

24.901/

Rules and representations

Reading this week: K&amp;K chapter 2; Reading next week: K&amp;K chapter 3

1. Generative grammar
2. Linguistic expression
3. Models of linguistic competence
4. “Grammatical = “approved of by English teachers and William Safire”
5. “Grammatical” (wrt some grammar G) = “an expression generated by G”
6. A phrase structure grammar:

$$S \rightarrow NP VP$$

$$NP \rightarrow N$$

$$VP \rightarrow V$$

$$N \rightarrow \text{dogs}$$

$$V \rightarrow \text{bark}$$

Expression generated: *Dogs bark*

Expressions not generated, hence ungrammatical: all others

7. The aim in constructing a grammar G of some natural language L:  
 set of expressions generated by G of L coincides with those found acceptable by native speakers of L
8. Two possible deviations:
  - G undergenerates --- cf. 6.
  - G overgenerates
9. Components of the grammar
10. Input and output of the phonological component
11. *-ism*
12. *babushka, rococo*

13. **Components of the phonological component:**

- **Lexicon:** a set of lexical entries, i.e. expressions that are memorized
- **Lexical constraints:** laws that characterize possible lexical entries
- **Rules:** map actual/potential lexical entries to pronunciations
- **Rule orderings:** which rule precedes which other rules.
- **Surface constraints:** laws for possible words as actually pronounced

9. **Lexical entries are likely to abstract away from** (at least):

- **voice quality:** e.g. breathy vs. nasal vs. ‘standard’
- **speech rate:** fast vs. slow speech
- **(maybe not speech register:** formal vs. casual

cf. *I want to go* vs. *I wanna go.* )

- **some context-induced differences:**

<i>ten books</i>	can be articulated as	[t <sup>h</sup> ɛmbuks]
<i>ten goats</i>		[t <sup>h</sup> ɛŋgo:ts]
<i>ten facts</i>		[t <sup>h</sup> ɛmfækts]

but there is probably a single lexical entry for *ten*, [t<sup>h</sup>ɛn] or [ten]

10. **Not every expression has its dedicated lexical entry:**

most are assembled on-line, rather than looked up in a lexicon.

11. **Nonce expressions:** unlisted

- Whatever sentence I just said before this one.
- *grammaticalizable, Kenstowiczian, questionnee*

12. **A question:** how much information is listed in the lexicon?

13. **A related question:** how much information do the phonological rules have to fill in?

14. *transmit* [trænzmit]  
*transmission* [trænzmiʃən]

15. **Option one:** two unrelated lexical entries: [trænzmit] and [trænzmiʃən]  
 no rule needed

16. **Option two:** one lexical entry for verb [trænzmit]  
 plus a suffix *-ion*, [jən] – cf. *rebellion*, *communion*, *confession*  
 plus a rule (preliminary): tj -> ʃ

<b>input</b>	->	<b>rule</b>	->	<b>output</b>
trænzmit-jən		tj -> ʃ		trænzmiʃən

17. **Observe also:**

- no *tj* in (American) English words: why not?? *pj*, *kj*, *ff* in *pure*, *cube*, *feudal*
- expected *tj* in phrases (*bet you*; *get you*) is possible  
 but frequently altered: cf. *betcha*, *gotcha* [betʃjə], [gətʃjə]

18. **Critical:** most rules don't care which morphemes the segments belong to

19. **A possible lexical constraint:**

- English: content words (N, V, A) cannot be just CV, where V is short  
 CV: *go* [go:], *bee* [bi:], *bay* [be:], *awe* [ɔ:] or [ɒ:]  
 CVCV *comma* [kəmə]  
 CVC *lick* [lɪk], *duck* [dʌk], *neck* [nek]  
 But no content words [Cɔ], [Cɛ], [Cɪ], [Cə]: CV syllable, short V
- Latin: ditto

20. **Rule mechanics:** back to palatalization in English

- **Reminder (a): target -> output/ context\_context**

t, d, s, z -> tʃ, dʒ, ʃ, z/ \_j

- **Reminder (b):** description of rule factors is given in features (phonetic props)

**alveolar obstruent-> palatoalveolar/ \_ palatal glide**  
 (preliminary feature notation)

- **Reminder ©:** output factor mentions only the features that have been changed

- **Reminder (d):** rules can delete (x -> Ø) and insert stuff (Ø -> x)  
**palatal glide -> Ø/ [...palatoalveolar\_...]<sub>word</sub>**

“...” = “possible additional material intervening here”  
 [...]<sub>x</sub> = a constituent of category x

- **Reminder** (e): we choose the simplest rule that works. Hence we reject:

**alveolar obstruent -> palatoalveolar/ \_ palatal glide vowel**

Because no English input will be mapped to the wrong output if the rule we use allows the possibility that palatalization will also take place before C or ]<sub>word</sub>

## 21. The palatalization system

### Rules in order of application

(a) Assibilation: alveolar stop -> fricative/ \_{suffixes: jən, jəl, -ɪv, ɪbl, ...}

(b) Palatalization: alveolar obstruent -> palatoalveolar/ \_ palatal glide

(c) Glide deletion: palatal glide -> Ø/ [...palatoalveolar\_...]<sub>word</sub>

Derivations for	rebellion	transmit	transmission	met you
Lexical entry	rəbəl-jən	trænzmit	trænzmit-jən	met-ju
Assibilation	n/a	n/a	trænzmisjən	n/a
Palatalization	n/a	n/a	trænzmiʃjən	metʃju
Glide deletion	n/a	n/a	trænzmiʃən	n/a
Output	rəbəlʃjən	trænzmit	trænzmiʃən	metʃju

Derivations for	divide	divisible	division
Lexical entry	divaɪd	divaɪd-ɪbl	divaɪd-jən
Assibilation	n/a	divaɪzɪbl	divaɪzjən
Palatalization	n/a	n/a	divaɪzjən
Glide deletion	n/a	n/a	divaɪzən
Other rules	n/a	divɪzɪbl	divɪzən
Output	divaɪd	divɪzɪbl	divɪzən

## 22. An output constraint

- **Feature:** the set {s, z, ʃ, ʒ} and fricative parts of {ts, dz, tʃ, dʒ} are *stridents*
- **The constraint:** No two strident sounds can be adjacent in an English word.
- **Consequence 1:** no words contain anything like VtʃsV or VzʒV or VzʒV etc. (zz in *puzzle* etc. is purely orthographic)
- **Consequence 2:** rules cannot create strident sequences either.  
*corruption* vs. *digestion*

Derivations for	corruption	digestion
Lexical entry	kəɾʌpt-jən	daɪdʒest-jən
Assibilation	kəɾʌpsjən	daɪdʒessjən
Constraint check		daɪdʒessjən? oops... revert to daɪdʒestjən

Derivations for	corruption	digestion	(continued)
Palatalization	kəɾʌpʃjən	dɑɪdʒestʃjən	
Glide deletion	kəɾʌpʃən	dɑɪdʒestʃən	
Output	kəɾʌpʃən	dɑɪdʒestʃən	

Note: in *stf* the strident parts of *s* and *tf* are separated by a non-strident, the [t] portion of [tʃ].

### 23. Not covered so far, but in your text, chap. 2

Why assume that *transmit* and *transmission* come from the same lexical entry?

### 24. The answer summarized

- We don't vouch for the status of *this* pair -- but see below.
- But in a large number of languages the morphology is so rich that the hypothesis that speakers memorize as distinct lexical entries all words in use is as promising as the hypothesis that speakers memorize all sentences in use.
- The important part is that phonological changes do affect some lexical entries in some languages and change their shapes : if not in *transmit-ion*, then others.

### 25. A psycholinguistic test that *transmission* is derived from *transmit*: priming

- Premise: Any verbal task is facilitated by repetition, incl. word recognition
  - ➔ subject presented with list of "words" and asked for each 'Is this a word?'
  - ➔ reaction time (RT) measured
  - ➔ faster RT for any word that had been presented earlier: repetition priming
  - ➔ compare self-priming (e.g. *dog* primes *dog*) with related-word priming (*doggie* primes *dog*). Is the effect the same? **Repetition priming**

- A simple experiment (Stanners & al. 1979 JVLVB)

	Prime	Target	Priming?	Effective?
Control	<i>pour</i> (932ms)	<i>pour</i> (766ms)	166ms	
Critical	<i>pours</i> (1028ms)	<i>pour</i> (751ms)	277ms	priming

- Applying this to pairs of words similar to *transmit*, *transmission*

	Prime	Target	Priming?	Effective?
Control	<i>select</i> (899ms)	<i>select</i> (779ms)	120ms	
Critical	<i>selective</i> (1080ms)	<i>select</i> (827ms)	253 ms	Priming (but less)

	Prime	Target	Priming?	Effective?
Control	<i>describe</i> (924)	<i>describe</i> (806)	118ms	
Critical	<i>descriptive</i> (1131)	<i>describe</i> (892)	239 ms	Priming (but less)

Similarly *receive-reception, destroy-destruction*