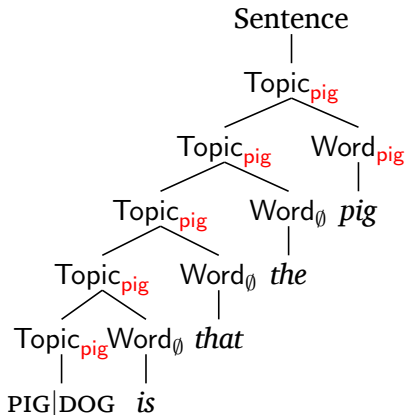




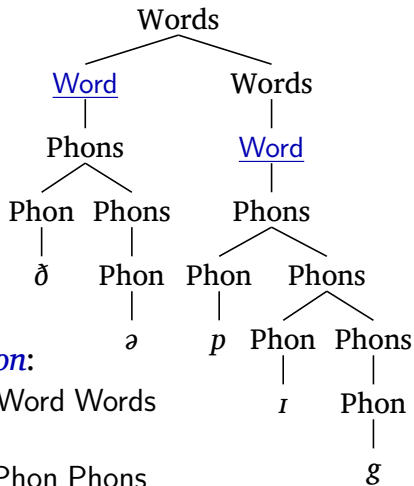
# Word to object “topic models” as PCFGs

- Objects in non-linguistic context  $\approx$  sentence topics
- Such topic models can be expressed as *Probabilistic Context-Free Grammars*
- PCFG rules *choose a topic* from possible topic marker and *propagate it through sentence*
- Each word is either generated by sentence topic or a special null topic
- Requiring *at most one topic per sentence*:
  - ▶ improves accuracy
  - ▶ can be expressed by PCFG



# Adaptor grammars for word segmentation

- Adaptor grammars (AGs) generalise PCFGs by learning probability of *entire subtrees*
  - Prob. of adapted subtree  $\propto$  *number of times tree was previously generated*  $+ \alpha \times$  PCFG prob. of subtree
  - AGs are *hierarchical Dirichlet or Pitman-Yor Processes*



- AG for *unigram word segmentation*:

Words  $\rightarrow$  Word | Word Words

Word  $\rightarrow$  Phons

Phons  $\rightarrow$  Phon | Phon Phons

- Segmentation accuracy improves if AG *learns collocations*

