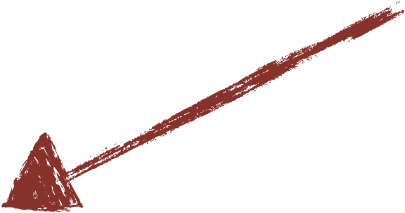
RANDOM SLOPES MODEL

$$
\begin{aligned}
y_i &\sim Normal(\mu_i,\ \sigma) \\
\mu_i &= \alpha_0 + \alpha_{block[i]} + (\beta_0 + \beta_{block[i]})x_i \\
\alpha_k &\sim Normal(0,\ \sigma_\alpha), \text{for } k \text{ in } \{1, \cdots, N_{blocks}\} \\
\beta_k &\sim Normal(0,\ \sigma_\beta), \text{for } k \text{ in } \{1, \cdots, N_{blocks}\} \\
\alpha_0, \beta_0 &\sim Normal(0,\ 1) \\
\beta &\sim Normal(0,\ 0.3) \\
\sigma, \sigma_{block} &\sim Exponential(1)
\end{aligned}
$$

Allows the slope associated with the x predictor to vary across blocks, but maintains a dependency across blocks



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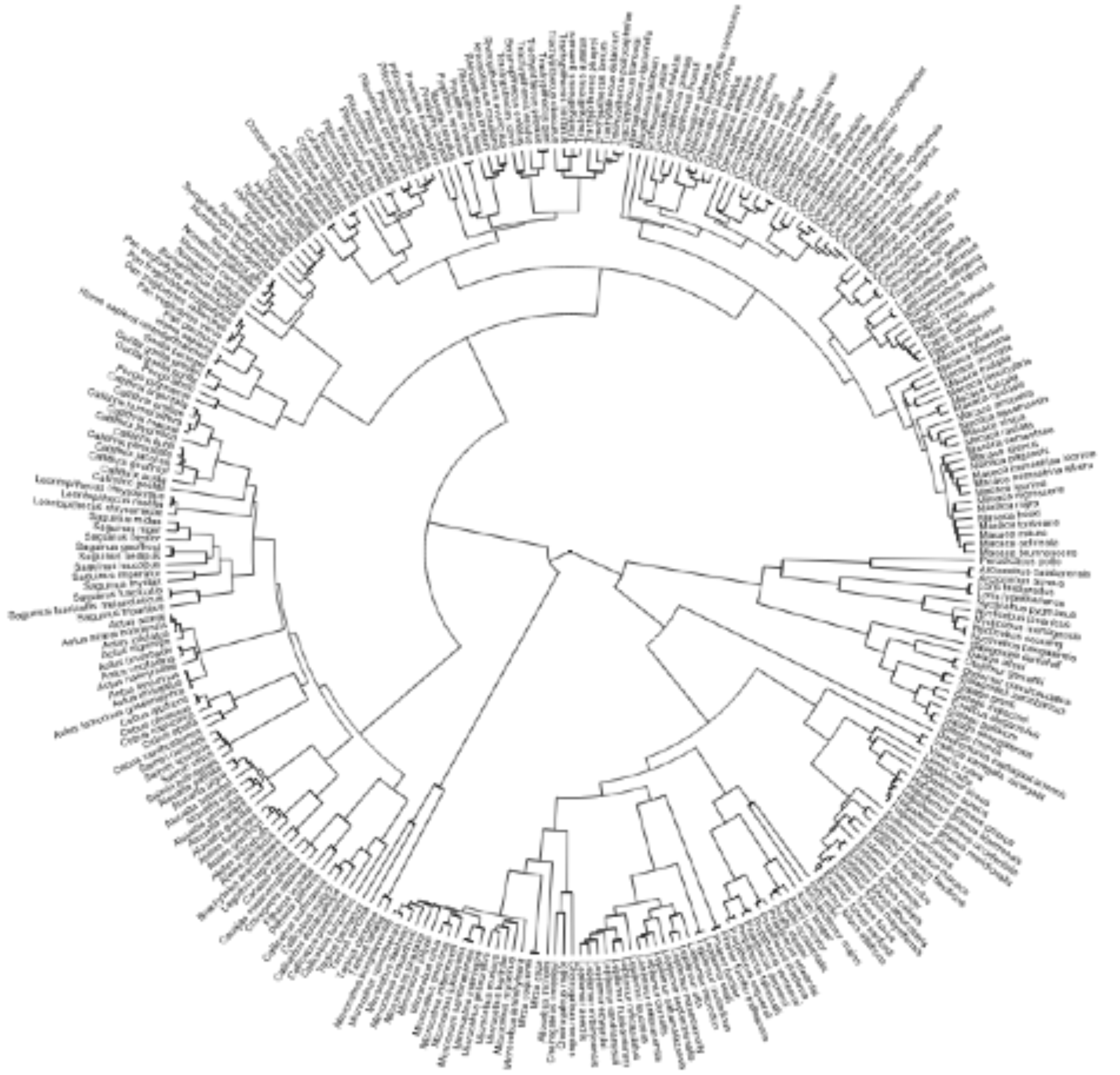
MORE COMPLEX STRUCTURING OF THE DEPENDENCY ACROSS COEFFICIENTS

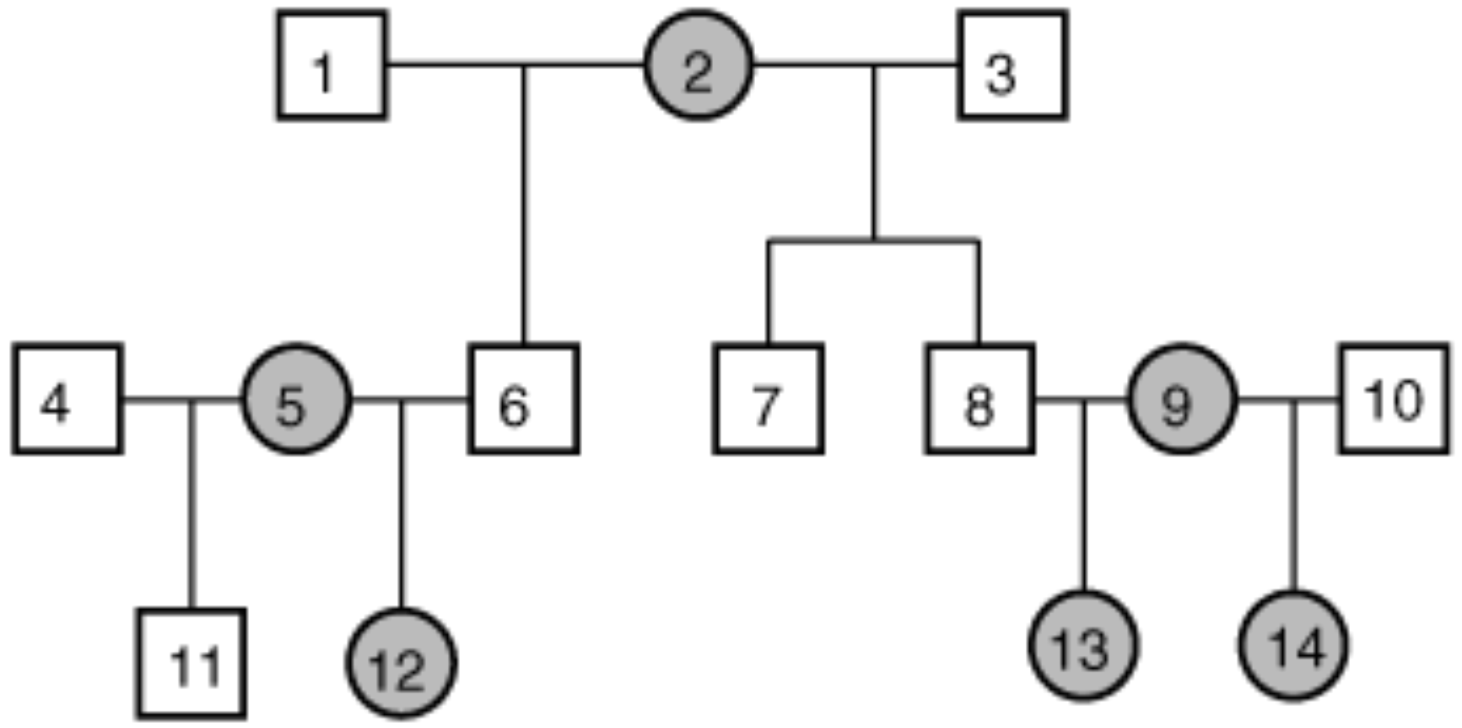
Phylogenetic models

Evolutionary relatedness



Animal models

Genetic relatedness



Spacial auto-correlation

Spacial proximity