

## Objectives:

- **Find informative losers**
- **Make valid ranking arguments**
- **Syllable-structure analysis in OT**

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*Background preparation:*

- *Data set: English syllabification with constraints*

# 0. Today's plan

- OT check-in
- Markedness and faithfulness constraints
- More practice
  - Informative losers, ranking arguments
  - OT and the syllable structure of English
- Summarizing rankings with Hasse diagrams

# 1. OT check-in

Doing phonological analysis in OT

- What does the **grammar** of a language consist of?
- What is a **ranking argument**?

# 1. OT check-in

## Doing phonological analysis in OT

- What does the **grammar** of a language consist of?
  - That language's ranking of the universal set of constraints
- What is a **ranking argument**?
  - **Evidence** that  $\text{CONSTRAINT A} \gg \text{CONSTRAINT B}$ 
    - Such evidence comes from **constraint conflict**
    - Requires an **informative loser**

# 1. OT check-in

## Constraints

- How should every constraint **definition** start?
- How is a constraint **different** from a **rule**?

# 1. OT check-in

## Constraints

- How should every constraint **definition** start?
  - Assign one \* for every...
- How is a constraint **different** from a **rule**?
  - **Rules** identify a target (in an environment) and **specify how to change it**
  - **Constraints** identify what phonological structures are **assigned violations**
    - In OT, what makes a surface form *different* from its UR?

## 2. Markedness and faithfulness constraints

- From last time:

/æklejm/	NoCODA	NoONSETCLUSTER
(→)(a) [ə.klejm ]	*	*
(b) [ə <u>k</u> .lejm ]	** <b>w</b>	<b>L</b>
× (c) [ə.k <u>ə</u> .lejm ]	*	<b>L</b>
× (d) [ə.lejm ]	*	<b>L</b>

- Which candidate(s) will the grammar pick here?
  - The grammar currently picks (c) and (d), *not* (a)!

## 2. Markedness and faithfulness constraints

- **What constraints** could make (c) and (d) lose?

/æklejm/	NoCODA	NoONSETCLUSTER
(→)(a) [ə.klejm ]	*	*
(b) [ə <u>k</u> .lejm ]	** <b>w</b>	<b>L</b>
× (c) [ə.k <u>ə</u> .lejm ]	*	<b>L</b>
× (d) [ə.lejm ]	*	<b>L</b>



## 2. Markedness and faithfulness constraints

- **What constraints** could make (c) and (d) lose?
  - We need a constraint **against deletion**
  - We need a constraint **against epenthesis**

NoDELETION      Assign one \* for every segment in the input that is not in the output

NoEPENTHESIS      Assign one \* for every segment in the output that is not in the input

- Are these plausible constraints?
  - Is avoiding deletion/epenthesis a plausible goal?

## 2. Markedness and faithfulness constraints

- Are these plausible constraints?
  - Is avoiding deletion/epenthesis a plausible goal?
- Having the **output (SR) be like the input (UR)** is a plausible goal
  - It should make it easier to find the UR in your lexicon on hearing the SR if the two are identical
  - Epenthesis and deletion are two ways for SRs *not* to look like URs

## 2. Markedness and faithfulness constraints

- Constraints that **compare outputs to inputs** and require them to be **identical** (in some way) are **faithfulness constraints**
  - NoEPENTHESIS and NoDELETION are faithfulness constraints
- Constraints evaluating only **properties of outputs** (surface forms) are **markedness constraints**
  - Markedness constraints are often justified based on phonetic or typological evidence
- Handout - [Markedness and faithfulness constraints](#)

## 2. Markedness and faithfulness constraints

- How do NoEPENTHESIS, NoDELATION assign violations?  
How are W/L assigned here?

/æklejm/	NoEPENTH	NoDEL	NoCODA	NoONSCl
→ (a) [ə.klejm]			*	*
(b) [ək.lejm]			** W	L
(c) [əkə.lejm]			*	
(d) [ə.lejm]			*	

Note: Aspiration is not transcribed in the tableau, for simplicity

## 2. Markedness and faithfulness constraints

- How do NoEPENTHESIS, NoDELETION assign violations?  
How are W/L assigned here?

/æklejm/	NoEPENTH	NoDEL	NoCODA	NoONSCl
→ (a) [ə.klejm]			*	*
(b) [ək.lejm]			** W	L
(c) [əkə.lejm]	* W		*	L
(d) [ə.lejm]		* W	*	L

- What constraint rankings can we prove?

## 2. Markedness and faithfulness constraints

- How do NoEPENTHESIS, NoDELETION assign violations?  
How are W/L assigned here?

/æklejm/	NoEPENTH	NoDEL	NoCODA	NoONSCl
→ (a) [ə.klejm]			*	*
(b) [ək.lejm]			** W	L
(c) [əkə.lejm]	* W		*	L
(d) [ə.lejm]		* W	*	L

- What constraint rankings can we **prove**?

## 2. Markedness and faithfulness constraints

- What is our overall ranking (so far)?
  - NoCODA » NoONSETCLUSTER
  - NoEPENTHESIS » NoONSETCLUSTER
  - NoDELETION » NoONSETCLUSTER
- Note that we have no information (yet?) about the ranking among NoEPENTHESIS, NoDELETION, AND NoCODA
  - It is not always possible to rank all constraints
  - Are there additional informative losers?
  - Sometimes, looking at a different input (a different form from the data set) will help find more rankings

# 3. Informative losers and ranking arguments

## Group discussion

- Data set: [English syllabification with constraints](#)

Considering the form **/ɪɡlu/ [ɪ.ɡlu] ‘igloo’**

- What is the **input** in an OT tableau for this word?
- Which **output** candidate must be in the tableau?
- What constraints does the winner violate?



### 3. Informative losers and ranking arguments

#### Checking in

- Considering the form **/ɪglu/ [ɪ.glu] ‘igloo’**
  - What is the **input** in an OT tableau for this word?
  - Which **output** candidate must be in the tableau?
  - What constraints does the winner violate?

/ɪglu/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [ɪ.glu]						

# 3. Informative losers and ranking arguments

## Group discussion

- Considering the form /ɪglu/ [ɪ.glu] ‘igloo’
  - What **other** candidates should we include?
    - *Hint:* The winner violates **two** constraints
    - We can look at the (failed) alternatives to violating those two constraints **separately**
    - Focus on the one we haven’t looked at yet! (Time permitting, you can look at the other one too)

# 3. Informative losers and ranking arguments

- Are these losers informative? What rankings do they prove?

/ɪglu/	No EPEN	No DEL	O <sub>NS</sub> ET	No CODA	No O <sub>NS</sub> CL	No CODCL
→ (a) [ɪ.glu]			*		*	
(b) [hi.glu]	* W		L		*	
(c) [glu]		* W	L		*	
(d) [hiɡ.lu]	* W		L	* W	L	
(e) [ɪɡ.lu]			*	* W	L	

### 3. Informative losers and ranking arguments

- Rankings proven:
  - (b) NoEPENTHESIS » ONSET
  - (c) NoDELETION » ONSET
- What can we conclude from candidate (d), [hɪg.lu]?
  - (d) NoEPENTH » ONSET                    *or* NoCODA » ONSET
  - NoEPENTH » NoONSCLUST *or* NoCODA » NoONSCLUST
  - More informative to look at (b), (e) separately
  - Usually best to address one winner \* at a time
- What can we conclude **about ONSET** from (e), [ɪg.lu]?

# 3. Informative losers and ranking arguments

- Are these losers informative? What rankings do they prove?

/ɪglu/	No EPEN	No DEL	O <sub>NS</sub> ET	No CODA	No O <sub>NS</sub> CL	No CODCL
→ (a) [ɪ.glu]			*		*	
(b) [hi.glu]	* W		L		*	
(c) [glu]		* W	L		*	
(d) [hiɡ.lu]	* W		L	* W	L	
(e) [ɪɡ.lu]			*	* W	L	

### 3. Informative losers and ranking arguments

- Are these losers informative? What rankings do they prove?

/ɪglu/	No EPEN	No DEL	O <sub>NS</sub> ET	No CODA	No O <sub>NS</sub> CL	No CODCL
→ (a) [ɪ.glu]			*		*	
(f) [ɪg.lu]						
(g) [ɪgl.u]						
(h) [ɪ.gə.lu]						
(i) [ɪ.lu]						

# 3. Informative losers and ranking arguments

- Are these losers informative? What rankings do they prove?

/ɪglu/	No EPEN	No DEL	O <sub>NS</sub> ET	No CODA	No O <sub>NS</sub> CL	No CODCL
→ (a) [ɪ.glu]			*		*	
(f) [ɪg.lu]			*	* W	L	
(g) [ɪgl.u]			** W	* W	L	* W
(h) [ɪ.gə.lu]	* W		*		L	
(i) [ɪ.lu]		* W	*		L	

### 3. Informative losers and ranking arguments

- Rankings proven:
  - (f) NoCODA » NoONSETCLUSTER
  - (h) NoEPENTHESIS » NoONSETCLUSTER
  - (i) NoDELETION » NoONSETCLUSTER
- What can we conclude from candidate (g), [ɪɡl.u]?
  - (g) ONSET » NoONSETCLUSTER
    - or* NoCODA » NoONSETCLUSTER
    - or* NoCODACLUSTER » NoONSETCLUSTER
  - Not actually informative: too many constraints favor the winner



# 3. Informative losers and ranking arguments

- Are these losers informative? What rankings do they prove?

/ɪglu/	No EPEN	No DEL	O <sub>NS</sub> ET	No CODA	No O <sub>NS</sub> CL	No CODCL
→ (a) [ɪ.glu]			*		*	
(f) [ɪg.lu]			*	* W	L	
(g) [ɪgl.u]			** W	* W	L	* W
(h) [ɪ.gə.lu]	* W		*		L	
(i) [ɪ.lu]		* W	*		L	

### 3. Informative losers and ranking arguments

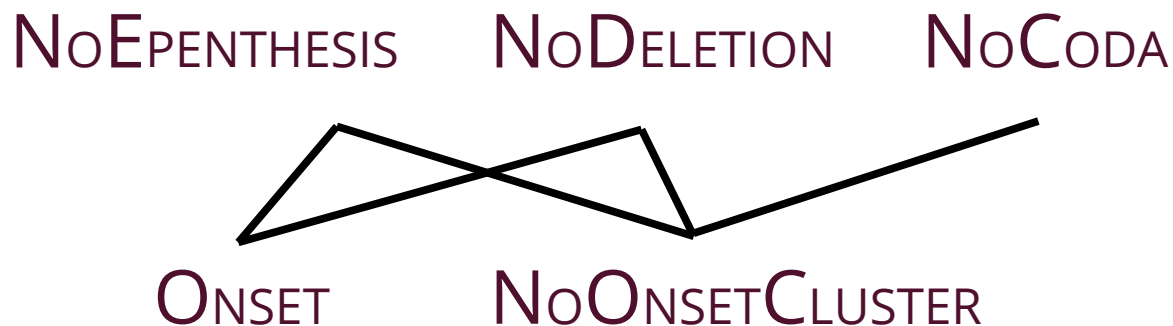
- All rankings proven using /Iglu/
  - (b) NoEPENTHESIS » ONSET
  - (c) NoDELETION » ONSET
  - (f) NoCODA » NoONSETCLUSTER
  - (h) NoEPENTHESIS » NoONSETCLUSTER
  - (i) NoDELETION » NoONSETCLUSTER
- We can summarize these individual pairwise rankings into an overall ranking for the language, using a **Hasse diagram**
  - Handout: [“Informative losers / ranking argts”](#)

### 3. Informative losers and ranking arguments

- We can summarize all these individual pairwise rankings into a ranking for the language, using a **Hasse diagram**
  - This is a type of tree diagram
  - A **line** between two constraints shows that there is a **ranking** between them
  - If there is a line between, **higher**-ranked constraints are shown **above** lower-ranked constraints
  - If there is no line between, vertical position doesn't mean anything

### 3. Informative losers and ranking arguments

- All rankings proven using /Iglu/
  - (b) NoEPENTHESIS » ONSET
  - (c) NoDELETION » ONSET
  - (f) NoCODA » NoONSETCLUSTER
  - (h) NoEPENTHESIS » NoONSETCLUSTER
  - (i) NoDELETION » NoONSETCLUSTER
- Combining these rankings in a Hasse diagram:



## 4. Another example

- PP: English syllabification with constraints

Considering the form **/fild/ [fild] 'field'**

- What is the **input** in an OT tableau for this word?
- Which **output candidate** must be in that tableau?

Which **constraint(s)** does it violate?

- What **other** output candidates might we like to include, and **why**?

## 4. Another example

- Are these losers informative? What rankings do they prove?

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(b) [fil]						
(c) [fi.ləd]						
(d) [fi.lə.də]						

## 4. Another example

- Are these losers informative? What rankings do they prove?

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(b) [fil]		* W		*		L
(c) [fi.ləd]	* W			*		L
(d) [fi.lə.də]	** W				L	L

## 4. Another example

- Are these losers informative? What rankings do they prove?

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(e) [fi]						
(f) [fildz]						
(g) [fi.l̩d]						
(h) [fil.ə̃d]						



## 4. Another example

- Are these losers informative? What rankings do they prove?

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(e) [fi]		** w		L		L
(f) [fildz]	* w			*		*
(g) [fi.l̩d]			* w	*		L
(h) [fil.ə̃d]	* w		* w	** w		L

## 4. Another example

- Candidate (f) is not actually an informative loser
  - No constraints prefer the loser (**no L** in the row)
  - That means there is **no constraint conflict** here
  - This gives us **no information** about how the constraints are **ranked** — (a) always beats (f)!

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(f) [fildz]	* <sub>w</sub>			*		*

## 4. Another example

- Candidate (f) is not actually an informative loser
- Does this mean we should *never* discuss losers that are not informative?
  - Not necessarily — it can sometimes be useful to show that **the grammar correctly rejects** a certain form, even if that doesn't help us figure out the ranking
  - But it is important to clearly understand which losers **actually provide information** about the ranking

## 4. Another example

- What does candidate (h) show us about the ranking?
  - What must dominate NoCODACLUST for (a) to win?

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(h) [fil.əd]	* W		* W	** W		L

## 4. Another example

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
(h) [fil.əd]	* <sub>W</sub>		* <sub>W</sub>	** <sub>W</sub>		L

- Remember: Every L-marked constraint must be dominated by **at least one** W-marked constraint
- We can't tell if it's NoEPENTHESIS, ONSET, or NoCODA (or more than one) that's making (h) lose
- So (h) does technically provide ranking information, but it's not very useful in practical terms — try finding candidates that compare these constraints **separately**

## 4. Another example

- Candidates must show **syllable structure!**  
(if it is relevant for the constraints under discussion)
  - Candidates (c) and (h) are **not the same thing** — your tableau has to make clear which you mean

/fild/	No EPEN	No DEL	ONSET	No CODA	No ONSCl	No CODCl
→ (a) [fild]				*		*
(c) [fi.ləd]	* <sub>W</sub>			*		L
(h) [fil.əd]	* <sub>W</sub>		* <sub>W</sub>	** <sub>W</sub>		L

- No language ever picks (h) — but it's a candidate!

## 5. Ranking arguments

- What rankings have we proven for English so far?

/fild/	NoEP	NoDL	ONS	NoCD	NoOCL	NoCCL
→ (a) [fild]				*		*
(b) [fil]		* W		*		L
(c) [fi.ləd]	* W			*		L
(d) [fi.lə.də]	** W			L		L
(e) [fi]		** W		L		L
(g) [fi.ɫd]			* W	*		L

## 5. Ranking arguments

- What rankings have we proven for English so far?
  - (b) NoDELETION » NoCODACLUSTER
  - (c) NoEPENTHESIS » NoCODACLUSTER
  - (d) NoEPENTH » NoCODA *and* NoEPENTH » NoCODACLUST
  - (e) NoDELETION » NoCODA *and* NoDELETION » NoCODACLUST
  - (g) ONSET » NoCODACLUSTER
    - This last one we have to be a little careful with, because there are probably also constraints against syllabic consonants (not allowed by all languages!)
    - But we do know [ɹ] is allowed in English



## 5. Ranking arguments

- Combining these rankings in a Hasse diagram (try it?)

(b) NoDELETION » NoCODACLUSTER

(c) NoEPENTHESIS » NoCODACLUSTER

(d) NoEPENTH » NoCODA *and* NoEPENTH » NoCODACLUST

(e) NoDELETION » NoCODA *and* NoDELETION » NoCODACLUST

(g) ONSET » NoCODACLUSTER

## 5. Ranking arguments

- Combining these rankings in a Hasse diagram

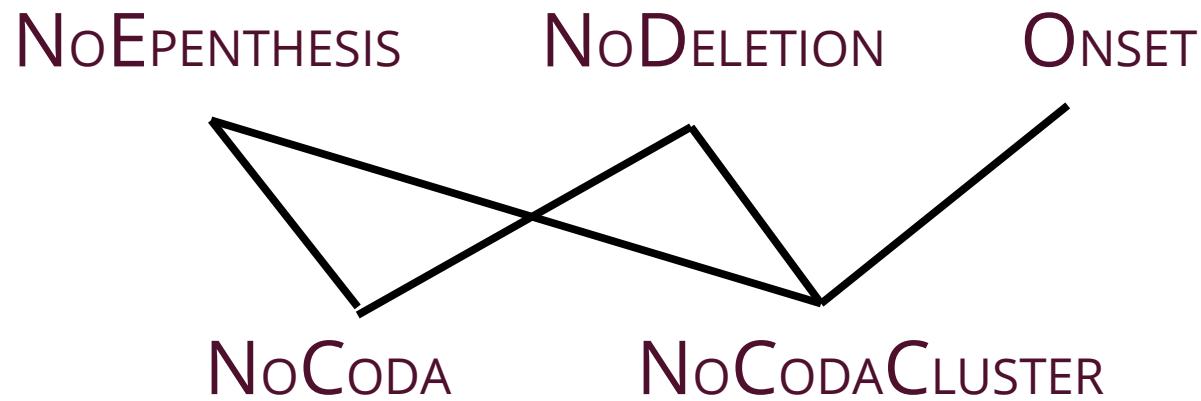
(b) NoDELETION » NoCODACLUSTER

(c) NoEPENTHESIS » NoCODACLUSTER

(d) NoEPENTH » NoCODA *and* NoEPENTH » NoCODACLUST

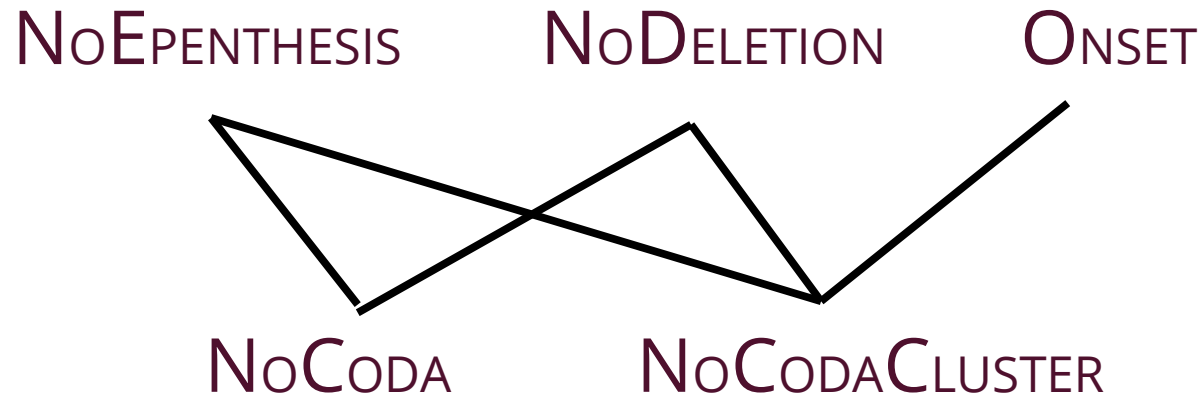
(e) NoDELETION » NoCODA *and* NoDELETION » NoCODACLUST

(g) ONSET » NoCODACLUSTER



## 5. Ranking arguments

- Combining these rankings in a Hasse diagram



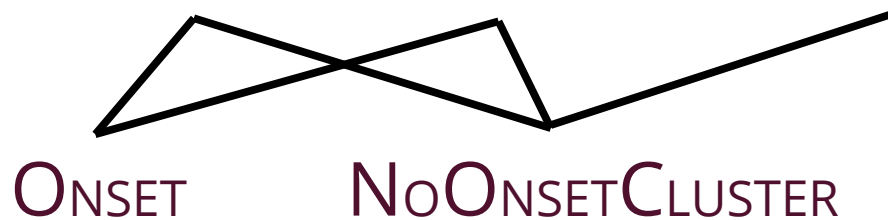
Something interesting we can see here:

- NoCODA is lower than NoEP and NoDEL; codas survive
- But what did we conclude about NoCODA vs. NoONSCl?

## 5. Ranking arguments

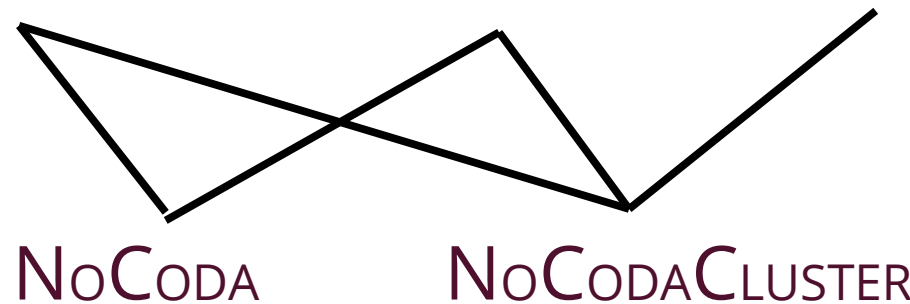
- All rankings proven using /ɪglu/

NoEPENTHESIS    NoDELETION    NoCODA



- All rankings proven using /fild/

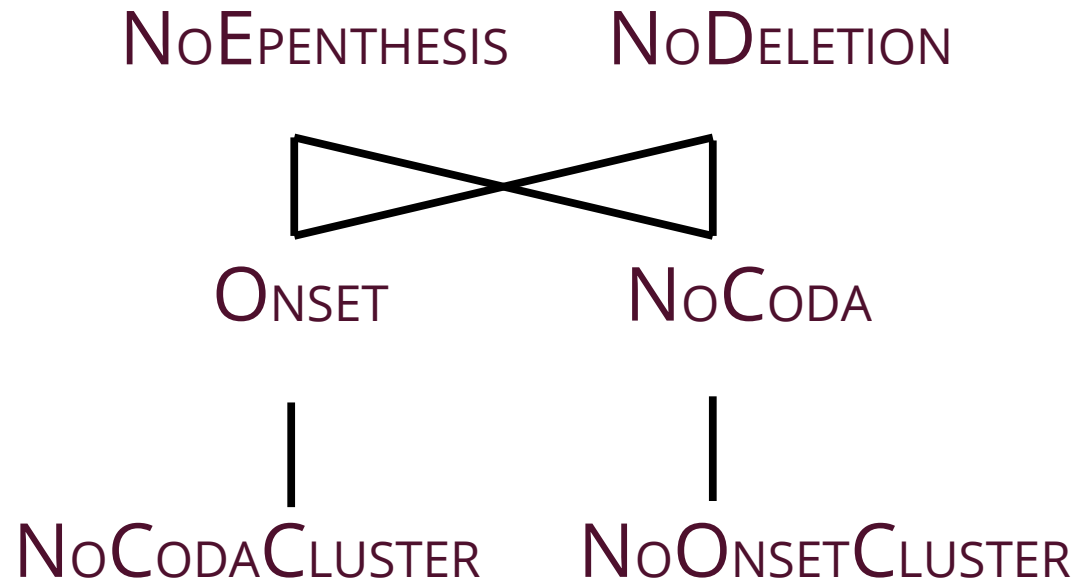
NoEPENTHESIS    NoDELETION    ONSET



- What overall ranking can we prove here for English?

## 5. Ranking arguments

- What overall ranking can we prove here for English?



- Constraints can be **dominated** but still make a difference!

## 5. Ranking arguments

- Constraints can be **dominated** but still make a difference!
  - Example: NoCODA is lower than NoEP and NoDEL — this means **codas survive**
  - But NoCODA is higher than NoONSCl — this means **codas are avoided** when faithfulness is not at stake

## 6. For next time

- We have been asking the question:
  - Given an input and the winning output,
  - how does this language rank its constraints?

This lets us **analyze a specific language**

- The OT approach allows us to ask another question:
  - Given an input and a ranking,
  - what candidate would win?

This allows us to test claims about the constraints in the **universal constraint set** — what kinds of languages are we **predicting** to be **possible**?