EFB 390 Recitation

Announcements:
- No homework – study for exam
    - Exam Tues. 10/11 (open note, no devices, print notes)

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

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 10/6, full group needs to present
- No longer than 3 minutes
- 5 slides:
    1. Title, 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 groups:

Vincelette et al 2021	Bernasconi et al. 2022	Kingsolver and Srygley 2000	Vanpe et al 2007	Hepp et al 2005
Alex Zamojski	Maggie Carrol	Jennifer Phelan	Emma Lynch	Alexis LaFever
Conner Colesante	Deandre Gutierrez	FaithAnn Vanderwalker	Kassidy Vaikness	Will Parker
Olivia O'Hara	Kristen Bashen	Adam Orlando	Abby Thomas	Kevin Henry
Chelsea Priest	Sherone Smith	Alexandria Emke	Mara Bugler	Nick Moses
Rainn Anderson	Megan Galenski	Andrew Beck	Macie Brannigan	

Wednesday groups:

van de Kerk et al 2020	Noren et al 2015	Johnson et al 2006
Kyle Higgins	David Hoffmann	Lane Moyer
Samuel Kelsey	Alyssa Colasanti	John Henry
Bri Svitak	Celebrity Wright	Aidan Perkins
Tim Carlson	Hayden Loan	Daniel Monroe
Megan Chesire	Caleb Landry	Will Edington