Class 1 (Week 0): Introduction, overview, SPE review

## 0. Icebreakers/Zoom practice

- **Body poll**: is this your very first class at UCLA?
- **Body poll**: is this your very first Zoom class?
- **Everyone at once**: In 1-2 words, how is the temperature in the space where you are right now?
- **Group annotation**: Write down your name (first name/nickname—however you want to be addressed in class) in the box that fits you best:

prefer cats	*prefer dogs*
prefer a different animal	*not that into animals*

- Introduce ourselves by name (so we can all hear the correct pronunciation) and briefly elaborate on animal choice

1.   Some quick mechanical things

- If at any point in class I suddenly disappear (e.g., my toddler turns off my wi-fi router), which may end the meeting, check your **e-mail**. I'll try to use my phone to send out an announcement about what's going on and what to do.

- Recommended Zoom settings for this course, adapted from this helpful video: youtu.be/CDoWSzoyxI8
    o When you join the meeting, choose "**Join with Computer Audio**" (or whatever device you're connecting from)
    o I'll be sharing my screen a lot, which makes Zoom default to full-screen
    o **Exit full-screen** now, then make the Zoom window as large as you can, using View in the top right
    o To make this permanent, go to Settings in your Zoom app:
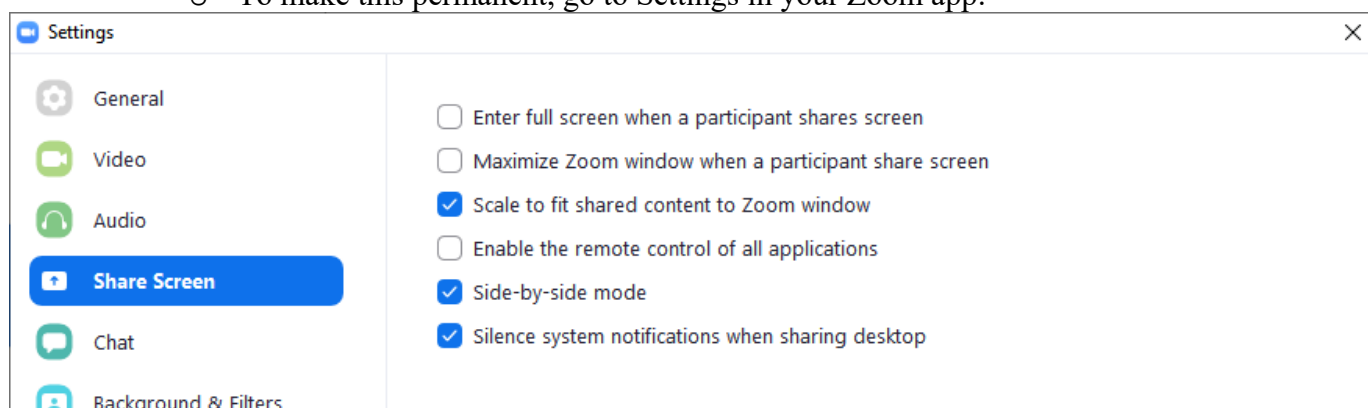
    o Back in your Zoom window, under View, choose 'Side-by-side: gallery'
        ▪ Now you can slide the barrier between the handout and the participant videos to change the relative size
    o Click the Participants tab and the Chat tab. This should open two new windows.
        ▪ In each, click the '…' in the bottom right and choose 'Merge to meeting window'

- We need a visual signal for 'You're on mute.' Ideas?

- Think about what will be a good attention-absorbing activity for you, something that requires no brain power or device use, but will keep you from pursuing true distractions if your attention flags
    o shelling peas
    o coloring book
    o the "knit 10 inches in plain stocking stitch" part of a knitting project
    o … ? Your ideas here

Great! Now let's do some actual phonology.

2. Phonology warm-up: Tongva

- UCLA is located on the ancestral lands of the Gabrielino/Tongva/Kizh people.[1] This land was never ceded through treaty.
- The Tongva language is not now fluently spoken, but the Gabrielino-Tongva Language Committee (with assistance from our department's own Pam Munro) works to reawaken the language.
- Especially if you're new to L.A., I hope you'll take a few minutes this week to learn the very basics of Tongva culture and history, including the history behind why the language is no longer spoken, which includes enslavement and land theft under Spanish rule, and continued forced labor under U.S. rule:
  - o Wikipedia: en.wikipedia.org/wiki/Tongva
  - o UCLA Newsroom article about contemporary Tongva educators: newsroom.ucla.edu/stories/ucla-project-reveals-invisible-presence-of-the-tongva
  - o Beautiful multimedia LA Times story about Tongva language, culture, geography, and history. Won LSA journalism award: www.latimes.com/projects/la-me-col1-tongva-language-native-american-tribe/

Tongva education conference at Kuruvungna Springs in West L.A.: Theresa Stewart-Ambo, Craig Torres, Barbara Drake, Julia Bogany, Paulina Sahagun, Desiree Martinez and Kelly Stewart—photo from UCLA Newsroom

- Uto-Aztecan language—this family spans a large area of the Western U.S. and Mexico. Well-known family members include Shoshoni, Comanche, Hopi, and Nahuatl.
- Some local place names that come from Tongva (or maybe a closely related language—it's not always clear): Azusa, Cahuenga, Topanga, Tujunga

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[1] All three names are widely used, with different spellings. Four different organizations represent the Tongva people and use somewhat different names—I'm not intending to support any one over the others by the choice of how to write the language name!

I'm going to put you in **breakout rooms** of 2-3 now. Your job (I'll paste this in the chat):
a. Nominate one **note-taker** and one **screen-sharer**, who will share their copy of the handout to the screen. Be ready to **report** your results to the group!
b. Some Tongva plurals are marked by **"reduplication"**—repeating the first consonant and vowel. Don't worry about explaining the suffixes (what comes after the last hyphen in each word).
c. Assume there's rule in Tongva that puts **stress** on the second syllable of a word, and don't worry about explaining the exceptions.
d. In **#1-#6**, explain why (or describe how) the vowel of the copied first syllable is different from the vowel of the root. If you know how, you can write a rule.
e. If you finish that, explain why some of the root vowels are also changing in **#7-#15**.
f. If you finish that, speculate about what's going on in **#16-17**.
You have 15 minutes, and I'll come around and visit each room if I can figure out how.

	singular	*plural*		*IPA tips*
1.	ˈkii-j	kɛ-ˈkii-j	'house'	**j** is the sound in English <u>y</u>es **ɛ** is the sound in English y<u>e</u>s ˈ means the syllable *after* the mark is stressed
2.	ˈnaavo-t	na-ˈnaavo-t	'tuna cactus'	
3.	ˈpiino-ɾ	pɛ-ˈpiino-ɾam	'hummingbird'	**ɾ** is the sound in American English *city*
4.	ˈmaanɛ-t	ma-ˈmaanɛ-tam	'toloache'	
5.	ˈʔiita-ɾ	ʔɛ-ˈʔiita-ɾom	'coyote'	**ʔ** is the sound in English *uh-oh*
6.	ˈʃoo-t	ʃo-ˈʃoo-tom	'rattlesnake'	**ʃ** is the sound in English <u>sh</u>ip
7.	ʃaˈxaa-t	ʃa-ˈʃaaxa-t	'willow'	**x** is the sound in Spanish *<u>j</u>alapeño* (voiceless velar fricative)
8.	toˈkoo-ɾ	to-ˈtooko-m	'woman'	
9.	ʃoˈʔii-t	ʃo-ˈʃooʔɛ-tam	'jackrabbit'	
10.	ʃaˈŋaa-ɾ	ʃa-ˈʃaana-ɾom	'yellow jacket'	
11.	kaˈvaajoʔ	ka-ˈkaavajoʔ-am	'horse'	
12.	t͡ʃɛˈveevɛ ʔ	t͡ʃɛ-ˈt͡ʃeevɛvɛʔ-am	'spotted'	**t͡ʃ** is the sound in English <u>ch</u>ip
13.	t͡ʃaˈmee-ɾ	t͡ʃa-ˈt͡ʃaamɛ-ram	'owl'	
14.	hoˈŋii-t	ho-ˈhooŋɛ-tam	'squirrel'	
15.	noˈvoo-ɾ	no-ˈnoovo-ɾ	'tray basket'	
16.	ʃoˈkaa-t	ʃo-ˈʃuuka-t	'deer'	
17.	pɛˈkʷaa-ɾ	pɛ-ˈpiikʷa-ɾ	'greedy eater, wolf'	

from Munro 1983

We'll get a bit more lecture-y now—but don't worry, I'll try to break it up and keep it lively.
Let's quickly practice the **hand-raising function** so you know how to stop/interrupt me

"This [class/meeting] is being conducted over Zoom. As the host, I will be recording this session. The recording feature for others is disabled so that no one else will be able to record this session through Zoom. No recording by other means is permitted. This session will be posted at the CCLE class website unless otherwise notified. If you have privacy concerns and do not wish to appear in the recording, do not turn on your video. If you also prefer to use a pseudonym instead of your name, please let me know what name you will be using so that I know who you are during the session. If you would like to ask a question, you may do so privately through the Zoom chat by addressing your chat question to me only (and not to "everyone"), or you may contact me by another private method. If you have questions or concerns about this, please contact me.

Pursuant to the terms of the agreement between the vendor and UCLA, the data is used solely for this purpose and the vendor is prohibited from redisclosing this information. UCLA also does not use the data for any other purpose. Recordings will be deleted when no longer necessary. However, the recording may become part of an administrative disciplinary record if misconduct occurs during a videoconference."

Overview
Big picture: what are we trying to do?
Little picture: review of SPE rule mechanics.


Part A: Intro & overview

3.   What is our job as phonologists? There are various answers out there...
- To describe phonologies (bullets from Goldsmith 1995):

  - What are the <u>legal/possible words</u> of the language?
    - phone <u>inventory</u> (set of basic units—sounds in spoken languages, gestures in sign languages)
    - <u>phonotactics</u> (set of legal sequences of units)

  - What <u>alternations</u> occur (changes that units undergo when placed in different contexts)?

  - Which phonetic differences are <u>contrastive</u>?

- To explain why phonologies are the way they are by constructing…
  - a theory of what people's knowledge of linguistic sound/gesture patterns is and how they learn, store, and use that knowledge

    This will be our focus

  - plus a theory of how linguistic sound/gesture patterns change over time, which ought to follow from the above
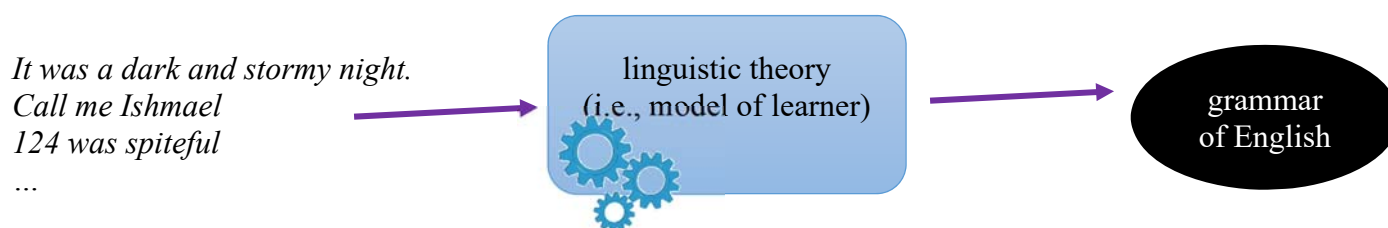
4. Chomskyan basics[2]

- Let a **grammar** consist of (at least)[3]
  - a function that labels any utterance as **grammatical** or **ungrammatical**.
  - a function that assigns truth conditions to any utterance
    - might be implemented as a lexicon and list of rules, or a set of constraints, or something else

Lilongwe is the capital of Malawi → **grammar** →
- → grammatical
- → true iff CAPITAL(LILONGWE, MALAWI)
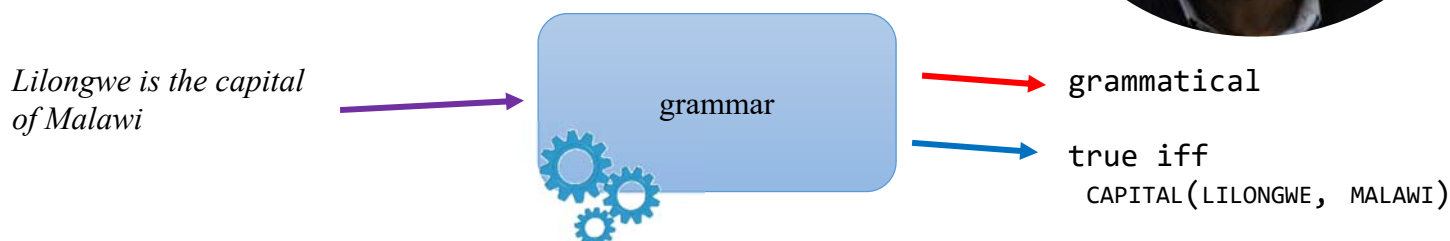
- Let a **linguistic theory** be a function that, given a (finite) set of utterances (the **learning data**), produces a grammar.[4]

It was a dark and stormy night.
Call me Ishmael
124 was spiteful
...
→ **linguistic theory (i.e., model of learner)** → **grammar of English**

5. So...

- an <u>observationally adequate grammar</u> labels the utterances that a typical learner would encounter as grammatical (perhaps trivially, e.g. by consulting a list), and assigns the right truth conditions to them.[5]
- a <u>descriptively adequate grammar</u> captures the significant, psychologically real generalizations—this is a lot!
- the real prize, an <u>explanatorily adequate theory (i.e., learner)</u>, will, given typical learning data, return an descriptively adequate grammar

But how do we even know what the significant/psychologically real generalizations are?????

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[2] Chomsky 1965 pp. 25-27, Chomsky 1964 p. 29, and Chomsky 1995 p. 3, simplified, and filtered, I admit, through my own views.

[3] We probably want the grammar to do much more! (Chomsky also requires a grammar to assign a structural description to an utterance, but I wonder if this is begging the question: the structural description can be used to explain more-observable properties of a sentence like its truth-conditions, but do we know *a priori* that it's necessary?)

[4] Chomsky sometimes breaks this into a **linguistic theory**, which defines the set of possible grammars, and a **strategy** for selecting a grammar out of that set, given the learning data.

[5] That's the best I can do for a definition—observational adequacy isn't discussed that much, though it's sometimes used, without definition, as an insult

6.   Case study: English noun plurals

cat	kʰæt	kʰæts	*pea*	pʰi	pʰi**z**
sack	sæk	sæks	*cow*	kʰaʊ	kʰaʊ**z**
dog	dɑg	dɑgz	*man*	mæn	mɛn
grub	gɹʌb	gɹʌb**z**	*foot*	fʊt	f**i**t
dish	dɪʃ	dɪʃ**iz**	*wife*	waɪf	waɪ**vz**
fudge	fʌd͡ʒ	fʌd͡ʒ**iz**	*whiff*	wɪf	wɪf**s**
			...		

We're going to do a "**gallery walk**" now. I'll put you in breakout rooms.
  a. Nominate a **scribe.**
  b. Scribe, open this **Google doc:** docs.google.com/document/d/1UNfgIWPmG2RtE0ZOfoo6o9Uh3VjV2yIOHUj3-ZcedDM/edit?usp=sharing and **share your screen**.
  c. Each group is designated to be the **advocate** of one of the five grammars for English below
  d. Write something under your designated grammar. If your grammar is B, you would start by writing, very briefly, an advantage you see for B.
  e. Then visit the other grammars in sequence, replying to what's been written a pro-B (or whichever) standpoint
  f. Circle back to your original reply and see what else has been posted for that grammar
You have 15 minutes. I'll be in the chat if you need me.

Examples of observationally adequate grammars for English noun plurals

*A. **No rules.** Just list every word you know, as though everything were an exception*

kʰæt	kʰæts		pʰi	pʰi**z**
sæk	sæks		kʰaʊ	kʰaʊ**z**
dɑg	dɑgz		mæn	mɛn
gɹʌb	gɹʌb**z**		fʊt	f**i**t
dɪʃ	dɪʃ**iz**		waɪf	waɪ**vz**
fʌd͡ʒ	fʌd͡ʒ**iz**		wɪf	wɪf**s**

  • How does this work as a grammar? The grammar's judgment function accepts utterances containing these items in positions where a plural is required (*I like cats*) and assigns appropriate truth-conditions
      o e.g., *I like cats* is true iff I like members of the set CAT: $\forall x\ x \in$ CAT $\rightarrow$ LIKE(I,x)
      o It has nothing to do with whether I like members of the set DOG).

*B. **Add –s** to everything, except for these exceptions:*

dɑg	dɑgz		kʰaʊ	kʰaʊ**z**
gɹʌb	gɹʌb**z**		mæn	mɛn
dɪʃ	dɪʃ**iz**		fʊt	f**i**t
fʌd͡ʒ	fʌd͡ʒ**iz**		waɪf	waɪ**vz**
pʰi	pʰi**z**		...	...

C. **Add –z** *to everything, except for these exceptions:*

kʰæt	kʰæts	mæn	mɛn
sæk	sæks	fʊt	fɪt
dɪʃ	dɪʃ**iz**	waɪf	waɪ**vz**
fʌd͡ʒ	fʌd͡ʒ**iz**	wɪf	wɪf**s**
		...	...

D1. **Add –iz** *after "sibilant" sounds, **–s** after non-sibilant [–voice] sounds, and **–z** otherwise, except for these exceptions:*

mæn	mɛn
fʊt	fɪt
waɪf	waɪ**vz**

> *phonetics tip*: "sibilants" are the fricatives and affricates made extra-noisy by shooting the already-turbulent airstream against the back of the front teeth

D2. **Change final /f/ to [v]**, *and then add –iz after sibilants, –s after non-sibilant [–voice] sounds, and –z otherwise, except for these exceptions:*

mæn	mɛn	...	...
fʊt	fɪt		
wɪf	wɪf**s**		

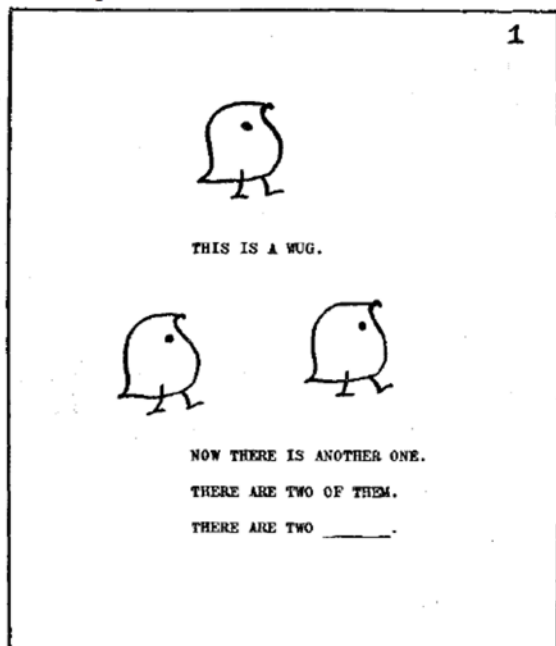### *Which generalizations are real? How about a wug test.*

Figure 1.   The plural allomorph in /-z/.

(Berko 1958, p. 154)

- Berko found that English-speaking adults (all highly educated, in her sample, FWIW) consistently give the following plurals when presented with invented words (pp. 155-158):

wʌg	wʌg**z**	lʌn	lʌn**z**
gʌt͡ʃ	gʌt͡ʃ**iz**	nɪz	nɪz**iz**
kæʒ	kæʒ**iz**	kɹa	kɹa**z**
toɹ	toɹ**z**	tæs	tæs**iz**

✎ Which of the grammars above could be descriptively adequate, given these data?

Annotation poll: Put a stamp on all the ones you think could be descriptively adequate

A, listing   B, add -s   C, add -z   D1, add -s/-z/-ɨz   D2, f → v, add -s/-z/-ɨz

✎ The adults disagreed about this word—what might we conclude?

    hif   hif**s**, hiv**z**

7.   Why is it hard to develop a <u>descriptively</u> adequate grammar in phonology?

- If a speaker already knows a word, it's uninformative! (Known words don't tell us anything about what generalizations the speaker has learned—they may have simply memorized those words.)

- Constructing novel phonological situations to put speakers in is a challenge.
    - Contrast this with syntax, where it's easier to construct sentences that—presumably—the speaker has not encountered before.

- We often can't be sure that these novel situations really test what we want them to test.

- In 200A, we'll mostly ignore this problem and proceed as though generalizations that we notice in the data are real to speakers.
    - In 201A there will probably be a more emphasis on methods for determining which generalizations are real.

8.   Why is it hard to develop an <u>explanatorily</u> adequate theory?

- Suppose we could magically achieve description adequacy for all real languages.

    - That only tells us which generalizations people have extracted for existing sets of data

    - We don't know what people *would do* if faced with a language with different generalizations

- To build our linguistic theory, we need to know which generalizations people can extract or tend to extract from all kinds of learning data, not just attested learning data.

    - Are some generalizations preferred to others?

    - Are there hard limits on learnability?

- In the English example…
  - Suppose we're convinced by the wug test that English speakers' grammar includes the rule "use the [ɨz] form of the plural after sibilants".

  → Exposed to the English data, learners choose a grammar with that rule

  - But we still know nothing about the learnability of "use the [ɨz] form of the plural after **non**-sibilants".
    - If the data had somehow reflected this rule instead, would children be able to learn it?

- Again, this won't be our focus this quarter, but some interesting things you could read:
  - (Becker, Ketrez & Nevins 2011) and (Becker, Nevins & Levine 2012) tackle this problem in a very interesting way, by comparing potential generalizations that exist within the same language—Turkish and English, here.

- Bowers 2012 argues that a sudden, one-generation change in Odawa happened because the data changed into something that children couldn't learn.

Depending on what time it is, let's either look at the syllabus, CCLE, and Perusall now, or save the last 15 minutes of class for it.

Part B: SPE (Chomsky & Halle 1968**) rule notation review**

9.　An example: SPE's main stress rule (p. 240)—let's just admire it for a minute

$$V \rightarrow [1 \text{ stress}] \Big/ \left[X\_C_0 \left(\begin{bmatrix} -\text{tense} \\ \gamma\text{stress} \\ V \end{bmatrix} C_0^1 \left(\begin{bmatrix} \alpha\text{voc} \\ \alpha\text{cons} \\ -\text{ant} \end{bmatrix} \right) \right) \right.$$

$$/ \_ \left\langle \left(\begin{Bmatrix} (fik)At \\ [+D]C_0 \end{Bmatrix} \right) \begin{Bmatrix} <_1+C_0>_1 \begin{bmatrix} -\text{stress} \\ -\text{tense} \\ -\text{cons} \end{bmatrix} [+\text{cons}]_0 \\ <_1 \begin{bmatrix} -\text{seg} \\ <_2-\text{FB}>_2 \end{bmatrix} >_1 C_0 \, [\beta\text{stress}] \, C_0 \, <_2 V_0 C_0>_2 \end{Bmatrix} \right\rangle \Big]_{<\text{NSP}<_1\text{VA}>_1>}$$

Conditions:　　$\beta = \begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$

　　　　　　　$\gamma \le 2$　[in another version, says γ is 2 or weaker]
　　　　　　　X contains no internal #

(Not much is said in SPE about these "conditions", except that they are truth-functional. It makes a big difference to the theory's computational power what restrictions we place on them.)
- Don't worry—you'll almost never encounter a rule this complicated!!!
- Let's step through the crucial elements of rule notation.

10.　A → B / X __ Y

Example: $\begin{bmatrix} +\text{syll} \\ -\text{low} \end{bmatrix} \rightarrow [+\text{high}] \, / \, \_\_ \, CC\#$

➢ means　　"*XAY* is rewritten as *XBY*", or, to put it another way, "*A* is rewritten as *B* when preceded by *X* and followed by *Y*".

- A is the **affected segment, focus**, or **target** of the rule.
- B is the **structural change** that the rule requires
- X__Y is the **context** for the rule
- XAY is the **structural description**

We'll use *A*, *B*, *X,* and *Y* to stand for these positions throughout this handout.

11.　*Something we'll skip*: A → B / X __ Y / P__Q
➢ Means "*PXAYQ* is rewritten as *PXBYQ*".
- I.e., A → B / PX __ YQ.
  - Except that ordering for "expansion conventions" (which we haven't discussed yet) is affected—see SPE pp. 72-77.

12. Left side of the arrow, "A"

A can be a feature matrix or Ø.

➢ <u>If *A* is a feature matrix</u>, like $\begin{bmatrix} +\text{syllabic} \\ -\text{low} \end{bmatrix}$, then the rule looks for any segment that is **nondistinct** from that matrix.

- Two feature matrices are **distinct** iff there is some feature F whose value is different in the two matrices.

  ❓ Which of the following are distinct from $\begin{bmatrix} +\text{syll} \\ -\text{low} \end{bmatrix}$?

  A: $\begin{bmatrix} +\text{syll} \\ -\text{low} \\ +\text{round} \\ +\text{back} \end{bmatrix}$ B: $\begin{bmatrix} -\text{low} \\ -\text{round} \end{bmatrix}$ C: $\begin{bmatrix} -\text{syll} \\ -\text{low} \\ +\text{high} \end{bmatrix}$ Zoom poll

  o This means that if *A* doesn't mention some feature F, it doesn't care about it—that part of the rule matches segments that are +F, or –F, or even fail to have a value for F.

- Sometimes, if *A* is meant to pick out a single sound, we use a phonetic symbol instead:

  u → [–high] / ___ (C)#

  o This is a good idea for readability, but in order to determine how long the rule is (e.g., if you think learners prefer short rules), you'd have to expand the IPA symbol into a feature matrix.

Annotation poll before we answer the next question**:** put a stamp next to whether you want a quick review of the features [high/low/front/back/round]

yes, I want a quick review   I don't need a review

❓ What's the smallest feature matrix that "u" could abbreviate if the language's vowel inventory is *i, a, u*? If it's *i, a, u, o*? If it's *i, y, a, u, o*?

Write down your answer, then I'll ask for **raised hands**

- Sometimes we also use C to abbreviate [–syllabic] or V to abbreviate [+syllabic].
  - Again, this is good for readability.
  - Be careful when *you* read, though, because some authors, following SPE, use C and V to abbreviate {[–vocalic], [+consonantal]} and [+vocalic, –consonantal].

➢ If *A* is Ø, you've got an insertion rule (the idea is that insertion changes "nothing" into something):

     Ø → i / C ___ C#

❓ Why don't we use the empty matrix [ ] instead of Ø? Take 2 minutes to think about this alone, then I'll give you 2 minutes to discuss it with a partner in a break-out room. If you're stuck, try applying the rule [ ] → i / C__C# to the word /potek/ and the word /bamk/.

13. **An unsolved issue: underspecified targets (if we have time)**

- Imagine a rule like $\begin{bmatrix} +\text{coronal} \\ -\text{voice} \end{bmatrix} \rightarrow$ Ø / ___ #
  - And imagine we've decided that sonorants in the language in question are underlyingly underspecified for [voice] (meaning they have no value for this feature—some later rule will fill in their voicing values).
  - E.g., feature matrix for /n/ doesn't contain any kind of [voice], either [+voice] or [–voice].

❓ How should the rule apply to /bil/ according to our definitions?
     A: produce [bi]
     B: produce [bil]

                                         Zoom poll

❓ Does this seem right? Answer with thumbs-up or thumbs-down emoji and I'll call on one or more people to make their case.

- There's an inconclusive discussion on pp. 382-389 of SPE about whether we should...
  - change the definition of when a rule is applicable so that nondistinctness isn't enough
  - or impose a condition that segments always have to be specified for all the features that a rule's structural description mentions, by the time the rule applies
  - or impose conditions on lexical entries that will rule out some of these cases

In practice, this won't come up much. If it does, you'll need to decide how the rule should apply and **be explicit** about your decision.

I have a feeling we'll be lucky to get this far! So we'll look at the rest of the rule (B, X, Y) next time.

14. Wrap-up of today

- We've started going into excruciating detail about how a seemingly simple theory works—why?
  - In the past, you've probably been taught a theory of convenience that worked well for the course material.
    - It may have cobbled together elements of various proposals, and left various aspects of its implementation vague.

  - Here we're going to try to be very explicit about what are our 2 base theories and what constitutes a departure from them.

Are there real cases that are
in I but not II?
in II but not I?
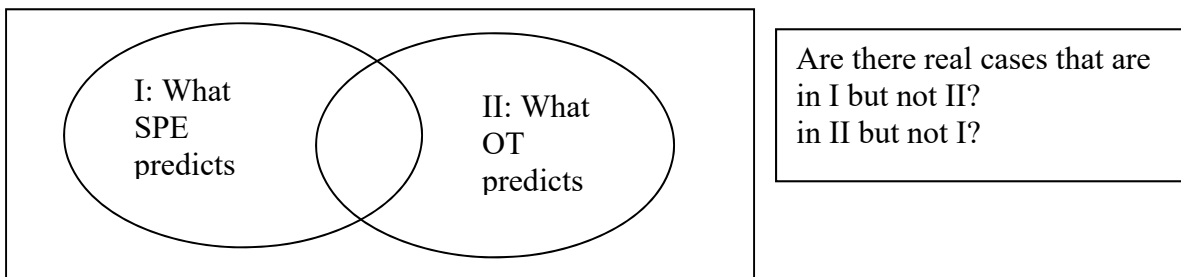
Next time
- The rest of the rule, and how to apply it
- You may recall seeing symbols like ( ) { } < > * ^{0} and others in rules, and treating them as convenient abbreviatory conventions. We'll review these symbols and see how SPE takes them seriously as theoretical claims.

Students' to do list—will also be posted on CCLE
- Do "**assignment**" listed under Week 0 on CCLE, which is just filling out an info sheet for me
- Get started on first **reading** (portions of K&K ch. 2, 3, 9), and annotate using instructions on Perusall. Due Wednesday night. If possible, get started soon, so that you can all have a chance to comment on each other's annotations
- If you have **questions**, please use the Questionsly discussion forum on CCLE whenever possible (instead of e-mailing me). This will allow your question to benefit everyone, or even get answered by a classmate before I get to it!
- Of course, you can still e-mail me for questions that don't make sense to post to the discussion because they pertain to you personally

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References

Becker, Michael, Nihan Ketrez & Andrew Nevins. 2011. The surfeit of the stimulus: analytic biases filter lexical statistics in Turkish laryngeal alternations. *Language* 87(1). 84–125.

Becker, Michael, Andrew Nevins & Jonathan Levine. 2012. Asymmetries in generalizing alternations to and from initial syllables. *Language* 88(2). 231–268. https://doi.org/10.1353/lan.2012.0049.

Berko, Jean. 1958. The child's learning of English morphology. *Word* 14. 150–177.

Bowers, Dustin. 2012. *Phonological restructuring in Odawa*. UCLA master's thesis.

Chomsky, Noam. 1964. *Current Issues in Linguistic Theory*. The Hague: Mouton.

Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, Mass.: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. MIT Press.

Chomsky, Noam & Morris Halle. 1968. *The Sound Pattern of English*. Harper & Row.

Goldsmith, John A. 1995. Phonological Theory. In John A Goldsmith (ed.), *The Handbook of Phonological Theory*, 1–23. Cambridge, Mass., and Oxford, UK: Blackwell.

Munro, Pamela. 1983. Selected Studies in Uto-Aztecan Phonology. *International Journal of American Linguistics* 49(3). 277–298.