

Today's topic:

- **Allophones in OT, part 2**
- **Morpheme alternations, review**

Background preparation (review):

- *PP: Greek*
- *PP: A CVCV language*
- *PP: Dutch*

0. Today's objectives

After today's class, you should be able to:

- Apply the concept of 'Richness of the Base' to make an OT analysis of allophone distribution more robust
- Identify alternating morphemes and propose URs (review from Unit 2)
- Begin to propose OT constraints for a case of morpheme alternations involving segments and features

1. OT check-in

- In OT, when we want to **determine the grammar of one language** (from a data set), what do we do?
 - We observe some _____
 - We might use phonological evidence to propose their _____ structure, as before
 - We use phonological evidence to propose their _____, as before
 - We use tableaux to make an argument about how the _____ are _____

1. OT check-in

- In OT, when we want to **determine the grammar of one language** (from a data set), what do we do?
 - We observe some **outputs (surface forms)**
 - We might use phonological evidence to propose their **syllable** structure, as before
 - We use phonological evidence to propose their **inputs (URs)**, as before
 - We use tableaux to make an argument about how the **constraints** are **ranked**

1. OT check-in

- In OT, when we want to **determine the grammar of one language** (from a data set), what do we do?
 - Observe some **outputs** (& determine syllable structure?)
 - Propose their **inputs**
 - Use tableaux to find the **ranking**
- In OT, when we want to **test the predictions of a certain constraint ranking**, what do we do?
 - We start by knowing or assuming a **ranking**
 - We pick some relevant _____ to work with
 - We use tableaux to identify the winning _____

1. OT check-in

- In OT, when we want to **determine the grammar of one language** (from a data set), what do we do?
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 - We use tableaux to identify the winning **outputs**

2. Review: Richness of the Base

- Suppose a language **has no onset clusters**, and no morphemes ever start with /CC.../
- If this restriction is **productive**, what do we propose about this language?
 - a. The reason why no surface forms have onset clusters is because no URs have potential onset clusters: inserting an extra consonant would violate NoEPENTHESIS as well as making the σ structure worse
 - b. Even though we never see constraint conflict involving NoONSETCLUSTER, we still conclude that it is ranked above at least one faithfulness constraint

2. Review: Richness of the Base

- Suppose a language **has no onset clusters**, and no morphemes ever start with /CC.../
- If this restriction is **productive**, what do we propose about this language?
 - ~~no The reason why no surface forms have onset clusters is because no URs have potential onset clusters~~
 - YES** Even though we never see constraint conflict involving NoONSETCLUSTER, we still conclude that it is ranked above at least one faithfulness constraint
 - **Enforcing predictable patterns** is the job of the phonological **grammar**

2. Review: Richness of the Base

- **Richness of the Base (ROTB):** There are no language-particular restrictions on input forms
 - We can't "explain" why there are no onset clusters simply by saying that the language has no inputs with /CC.../
 - Instead, we have to **make the grammar robust enough** to cause candidates with clusters to lose
 - We do this by using a **hypothetical input** — making sure its output wouldn't be faithful

3. Review: Context-specific allophones in Greek

Data set: [Greek](#) | [k], [x], [c], [ç]

- In what **environments** do these sounds occur?
 - The palatals [c], [ç] occur only __[-bk]
 - The velars [k], [x] occur elsewhere

3. Review: Context-specific allophones in Greek

Data set: Greek | /keri/ → [ceri] 'candle'

/keri/ 'candle'		
→ (a) [ceri]		*
(b) [keri]	* w	L

- What constraints did we propose last time to get the right winner in the front-vowel context?

3. Review: Context-specific allophones in Greek

Data set: [Greek](#) | /keri/ → [ceri] 'candle'

/keri/ 'candle'	NoVELAR+FRV	IDENT[COR]
→ (a) [ceri]		*
(b) [keri]	* W	L

3. Review: Context-specific allophones in Greek

- **Markedness** constraint that assigns a penalty when the default allophone appears in the “special” context of the complementary distribution pattern

NOVELAR+FRONTVOWEL: Assign one * for any sequence of segments [DORS] [-bk] in which the [DORS] segment is not also [COR]

- **Faithfulness** constraint that assigns violations when the allophone is different from the input

IDENT[COR]: Assign one * for any output segment that differs from its corresponding input segment with respect to [CORONAL]

3. Review: Context-specific allophones in Greek

Data set: [Greek](#) | /kɔri/ → [kɔri] 'daughter'

/kɔri/ 'daughter'	NoVELAR+FRV	IDENT[<small>COR</small>]
(a) [cɔri]		
(b) [kɔri]		

- What predictions does this ranking make if we check the **default/elsewhere context**?

3. Review: Context-specific allophones in Greek

Data set: [Greek](#) | /kɔri/ → [kɔri] 'daughter'

/kɔri/ 'daughter'	NoVELAR+FRV	IDENT[<small>COR</small>]
(a) [cɔri]		*!
→ (b) [kɔri]		

- No ranking argument here, but the ranking makes the **right prediction** about the output

4. Enforcing the default allophone

Data set: [Greek](#)

- We're not actually finished with this analysis yet!

(Here is where it gets particularly interesting...)

- If [k] and [c] are in **predictable** (complementary) distribution in a language, with [c] before [-bk] and [k] elsewhere, which of these are **grammatical**?

[ke]

[ka]

[ce]

[ca]

4. Enforcing the default allophone

Data set: Greek

- If [k] and [c] are in **predictable** (complementary) distribution in a language, with [c] before [-bk] and [k] elsewhere, which of these are **grammatical**?

* [ke] [ka] [ce] *[ca]

- Which of these are **predicted** by our grammar to be grammatical?
 - How can we investigate this?

4. Enforcing the default allophone

Data set: [Greek](#)

- Which of these should be **grammatical**?

* [ke]

[ka]

[ce]

*[ca]

- Which of these are **allowed** by our grammar?

/ke/	NoVELAR+FRV	IDENT[<small>COR</small>]
→ (a) [ce]		*
(b) [ke]	*!	

- *[ke] is correctly avoided: /ke/ surfaces as [ce]

4. Enforcing the default allophone

Data set: Greek

- Which of these should be **grammatical**?

* [ke] [ka] [ce] *[ca]

- Which of these are **allowed** by our grammar?

/ka/	NoVELAR+FRV	IDENT[COR]
→ (a) [ka]		
(b) [ca]		*!

- [ka] wins, as desired, without turning into *[ca]

4. Enforcing the default allophone

Data set: Greek

- Which of these should be **grammatical**?

* [ke] [ka] [ce] *[ca]

- Which of these are **allowed** by our grammar?

/ke/	NoVELAR+FRV	IDENT[COR]
→ (a) [ce]		*
(b) [ke]	*!	

- We know that [ce] is allowed because /ke/ → [ce]

4. Enforcing the default allophone

Data set: Greek

- Which of these should be **grammatical**?

* [ke] [ka] [ce] *[ca]

- Which of these are **allowed** by our grammar?
 - How do we know if our grammar allows *[ca]?
 - We saw above that /ka/ doesn't turn into *[ca]...

Is this enough?

4. Enforcing the default allophone

Data set: Greek

- How do we know if our grammar allows *[ca]?
 - We saw above that /ka/ doesn't turn into *[ca]...

Is this enough? No.
- How does **Richness of the Base** apply here?

4. Enforcing the default allophone

Data set: [Greek](#)

- How do we know if our grammar allows *[ca]?
 - We saw above that /ka/ doesn't turn into *[ca]...
Is this enough? No.
- Last class, we learned about **richness of the base...**
 - We can't claim that *[ca] is ungrammatical just because there are no URs with /ca/ in Greek
 - The grammar must **actively get rid of /ca/!**
 - Presumably by turning it into [ka]
(because [k] and [c] are allophones)

4. Enforcing the default allophone

Data set: [Greek](#)

- Which of these should be **grammatical**?

* [ke] [ka] [ce] *[ca]

- Which of these are **allowed** by our grammar?

/ca/	NoVELAR+FRV	IDENT[<small>COR</small>]
× (a) [ca]		
(→) (b) [ka]		*!

- **Wrong** winner! *[ca] beats the intended [ka]

4. Enforcing the default allophone

Data set: [Greek](#)

- We need a **third constraint** for allophone patterns!
 - We need a **markedness** constraint that will **enforce the default allophone** (by penalizing the context-specific one)
 - Can we make this constraint refer to the “elsewhere” environment?
 - ***Do we need to?***

4. Enforcing the default allophone

Data set: [Greek](#)

- We need a **third constraint** for allophone patterns!
 - We need a markedness constraint that will **enforce the default allophone** (by penalizing the context-specific one)
- *COR-DORS (aka “No palatals”): Assign one * for any segment that is [COR, DORS]
- How is this constraint ranked with respect to the others?

4. Enforcing the default allophone

Data set: [Greek](#) | How are these constraints ranked?

/ca/	*COR-DORS	NoVELAR+FRV	IDENT[COR]
→ (a) [ka]			
(b) [ca]			

/ke/	*COR-DORS	NoVELAR+FRV	IDENT[COR]
→ (a) [ce]			
(b) [ke]			

4. Enforcing the default allophone

Data set: [Greek](#) | How are these constraints ranked?

/ca/	*COR-DORS	NoVELAR+FRV	IDENT[COR]
→ (a) [ka]			*
(b) [ca]	* W		L
/ke/	*COR-DORS	NoVELAR+FRV	IDENT[COR]
→ (a) [ce]	*		*
(b) [ke]	L	* W	L

4. Enforcing the default allophone

Data set: [Greek](#) | How are these constraints ranked?

NoVELAR+FRONTVOWEL » ***COR-DORS** » **IDENT[COR]**

- What this analysis enforces:
 - Don't **ever** have velar obstruents / __ [-bk]
 - **Otherwise** (elsewhere!), don't have palatals
 - The distribution is completely specified by the grammar by the markedness constraints;
the [CORONAL] value in the input plays no role

5. Predictable distribution in OT — Discussion

- In **rule-based phonology**, how did we guarantee...
 - only the **specific** allophone shows up in the **special context** ([ce], *[ke])?
 - only the **default** allophone shows up **outside** the special context ([ka], *[ca])?
- In **OT**, how do we guarantee...
 - only the **specific** allophone shows up in the **special context** ([ce], *[ke])?
 - only the **default** allophone shows up **outside** the special context ([ka], *[ca])?

5. Predictable distribution in OT — Discussion

- In **rule-based phonology**, how did we guarantee...
 - only the specific allophone shows up in the special context ([ce], *[ke])? | a phonological rule
 - only the default allophone shows up outside the special context ([ka], *[ca])? | only default in URs
- In **OT**, how do we guarantee...
 - only the specific allophone shows up in the special context ([ce], *[ke])? | constraint ranking
 - only the default allophone shows up outside the special context ([ka], *[ca])? | constraint ranking

5. Predictable distribution in OT — Discussion

- In **OT**, how do we guarantee...
 - only the specific allophone shows up in the special context ([ce], *[ke])? | constraint ranking
 - only the default allophone shows up outside the special context ([ka], *[ca])? | constraint ranking
- > It **doesn't matter** which allophone is in the input!
 - *if* the distribution of the allophones is completely predictable (so, *not* in cases of neutralization)
 - Default allophone still useful as a **label** for the phoneme
 - What do speakers do? **We can't tell** *from the data*

5. Predictable distribution in OT — Discussion

- General ranking for **complementary distribution**:

Context-specific M

(prefers specific allophone in context)

»

Context-free M

(prefers default allophone)

»

F

(the faithfulness constraint(s) on the features that *distinguish* the two allophones)

6. Review: Morpheme alternations

- Another case of **predictable** patterns in the phonological grammar: **morpheme alternations**
- Data set: [Dutch](#)
 - Which alternating morphemes did we find?
 - What URs did we propose for the alternating morphemes?
 - Can we think about this pattern in terms of OT?
- We will continue this discussion next time!