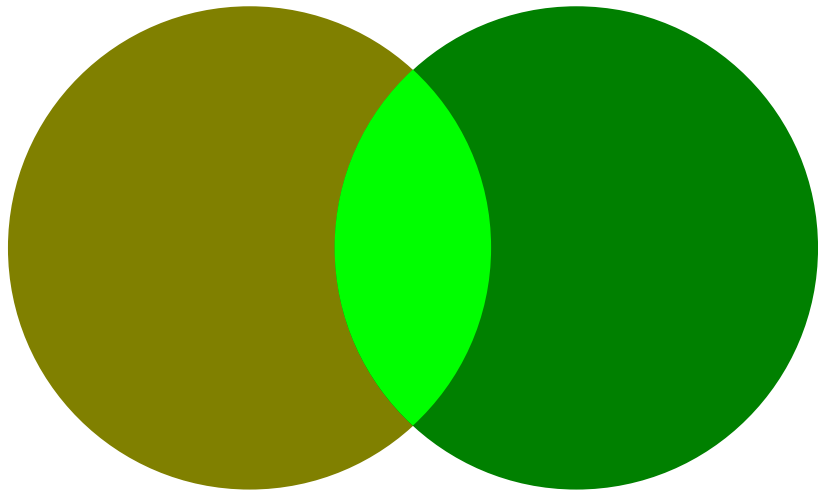


(Harnik and Simpson 2013 *Proc B*)

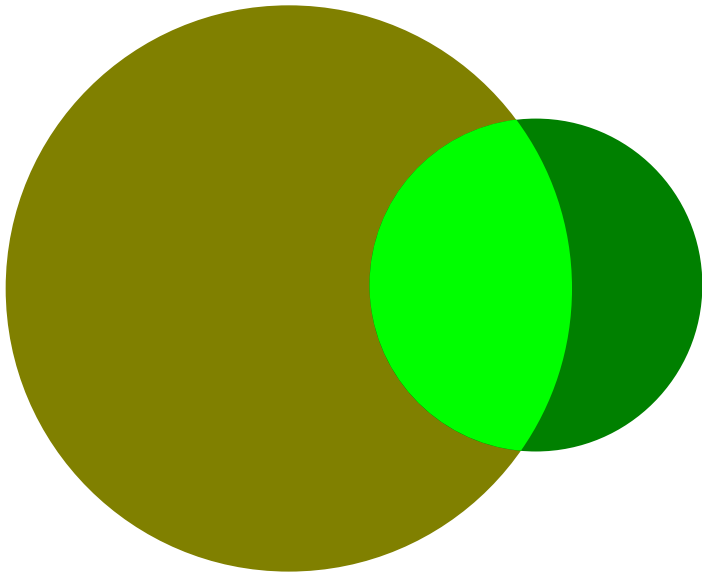
Hypotheses of effects of dietary category



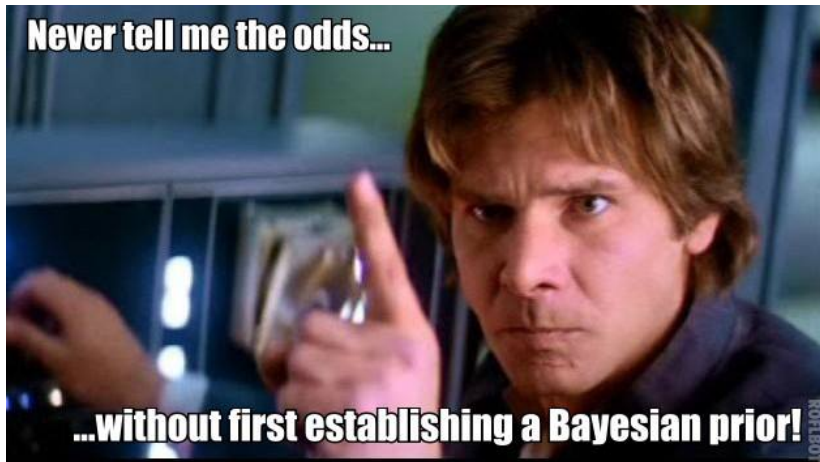
Hypotheses of effects of locomotor category



Hypotheses of effects of locomotor category

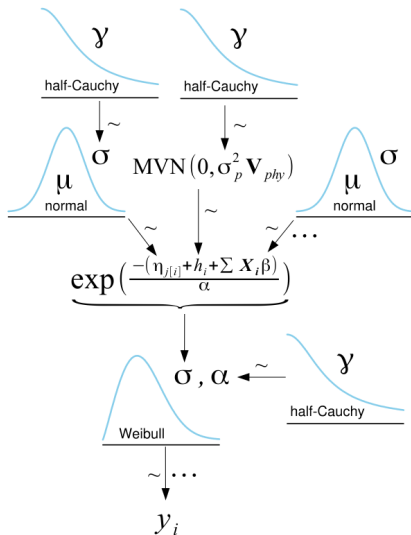


Hierarchical Bayesian modeling approach

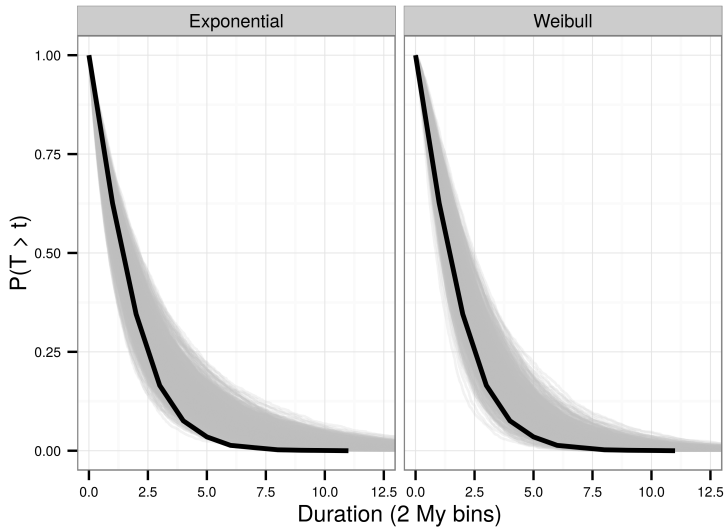


(www.countbayesie.com)

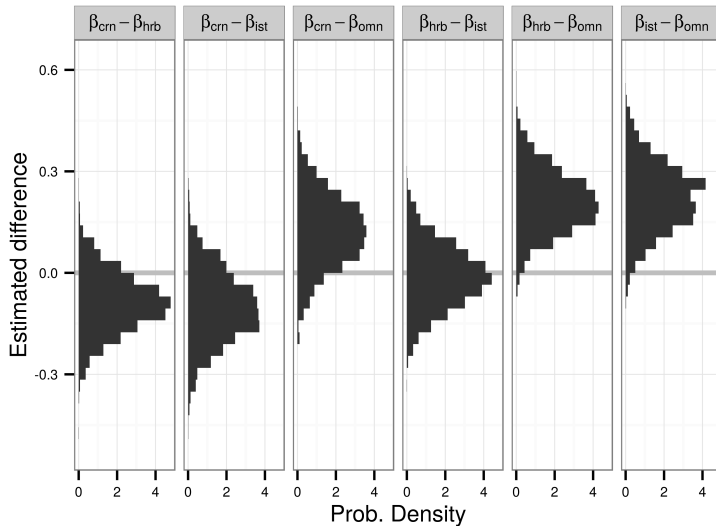
Survival model diagram



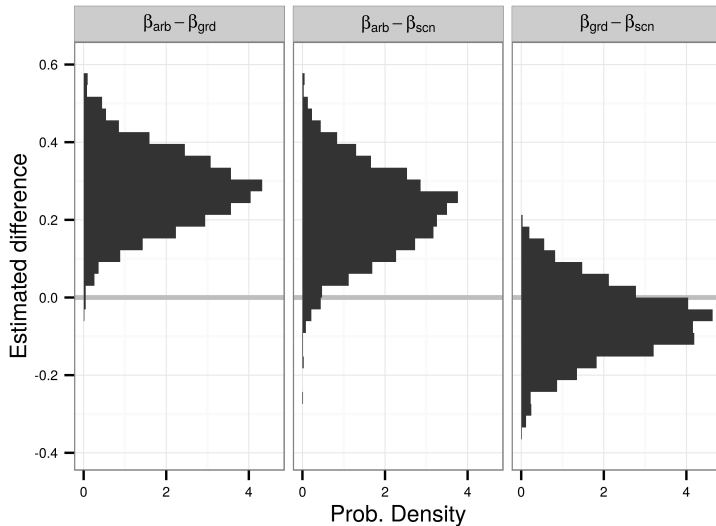
Pattern of species survival under two models



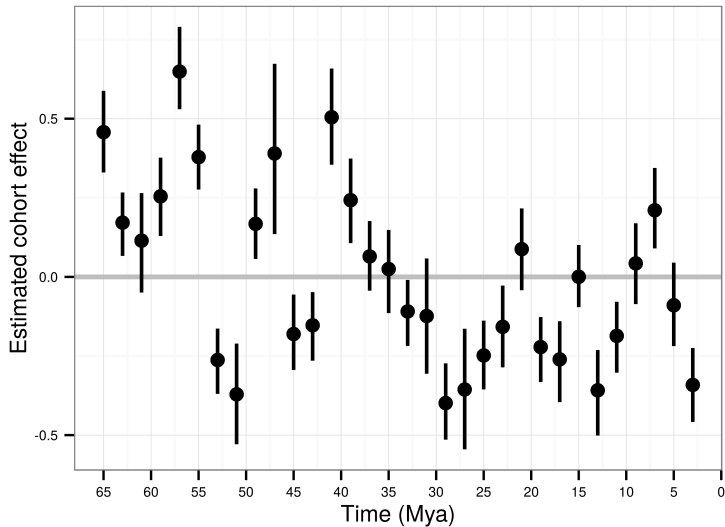
Effect of dietary category on extinction risk



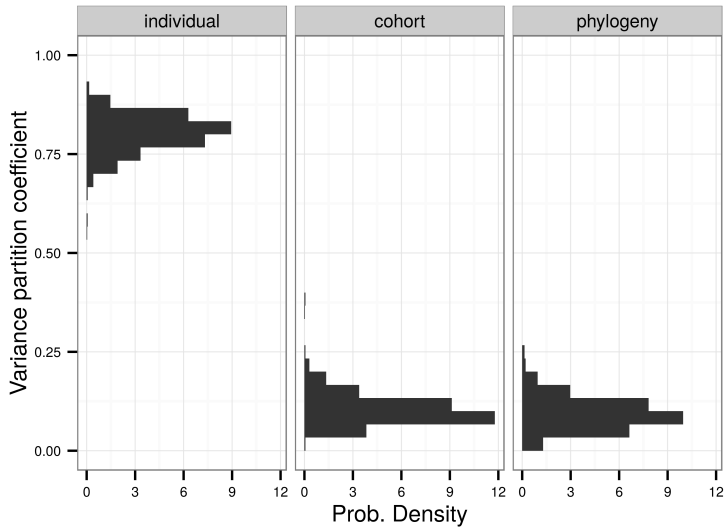
Effect of locomotor category on extinction risk



Difference in risk between origination cohorts



Three sources of variance



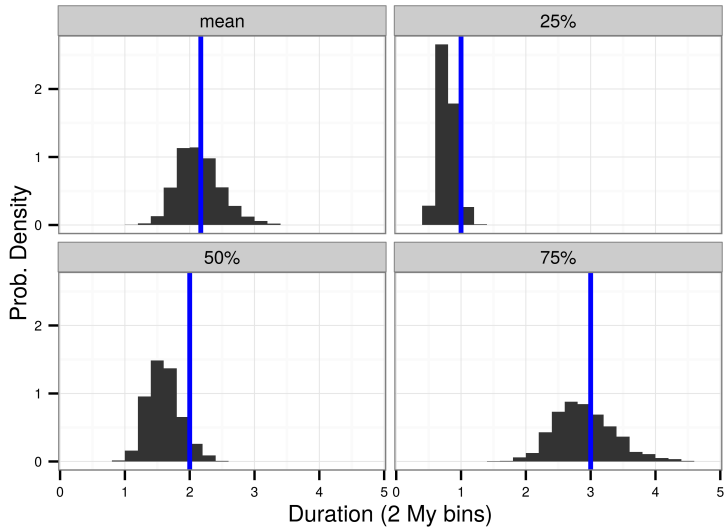
Conclusions

- ▶ Survival of the unspecialized as time-invariant generalization.
- ▶ Decrease in extinction risk with time.
 - ▶ Both cohort/temporal and phylogenetic effect.
- ▶ Some incongruence with risk factors in the Recent.
 - ▶ e.g. body size, trophic category, phylogenetic clustering.

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Further posterior predictive checks



Concerns regarding estimation of α

