Phonology

Introducing constraints

Suzana Fong
sznfong@mit.edu

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An empirical observation about markedness

Linguistic structures can be *marked* or *unmarked*.

- **Unmarked:** values that are crosslinguistically preferred and basic in all grammars.
- **Marked:** values that are crosslinguistically avoided and used by grammars only to create contrast.

Example #1: round *vs.* unrounded front vowels

- Most languages have unrounded front vowels like [i] and [e].
- Only a subset of languages contrast these vowels with rounded front vowels like [y] and [ø].

(1)	a.	*si* 'if'	[si]	*vs.*	*su* 'known'	[sy]
	b.	*fée* 'fairy'	[fe]	*vs.*	*feu* 'fire'	[fø]

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Example #2: syllables

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Modelling markedness

The markedness of linguistic values can be stated in terms of **constraints**.

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Rule that states marked and unmarked linguistic values.

- **Example #1:** recall that languages prefer to have unrounded front vowels (*e.g.* [i e]).

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Constraints act as **filters**.

		Constraint I		**Constraint II**		**Constraint III**
Option a	$\longrightarrow$	Option a		*		
Option b	$\longrightarrow$	Option b	$\longrightarrow$	Option b		*
Option c	$\longrightarrow$	Option c	$\longrightarrow$	Option c	$\longrightarrow$	**Option *c***
Option d		*				

- Constraint I filters out option d, Constraint II filters out option a, *etc*.

Banning rounded front vowels:

(4)

	***[+front, +round]**
[i e]	[i e]
[i e y ø]	*

- The constraint *[+front, +round] filters out inventories with front round vowels.

A problem

- Our simple constraint (3) *[+front, +round] successfully derives languages without front round vowels like [y ø].
- **But:** what about languages like French, which do have these sounds?
- Possible solutions:
  - Maybe this constraint isn't active in French?
  - A more interesting alternative: there is another constraint that "overrules" (3).
    - More on this in the upcoming lectures!

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English allows for several *obstruent–liquid* clusters (sequences):

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	b.	*blade*	[bleɪd]	*braid*	[bɹeɪd]
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	f.	*glade*	[gleɪd]	*grade*	[gɹeɪd]
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- What is intriguing about this paradigm?

- There is no [tleɪd] or [dleɪd].
- In fact, there does not seem to be any word in English that contains the clusters *tl* and *dl*.
- How can we account for this fact?
  - By using a constraint that bans [t d] before [l].
  - Let's call the latter 'lateral' and use the feature [lateral] to refer to it.

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(6) a. *[voiceless alveolar stop][lateral]

b. *[voiced alveolar stop][lateral]

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- Could the constraint be even more general?

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1. *[alveolar][lateral]
   - This incorrectly rules out *slide* and *Sri Lanka*.
2. *[stop][lateral]
   - This incorrectly rules out everything, but *slide* and *Sri Lanka*.

⇒ **Takeaway:** we can use constraints not only to capture inventories of sounds, but also to state which clusters of sounds are allowed in a given language.

Complementary distribution

Consider the data from Setswana, **paying attention to** [d] **and** [l]:

(8)

a.	lefifi	‘darkness’
b.	loleme	‘tongue’
c.	selɛpɛ	‘axe’
d.	molɔmo	‘mouth’
e.	sobala	‘to read’
f.	mmadi	‘reader’
g.	lerumɔ	‘spear’
h.	xoɲala	‘to marry’
i.	loxadima	‘lightning flash’
j.	diʤɔ	‘food’
k.	dumɛla	‘greetings’
l.	feedi	‘sweeper’
m.	lokwalɔ	‘letter’
n.	k^hudu	‘tortoise’
o.	mosadi	‘woman’
p.	podi	‘goat’
q.	badisa	‘herd’
r.	hudi	‘wild duck’

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1. Can they occur in word-initial position?
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3. Which vowels occur *after* [d l]?
   - After [l]: [e ɛ a ɔ o].
   - After [d]: [i u].

- There is striking regularity in the division between [d] and [l] if we consider the vowels that occur after them.

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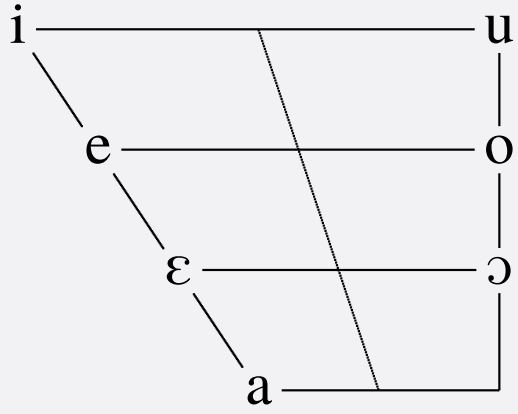

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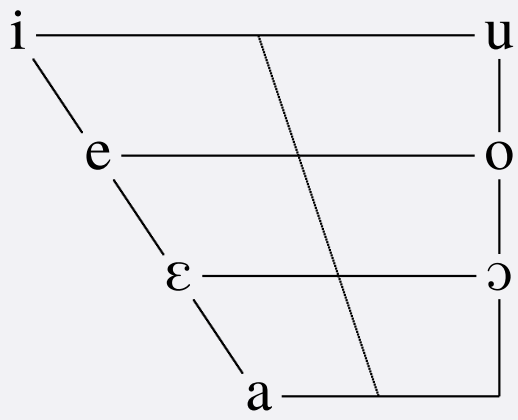

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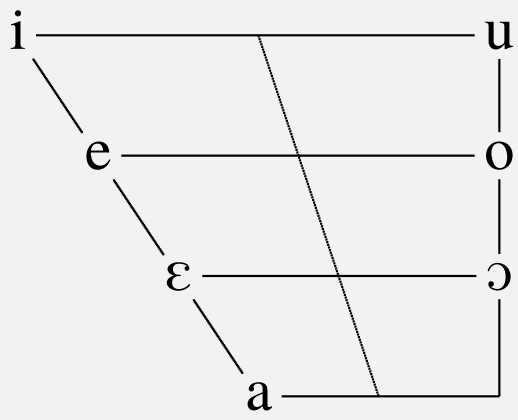

  - After [d]: [i u]. **These are high vowels.**
  - After [l]: [e ɛ a ɔ o].

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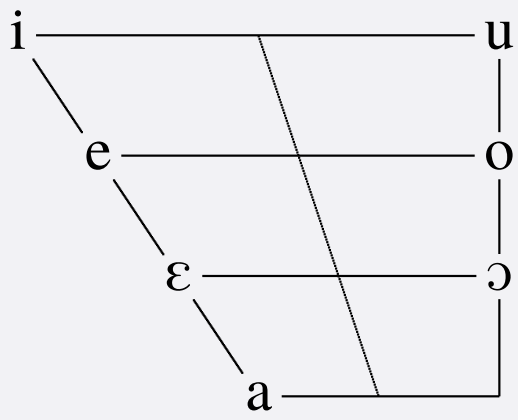

  - After [d]: [i u]. **These are high vowels.**
  - After [l]: [e ɛ a ɔ o]. **Everything else.**

- [d] and [l] occur in mutually exclusive contexts.
  - This is called **complementary distribution**.
- **Hypothesis:** [d l] are two ways of pronouncing the same sound, depending on the context.
  - They are **allophones**.

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  - *Cf.* allomorphs: pronunciations of the morpheme in different contexts.

Can we use constraints to model the behavior of [d l] in Setswana?

- **Important:** this is not enough to derive the data because we have not said anything about [le lɛ la lɔ lo], which are presumably excluded.
- The point of this recitation is to have a basic understanding of how constraints work.
  - We will need a richer system, where constraints interact with each other.

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  - Before [l]: [e a o ɛ].
  - Before [d]: [e a o u].
    - Could [ɛ u] be determining the distribution of [d l]?

- We, unfortunately, have too little data to tell.
  - There is exactly one word illustrating each fact: ([dumɛla] and [k^hudu]).
  - **Important:** we don't just need any type of data to probe into this question.
  - Linguistic phenomena are not random: they target natural classes.
    - These are units that share some common property.
    - *E.g.* [i u] are high vowels.
  - What we need is more data with sounds that would form a natural class with [ɛ] and [u] to see behavior of [d l] *wrt* them.

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References

- Kager, René. *Optimality theory*. Cambridge University Press, 1999.

- Data and guidance provided by Adam Albright.