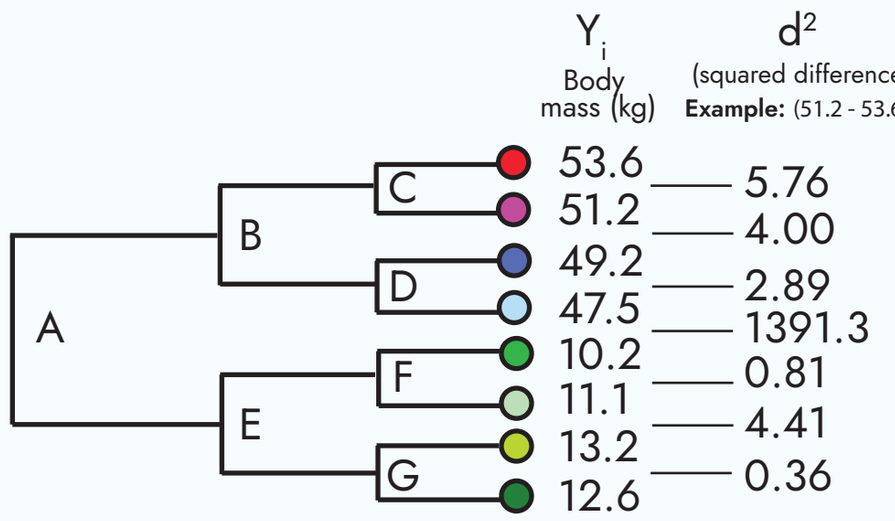
Abouheif Mean C (1999)

Modification from the original figure

Question:

Is there a phylogenetic signal in body mass?



$$\sum y^2 = \sum (Y_i - \text{mean}(Y))^2 = 3006.3$$

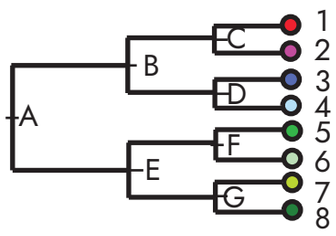
$$\sum d^2 = \sum (Y_{i+1} - Y_i)^2 = 1409.5$$

$$n = \frac{\sum d^2}{\sum y^2} = 0.46$$

$$c = (1 - n/2) = 0.766$$

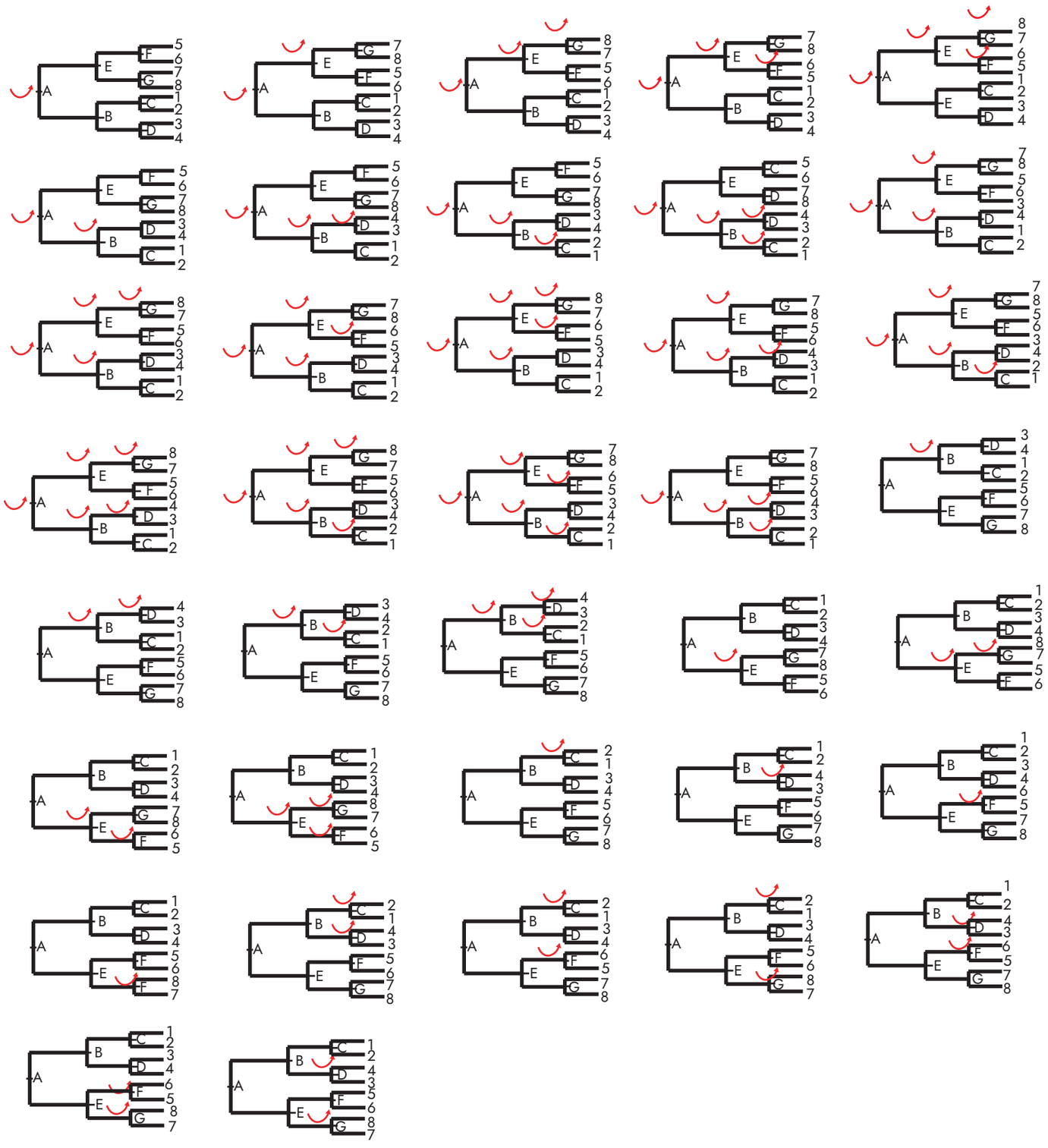
The c-statistic for this specific topology is 0.77

Our original way of showing the topology:



You have to account for the fact that topologies can be shown in multiple ways!

You must account for all (or subsample) the multiple ways that nodes can be rotated

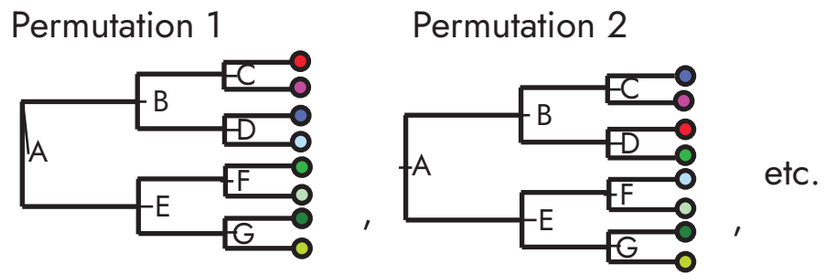


1) For each new topology, calculate the d^2 as above:

2) Then average all of the d^2 across all topologies:

$$1 - \frac{\text{average}(\sum d^2)}{2\sum y^2} = C_{\text{mean}}$$

3) Then to create a null distribution, permutate trait value across the original topology and calculate a distribution of C:



4) Calculate p-value