EFB 390 Recitation – Tues 10/3

Announcements:
- Week 5 homework due at midnight on Thurs 10/5
- Guest lecturer Thurs, readings, submit question before lecture
- No recitation next week (fall break!)

Today:
- AIC presentation overview, example
- Prep AIC presentation in class Thursday 10/12

AIC (Akaike Information Criterion)

- Most common criterion used for model selection
  - Given a collection of models for data, estimates the quality of each model, relative to each of the other models
- Used when we want parsimony (simplest model with the least assumptions and variables but with greatest explanatory power)
- AIC can be any number
  - Value of AIC means absolutely nothing by itself
  - Comparative tool
  - Rules of thumb
    - 0-2 Δ AIC = strongly competing model
    - 4-7 Δ AIC = limited support
    - > 10 Δ AIC = essentially no support

AIC Presentation

- In class Thursday 10/12, full group needs to present
- Submit slides to Blackboard Weds 10/11 before midnight
- No longer than 3 minutes
- 5 slides:
    1. Title (Ecology style citation), question
    2. Response variable and predictors
    3. AIC Table
    4. Important models
    5. Concluding remarks

Question:

- Article:

Codron, D., J. A. Lee-Thorp, M. Sponheimer, J. Codron, D. De Ruiter, and J. S. Brink. 2007. Significance of diet type and diet quality for ecological diversity of African ungulates. Journal of Animal Ecology 76:526–537.

- Do morphological adaptations in African savanna ungulates reflect variations in diet type or quality?

Response variable and predictors:

- Response variables:
  - Body mass (kg)
  - Hypsodonty (height:width ratio of molar)
- Predictors:
  - Fecal carbon (13) isotopes represents percentage grass consumed
  - Fecal proxies for diet quality
    - %N (percent nitrogen)
    - NDF (neutral detergent fiber)
    - ADF (acid detergent fiber)
    - ADL (acid detergent linen)

AIC Table:

Table 1. Akaike's second-order information criterion (AIC_c) of the regression models of ungulate body mass with diet type (percentage grass intake) and diet quality (faecal %N and faecal %ADL). Models are repeated using only members of the family Bovidae

Model (body mass-dependent)	K	AIC_c	Δ_i	w_i	Weighted averages			
					$\sum w_i$	SE	–95% conf.	+95% conf.
All species								
% grass	3	55·50	7·03	0·01	0·56	0·1024	–0·3790	0·0223
%N	3	48·90	0·44	0·29	0·95	0·3827	*–1·8528*	*–0·3526*
%ADL	3	53·65	5·18	0·03	0·33	0·2143	–0·5752	0·2648
% grass, %N	4	48·46	0·00	0·37				
% grass, %ADL	4	55·04	6·57	0·01				
%N, %ADL	4	50·78	2·31	0·12				
% grass, %N, %ADL	5	49·96	1·50	0·17				
Model average						0·3456	*0·8122*	*2·1668*
Bovidae only								
% grass	3	29·12	7·01	0·01	0·50	0·0916	–0·3633	–0·0041
%N	3	23·24	1·13	0·17	0·72	0·3638	*–1·5195*	*–0·0935*
%ADL	3	23·17	1·06	0·18	0·76	0·2016	*–0·8714*	*–0·0810*
% grass, %N	4	24·84	2·73	0·08				
% grass, %ADL	4	24·18	2·06	0·11				
%N, %ADL	4	23·26	1·15	0·17				
% grass, %N, %ADL	5	22·11	0·00	0·30				
Model average						0·3117	*1·0669*	*2·2888*

Italics depict parameters for which 95% confidence limits exclude zero. K = number of parameters; Δ_i = delta AIC_c; w_i = Akaike weight; SE = standard error.

Important models:

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Conclusion:

- Body mass related to diet quality
  - Contradicts predictions that body mass related to diet type

Tuesday 3:30 groups:

Vincelette et al 2021	Bernasconi et al. 2022	Kingsolver and Srygley 2000	Vanpe et al 2007	Hepp et al 2005
Holly Anderson	Julianna Anglada	Mia Villanueva	Gillian Burch	Rae Burke
Thomas Fernandez	Jem Garcia	Kalani Bankston	Allison Greiner	Max Handen
Shawn Henderson	Elise Herrick	Jack Gerbe	Julia Lotempio	Nancy Mazor
Ethan McDevitt	Mila Miller	Sam Lasher	Marie Rogers	Will Schofield-broadbent
Anyka Tetu	Sarah Baker			

Tuesday 5:00 groups:

van de Kerk et al 2020	Noren et al 2015	Johnson et al 2006	Bilodeau et al. 2013
Olivia Arce	Connor Eisenbach	Nao Bellio	Sarah Brazzillo
Jasper Edwards	Mark Loveless	Victor Ferraro	Anne Gutelius
Natalie Jurgielewicz	Emily Valenti	Fritz Hopf	Adi Norris
Damien Terrell	Bruce Tangredi	Brandon Wingert	Lily Celmer