Language production

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Stages of Language Production: Attempt 1

- Message generation: a conceptual representation of what to say

- Select words to express concepts

- Organize words syntactically to convey a message

- Articulation: Generate auditory/written/signed sequence

Message Generation

- Message – Conceptual representation independent of particular words
- Take into account:
  - ➢ Level of politeness
  - ➢ Speech act(s)
    - Illocutionary force - purpose of utterance (question, command, etc.)
  - ➢ Register (slang vs. formal)
  - ➢ Reference
  - ➢ Listener knowledge

Accounting for Perceiver in the Message

- Message includes includes information tailored to specific communicative context: the "common ground" between the speaker and the listener.

- Isaacs and Clark (1987)
  - ➤ Two subjects (director and matcher) ordering postcards with pictures of NYC landmarks
  - ➤ Director adjusted descriptions based on combined knowledge of NYC

  the building with the slanty roof vs. *the Citicorp building.*

The Message is Independent of Syntax

- Word order
  - *French noun-adjective: le roi noir*
  - English adjectiv-noun *the black king*
- Pro-drop – subject pronoun understood from context in many languages
  - *He is happy* vs. *Is happy*
- Lexical gap – no word, have to use a phrase
  - Foreign phrase borrowing
    - *Je ne sais quoi.*   *carte blanche*
- Starting sentences that can't be completed grammatically
  - **The dishes that I don't know where they go I left in the sink.*

Word Selection

- Select content words
- Adult English:
  - ➢ Speaking vocabulary: 45,000-60,000 words
  - ➢ Speaking rate: 120-150 words/min
  - ➢ Selection error rate   1 in 1000 words

Word Organization / Ordering

- Apply syntactic and discourse rules to determine a word sequence
  - Discourse function: Old, background information first.
    - *The glass is filled with water.* vs. *Water fills the glass.*
  - Function words
  - Inflectional morphemes
  - Agreement
  - Long-distance dependencies (*wh*-transformations, etc)

Word Selection and Ordering are Interrelated

I gave $100 to a charity.

I gave a charity $100.

Either order OK, include preposition or not.

I donated $100 to a charity.

*I donated a charity $100.

Only one order permitted, preposition required

- Order of arguments depends on choice of verb

Word Selection and Ordering are Interrelated

- Bock (1986)
  - ➢ Task: Alternate (a) describing a picture; and (b) reading a single word. Later asked to identify the pictures and words. Seems like a memory task to the subjects.
  - ➢ Prime word: *worship* vs. *thunder*

"worship" as prime: "The church is being struck by lightning."
"thunder" as prime: "Lightning is striking the church."

Word organization affects future word organization in sentence production

- Syntactic priming:
  - ➢ The voice of a context sentence affects how a picture is described:
    - Active voice in the context -> Producing an active sentence
    - Passive voice in the context -> Producing an passive sentence

  - ➢ The type of direct object / indirect object that have been used most recently affect how a picture is described, independent of the verbs / nouns in the sentences:
    - "A boy is giving a book to a girl" -> Producing a sentence with the indirect object following the preposition "to". E.g., "A woman is throwing a ball to a man."
    - "A boy is giving a girl a book" -> Producing a sentence with the indirect object immediately following the verb. E.g., "A woman is throwing a man a ball."

Speech Errors

- Production is hard to examine experimentally
- Errors are rare
- Examine what kinds of errors are more or less common in different situations

- Famous Errors: Spoonerisms, Malapropisms
  - *You have missed my history lectures. →*
      You have hissed my mystery lectures.
  - *Noble sons of toil. → Noble tons of soil.*
  - *You have wasted the whole term. →*
      You have tasted the whole worm.
  - *The dear old queen. → The queer old dean.*

Reverend William Spooner
Spoonerisms

- 1844–1930, born in London, priest and scholar at Oxford University
  - ➢ Son, it is now **kiss**tomary to **cu**ss the bride**.**
  - ➢ I believe you're occupewing my pie. May I **se**w you to another **sh**eet?
  - ➢ Is the **b**ean **d**izzy?
  - ➢ Which of us has not felt in his heart a half-**w**armed **f**ish?

Freud's Theory of Production Errors

- Errors represent unconscious beliefs or desires: repressed thoughts of some kind.

    - *It's my pleasure to **prevent**, er.. present the next person on the panel.*
        - Infer that the speaker objects to the person.

    - *From a politician "I like Heath. He's tough - like **Hitler** - (shocked silence from reporters) - Did I say Hitler? I meant Churchill."*

    - *Last night my grandmother **lied**.*
        - Student seeking to postpone an exam

Freud's Theory of Production Errors

- Errors represent unconscious beliefs or desires: repressed thoughts of some kind.

  ➢ *I don't want to run the risk of ruining what is a lovely* **recession**.
    - G.Bush, Sr. 1992

  ➢ *For seven-and-a-half years, I've worked alongside President Reagan. We've had triumphs. Made some mistakes. We had some* **sex**... *uh... setbacks.*
    - G.Bush, Sr. 1988

Problems with the Freudian account

- Always post-hoc explanations - it doesn't predict when slips will occur, type of slip, or what slip will be.
  - ➤ E.g., does repressed anger result in more word substitutions or sound errors than sexual repression does?

- Many (most) slips cannot be explained as with reference to repressed thoughts
  - ➤ because the speaker will openly admit to having them
  - ➤ or they relate to concepts that are too trivial to repress: most speech errors are **mundane**.

Disfluencies

I have to remember to **...um...** leave a note.

Planning is still going on while producing.

- Filler: "um", "er", "uh"
- Phoneme, word and phrase repetitions.
- Re-starts

Exchange Errors

- Garrett (1975)

*Billy Joel → **J**illy **B**oel*   (phonological)

brush my teeth and wash my face →
 *brush my **face** and wash my **teeth*** (word)

My sister went to the Grand Canyon →
  The Grand Canyon** went to **my sister (phrase)

- Phonological
  - ➢ Usually close together, in the same phrase similar in sound or sound environment, syntactic factors irrelevant
- Words and phrases
  - ➢ Can be far apart, in different phrases often dissimilar in sound, but similar in syntax (same grammatical category)

Lexical Access

TARGET: I wanted to read the letter to my grandmother.
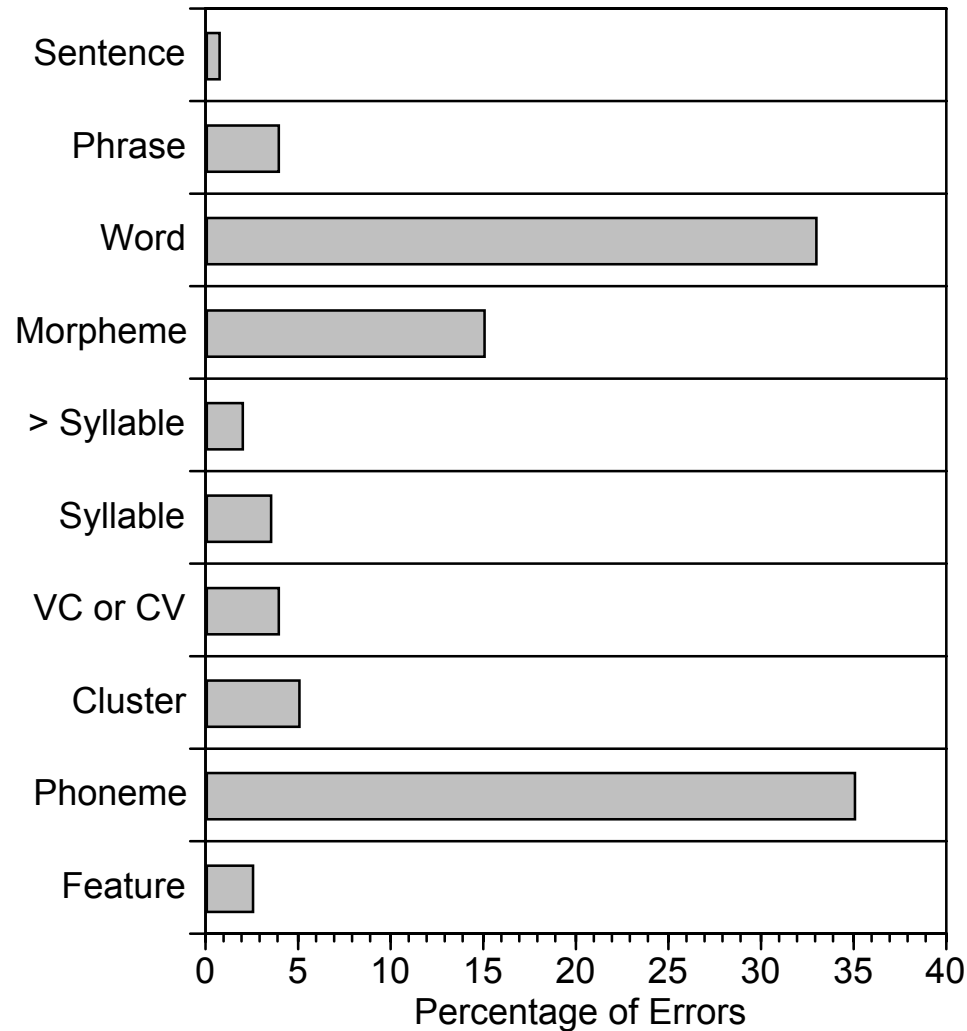
Category	
Sentence	
Phrase	I wanted to read <u>my grandmother</u> to <u>the letter</u>.
Word	I wanted to read the <u>grandmother</u> to my <u>letter</u>
Morpheme	I <u>read</u>ed to <u>want</u> the letter to my grandmother.
> Syllable	
Syllable	I wanted to read the <u>grander</u> to my <u>let</u>mother.
VC or CV	
Cluster	I wanted to read the <u>gr</u>etter to my grandmother.
Phoneme	I wanted to read the letter to my <u>l</u>andmother.
Feature	I wanted to read the letter to my <u>b</u>randmother.

Percentage of Errors

0   5   10   15   20   25   30   35   40

Two Organization / Ordering Stages

- Different distributional properties suggest different stages where exchanges can occur.
  - ➤ Phonological Encoding stage
    - Puts phonemes in order
    - Sounds are relevant
    - Syntax is irrelevant
    - Narrow scope planning
  - ➤ Functional / Grammatical Encoding stage
    - Puts words in order
    - Sounds irrelevant
    - Syntactic relations relevant
    - Wide scope planning

Other Sequencing Errors

- Shifts – movement to a new position
  - *black boxes → back b**l**oxes*
  - *something to tell you all → something **all** to tell you*

- Anticipations – copy to an existing earlier position
  - *reading list → **l**eading list*
  - *sun is in the sky → **sky** is in the sky*

- Perseverations – copy to an existing later position
  - *beef noodle → beef n**ee**dle*
  - *class will be about discussing the test →
    class will be about discussing the **class***

Other Sequencing Errors

- Additions – insertion in a newly created position
  - ➢ *blue bug* → *blue b**l**ug*
  - ➢ *These flowers are purple* →
    *These **purple** flowers are purple*

- Deletions – removal from an existing position
  - ➢ same state → same sate
  - ➢ I just wanted to ask that → I just wanted to that

Lexical Bias in Phoneme Errors

- If two phonemes are swapped in an error, words should result about 45% of the time.
  - ➤ Observed percentage: 61%.
  - ➤ "With this **wing**, I thee **red**."
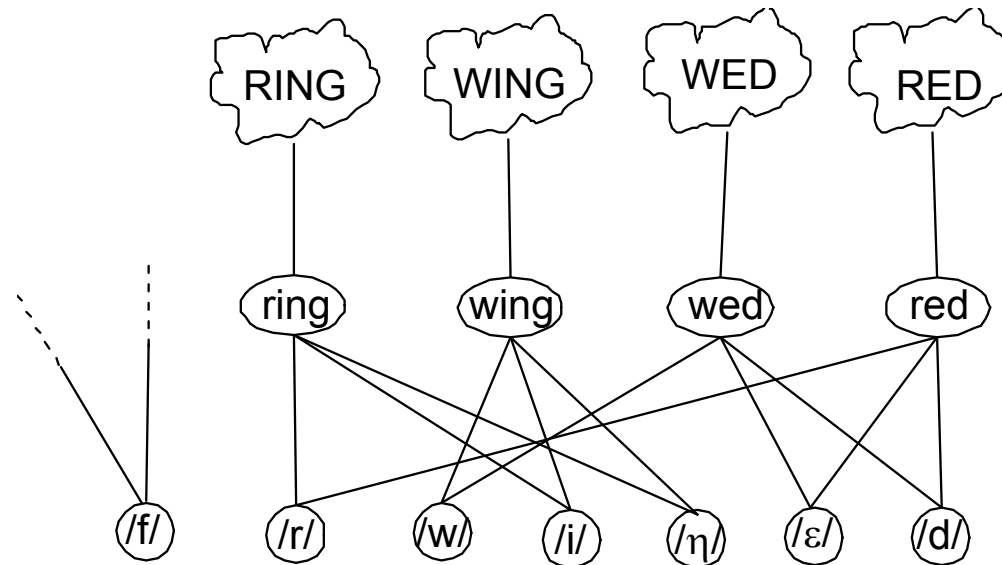
- Why?
  - When a sound is in a word, it gets more active than when it is not.

Substitutions (Selection Errors)

- Semantic:
  - Don't burn your fingers → Don't burn your **toes**
- Phonological
  - They disseminated the info → They **decimated** the info
  - I'm ambidextrous → I'm **amphibian**

  - We've had some success. → We've had some **sex**.

Two parts of word retrieval

- **Lemma** retrieval:
  - ➢ select a word that matches needed meaning and grammatical category
- **Lexeme** retrieval:
  - ➢ retrieve the sound of a word

Tip of the Tongue Phenomenon: Evidence for two parts of a lexical entry

- Can retrieve lemma without lexeme
  - Can know the meaning, first letter, syllables, and stress pattern but can't generate the word.

- Brown & McNeill (1966)
  - Navigational instrument used in measuring angular distance, especially the altitude of the sun, moon, and stars at sea.

- Vigliocco et al. (1996)
  - Put Italian speakers into a TOT state.
  - Could identify grammatical gender 80% of the time.

- Badecker et al. (1995)
  - Italian speaker with brain damage: poor picture-naming, but close to 100% at using the appropriate article (masc. / fem.)

Stages of Lang. Production: Attempt 2

(1) Message generation

(2) Grammatical Processing

> Lemma selection

   Evidence: TOT, substitution errors (word and phrase)

> Syntactic organization

   Evidence: sequencing errors (word and phrase)

(3) Phonological Processing

> Lexeme selection

   Evidence: TOT, substitution errors (phonological)

> Phonological organization

   Evidence: sequencing errors (phonological)

(4) Articulation

"THE SQUEAKY WHEEL GETS THE GREASE."

"THE GREEKY SQUEEZE GETS THE WHEEL."

Imagine that you heard something like this.

   This, of course, is called a "speech error."

Might think that it's completely random.

     Or a "Freudian slip."

Today, going to be talking a lot about errors like these, and where they might come from.

By end of lecture, hope to show that there is a rhyme and reason to this error.

     These kinds of error can show us interesting things about the way we produce words and sentences.

Bird's Eye View of Production
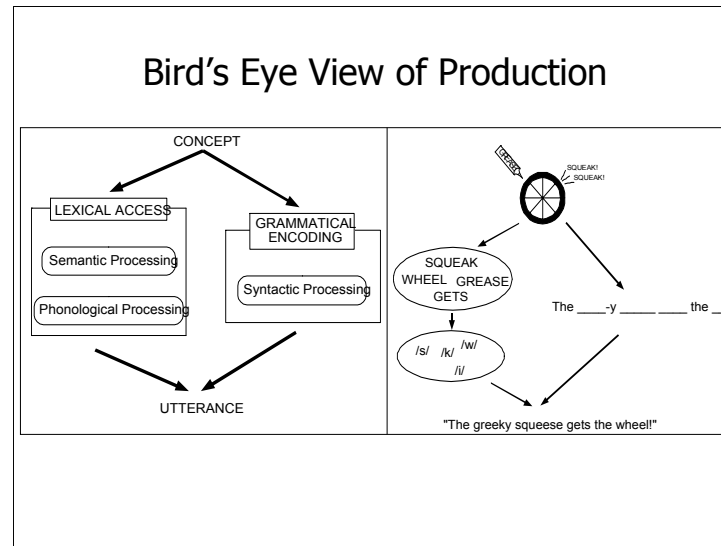
Generally, language production made up of two processes:

    Lexical access:

        Look up words in mental dictionary.

        Consists of two processes itself:

            Semantic processing: Go from definition to word.

                Like the mental set demonstration.

            Phonological processing: Go from word to how it sounds.

                Complexity illustrated by tongue twister.

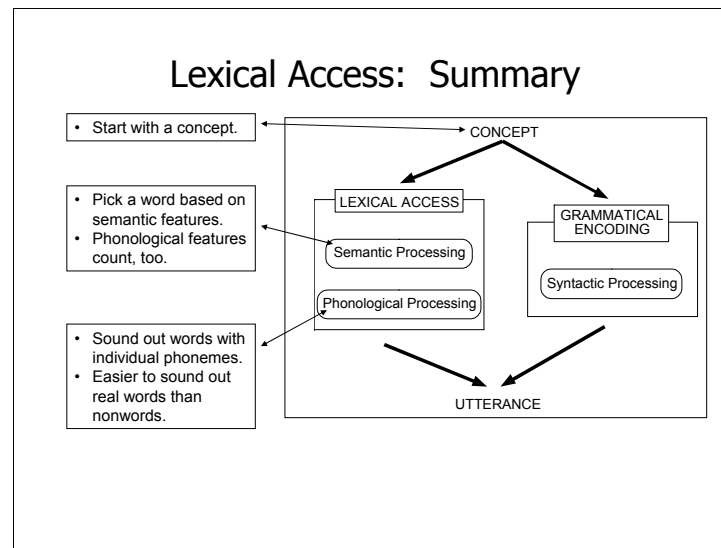   Grammatical encoding:

        Communicate who did what to whom.

        Consists of syntactic processing: Decide what syntactic structure to use.

        For example, **decide whether to use an active or passive**.

We're going to basically look at these one at a time.

Lexical Access: Summary

- Start with a concept.

- Pick a word based on semantic features.
- Phonological features count, too.

- Sound out words with individual phonemes.
- Easier to sound out real words than nonwords.

CONCEPT

LEXICAL ACCESS

Semantic Processing

Phonological Processing

GRAMMATICAL ENCODING

Syntactic Processing

UTTERANCE

Summary of lexical access:

    Start with a concept -- meaning of what you want to say.

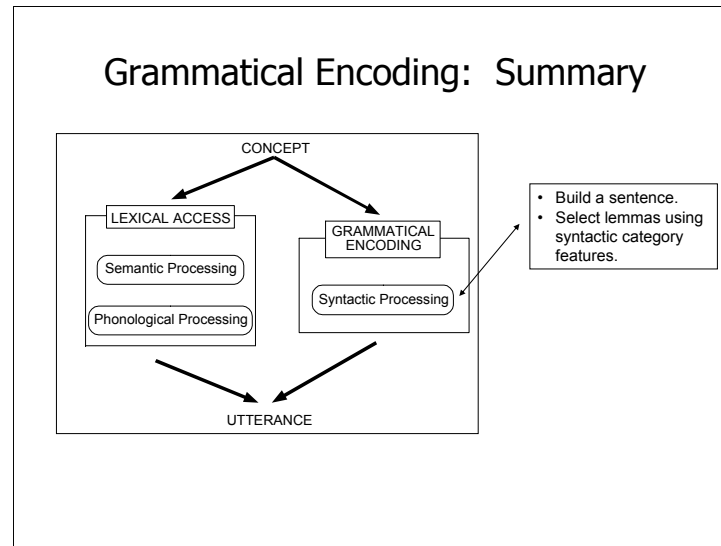   Pick word that you want to say, based on semantic features.

        Overcome competition from semantically similar words.

        Phonological features come into play, too.

    Once you're at the lemma, you don't have access to sounds yet.

    Sound out the word with individual phonemes.

But what about grammatical encoding?

Grammatical Encoding: Summary

CONCEPT

LEXICAL ACCESS

Semantic Processing

Phonological Processing

GRAMMATICAL ENCODING

Syntactic Processing

- Build a sentence.
- Select lemmas using syntactic category features.
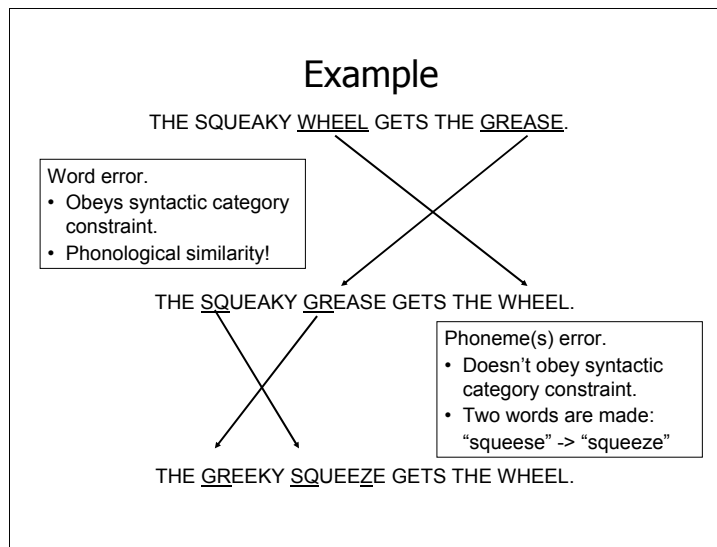
UTTERANCE

Summary:

Sentences get built when lemmas are selected.

Lemmas get selected with syntactic category labels.

Grammatical encoding selects first available lemma.

When timing's not right, speech error results.

Example

THE SQUEAKY <u>WHEEL</u> GETS THE <u>GREASE</u>.

Word error.
- Obeys syntactic category constraint.
- Phonological similarity!

THE <u>SQUEAKY</u> <u>GREASE</u> GETS THE WHEEL.

Phoneme(s) error.
- Doesn't obey syntactic category constraint.
- Two words are made: "squeese" -> "squeeze"

THE <u>GREEKY</u> <u>SQUEEZE</u> GETS THE WHEEL.

So, what about the error that we started with?

The original error was "The greeky squeese gets the wheel."

Can be analyzed as the result of two consecutive errors:

First, a lexical (word) error.

Speaker chose the wrong word initially.

Note that both words come from same syntactic category

Note that the two words are phonologically similar.

Then, a phoneme error.

Actually, a cluster error (similar to phoneme errors).

Note that both words come from different syntactic category.

Note the lexical bias -- "greeky" could be a word.