

2015

Lin 110: Language and Mind, Lecture Notes

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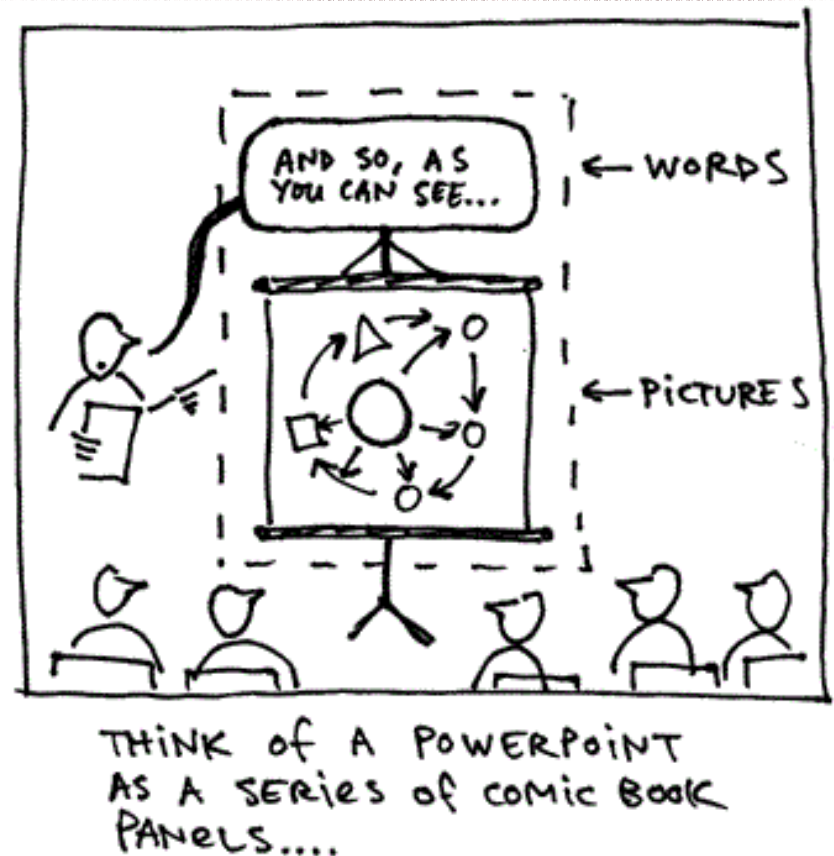
Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Lecture Notes: PowerPointless?



Chapter 1



What is Language?

What is Language?

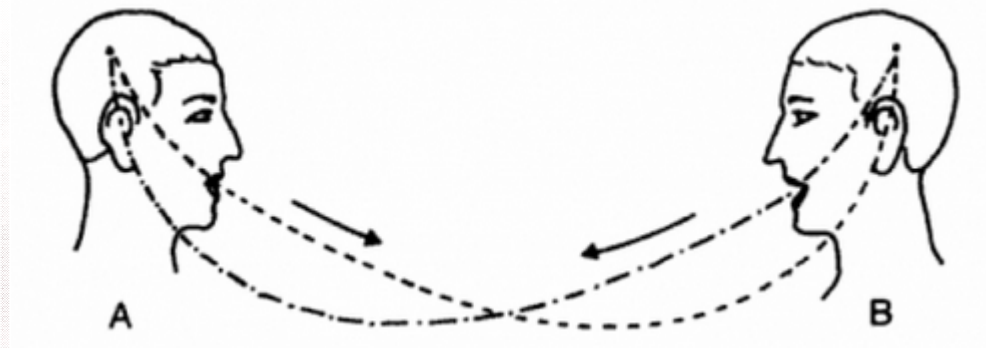
- All humans have language, or more precisely, have the ability to acquire language(s).
- Is language a biological property of humans, or is it a social phenomenon?
- The ability to use language, more than any other attribute, distinguishes humans from other animals
- But what does it mean to know a language?



A mural in Teotihuacan, Mexico (c. 2nd century) depicting a person emitting a speech scroll from his mouth, symbolizing speech

Linguistic Knowledge

- Language is a code. When you know a code, you can form messages understandable for others who know that code (coding and decoding)



- Five-year-olds already know their first language(s); cf. the phenomenon of code-switching
- The ability to use a language requires profound knowledge that most speakers don't know that they know

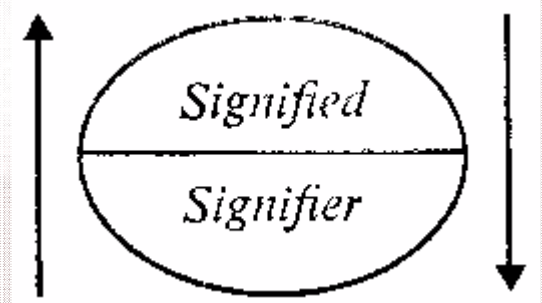
Knowledge of the Sound System

- Distinguishing phonemes, i.e., when we know a language, we know what sounds (or gestures in ASL) are used in the language and which sounds are not
- This also includes knowing how the sounds of the language can be combined
 - Which sounds may start a word
 - Which sounds may end a word
 - Which sounds may follow each other within a word



Knowledge of Words

- Knowing a language also means identifying certain strings of sounds as meaningful words
- Most if not all words in all languages are *arbitrary* connections of sound to meaning (= *signifier* & *signified*)



hand

(English)

main

(French)

nsa

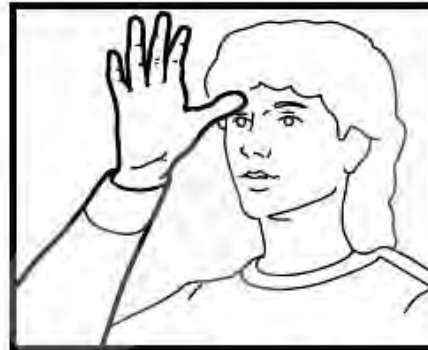
(Twi)

ruka

(Russian)

Knowledge of Words

- The conventional and arbitrary relationship between form and meaning is also true in sign languages



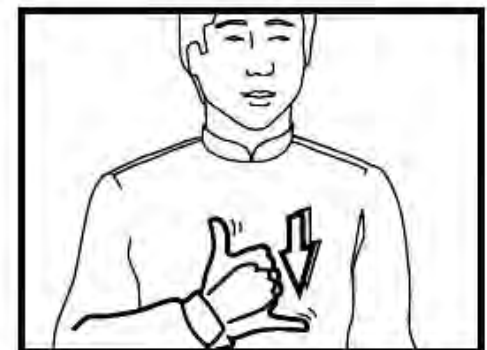
FATHER (ASL)



FATHER (CSL)



SUSPECT (ASL)



SUSPECT (CSL)

From Poizner, Howard, Edward Klima, and Ursula Bellugi. What the Hands Reveal about the Brain Figure: "Arbitrary relation between gestures and meanings of the signs for 'father' and 'suspect' in ASL & CSL" © 1987 MIT Press

Knowledge of Words

- **Sound symbolism:** there are some words whose pronunciation seems to reflect the meaning
 - **Onomatopoeia:**
 - English *cock-a-doodle-doo* and Finnish *kukkokiekuu*
 - English *gobble gobble* and Turkish *glu-glu*
 - English *gl* and the concept of sight:
 - *glare, glint, gleam, glitter, glossy, glance, glimpse*
but there is also
 - *gladiator, glucose, glory, glutton, globe, etc.*



How Do Animals Sound In Different Languages?

- *Onomatopoeia*



Source: chapmangamo.tumblr.com

Onomatopoeia

Barking of a Dog	
Urdu/Hindi	bhau bhau
English	bow wow

The onomatopoeic words in Malay are as follows:

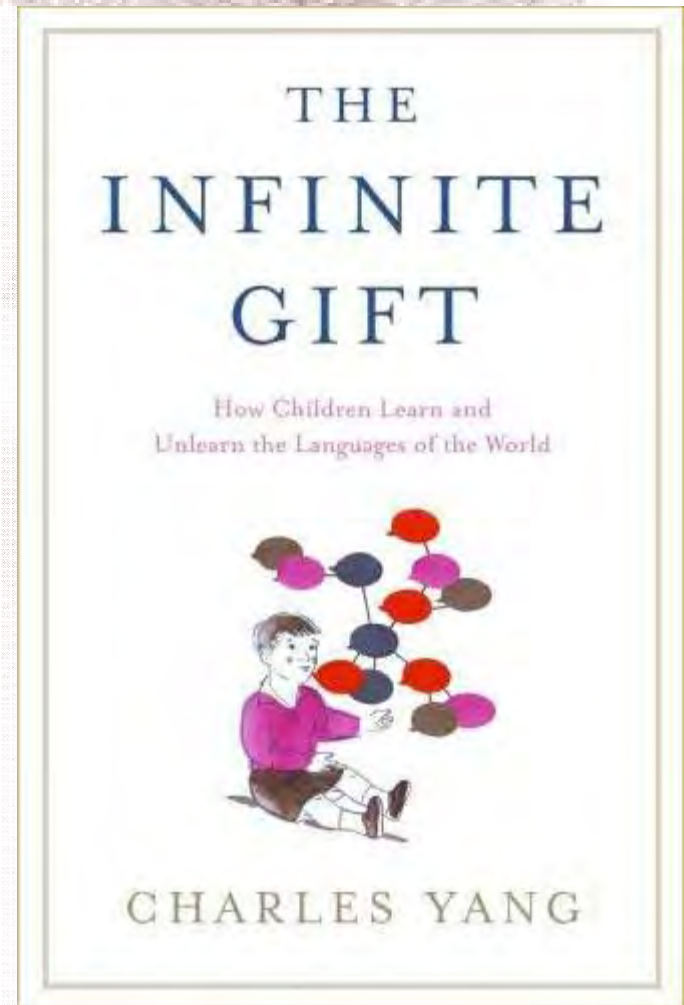
Onomatopoeic Lexicon	Meaning
debuk	The sound of slapping or boxing.
debum	The sound of heavy things falling.
debung	The sound of drumming.
debur	The sound of waves breaking on the shore.
debus	The sound of flapping wings.

Source: Jhy Wae 2005: Vol. 2, 796-797.

Source: Tariq Rahman “Linguistics for Beginners : Basic Concepts” (2010)

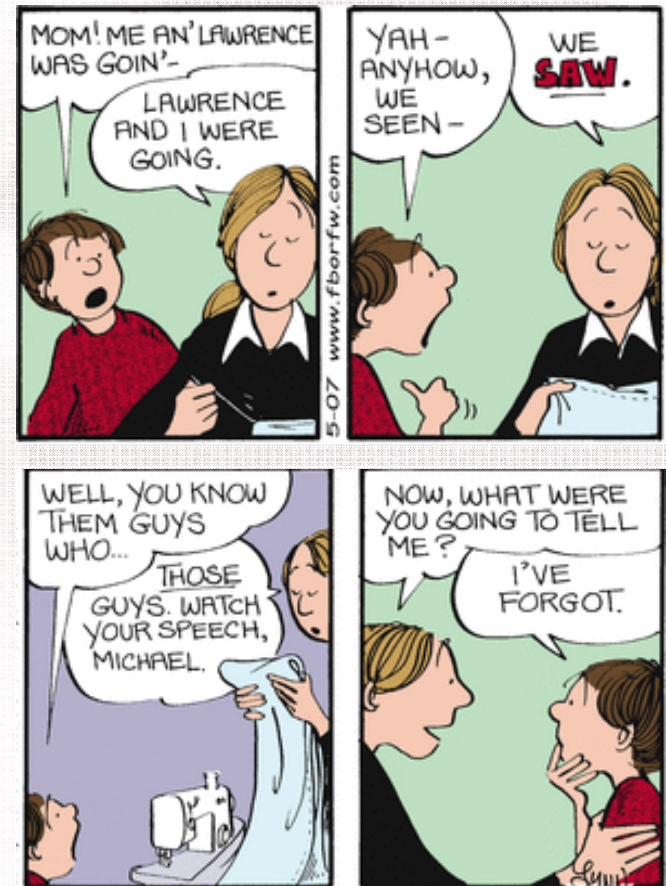
Creativity of Linguistic Knowledge

- Every language has an **infinite** number of possible sentences
- Knowing a language enables you to:
 - Create a sentence that has never been uttered before
 - Understand a sentence that has never been uttered before
- Most sentences we use are new; very few sentences are stored in our brains



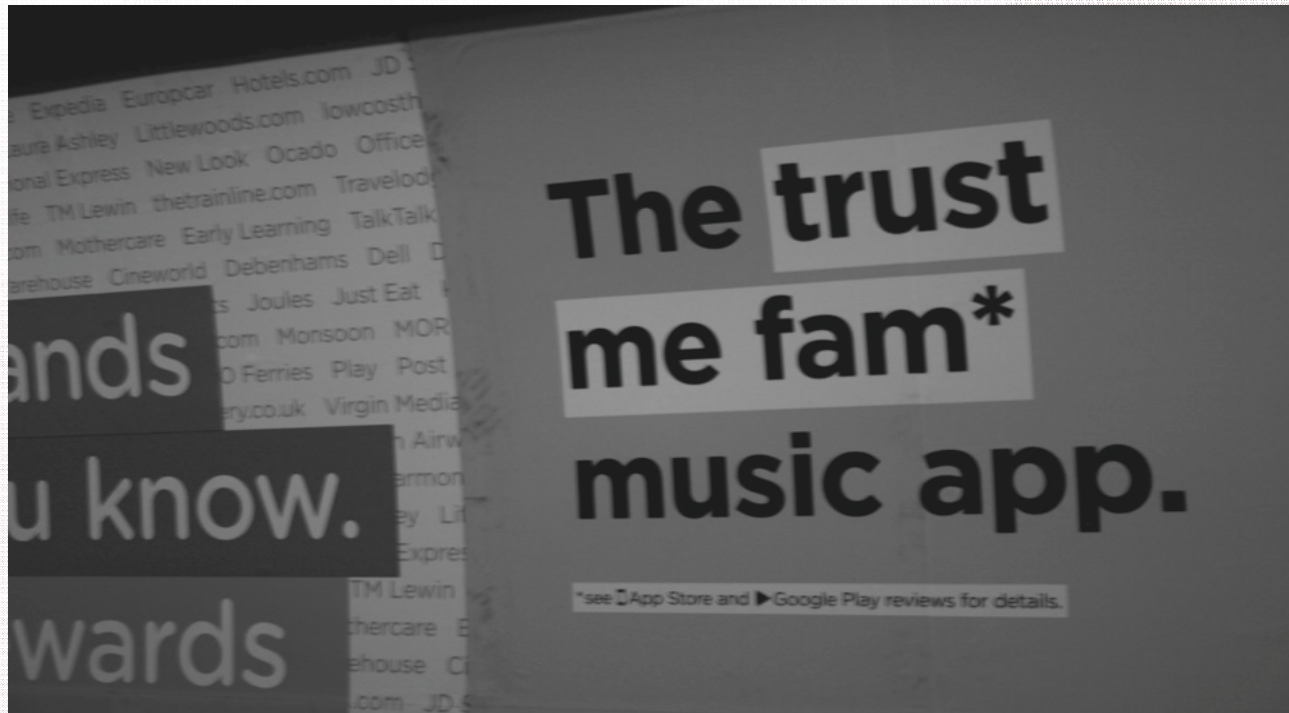
Knowledge of Sentences & Non-Sentences

- Language is more than a set of words because words must be ordered in certain ways to create sentences (cf. grammatical agreement)
- Our knowledge of language allows us to separate possible sentences from nonsentences
 - *What he did was climb a tree*
 - **What he thought was want a sports car*



Non-sentences?

- The ‘I Want To Sell You A Music App’ Construction

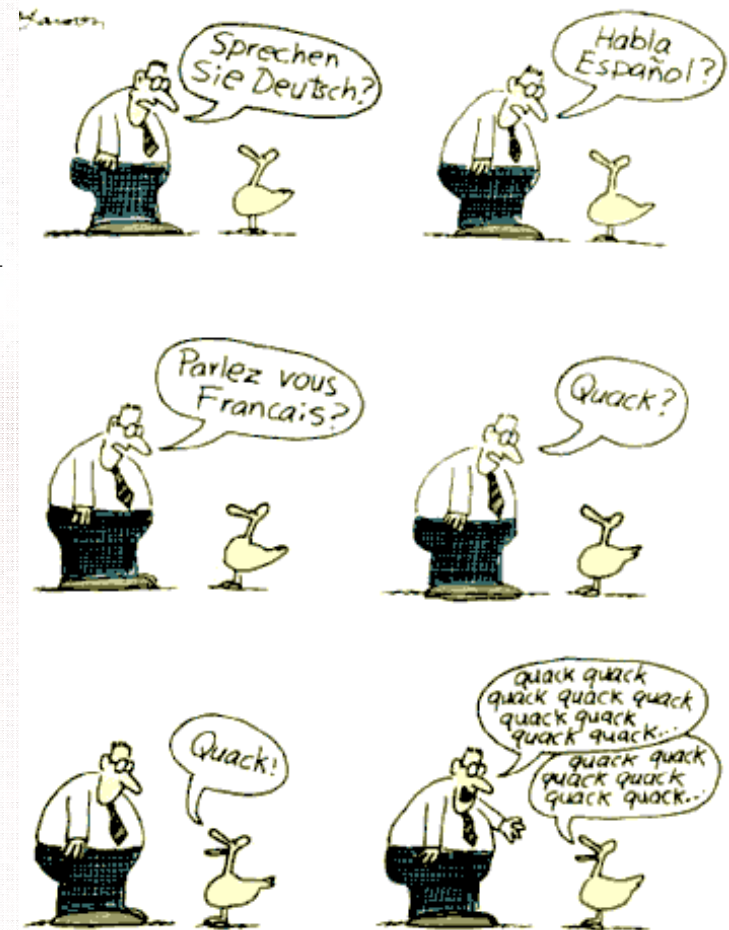


- The picture above is just one example of a series of adverts for the app in which the words ‘the _ music app’ are written in bold lettering on a plain yellow background; the only difference between them is what is written in the slot between the **determiner** ‘the’ and the compound **noun** ‘music app’.

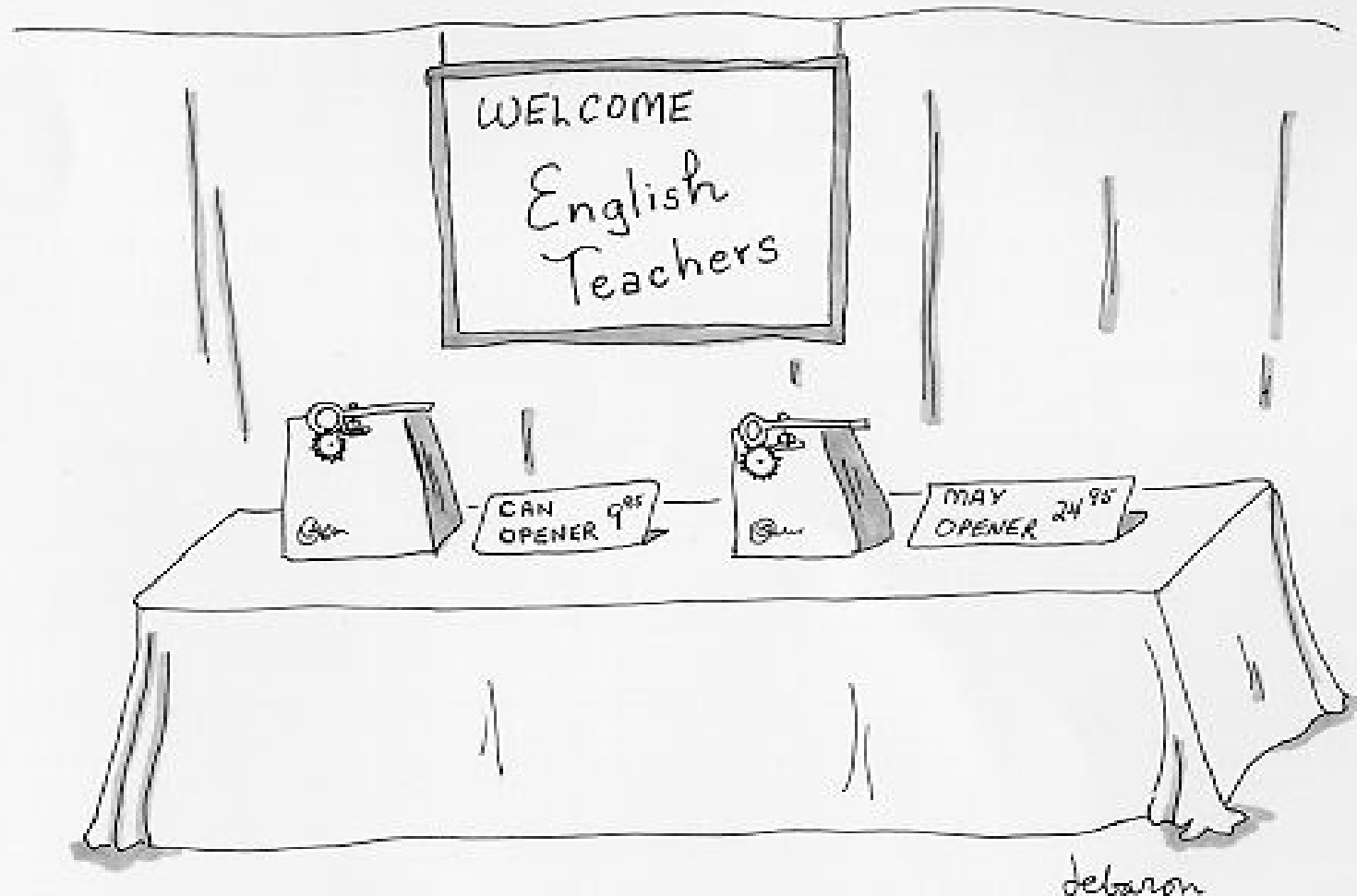
Source: <https://languagejazz.wordpress.com/page/3/>

Linguistic Knowledge and Performance

- **Knowledge:** what we know about a language (**linguistic competence**)
 - Mostly unconscious knowledge about sounds, structures, meanings, words, and rules for combining linguistic elements
- **Performance:** how we use this knowledge in actual speech production and comprehension
 - We can theoretically create an infinitely long sentence, but physical constraints make this impossible
 - In speech we stammer, pause, and produce slips of the tongue



What Is Grammar?



What Is Grammar?

- **Grammar** = the knowledge speakers have about the units and rules of their language

- Saussure's Chess metaphor
- Rules for combining sounds into words, word formation, making sentences, assigning meaning
- When a sentence is ungrammatical in a linguistic sense, it means that it breaks the rules of the shared mental grammar of the language



Back to the chessboard. Let's take the knight. Is its unique identity (its shape) an essential element of the game? No. It's the position on the board and conditions of the game that are essential. If you can't find the knight when you're setting up the board to start a game, you can replace it by something of any shape--as long as the new piece makes only the moves the knight would have.

19

Source: W. Terrence Gordon & Abbe Lubell "Saussure for Beginners" (1996) ▲

Components of (Broadly Interpreted) Grammar

- **Phonology:**
the sound system of a language
- **Morphology:**
the rules of word formation
- **Syntax:**
the rules of sentence formation
- **Semantics:**
the system of meaning
- **The Lexicon:**
our mental dictionary

Plus



Three Types of Grammars

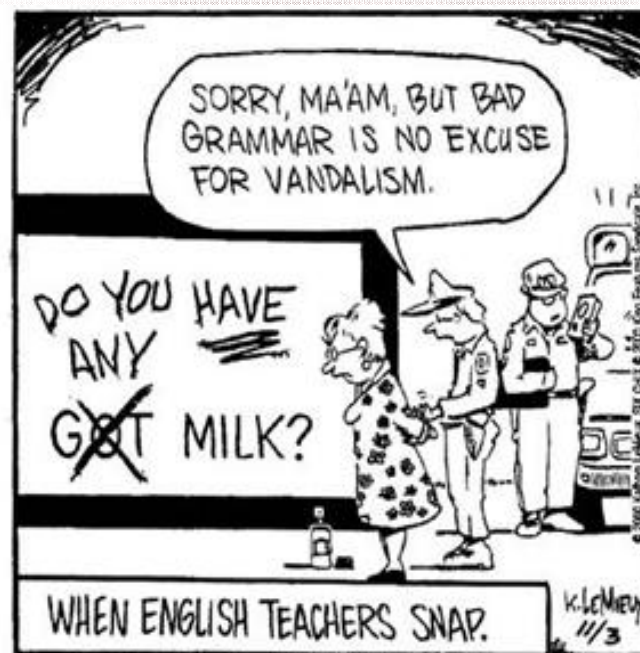
- **Descriptive Grammar**
 - Models on our mental grammar
 - Reflects but does not evaluate or judge
- **Prescriptive Grammar**
 - Influenced by a prestige language or dialect
 - Intended to correct how one speaks L1
 - With socio-economic and cultural motives
- **Teaching (Pedagogical) Grammar**
 - For L2 learning by adults
 - Assumes L1

Descriptive grammar
(definition #1)
refers to the structure of a language as it is actually used by speakers and writers.

Prescriptive grammar
(definition #2)
refers to the structure of a language as certain people think it *should* be used.

Descriptive Grammar

- **Descriptive grammar:**
a true model of the mental grammar of language speakers
 - In other words, a descriptive grammar describes the linguistic rules that people use when they speak their language
 - The point of view of a descriptive grammarian is that grammars from every language and dialect are equal



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Prescriptive Grammar



- **Prescriptive Grammar:**
attempts to prescribe what rules of language people *should* use to speak “properly”
 - The view of a prescriptive grammarian is that some grammars are better than others
- During the Renaissance, a middle class of English speakers wished to talk like the upper class, so they started buying handbooks that told them how to speak “properly”
 - Bishop Robert Lowth’s *A Short Introduction to English Grammar with Critical Notes* (1762)

Prescriptive Grammar

Source: <http://codifiers weblog.leidenuniv.nl/2007/04/23/prescriptive-grammar-lesson/>



Prescriptive Grammar

- Lowth decided that “two negatives makes a positive,” therefore people should not use double negatives
(Despite the fact that many languages of the world *require* the use of double negatives)
 - “Two negatives in English destroy one another, or are equivalent to an affirmative.” Ex. “I don’t see no one.”
 - “Never put a preposition at the end of a sentence” Ex. “It is a rule up with which we should not put.”



What Cannot Be Right with a Prescriptive Grammar?

- **Language changes constantly:**
 - *awful* ‘inspiring reverence and fear’ → ‘bad’
 - *terrific* ‘causing terror’ → ‘extraordinarily good’
- **All grammars are equally complex:**
 - Human languages are all rule-governed—they all have a sound system, a vocabulary, and grammar, even for illiterate people.
 - Prestige and standard dialects may be socio-politically superior or economically more advantageous, but NOT linguistically so.

**WHEN COMFORTING A
GRAMMAR NAZI**



**I ALWAYS SAY SOFTLY,
“THERE, THEIR, THEY'RE”**

Where to Find the Invisible Hand of Prescriptive Grammars?

- In societies where “linguistic profiling” and social or political hierarchies rule
- On occasions where value judgments may jeopardize one’s access to equal opportunities
- In writing, which tends to be more formal and less prone to change



Teaching (Pedagogical) Grammar

- A **teaching grammar** explicitly states the rules of a language and is used to learn another language or dialect.



Source: H.E. Palmer "The New Method Grammar" (1938)

- Teaching grammars assume the student already knows one language and then compares the grammar of the new language to the one they already know

Language Universals

- **Universal Grammar (UG)** refers to the universal properties that all languages share
 - It is based on the **hypothesis** that human language faculty is biologically endowed (Chomsky's LAD)
 - Language Universals are the basic blueprint that all languages follow
- It is a major goal of **certain** linguistic theories to discover the nature of UG

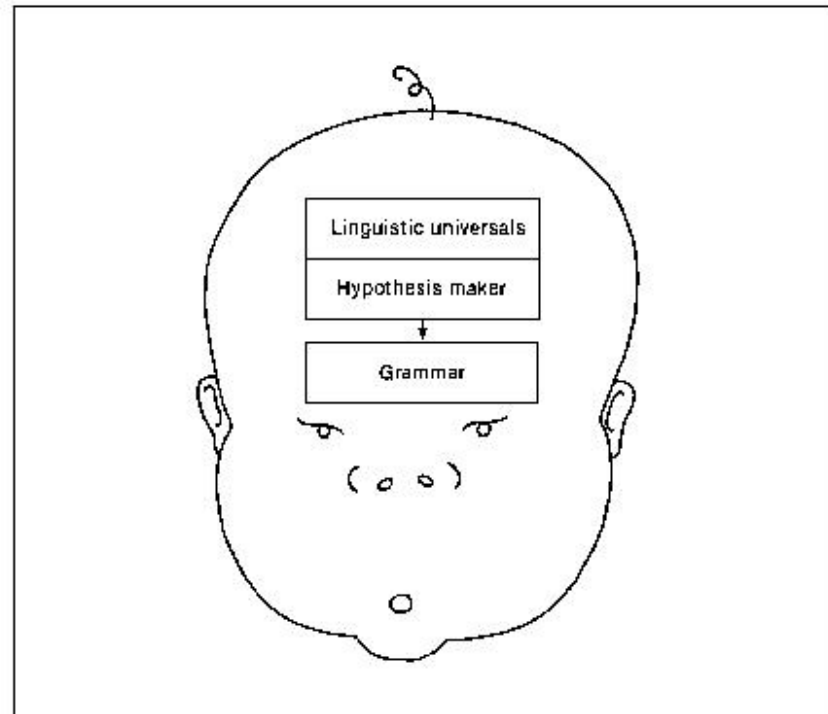


Figure 8.8

The relationship of linguistic universals to grammar, as assumed in Chomsky's theory. (From *The Articulate Mammal: An Introduction to Psycholinguistics*, 2d ed., by Jean Aitchison. © 1976, 1983 by Jean Aitchison. Reprinted by permission of Universe Books, New York.)

Source: John B. Best "Cognitive Psychology" (1995) ▲

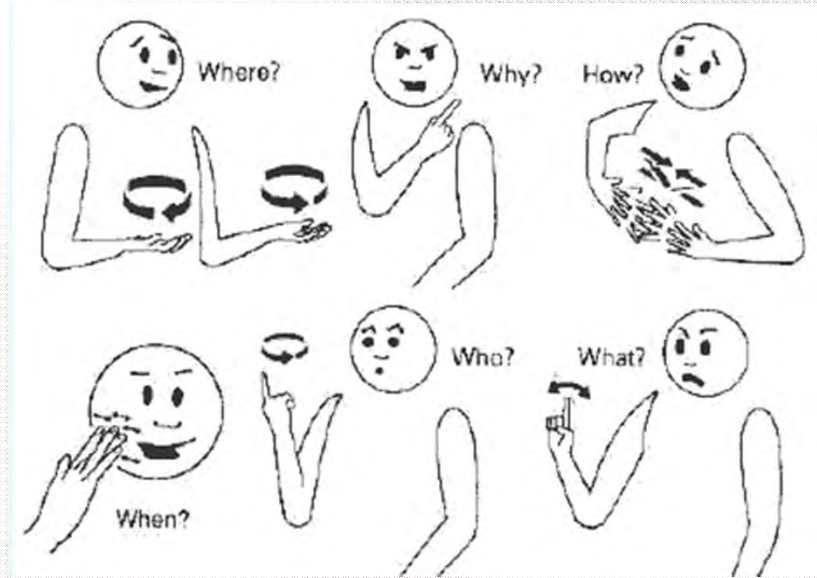
The Development of Grammar

- All normal children acquire language relatively quickly and easily and without instruction (Clip: twin baby boys have a conversation)
- Children learn the world's languages in similar ways and pass through similar stages of acquisition
- Deb Roy “The Birth of a Word” (2011)
http://www.ted.com/talks/deb_roy_the_birth_of_a_word
- Language acquisition and language socialization



Sign Languages

- Fully-developed visual-gestural systems
- Naturally-evolved as native languages for non-hearing individuals
- Structurally as complex as spoken languages
- Employ hand, body, head, and facial gestures as “primes”
- Provide proof that language faculty exists independently of vocal organs.



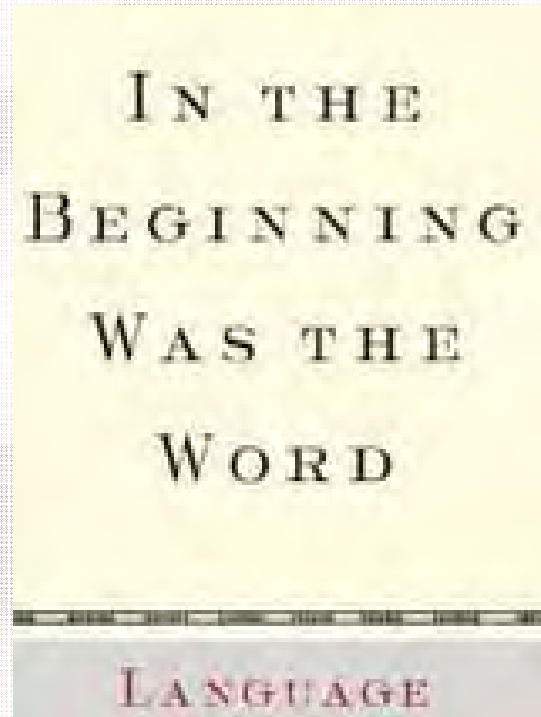
Some Parameters of ASL

- Hand configuration
 - ASL has 30 hand shapes
 - Is used to finger-spell English letters
- Hand movement
 - Toward or away from the body
 - Straight or in an arc; wiggling or hooking
 - Uni- or bi-directional
- Location of the hand
 - For example, “father” vs. “fine”
- An online dictionary: www.signingsavvy.com/



Main Features of Human Language

- **Discreteness:** the ability to combine linguistic units to make larger units of meaning
- **Creativity:** the ability to create and understand never-before-uttered sentences (cf. Chomsky's *Generative Grammar*: under the same grammar one can generate endlessly new and newer utterances)
- **Displacement:** the ability to talk about things that are not physically present
 - Allows for discussion of past events, abstract ideas, lying, etc.



What Is Not (Human) Language

- Parrots can mimic words, but their utterances carry no meaning
- They cannot dissect words into discrete units
 - *Polly* and *Molly* don't rhyme for a parrot

(b) Language makes use of clearly distinguishable discrete, separately identifiable symbols while animal communication systems are often continuous or non-discrete.

One can clearly distinguish between /k/, /æ/ and /t/ in the word *cat*, but one

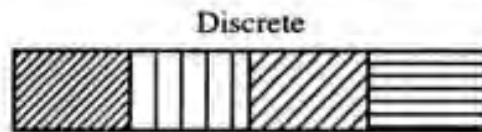
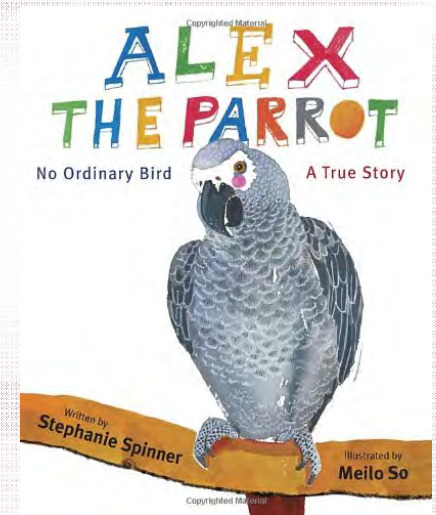


Fig. 1.1 Language is discrete.

cannot identify different discrete symbols in the long humming sound that a bee produces or the 'caw-caw' sound of a crow.



Alex the parrot.mp4

- They cannot deduce rules and patterns to create new utterances
 - If the parrot learns “Polly wants a cracker” and “Polly wants a doughnut” and learns the word “bagel,” the parrot will not say “Polly wants a bagel”

What Is Not (Human) Language

- **Birdcalls** convey messages associated with the immediate environment
- **Bird songs** are used to stake out territory and attract mates
 - There is no evidence of internal structure in these songs, although they may vary to express varying degrees of intensity
- Birdcalls and songs are similar to human languages in that they contain regional dialects, are passed down from parents to offspring, and can only be acquired before a certain age

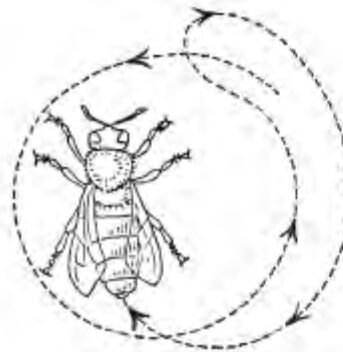


bl.uk > Listen to nature > the language of birds

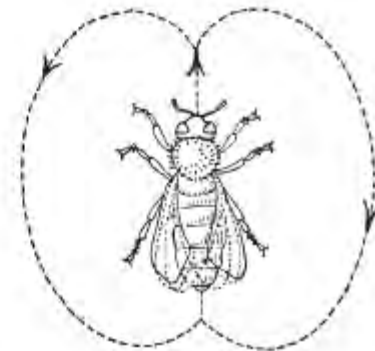
<http://www.bl.uk/listentonature/specialinterestlang/langofbirdscontents.html>

What Is Not (Human) Language

- **Honeybees** have a communication system that relies on dance to convey information about the location and quality of food sources to the rest of the hive
 - *Round dance*: food source is within 20 feet from the hive
 - *Sickle dance*: food source is 20 to 60 feet from the hive
 - *Tail-wagging dance*: food source is more than 60 feet from the hive
 - The number of repetitions of the basic pattern in the tail-wagging dance indicates the precise distance, with a slower repetition rate indicating a longer distance



*Figure 1.
Round dance*

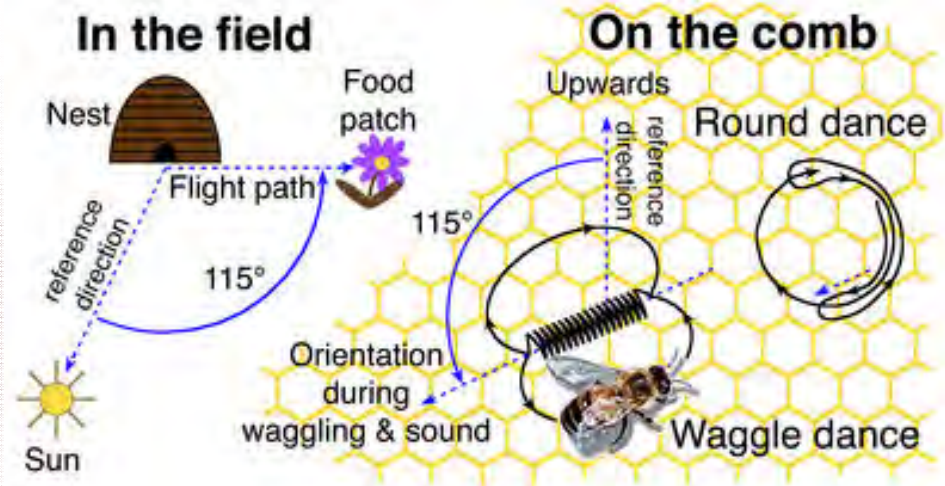


*Figure 2.
Waggle dance*

Source: David R. Tarpy "The Honey Bee Dance Language" (2010)

What Is Not (Human) Language

- The bee dances are theoretically able to create an infinite number of messages
 - But, the messages are confined to the subject of food sources
 - If there are any special circumstances regarding the food source, the bee cannot convey that information



The Waggle Dance of the Honeybee.mp4

<https://www.youtube.com/watch?v=bFDGPgXtK-U>

Can Animals Learn Human Language?

- Nonhuman primates have communication systems in the wild to convey information about the immediate environment and emotional state (stimulus-response)
- Humans have attempted to teach human language to other primates

- These nonhuman primates were taught sign languages because their vocal tracts cannot produce the sounds of human language

Infinite Monkey Theorem



Given an infinite length of time, a chimp punching at random on a typewriter would almost surely type out all of Shakespeare's plays.

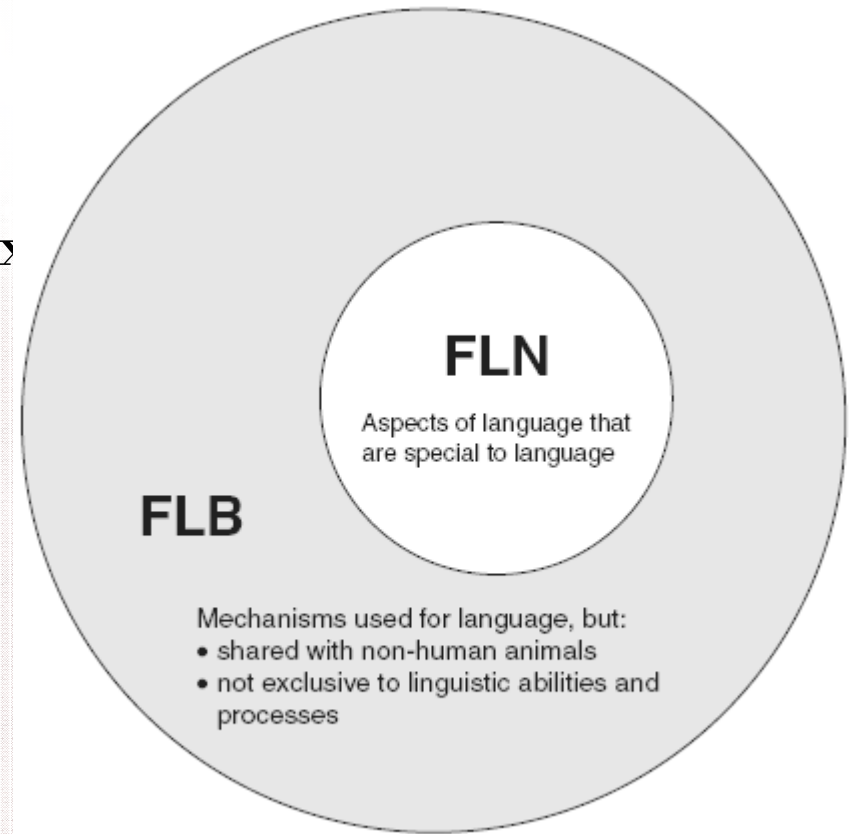
Animal Communicative Systems vs. Human Language

Superficial Similarities

- Could be vocal or gestural
- Could be relatively complex

Qualitative Differences

- Signals composed of continuous units
- Meanings restricted to close environments and emotional state
- Stimulus-bound



The faculty of language: broad (FLB) and narrow (FLN)

Source: Matthew Saxton "Child Language: Acquisition and Development" (2010)

Language and Thought

- Sapir-Whorf Hypothesis
- Linguistic Determinism vs. linguistic Relativism
- Color discrimination and lexical distinction
- To influence or to shape and filter thought?
- PC language
- Steven Pinker “euphemism treadmill”



Language serves not only to express thought but to make possible thoughts which could not exist without it.

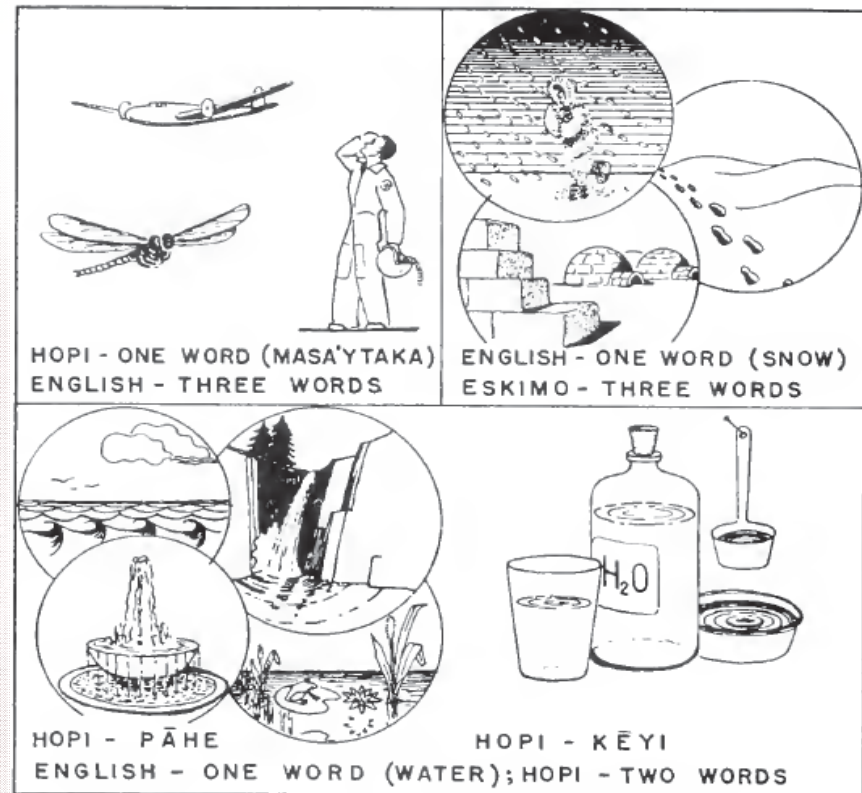
Bertrand Russell

meetville.com

Language and Thought

- **Sapir-Whorf Hypothesis:**
the theory that the structure of a language influences how its speakers perceive the world around them

- **Linguistic determinism:**
the strongest form of the Sapir-Whorf hypothesis which claims that the language we speak *determines* how we perceive the world



Source: Benjamin Whorf "Science and Linguistics" (1940)

- Whorf claimed that the Hopi people do not perceive time in the same way as speakers of European languages because the Hopi language does make grammatical distinctions in tense

Language and Thought



"You'll have to be more specific—my people have more than four hundred different words for snow cone."



Language and Thought

- **Linguistic relativism:**
a weaker form of the hypothesis which claims that different languages encode different categories which can influence a speaker's perceptions of the world



- Navaho: *green* and *blue* expressed as one word
- Russian: *siniy* (“dark blue”) and *goluboy* (“light blue”)
- Zuni: *yellow* and *orange* are expressed as one word

Language and Thought

- The strong form of the Sapir-Whorf hypothesis is clearly false
 - We can translate between languages
 - We can learn additional languages
 - If we don't have a particular word for a concept, we can express the concept with a string of words

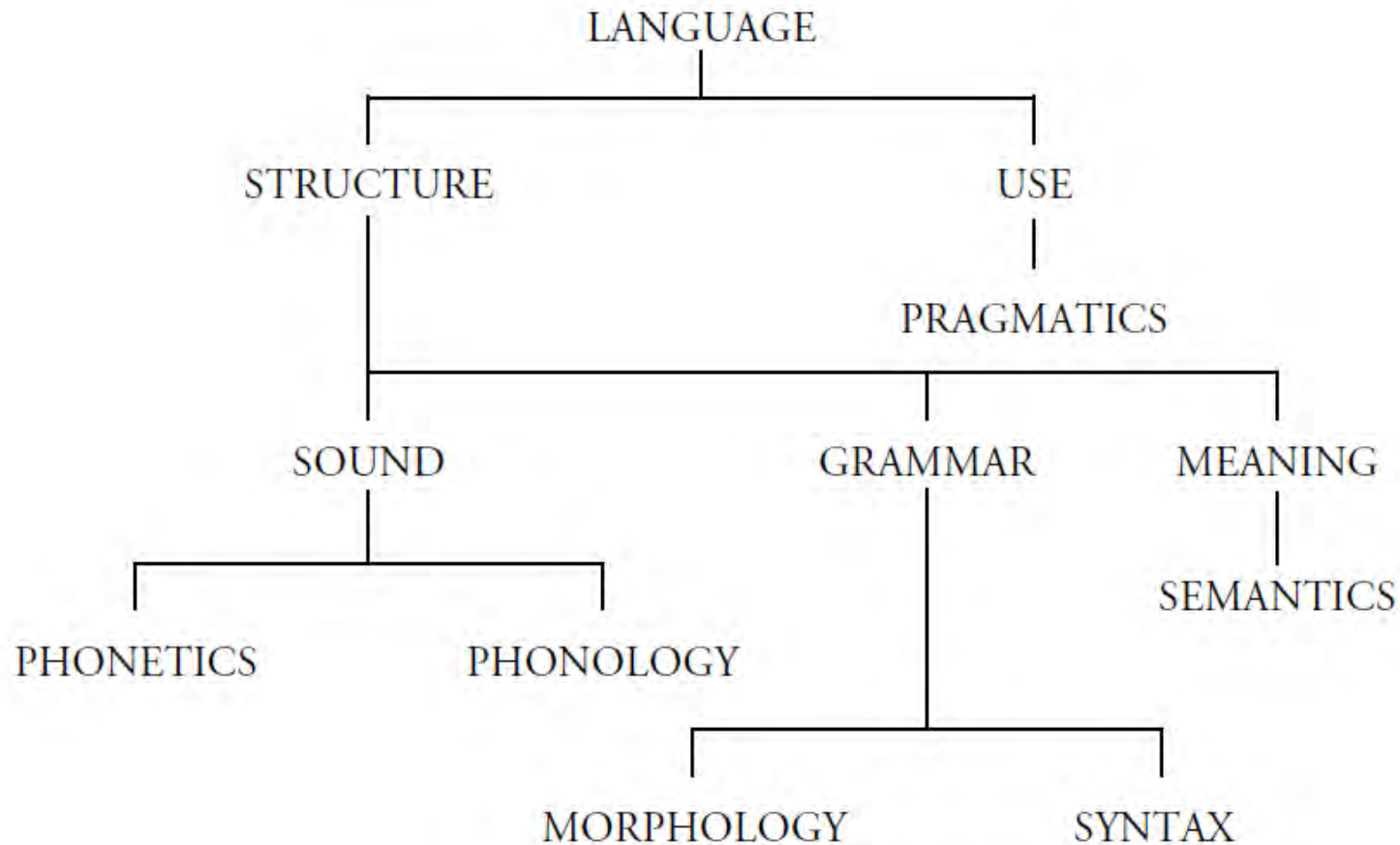


Gendered Language, Gendered Mind?

- Some psychologists have suggested that speakers of gender-marking languages think about objects as being gendered
 - In Spanish the word “bridge” is masculine (*el puente*), and Spanish speakers described a bridge with masculine adjectives such as *big, dangerous, long, strong, and sturdy*
 - In German, the word “bridge” is feminine (*die Brücke*) and German speakers described a bridge with feminine adjectives such as *beautiful, elegant, fragile, pretty, and slender*
 - **HOWEVER**, in English “ship” is feminine without being a female

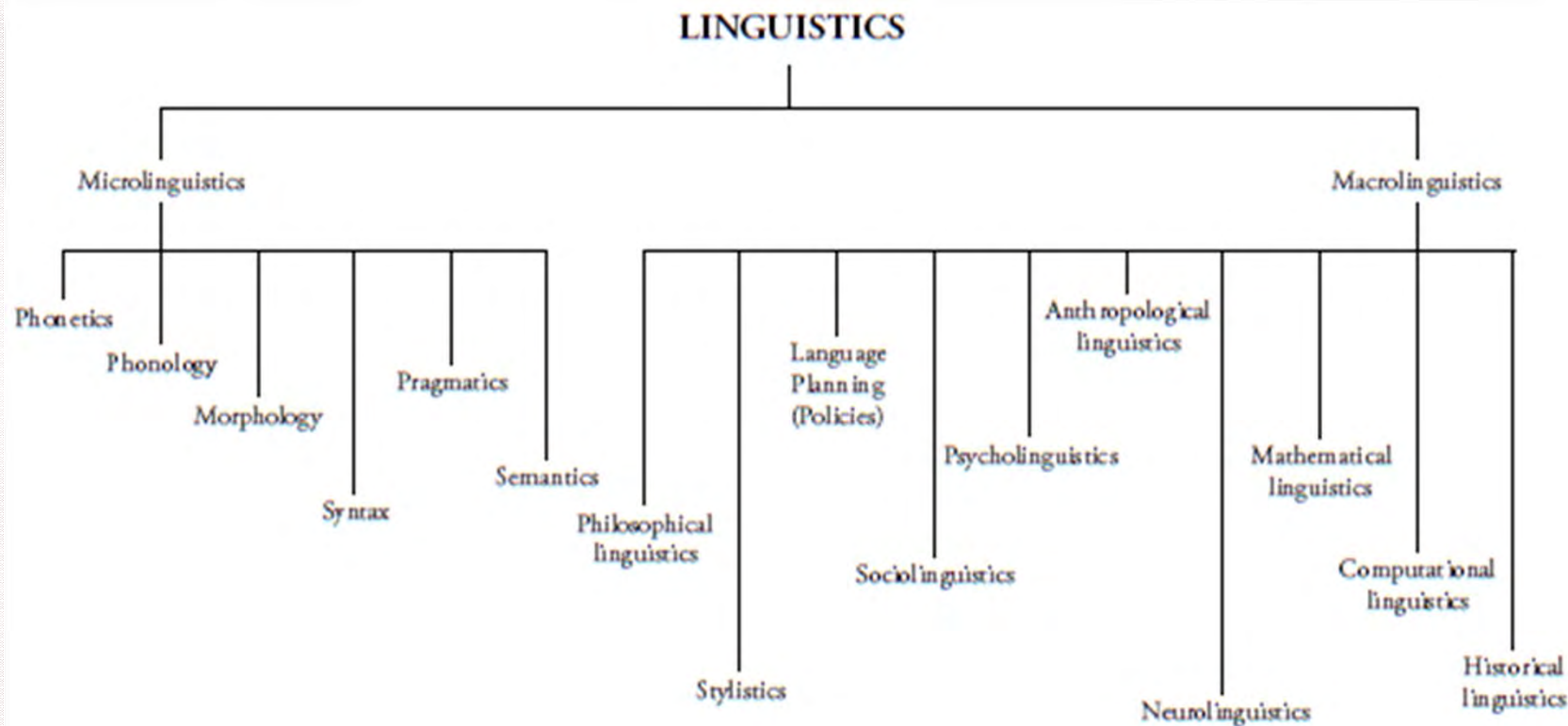


Language & Linguistics



Source: Tariq Rahman “Linguistics for Beginners: Basic Concepts” (2010)

Linguistics: Branches



Source: Tariq Rahman “Linguistics for Beginners: Basic Concepts” (2010)

Linguistics! Linguistics!

- Linguistics Rock at the University of Tennessee.



Acknowledgments

- This presentation incorporates texts borrowed from the following sources:
 - Victoria Fromkin et al. *An Introduction to Language*. Wadsworth, Cengage Learning, 10th ed., 2013 *Supplemental materials*
 - Tek-wah King. *Chapter 01 Lecture Notes*. ConnColl, 2014
 - Benjamin Whorf “Science and Linguistics” (1940)
 - Matthew Saxton “Child Language: Acquisition and Development” (2010)
 - David R. Tarpy “The Honey Bee Dance Language” (2010)
 - Deb Roy “The Birth of a Word” (2011)
 - John B. Best "Cognitive Psychology" (1995)
 - W. Terrence Gordon & Abbe Lubell “Saussure for Beginners” (1996)
 - Tariq Rahman “Linguistics for Beginners : Basic Concepts” (2010)

& many internet sources

Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 2



Morphology: The Words of Language

What Is a Word?

- Train station in Wales, first line in Welsh, second line for the benefit of English travelers. *Llanfairpwllgwyngyll* is a village on the island of Anglesey in Wales. *Translation*: "Saint Mary's Church in a hollow of white hazel near the swirling whirlpool of the church of Saint Tysilio with a red cave."



What Is a Word?

- Most people take for granted that languages contain words (= all languages come with a vocabulary). But what units are to be treated as words?
- In spoken language we don't pause between most words
- So when you hear a sentence in a language you don't know, you won't be able to tell where one word ends and the next begins
- Most English speakers can pick out all of the words in *The cats at on the mat* because they can identify them as separate units
- But what about the sentence “*The splody cat sat on the mat*”? Is the form *splody* a word?

What Is a Word?

- And what about *gredunza* in “Somebody stole my moss-covered, three-handled family gredunza, ...”



- Dr. Seuss “The Cat in the Hat” (TV Short 1971)

What Is a Word?

- What we mean by ‘word’ is not always clear. As it turns out, it is a complex category that depends on its “elements.”
- Consider the sentence “He went to the pub for a pint and then *pockled* off.” What would you do if you encountered the ‘word’ *pockled* for the first time in this context?
- If you decide to consult a dictionary, would you look for that unfamiliar word under *pockled* or under *pockle*?
- Although nobody has told you, you would probably assume that the words *pockling* and *pockles* will also exist.

What Is a Word?

- The forms *pockling*, *pockle*, *pockles* and *pockled* are different manifestations of the ‘same’ abstract vocabulary item (= *lexeme*).
- Let’s now consider the following words: *Bible*, *bibliography*, *bibliophile* (the form *bibl-* comes from Greek, ‘papyrus, scroll, book’)
- *Words are like onions:*

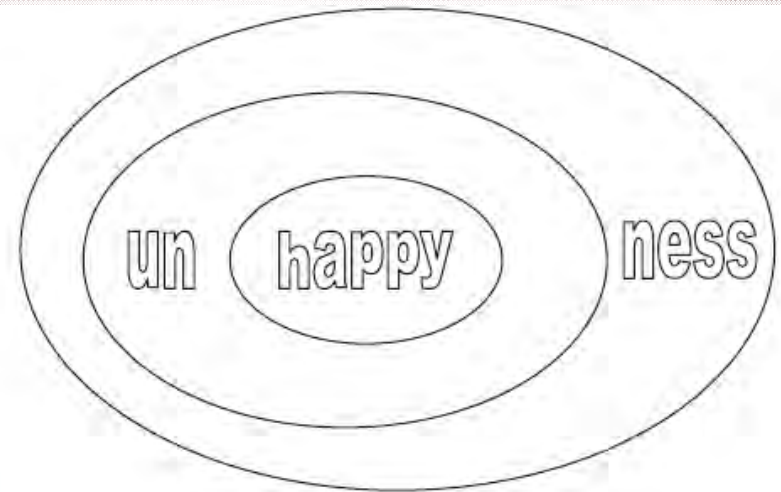



FIGURE 3.2
Words are like onions.

What Is Lexical Knowledge?

- We can **segment** a stream of sounds into individual entities, i.e., we “know” the borders of a word.
 - These boundaries between words can be played with for humor, as in the credits for NPR’s Car Talk: “Legal Firm: Dewey, Cheetham, and Howe”
- We generate and perceive a word’s **sound** and **meaning** in the right context, despite their *arbitrary* matching relationship. Depending on the environment, several pairings of sound with meaning are available.
 - **Homophones:** the phonological form /raɪt/ has four spellings: *right*, *write*, *wright*, *rite*; cf. also *bark* ‘the sound of a dog’ and *bark* ‘the skin of a tree’).
- We arrange words according to their **grammatical categories**, or **syntactic classes**.

Content Words and Function Words

- **Content words:** *Open class* members (= new content words can be added, e.g. a noun called a *flurg*) with clear semantic content such as objects, concepts, actions, and attributes:
 - ☐ Nouns ☐ Verbs ☐ Adjectives ☐ Adverbs
- **Function words:** *Closed class* items (= very rarely added to a language) that convey grammatical relations such as tense, possession, definiteness, and reference:
 - ☐ Pronouns ☐ Prepositions ☐ Conjunctions ☐ Particles
 - English does not have a gender-neutral third person singular pronoun, and rather than adopt a new pronoun, many people use *they* instead of choosing between *he* and *she*.

Content Words and Function Words

- The brain treats content and function words differently
 - Some aphasics are unable to read the function words *in* and *which* but can read the content words *inn* and *witch*.
 - Content words may be inadvertently switched in speech (e.g., “the journal of the editor”), but there is no documentation of function words being switched in this way, i.e, they show no **slip-of-the-tongue** effect.
 - “Families are where our nation finds hope, where **wings take dream**”
- *G.W. Bush in La Crosse, Wisconsin, 18 Oct. 2000.*
Target - Families **dreams take wing**“
 - Children often omit function words from their speech when learning their first language (“doggie barking”)

Morphemes

- **Morphology:** the study of the structure of words and the rules for word formation
 - The word *morphology* itself consists of two morphemes, *morph* from Greek ‘form’, and the suffix *-ology* ‘branch of knowledge’
- **Morphemes:** the minimal units of meaning
 - *Minimal* = cannot be broken down any further
 - Morphemes can be words on their own, and/or can often be combined with other morphemes to make words
 - E.g. the word *book* has one morpheme but the word *books* has two morphemes:
book (noun) + *-s* (plural marker)
 - Do not confuse morphemes with **syllables** (= groupings of sounds for the purposes of articulation)
 - E.g. the word *books* consists of a single syllable.

Morphemes

- *Discreteness*: In all languages, sounds combine to make morphemes, morphemes combine to make words, and words combine to make sentences

- *Creativity*: We can combine morphemes in new ways to create new words that can easily be understood. All we need to do is to follow the *morphological rules*.



- *Writable / Rewritable / Unrewritable*
- *Fight Stupidization!* (A car sticker)
- *One of these days I'm gonna get organized!* (Taxi Driver, 1972)

Morphemes

Fight Stupidization!



– <http://fightstupidization.com/>

Taxi Driver (1972)

One of these days I'm gonna get organized!



- Robert De Niro plays Travis Bickle, with the “organiz-ized” poster

Morphemes

- A word that contains more than one morpheme is a *morphologically complex* (=Polymorphemic) *word*
- One morpheme is the basic one, the core of the form = *root* or *stem*
- The add-ons bound morphemes are *affixes*
 - E.g. ‘*re+arrang+ed*’
‘*teach+er+s*’

Roots and Stems

- **Roots:** the morpheme base upon which other morphemes are attached to create complex words:
 - *Un-love-able; paint-er, paint-ing, un-paint-able, etc.*
- **Stems:** once an affix has been attached to a root, the result is called a stem to which more morphemes may be attached:
 - *Un-lovable; human-it-arian-ism, under-en-roll-ment, beaut[y]-ification*
- **Bound roots:** Roots that cannot stand alone and can only occur in combination with other morphemes
 - *-ceive: receive, conceive, perceive, deceive*
 - *-mit/-sist/-flect: re-mit, ad-mit, per-sist, in-sist, re-flect, de-flect, etc.*
 - *ungainly (*gainly), discern, concern (*cern), nonplussed (*plussed)*
 - *huckleberry, lukewarm, cranberry*

Free vs. Bound Morphemes

Bound and Free Morphemes

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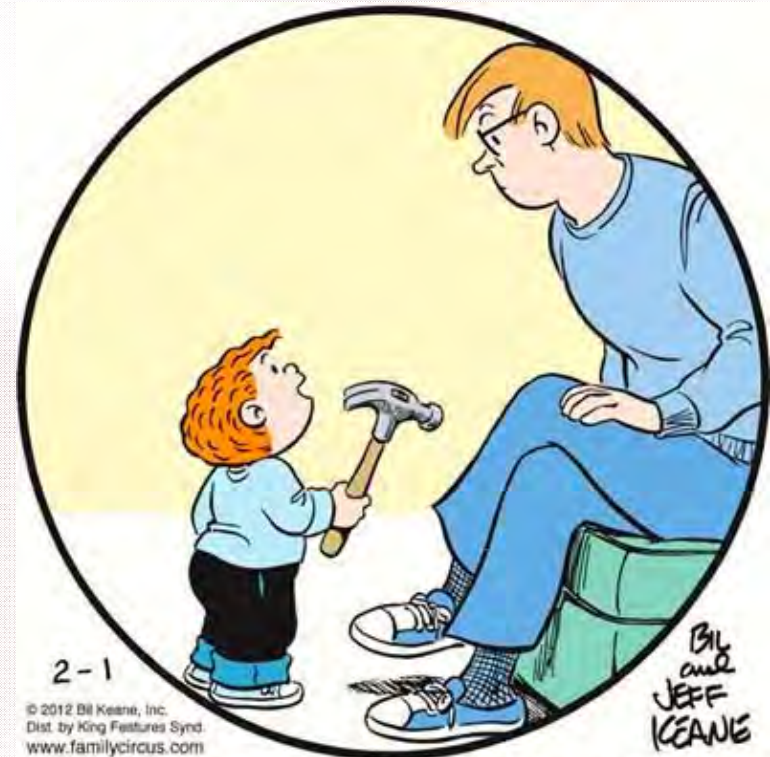
By Bil Keane



© 1991 Bil Keane, Inc.
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"Mommy said to behave, so I'm
bein' as hayve as I can."

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"Would you like me to check
your knee-flexes?"

Free vs. Bound Morphemes

<i>Free</i>	<i>Bound</i>
Can stand alone as separate words	Cannot occur on their own but must be attached to other morphemes
Single morphemes e.g. <i>hunt, kill, the, play, child, book, love</i> are single morphemes that can be uttered with no other morphemes connected to it	Affixes e.g. <i>un-</i> and <i>-ish</i> are bound morphemes because they cannot stand alone; <i>-s</i> in dogs <i>-ness</i> in happiness <i>-ed</i> in walked

Free Morphemes

“You put the less in tasteless”



Bound Morphemes

- **Prefixes:** bound morphemes that attach to the *beginning* of a root
 - E.g. *un-* as in untie
- **Suffixes:** bound morphemes that attach to the *end* of a root
 - E.g. *-ness* as in kindness
- **Infixes:** morphemes that are inserted inside a root
 - Bontoc (Phillippines):

<i>fikas</i> “strong”	<i>fumikas</i> “to be strong”
<i>Kilad</i> “red”	<i>kumilad</i> “to be red”
 - NB *bloody* in British Eng. is free:

<i>kangaroo</i>	<i>kanga-bloody-roo</i>
<i>impossible</i>	<i>in-fuckin-possible</i>
- **Circumfixes:** affixes that attach to both the beginning and the end of a root
 - Chickasaw (USA):

• <i>chokma</i> “he is good”	<i>ikchokmo</i> “he is not good”
• <i>lakna</i> “it is yellow”	<i>iklakno</i> “it is not yellow”

Rules of Word Formation

Bound Morphemes

Divided into derivational vs. inflectional morphemes.

■ **Derivational**
morphemes add new semantic content and/or changes the grammatical category

e.g. suffix *–ness* in *happiness*; *-ship* in *citizenship/friendship/kinship/relationship*

■ **Inflectional** morphemes indicate grammatical function; lexical meaning is *not* added and grammatical category not changed

e.g. suffix *–ed* in *walked* indicates past tense; suffix *–s* in *books* for Pl.

'-ship' in Relationship



Rules of Word Formation

- **Derivational morphemes** change the meaning and/or part of speech of a root
 - Adding *-un* to the word *do* changes the meaning drastically
 - Adding *-ish* to the noun *boy* creates the adjective *boyish*
- Derivational morphemes carry semantic meaning and are like the affix version of content words
- When a new word is created through derivation, other possible derivations may be blocked
 - *Communist* exists, therefore we don't need *Communit*e or *Communi*an
- Some derivations trigger pronunciation changes, while others do not
 - *specific*ɪ → *specific*ity and *Elizabeth*ə → *Elizabeth*an
 - vs.
 - *bake*e → *bake*r and *wish*ə → *wish*əful

Rules of Word Formation

- **Inflectional morphemes** have only grammatical function (similar to function words) and never change the part of speech of the root
 - *waited, waits, waiting*
- Inflectional morphemes are always suffixes in English and always follow any derivational morphemes
 - *commit + ment* can become *commit + ment + s* but not *commit + s + ment*
- Inflectional morphemes are **productive**, meaning they apply freely to almost any appropriate base
 - Most nouns will take the inflectional suffix *–s* to make a plural noun
 - Only some nouns will take the derivational suffix *–ize* to make a verb

Rules of Word Formation

- Some languages use *case morphology*, where the grammatical relations of nouns are marked with inflectional morphemes
- In Russian, the sentence “Maxim defends Victor” can have a variety of word orders:

Maksim zašiščajet Viktora.
Maksim Viktora zašiščajet.
Viktora Maksim zašiščajet.
Viktora zašiščajet Maksim.

- This is because the *-a* in *Viktora* marks the object of the sentence (= *Accusative case animate*), regardless of the word order
- In English: prepositions—function words

Case Morphology in Polish

- Polish noun *kot* ‘cat’: inflectional paradigm

	SINGULAR	PLURAL	
NOMINATIVE	kot	kot-y	“cat, subject”
GENITIVE	kot-a	kot-ów	“of the cat”
DATIVE	kot-u	kot-om	“to the cat”
ACCUSATIVE	kot-a	kot-y	“cat, object”
INSTRUMENTAL	kot-em	kot-ami	“with the cat”
LOCATIVE	koci-e	kot-ach	“on the cat”
VOCATIVE	koci-e	kot-y	“o, cat”

Inflectional paradigm of Old English nouns

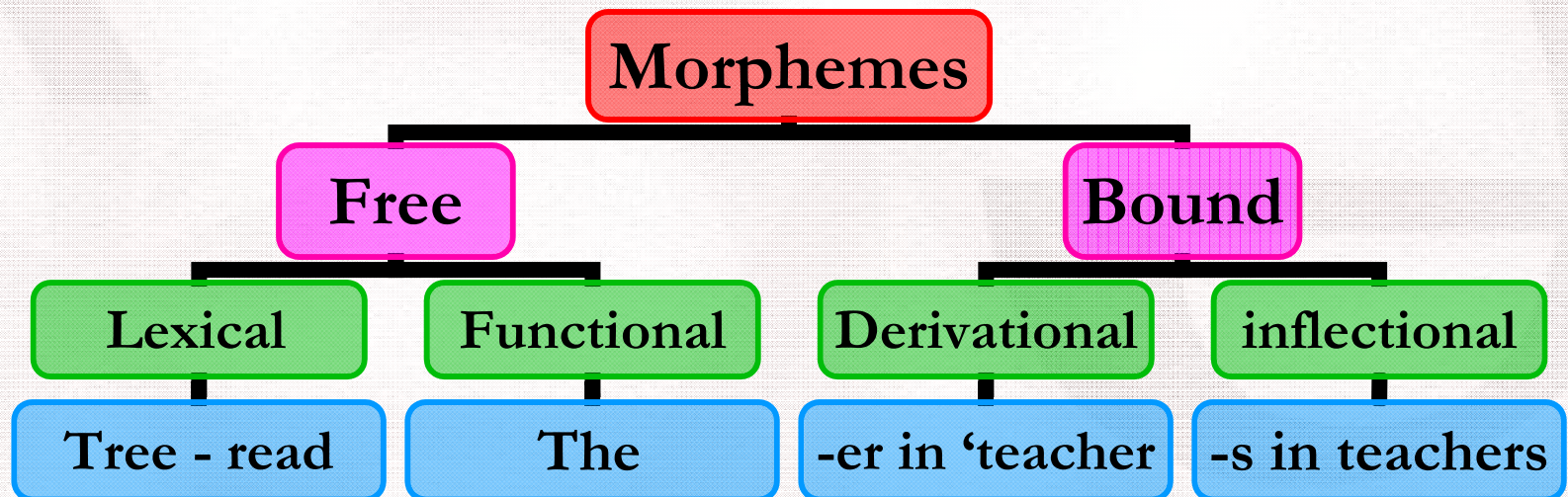
- Modern English nouns have no more than two inflected word forms: singular and plural. In Old English, however, there was superimposed on this number a contrast of case, like that found in modern English personal pronouns (nominative *we* versus accusative *us* etc.), but more extensive. These two numbers and four cases yielded a pattern of eight grammatical words for each noun lexeme, as illustrated at (2) and (3):

(2)	<i>Singular</i>	<i>Plural</i>
<i>Nominative</i>	nama 'name'	naman
<i>Accusative</i>	naman	naman
<i>Genitive</i>	naman	namena
<i>Dative</i>	naman	namum
(3)	<i>Singular</i>	<i>Plural</i>
<i>Nominative</i>	stān 'stone'	stānas
<i>Accusative</i>	stān	stānas
<i>Genitive</i>	stānes	stāna
<i>Dative</i>	stāne	stānum

Source: Andrew Carstairs-McCarthy "An Introduction to English Morphology" (2002)

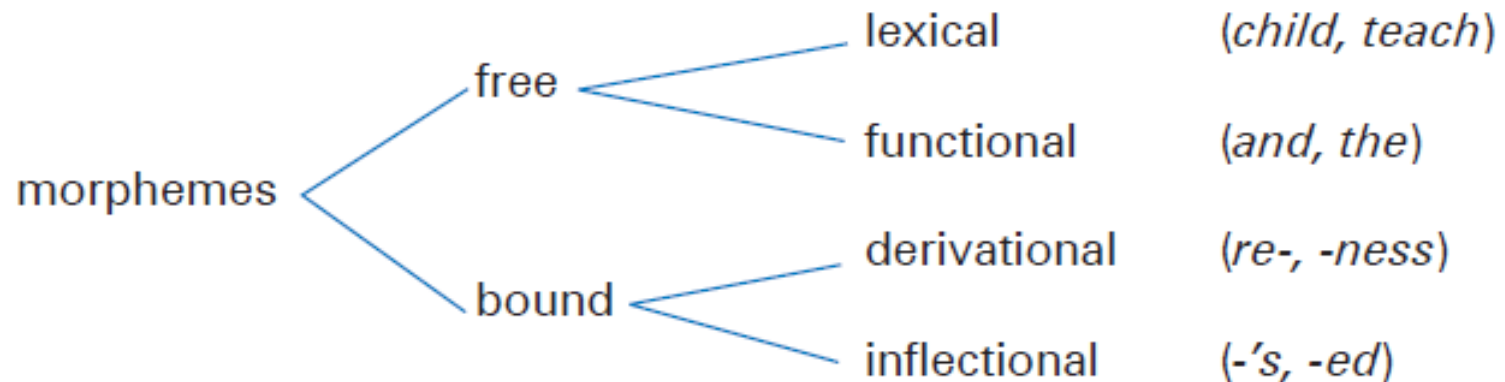
Morphemes: Summary

Categories of Morphemes



Morphemes: Summary

Another useful way to remember all these different types of morphemes is in the following chart:



English Morphemes

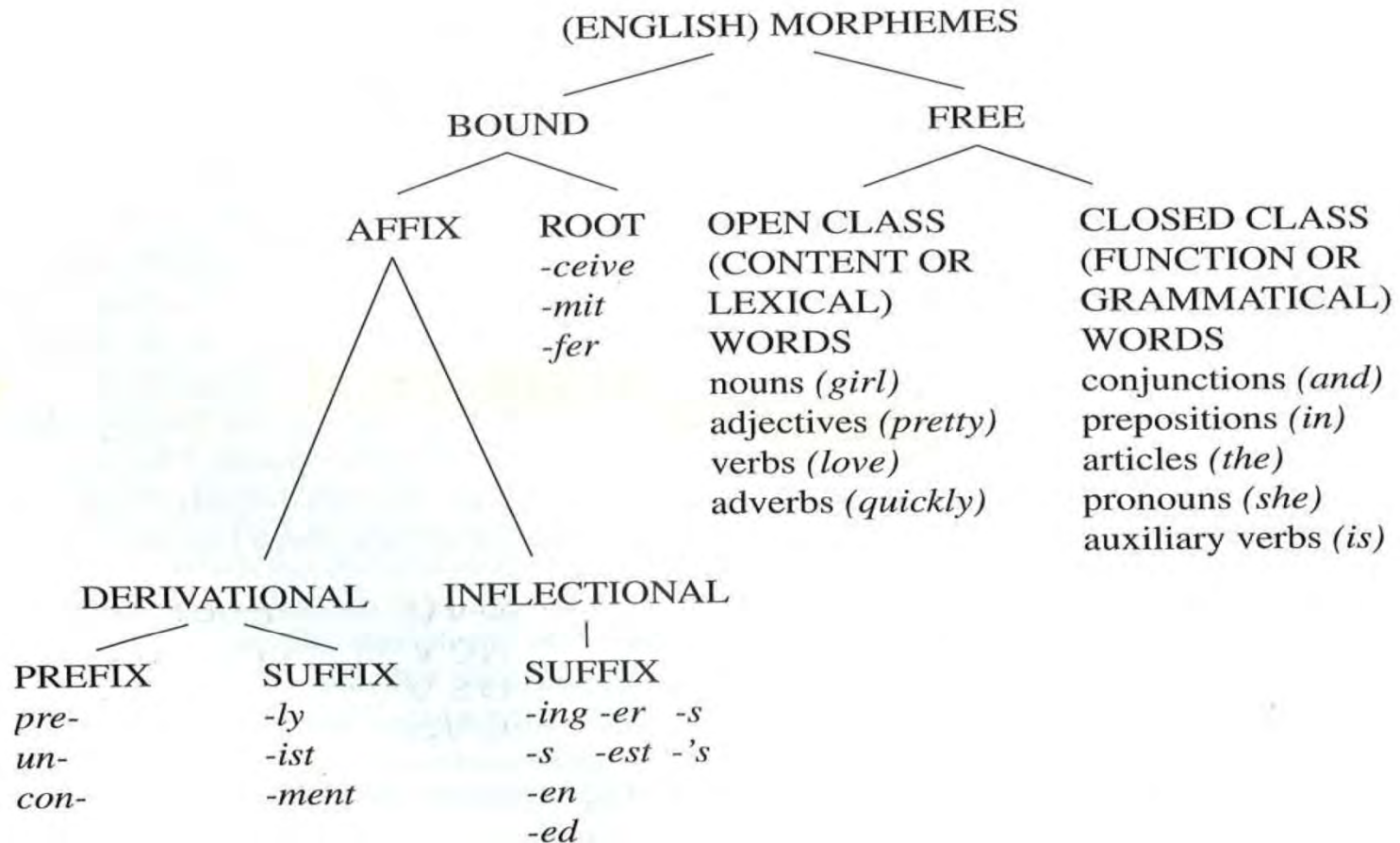


Figure 3.2 Classification of English Morphemes.

Morphology in *Legalese*



“We finally agreed to disagree about agreeing to the agreement that we disagreed about before we agreed we would agree, prior to disagreeing to change the part that we agreed not to disagree on when we agreed to the disagreeable part of the agreement. But they want it in writing.”

Words are like onions

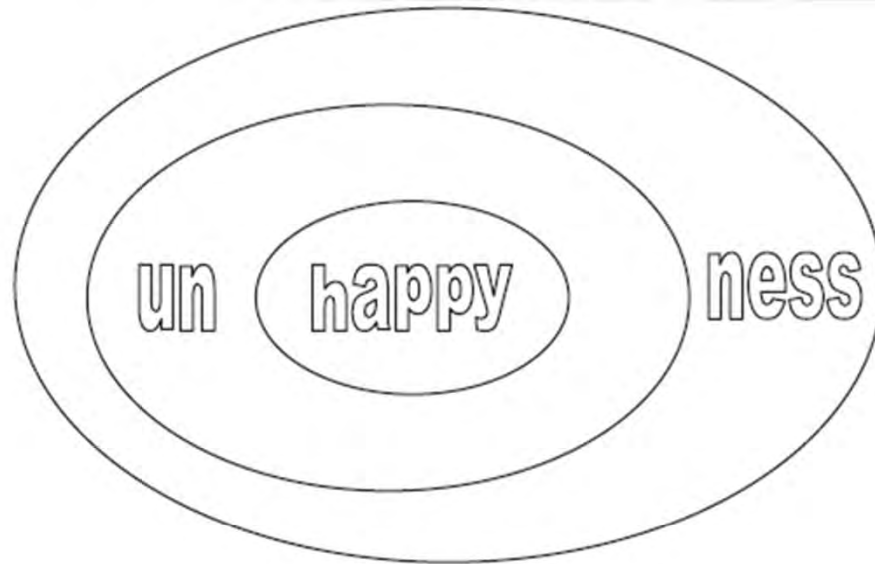
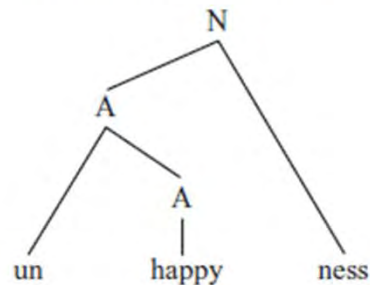


FIGURE 3.2
Words are like onions

But linguists, not generally being particularly artistic, prefer to show these relationships as 'trees' that look like this:

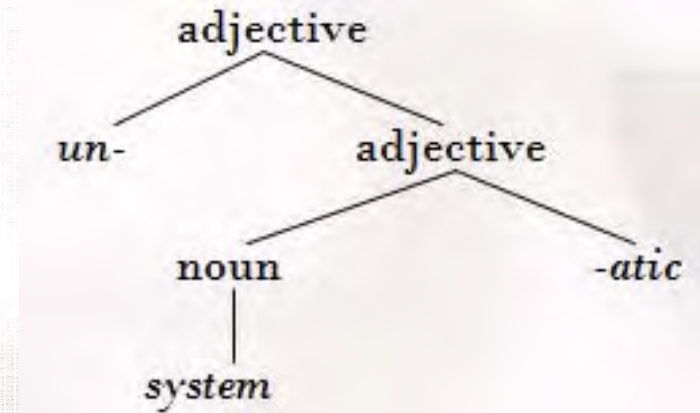
(12)



Hierarchical Structure of Words

- Morphemes are added to a base in a fixed order which reflects the structure of a word

- *unsystematic* = *un* + *system* + *atic*



- The example of *unsystematic* represents the application of two morphological rules:
 - Noun + *-atic* → Adjective
 - *un-* + Adjective → Adjective
- In the case of *unsystematic*, this is the only possible hierarchy, as **unsystem* is not a word

Hierarchical Structure of Words

- The hierarchical structure of words can help disambiguate ambiguous words:
- *unlockable* could mean:
1) “not able to be locked” or 2) “able to be unlocked”



‘That which cannot
be locked’



‘That which can
be unlocked’

Rule Productivity

- Derivational affixes are productive to different extents:
 - *-able* can be affixed to any verb to create an adjective
 - *un-* is most productive for adjectives derived from verbs and words with polysyllabic bases
 - *unsimplified*, *unenlightened*, and *unhappy*, but not **unsad*, **unbrave*, or **untall*
- Exceptions and *Suppletions* (irregular forms of a word):
 - Not all words undergo regular morphological processes (e.g. *feet*, *went*, *sing*, *children*)
 - These words must be learned separately since rules don't apply to them

LEGAL isn't from *LEG+AL*

- If *-al* is the derivational suffix added to the stem *institution* to give us *institutional*, then can we take *-al* off the word *legal* to get the stem *leg*? Unfortunately, the answer is “No.”
- The relationship between *law* and *legal* is a reflection of the historical influence of different languages on English word forms. The modern form *law* is a result of a borrowing into Old English (*lagu*) from a Scandinavian source over 1,000 years ago. The modern word *legal* was borrowed about 500 years later from the Latin form *legalis* (“of the law”). Consequently, there is no derivational relationship between the noun *law* and the adjective *legal* in English, nor between the noun *mouth* (from Old English) and the adjective *oral* (a Latin borrowing). An extremely large number of English words owe their morphological patterning to languages like Latin and Greek.

Source: George Yule *The Study of Language* (2010)

Compounds

- **Compounds:** joining two or more words together to make a new word (e.g. *landlord*)
 - The rightmost word in a compound is the head, which determines its meaning and part of speech
 - Noun + adjective = adjective (*headstrong*)
 - The stress on English compounds falls on the first word
 - *greenhouse* vs. *green house*
- The meaning of a compound is not always the sum of the meaning of its parts
 - *Blackboard*
 - *Cathouse*
 - *Turncoat*

Lexical Gaps

- **Lexical Gaps** (Accidental Gaps): words that *could be in a language but aren't* (possible but unacceptable words)
 - e.g., *curiouser, *mentalic, *disobvious, *upclean, *underratedness, *oversource, etc.
 - Some permissible sound sequences have no meaning (e.g. *blick*)
- **Lexical Gaps** result either from an error or from an attempt at humor, i.e., new words can be created through misanalysis of morpheme boundaries (a.k.a *back-formations*):
 - *pease* → *pea* (by speakers who thought *pease* was a plural)
 - *bikini* (from Bikini atoll of Marshall Islands) → *monokini*, *tankini*
 - *television* → *televise* (on analogy with pairs like *revise/revision*)
- **Lexical Gaps** provide evidence that our mental lexicon is not a fixed list of existing words.

Guessing Games

- We can use our knowledge of morphemes and morphological rules to guess the meaning of words we don't know
- Our guesses may be wrong but they are based on morphological (mis)analysis
 - *deciduous* “able to make up one's mind”
 - *bibliography* “holy geography”
 - *gullible* “to do with sea birds”

Guessing Games: *Gullible*

- *gullible* ‘easily deceived’

How Gullible Are You?

Do YOU CONSTANTLY fall for ads promising gadgets that can't possibly work? Do unscrupulous merchants take advantage of your trusting nature?

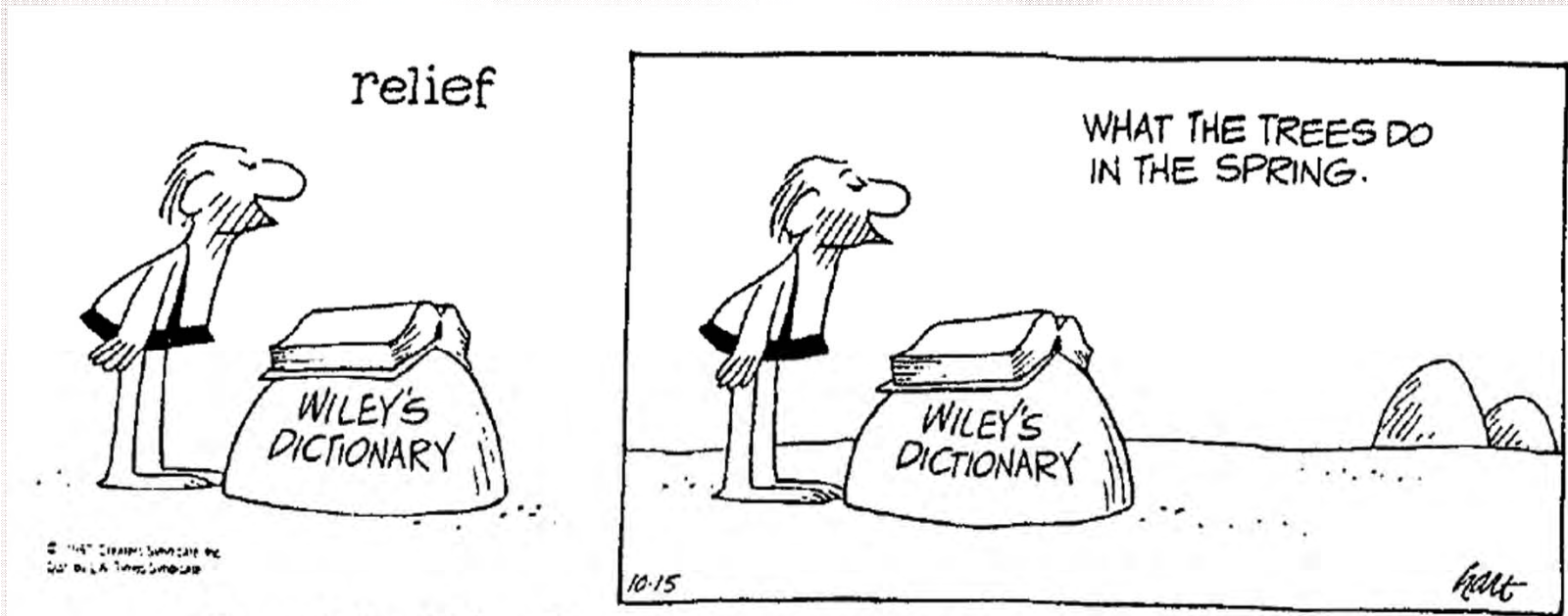
Now at last you can know *exactly* how gullible you are. Our new GULL-O-MATIC measures your gullibility with an accuracy of an astonishing 17 picomadoffs! *Now*, before you buy another useless gadget, know the *facts* about your own vulnerability. Unconditionally guaranteed for one full month from date of order! Allow 45 days for delivery.

Pretorius Scientific Novelties, Hazelwood.

- *Picomadoffs* - a reference to Bernard Madoff who operated \$40 billion fraud in 2008

Guessing Games: *Deciduous*

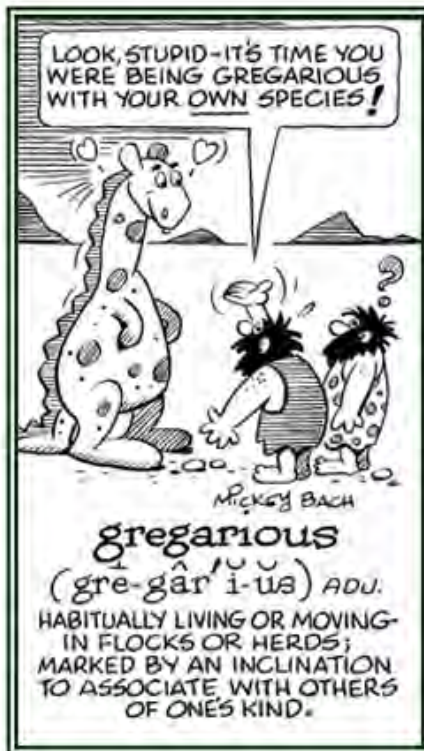
- *deciduous* ‘shedding the leaves annually, as certain trees and shrubs’



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Guessing Games: *Gregarious*

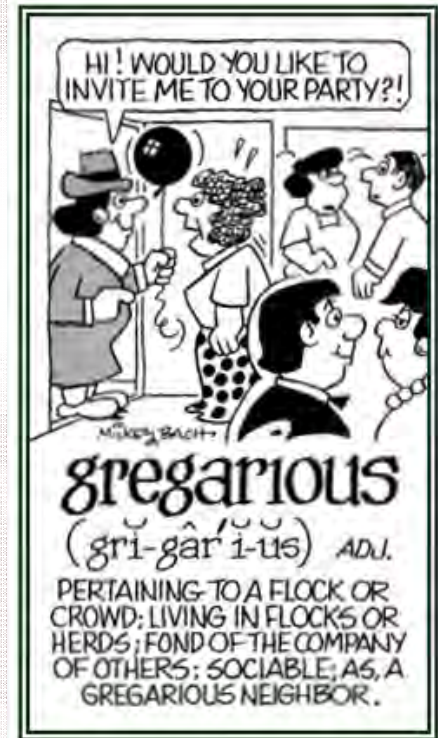
- *Gregarious* ‘(of a person) fond of company; sociable’



WORD ROOT OF THE DAY:

GREG (group)

gregarious: outgoing; sociable
segregate: to separate from the group
congregate: to gather together
aggregate: collection from separate parts
congregation: gathering of people
egregious: standing out of the group
for being bad or evil



- An ad put out by the Merriam-Webster's Collegiate Dictionary:
Father: *When I was at college, I used to be gregarious!*
Son: *Gregarious? Eating too much garlic?*



Invention of New Words: *Acronyms*

- Capital letter spelling: *NASA*, *UNESCO*, *NATO*, *MIT*, *WWII*, etc.
- Lowercase spelling: *Radar*, *laser*, *scuba*, *url*, *lol*, *asap*, etc.

Acronyms



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Quiz of the Day: *Songwriters*

- Q: About the internal organization of the English word *songwriters*, which of the following statements is *INCORRECT*?
- (A) The peripheral -s, the plural marker, is the only inflectional morpheme found here.
- (B) The verb *write* is the head of this compound.
- (C) -er changes the grammatical category of *write* from a verb to a noun, and is therefore a derivational morpheme.
- (D) -er and -s are both free morphemes.

Quiz of the Day: *Songwriters*

- Q: About the internal organization of the English word *songwriters*, which of the following statements is *INCORRECT*?
- Correct Answer (i.e., *the incorrect statement*): (D) *-er* and *-s* are both free morphemes.

Acknowledgments

- This presentation incorporates texts borrowed from the following sources:
 - Francis Katamba. *Morphology*. New York: St. Martin's Press, 1993
 - Tek-wah King. *Chapter 02 Lecture Notes*. ConnColl, 2014
 - Rochelle Lieber. *Introducing Morphology*. Cambridge University Press, 2009
 - Geert Booij. *The Grammar of Words. An Introduction to Linguistic Morphology*. Oxford University Press, 2005
 - Andrew Carstairs-McCarthy. *An Introduction to English Morphology*. Edinburgh University Press, 2002
 - Mark Aronoff & Kirsten Fudeman. *What is Morphology?* Wiley-Blackwell, 2nd ed., 2011
 - Alaa Al Mohammadi. *Morphology Handout*. 2012
 - George Yule *The Study of Language*. Cambridge University Press, 4th ed., 2010

Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 3



Syntax:

The Sentence Patterns of Language

What Is Syntax

- Any speaker of any human language can produce and understand an infinite number of possible sentences
 - Thus, we can't possibly have
 - a mental dictionary of *all*
 - the possible sentences
 - Rather, we have the rules for
 - forming sentences stored in our brains
- **Syntax** is the part of grammar that pertains to a speaker's knowledge of sentences and their structures



Etymology of 'Syntax'

- Syntax = 'Putting things together in an orderly manner'

- *Etymology* (from Greek):

sun – taxis

‘together’ ‘to put in order’

GREEK

sun-
together

GREEK

tassein
arrange

GREEK

suntaxis

FRENCH

syntaxe

LATE LATIN

syntax

late 16th century



What the Syntax Rules Do

Some Yoda utterances (from ESB)



Star Wars - Yoda's Theme.mp4



"Stopped
they must
be."

"Help you I
can."

"If you leave
now, help
them you
could."

"Mmm. Take
you to him, I
will."

"Consume you it
will, as it did Obi-
Wan's apprentice."

"Found someone,
you have, I would
say, hmmm?"

"Stay and
help you, I
will."

What the Syntax Rules Do

Yoda's most typical feature

- The most typical Yoda feature is **VP fronting**.
 - [_{VP} Help you] I can.
 - [_{VP} Stopped] they must be.
 - [_{VP} Found someone] you have.
 - [_{VP} Take you to him] I will.
- **V(erb)P(hrase) fronting** (also known as VP preposing and VP topicalization) is a productive process in standard English.

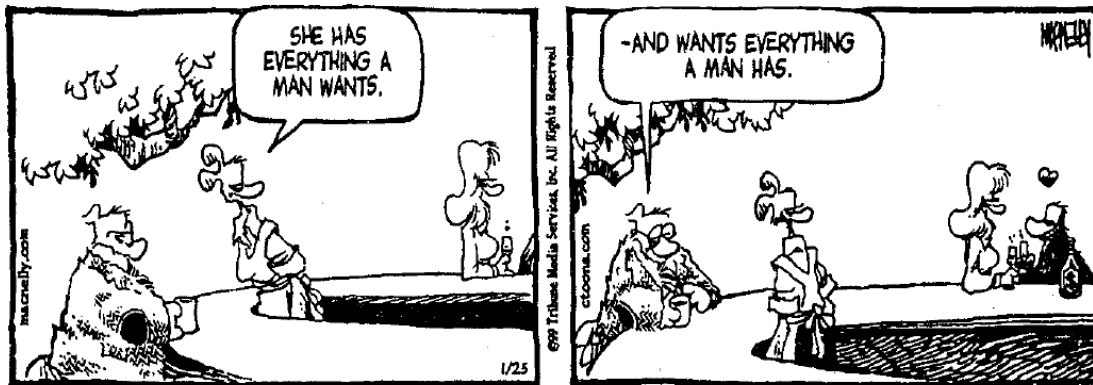
Source: George Walkden “English VP fronting and the syntax of Yoda” (2012)

What the Syntax Rules Do

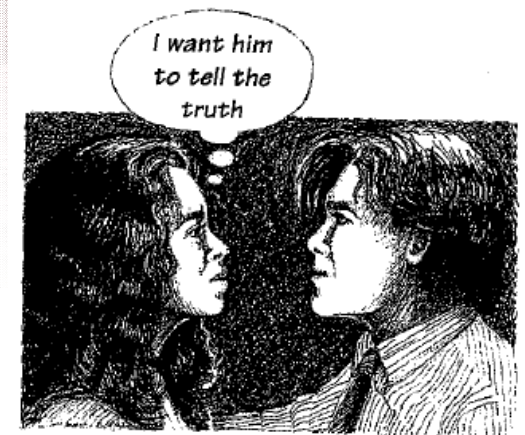
- The rules of syntax combine words into phrases and phrases into sentences
- They specify the correct word order for a language
 - For example, English is a Subject-Verb-Object (SVO) language
 - *The President nominated a new Supreme Court justice*
 - **President the new Supreme justice Court a nominated*
- They also describe the relationship between the meaning of a group of words and the arrangement of the words
 - *I mean what I say* vs. *I say what I mean* (cf. Alice's Adventures in Wonderland)

What the Syntax Rules Do

- The rules of syntax also specify the grammatical relations of a sentence, such as the subject and the direct object
 - *Your dog chased my cat* vs. *My cat chased your dog*



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What the Syntax Rules Do

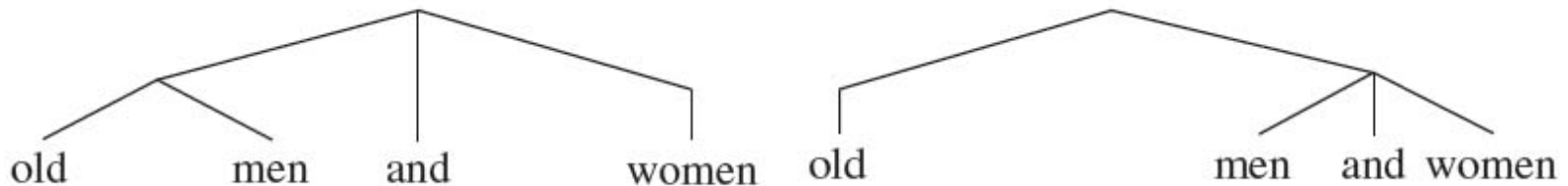
- Syntax rules also tell us how words form groups and are hierarchically ordered in a sentence

“The captain ordered the old men and women off the ship”

- This sentence has two possible meanings:
 - 1. The captain ordered the old men and the old women off the ship
 - 2. The captain ordered the old men and the women of any age off the ship
- The meanings depend on how the words in the sentence are grouped (specifically, to which words is the adjective ‘old’ applied?)
 - 1. The captain ordered the [old [men and women]] off the ship
 - 2. The captain ordered the [old men] and [women] off the ship

What the Syntax Rules Do

- These groupings can be shown hierarchically in a tree



- These trees reveal the structural ambiguity in the phrase “old men and women”
 - Each structure corresponds to a different meaning
- Structurally ambiguous sentences can often be humorous:
 - She criticized my apartment, so I knocked her flat.
 - I saw the Grand Canyon flying to LA.

Grammatical or Ungrammatical?

Grammatical or Ungrammatical?

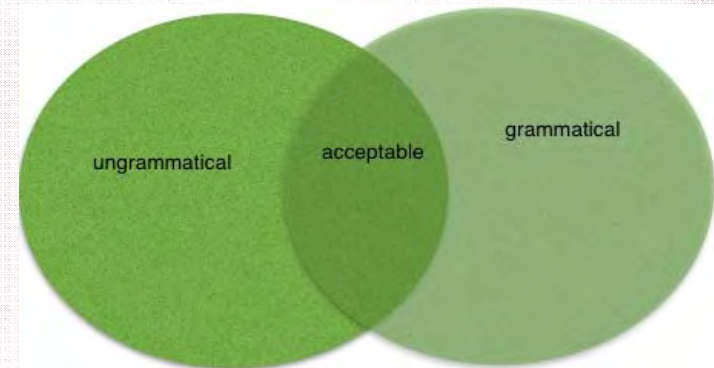
119



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Grammaticality vs. Acceptability

- *Acceptability* is the extent to which:
 - a sentence is produced by the grammatical rules of that language;
 - that sentence is considered permissible by speaker and hearer.
- On the other hand, *grammaticality* is the extent to which a ‘string’ of language conforms with a set of given rules.
- It is assumed that a native speaker’s grammar generates **grammatical** strings and that the speaker also has the ability to judge whether this string is **acceptable** in that language. In practice, the two notions are frequently confounded and speakers are typically asked to give their ‘grammaticality judgements’ instead of ‘acceptability judgements’.



Source: Wikipedia

What Grammaticality Is Not Based On

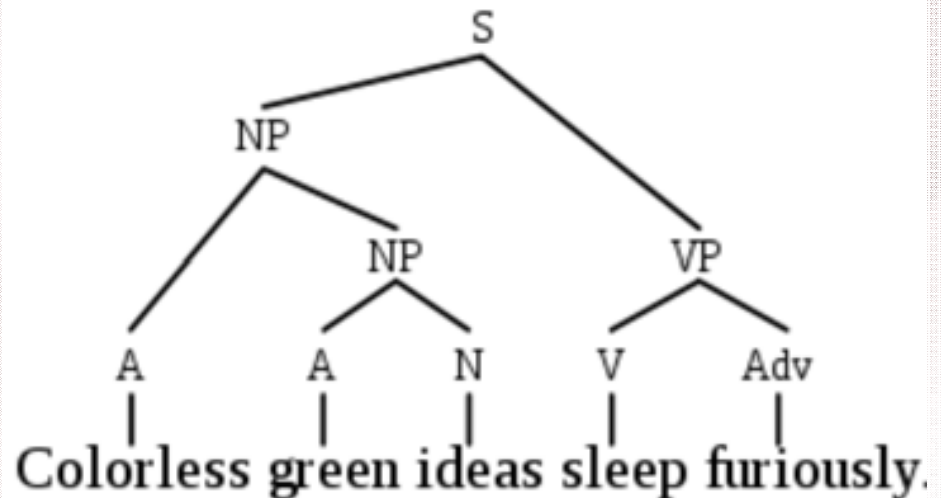
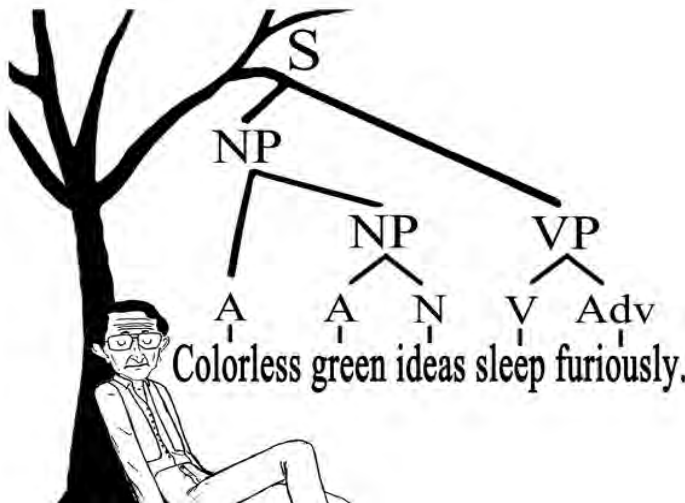
- Grammaticality is not based on prior exposure to a sentence
- Grammaticality is not based on meaningfulness
- Grammaticality is not based on truthfulness



I sentence you to ten hours of community service for ungrammatical utterances!

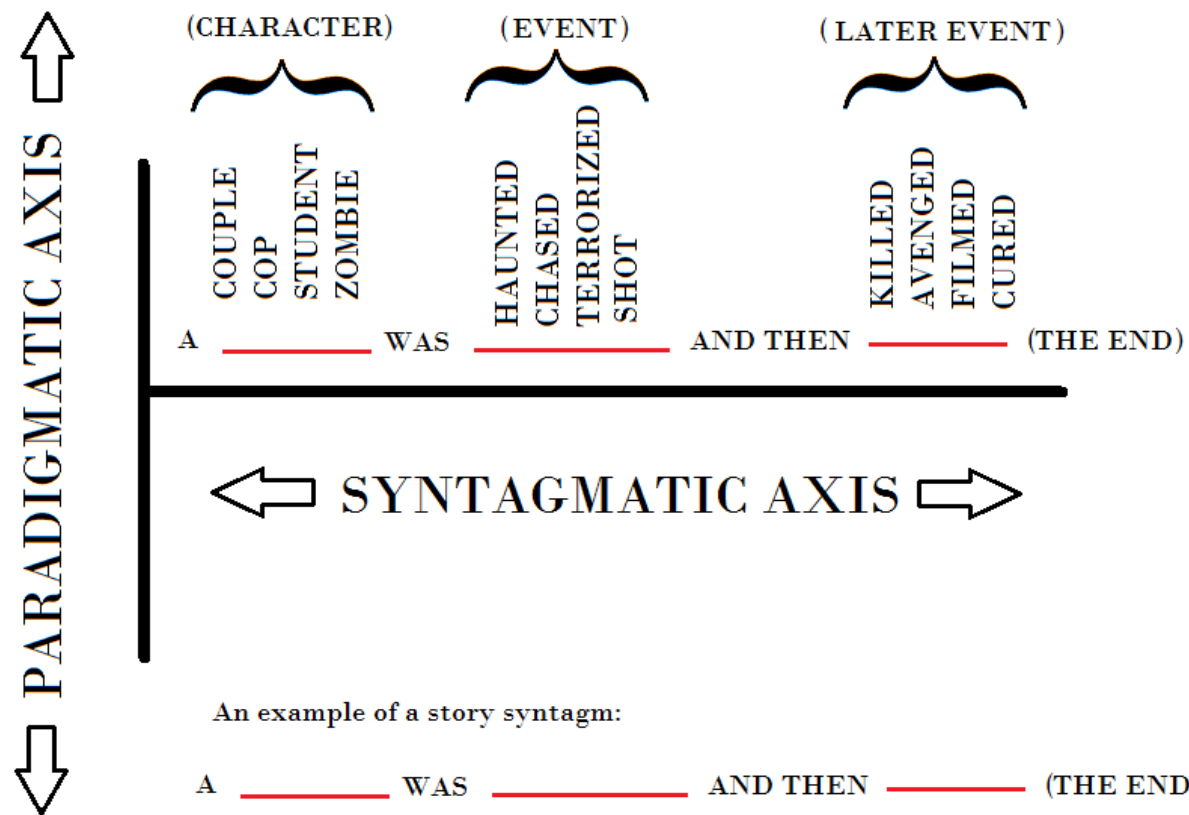
“Colorless green ideas sleep furiously”

- This sentence was constructed by Noam Chomsky as an illustration that sentences can be syntactically correct but semantically nonsensical. The tree-diagram for Chomsky's famous sentence can be rendered as follows:



Sentence Structure

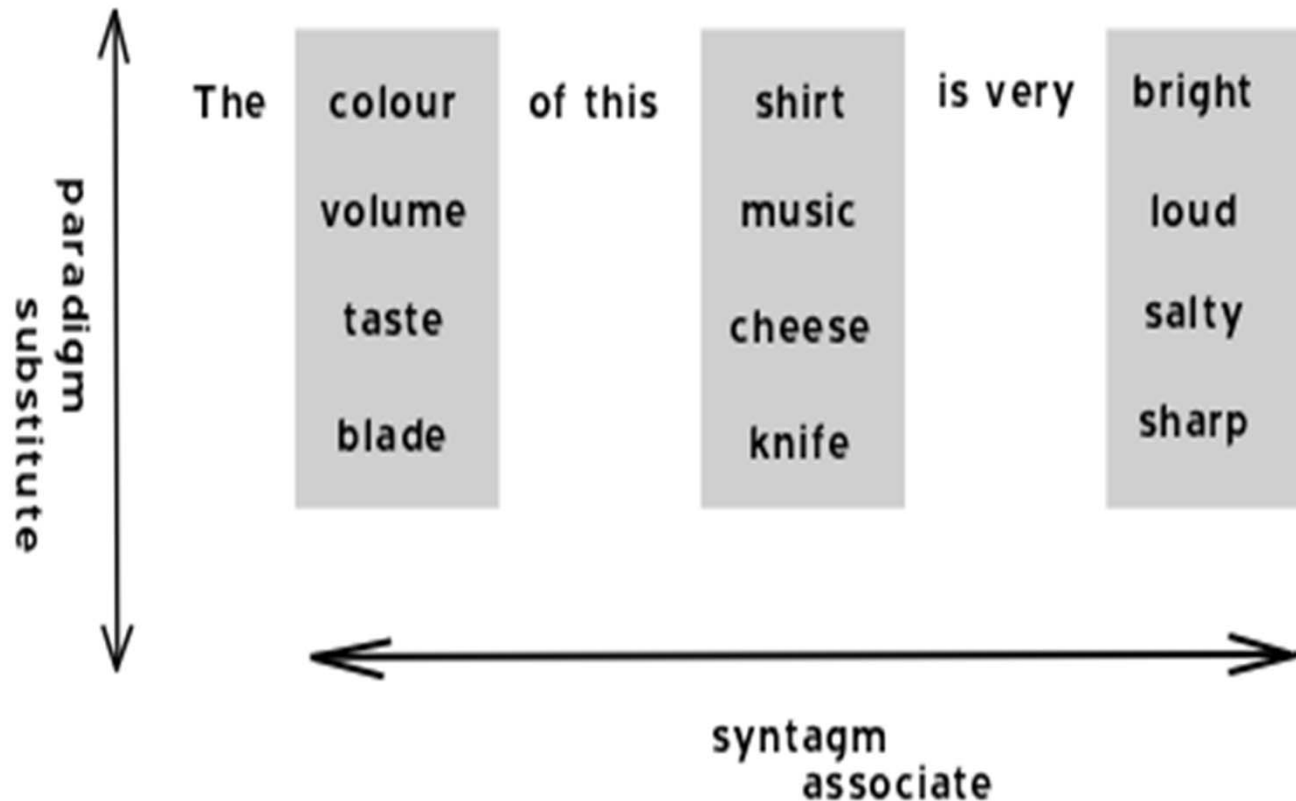
- The Syntagmatic and Paradigmatic axes



- Analysis: J.T. Velikovsky, after de Saussure

Sentence Structure

- The Syntagmatic and Paradigmatic axes



Sentence Structure

- The Syntagmatic and Paradigmatic axes

Now let us look at the same sentence and what we can put in place of the words in it:

(1a)	He	is	like	a	horse
(2)	She	was	unlike	the	cow
(3)	I	am	like	one	monkey
(4)	You	are	like	a	boy
(5)	We	are	unlike	most	cats

You can see that *he* can be replaced by words of the same kind. Similarly other words can be replaced by words of the same kind.

Source: Tariq Rahman “Linguistics for Beginners: Basic Concepts” (2010)

Sentence Structure

- Consider a simple sentence such as:

(1) The man left.

- Clearly, this is not simply a sequence of three autonomous words. *The* and *man* are closely associated in a way in which *man* and *left* are not. In fact, they constitute a sort of unit based on the noun *man*, as the following two syntactic tests demonstrate. First, a "pro-form" (in this case a pronoun) can substitute for *the man*:

(2) He left.

- No comparable substitution is possible for the sequence *man left* in (1). Second, an adverb modifying the sentence can easily be inserted between *man* and *left*, as in (3), but not between *the* and *man*, as in (4):

(3) The man obviously left.

(4) *The obviously man left.

- This pattern of data strongly suggests that the sequence *the man* constitutes a unit, whereas the sequence *man left* does not. How can this fact be represented? Apparently, sentence (1) is divided into two major parts, or *constituents*.

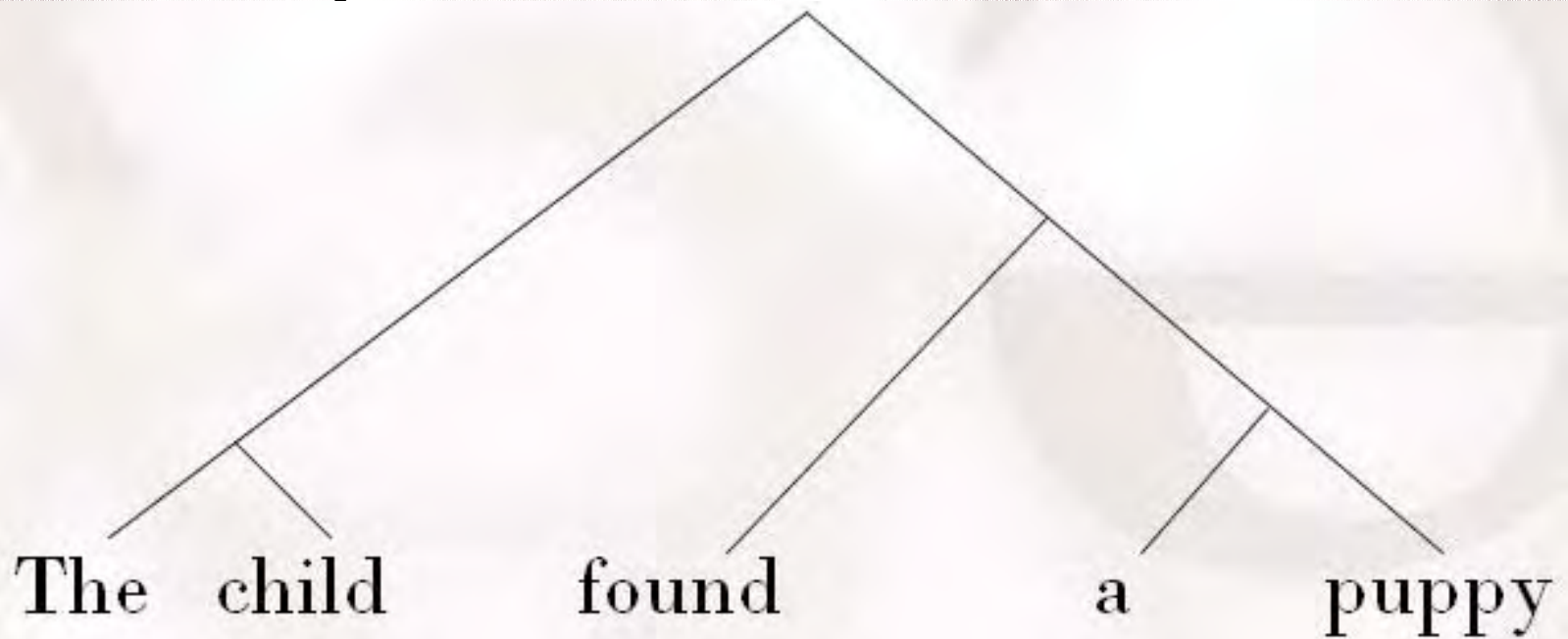
Source: Howard Lasnik "Syntax" (1979)

Sentence Structure

- Consider another sentence: “The child found the puppy.”
We could say that it is based on the template:
Det—N—V—Det—N,
a *determiner* (e.g. an article like *the* or *a*) is followed by a noun, which is followed by a verb, etc.
 - But this would imply that sentences are just strings of words without internal structure
 - This sentence can actually be separated into several groups:
 - [the child] [found a puppy]
 - [the child] [found [a puppy]]
 - [[the] [child]] [[found] [[a] [puppy]]]

Sentence Structure

- A **tree diagram** can be used to show the hierarchy of the sentence:



Constituents and Constituency Tests

- **Constituents** are the natural groupings in a sentence
- Tests for constituency include:
 - 1. “stand alone test”: if a group of words can stand alone, they form a constituent
 - A: “What did you find?”
 - B: “A puppy.”
 - 2. “replacement by a pronoun”: pronouns can replace constituents
 - A: “Where did you find a puppy?”
 - B: “I found him in the park.”
 - 3. “move as a unit” test: If a group of words can be moved together, they are a constituent
 - A: “The child found a puppy.” → “A puppy was found by the child.”

Constituents and Constituency Tests

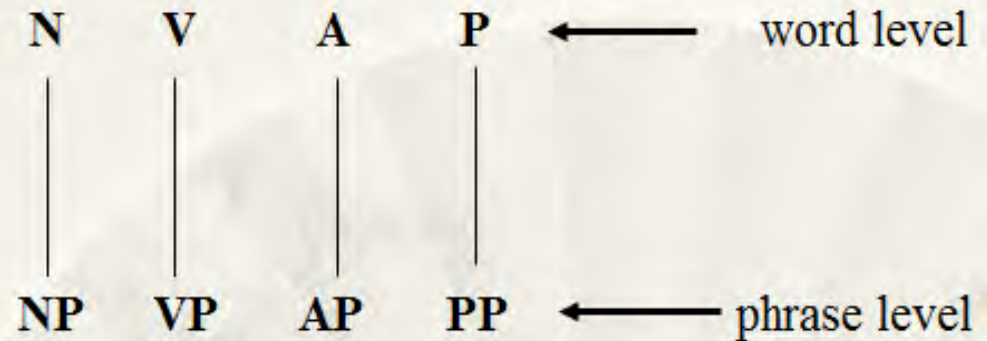
- Experimental evidence shows that people perceive sentences in groupings corresponding to constituents
- Every sentence has at least one constituent structure
- If a sentence has more than one constituent structure, then it is ambiguous and each constituent structure corresponds to a different meaning.
- For example, the sentence *I bought an antique desk suitable for a lady with thick legs and large drawers* has two phrase structure trees associated with it.
 - A. “Who did you buy an antique desk for?”
 - B. “What did the desk have?”

Syntactic Categories



"I MISS THE GOOD OLD DAYS WHEN ALL WE HAD TO WORRY ABOUT WAS NOUNS AND VERBS."

Copyright © S. Harris.



Noun Phrase (NP)

Verb Phrase (VP)

Adjective Phrase (AP)

Prepositional Phrase (PP)

Adverbial Phrase (AdvP)

+

Determiner (Det)

Auxiliary Verb (Aux)

Syntactic Categories

- Constituents, whether single- or multiple-word expressions, can be classified as belonging to the same **syntactic category** if they can substitute for one another in a sentence without loss of grammaticality, despite change in meaning. The traditional term is **part of speech**.

The child found a puppy.

A police officer found a puppy.

Your neighbor found a puppy.

The child ***found a puppy***.

The child ***ate the cake***.

The child ***slept***.

- All the underlined groups constitute a syntactic category known as a **noun phrase (NP)**
 - NPs may be a subject or an object of a sentence, may contain a determiner, proper name, pronoun, or may be a noun alone
- All the bolded groups constitute a syntactic category known as a **verb phrase (VP)**
 - VPs must always contain a verb but may also contain other constituents such as a noun phrase or a **prepositional phrase (PP)**

Syntactic Categories

Noun Phrases

- **NPs** often function as the **subject** or the **object** of a sentence.
- All the following words or phrases can be treated as **NPs** because they can all be inserted into “Who discovered _____?”, “_____ was heard by everyone,” and “What I heard was _____?”:
 - *John*
 - *It*
 - *A bird*
 - *The red banjo*
 - *The woman who was laughing*
 - *That the earth is round*

Syntactic Categories

Verb Phrases

- All the following words or phrases can complete the sentence “The child _____” and are therefore **VPs**:
 - *Saw a clown* (but not *saw)
 - *Slept*
 - *Is smart* (but not *smart)
 - *Found the cake*
 - *Found the cake in the cupboard*
 - *Realized that the earth was round*

Syntactic Categories

- Phrasal categories: NP, VP, PP, AdjP, AdvP
- Lexical categories:
 - Noun: *puppy, girl, soup, happiness, pillow*
 - Verb: *find, run, sleep, realize, see, want*
 - Preposition: *up, down, across, into, from, with*
 - Adjective: *red, big, candid, lucky, large*
 - Adverb: *again, carefully, luckily, very, fairly*
- Functional categories:
 - Auxiliary: verbs such as *have*, and *be*, and modals such as *may, can, will, shall, must*
 - Determiners: *the, a, this, that, those, each, every*



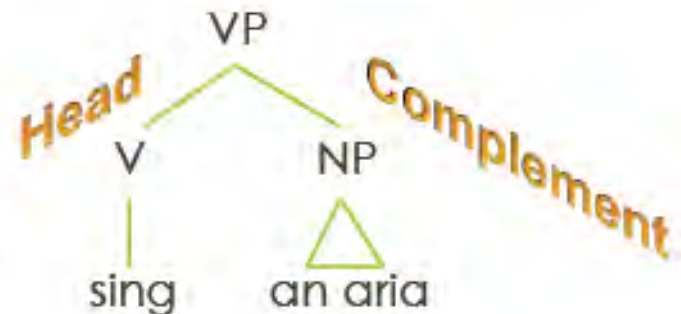
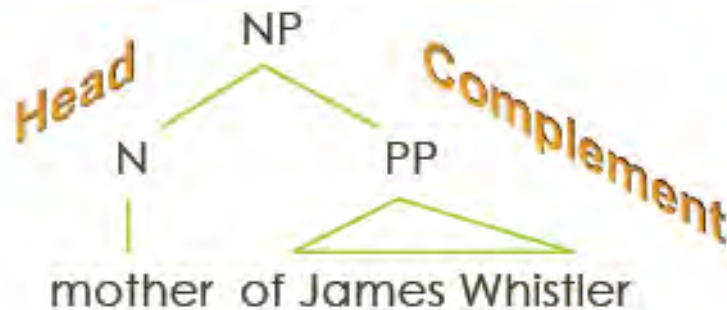
Phrase Structure Trees

- The core of every phrase (=XP) is its **head**, i.e., all XPs contain a **X**, defined as its **head** node.
 - In the VP *walk the pugs*, the verb *walk* is the head
- The phrasal category that may occur next to a head and elaborates on the meaning of the head is a **complement**
 - In the PP *over the river*, the NP *the river* is the complement
- Elements preceding the head are **specifiers**
 - In the NP *the fish*, the determiner *the* is the specifier

Phrase Structure Trees

Heads and Complements

- The terminal node X that is the distributional core of a phrasal category XP is its **head**. An **XP** is always headed by an **X**.
- The constituent that occurs next to the head to elaborate on the meaning of the latter is the **complement**. The **head-complement** relation is universal, although not necessarily in a certain order of precedence:



Complements vs. Adjuncts

Tests for complementation

- **Semantics:**
 - Does the phrase complete the meaning of the sentence or just add extra information?
 - ***Complements complete the meaning of the sentence; adjuncts add additional information*** (time, place, manner).
- **Selection:**
 - Is the phrase selected by the head? Does there seem to be a relationship between the head and the phrase?
 - If there is a relationship between the head and the XP then the XP is a complement, if not then it is an adjunct.
 - Complements are selected (chosen) by the head whereas adjuncts are not selected by the head and can occur freely.
- **Optionality:**
 - Is the phrase optional? This test is not the most reliable as complements can at times be optional! If the phrase is **obligatory**, then it is a complement. Adjuncts are always optional. If the phrase is optional, one cannot tell if the XP is an adjunct or complement.

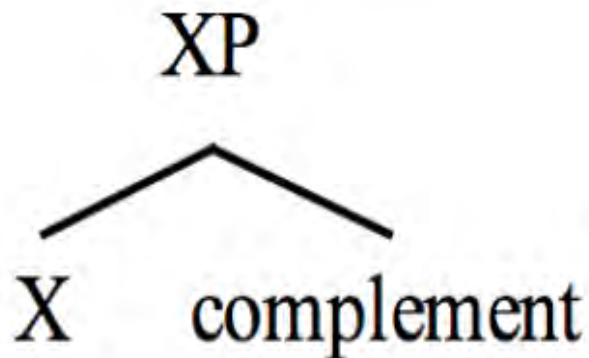
Source: Kristin Bunch Syntax site
(<http://bunchsyntax.weebly.com/complent-or-adjunct.html>)

Complements vs. Adjuncts

Tests for complementation

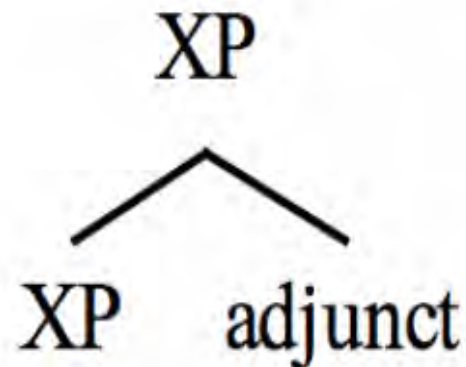
Complements

1. Complete the meaning of the sentence
2. Are selected by the head
3. Obligatory or optional
4. Closest to the head



Adjuncts

1. Modify (add extra information to) the sentence
2. Are not selected by the head
3. Always Optional
4. Farther from the head, cannot precede a known complement

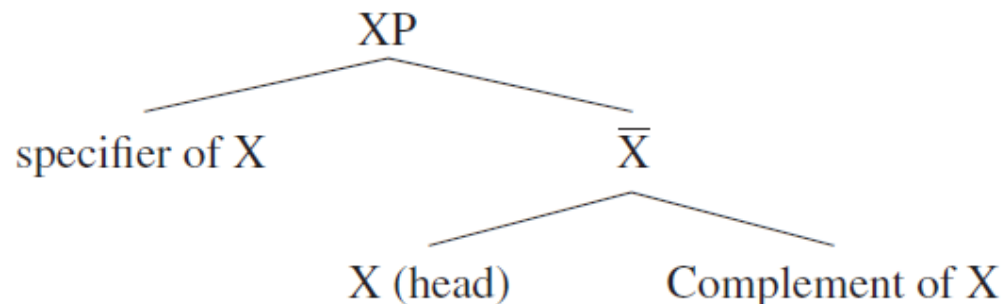


Source: Kristin Bunch Syntax site
(<http://bunchsyntax.weebly.com/complent-or-adjunct.html>)

Phrase Structure Trees

- The internal structure of phrasal categories can be captured using the X-bar schema:

To capture the generalization that each phrasal category has the same internal structure, we substitute X in place of N, V, P, A and we get the following tree:

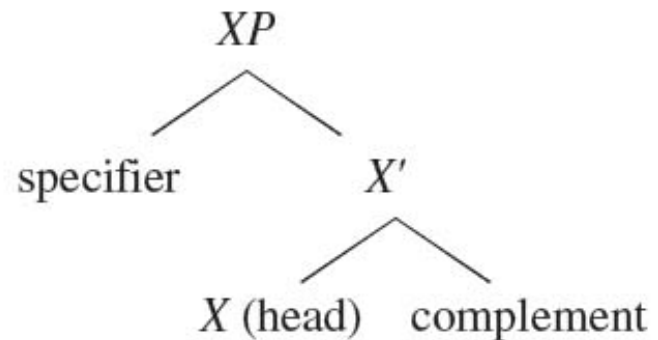


This 3-tiered structure, referred to as the **X-bar (\bar{X}) schema**, is a template or blueprint that specifies how the phrases of a language are organized. The X-bar schema “stands for” the various phrasal categories given above (and others we will see later). The X-bar schema applies to all syntactic phrases.

Phrase Structure Trees

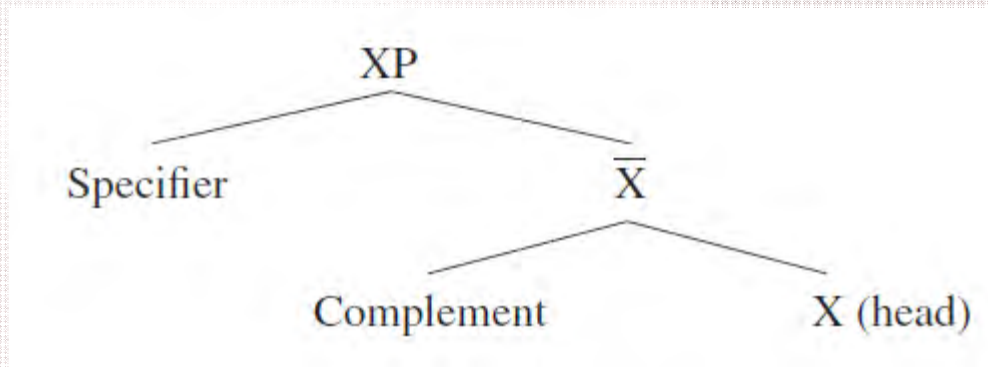
Once again:

- **X-bar theory** is the theory that all XPs have three levels of structure
 - 1. the XP
 - 2. the specifier (modifier)
 - 3. X' with head X and a complement



Phrase Structure Trees

- The order of the head and complement may differ in different languages. In English the head comes first, followed by the complement. In Japanese complements precede the head.
- For Japanese the X-bar schema looks like this:

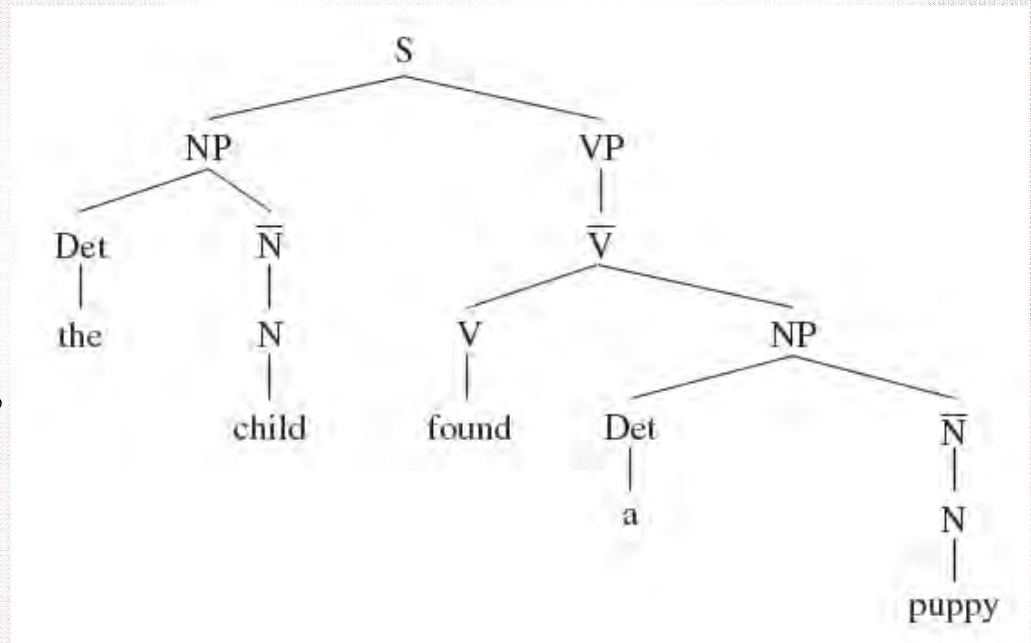


Phrase Structure Trees

Phrase structure (PS) trees show the internal structure of a sentence along with syntactic category information:

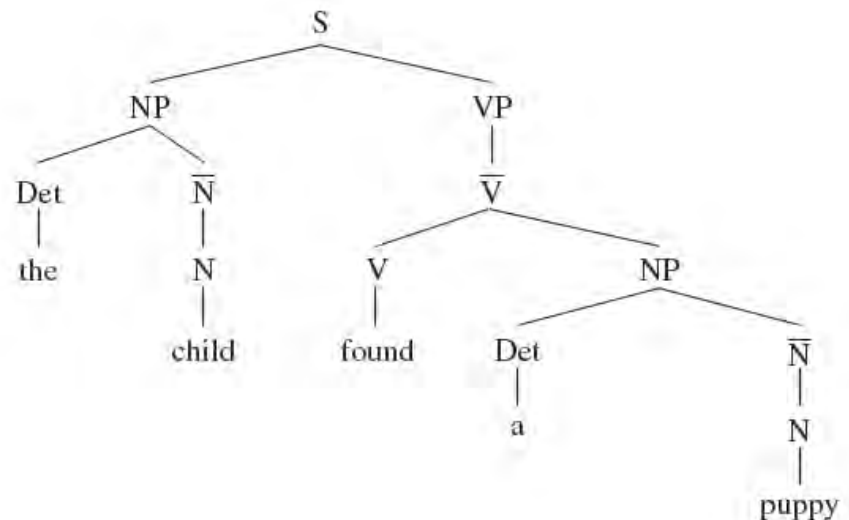
S = sentence

“The child found a puppy.”



Phrase Structure Trees

- In a PS (phrase structure) tree, every higher node **dominates** all the categories beneath it
 - S dominates everything
- A node **immediately dominates** the categories directly below it
- **Sisters** are categories that are immediately dominated by the same node
 - The V and the NP are sisters



Phrase Structure Trees: Selection

- Some heads require a certain type of complement and some don't. For example, **transitive verbs** require an NP complement (= direct object) **vs. intransitive verbs** (no NP complement)
 - The verb *find* requires an NP: *Alex found the ball*.
 - The verb *put* requires both an NP and a PP: *Alex put the ball in the toy box*.
 - The verb *sleep* cannot take a complement: *Alex slept*. (BUT *Michael slept their baby.)
 - The noun *belief* optionally selects a PP: *the belief in freedom of speech*.
 - The adjective *proud* optionally selects a PP: *proud of herself*
- **C-selection** (C stands for “categorial.”) or **subcategorization** refers to the information about what types of complements a head can or must take

Phrase Structure Trees: Selection

- Verbs also select subjects and complements based on semantic properties (**S-selection**, S stands for “semantic”)

- The verb *murder* requires a human subject and object (= animacy)

!The beer murdered the lamp.

- The verb *drink* requires its subject to be animate and its optional complement object to be liquid

!The beer drank the lamp.

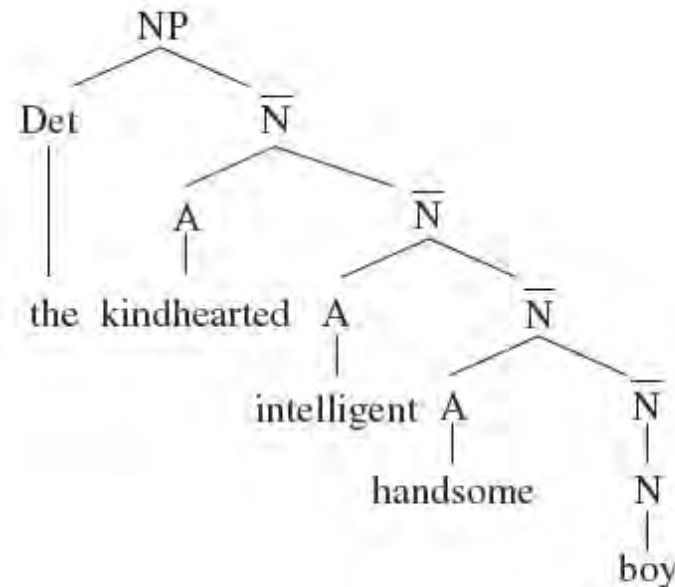
- For a sentence to be well-formed, it must conform to the structural constraints of PS rules and must also obey the syntactic (C-selection) and semantic (S-selection) requirements of the head of each phrase

The Infinity of Language: Recursive Rules

- **Recursive** rules are rules in which a phrasal category can contain itself

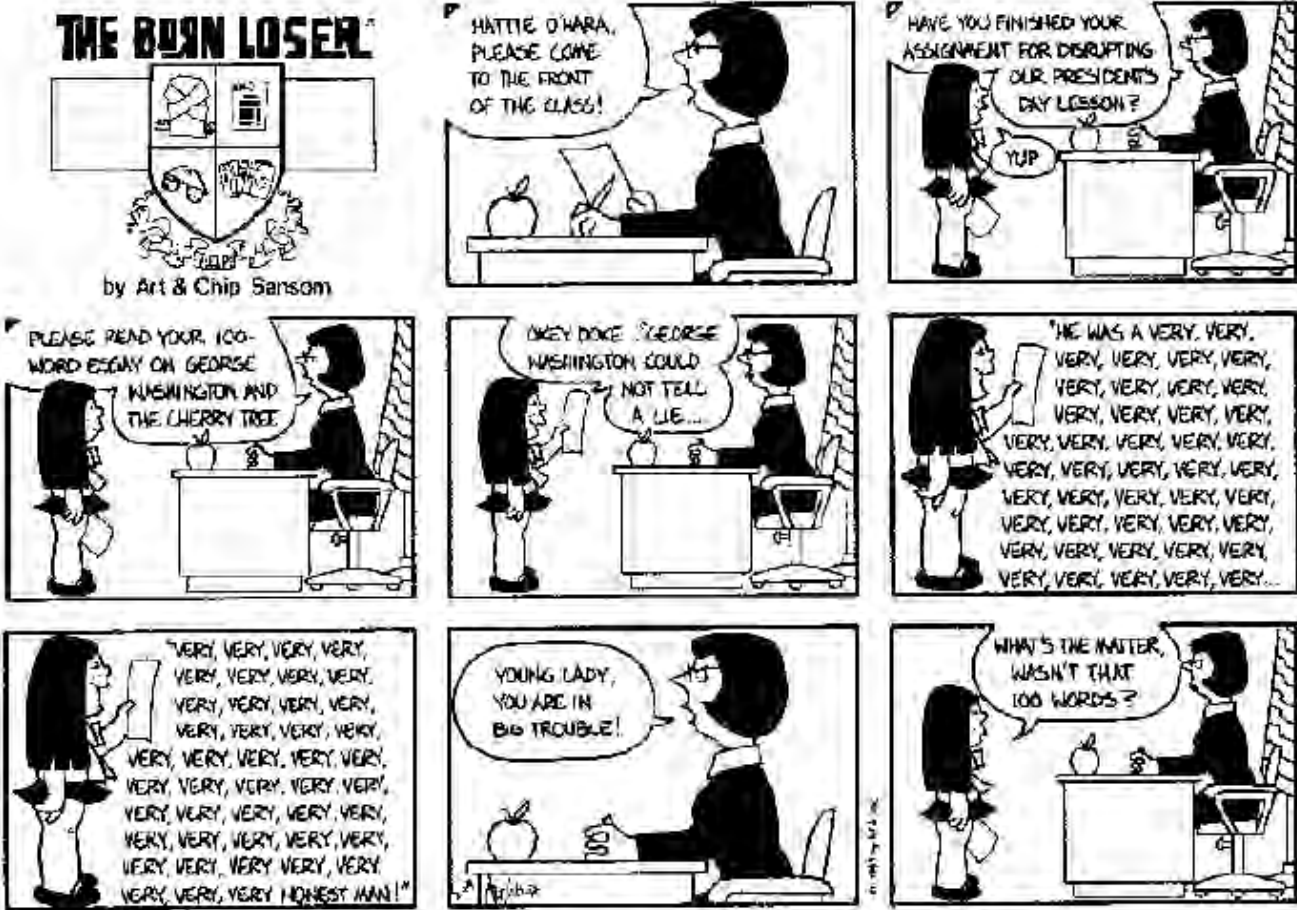
$$14. \bar{N} \rightarrow A \bar{N}$$

- Recursive rules allow a grammar to generate an infinite number of sentences
 - *the kindhearted, intelligent, handsome, ... boy*



The Infinity of Language: Recursive Rules

- A similar kind of recursion occurs in this cartoon:

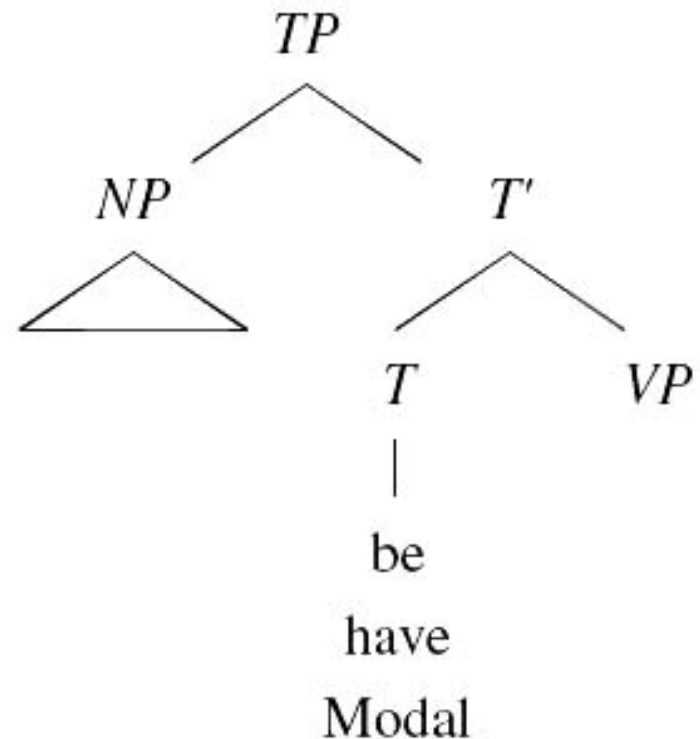
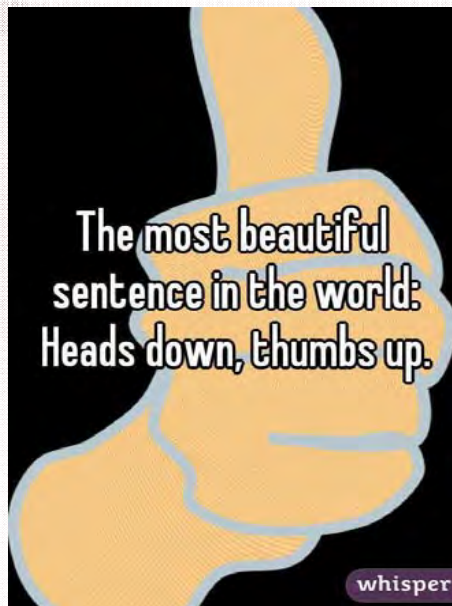


What Heads the Sentence

- The category of Auxiliary verbs (such as *will*, *has*, *is*, and *may* as well as modals *might*, *could*, *would*, and *can*) heads a sentence because a sentence is about a situation of state of affairs that happens at some point in time
- Particular kinds of auxiliaries go with certain kinds of VPs
 - *be* selects the progressive form of the verb
 - *The baby is eating.*
 - *have* selects the past participle form of the verb
 - *The baby has eaten.*
 - The modals select the infinitival form of the verb
 - The baby must eat.

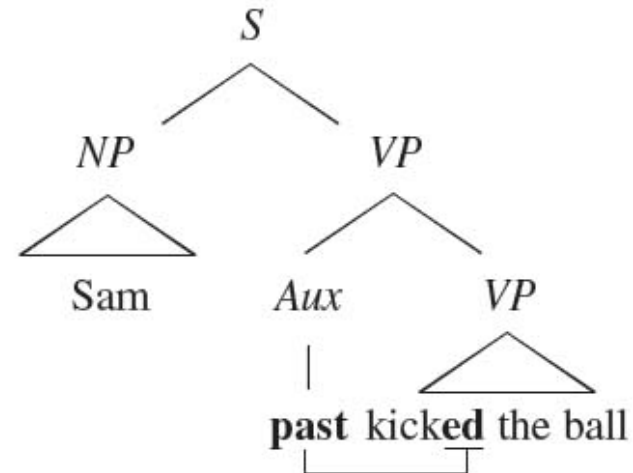
What Heads the Sentence

- Many linguists use the symbols **T (tense)** and **TP (tense phrase)** instead of Aux and S(entence), with the TP having an intermediate **T'** category



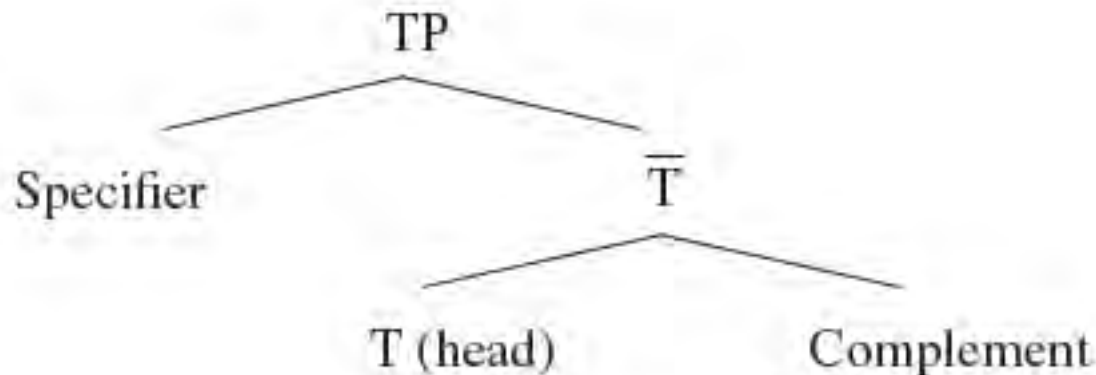
What Heads the Sentence

- However, not all sentences seem to have auxiliaries
 - *Sam kicked the soccer ball.*
- But, this sentence does have the past tense morpheme *–ed*, and in sentences without an auxiliary, the tense is the head of the S
 - Instead of having a word under Aux, there is a tense specification
 - The tense specification must match the inflection on the verb



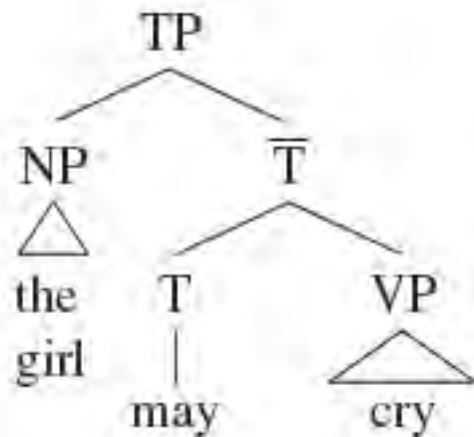
What Heads the Sentence

- *To summaries:*
- All sentences contain information about tense—when a certain event or state of affairs occurred, so we can say that Tense is the head of a sentence
 - So sentences are TPs, with T representing tense markers and modals

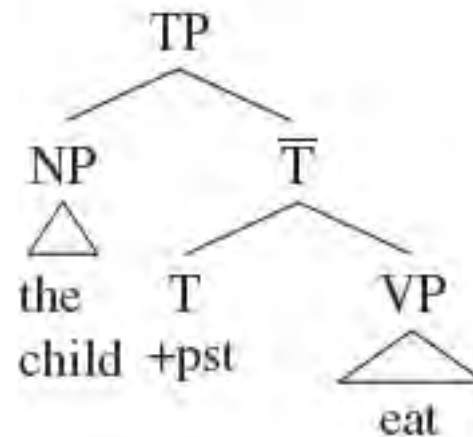


What Heads the Sentence

The girl may cry.



The child ate.



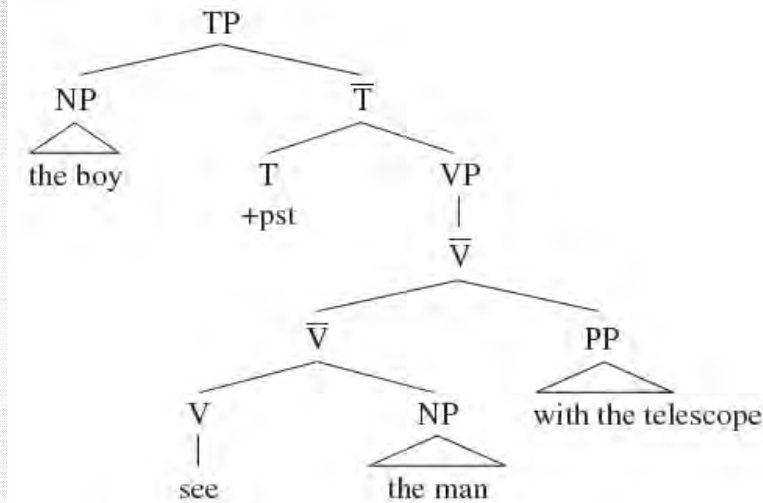
Structural Ambiguities

- The following sentence has two meanings:

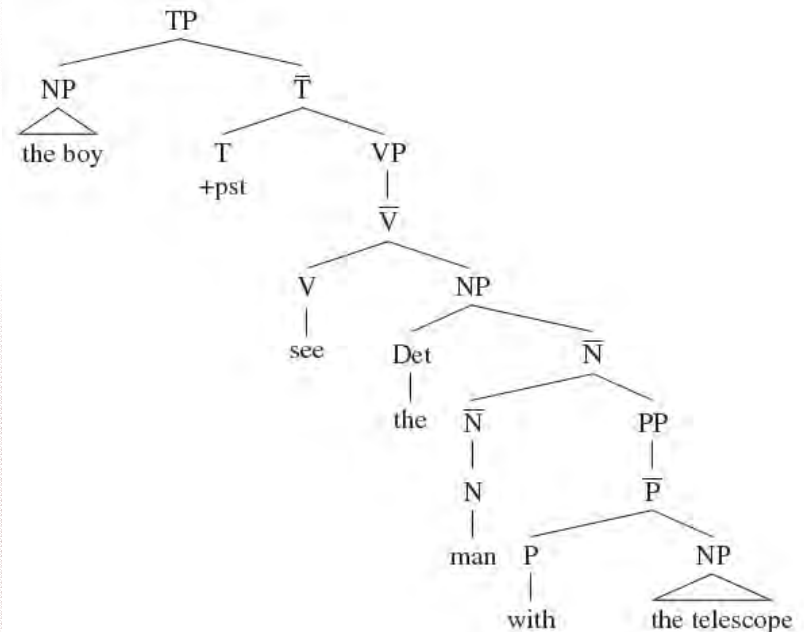
The boy saw the man with the telescope.

- The meanings are:
 - 1. The boy used the telescope to see the man
 - 2. The boy saw the man who had a telescope
- Each of these meanings can be represented by a different phrase structure tree
 - The two interpretations are possible because the PS rules allow more than one structure for the same string of words

Structural Ambiguities



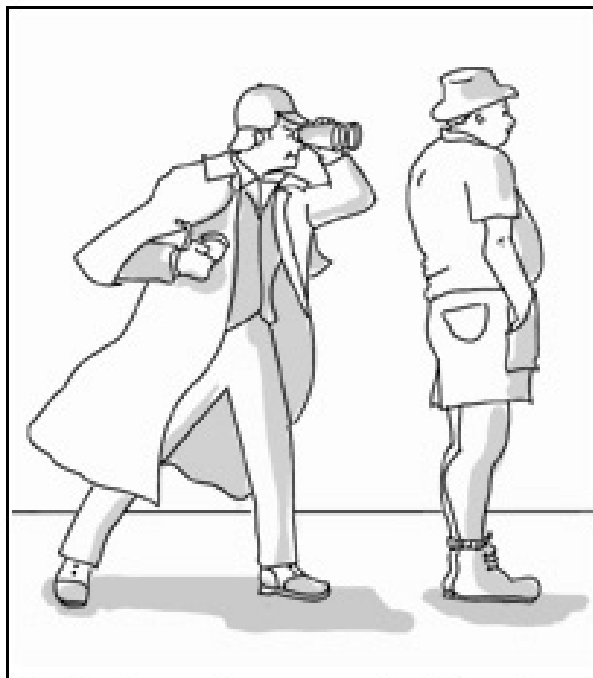
- The boy used a telescope to see the man



- The boy saw the man who had a telescope

Structural Ambiguity

- “Our enemies are innovative and resourceful, and so are we. They never stop thinking about new ways to harm our country and our people, and **neither do we.**”
- *President G.W. Bush*, Washington, D.C., 5 Aug. 2004.



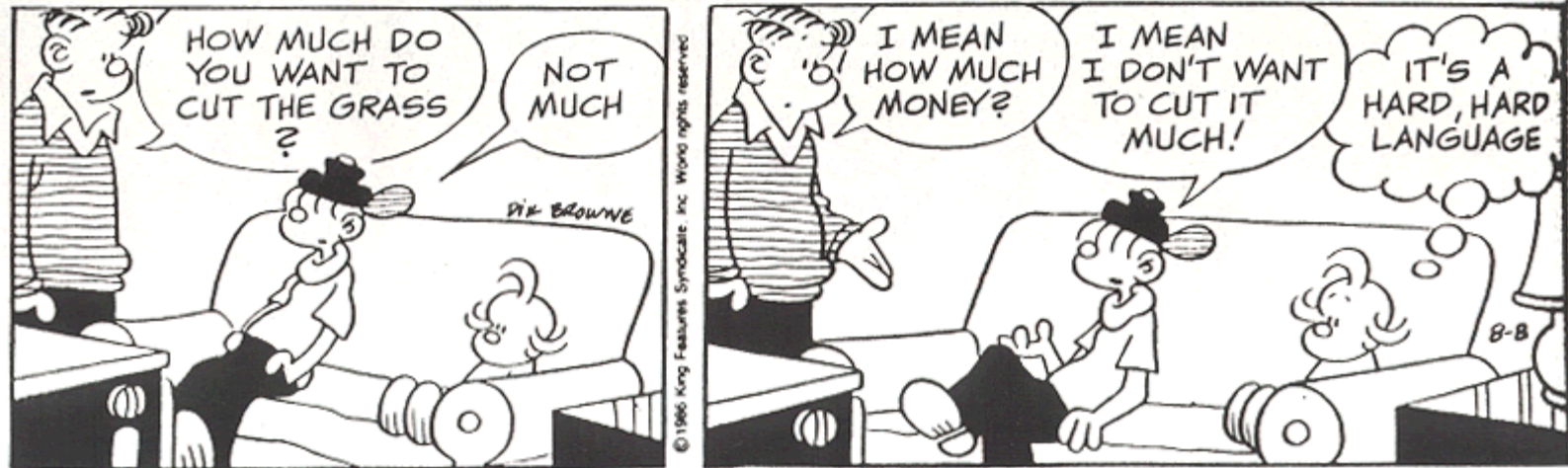
Sherlock saw the man using binoculars.



Sherlock saw the man using binoculars.

Structural Ambiguity

HI & LOIS



Structural Ambiguity

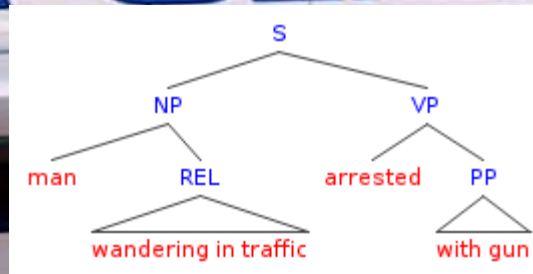
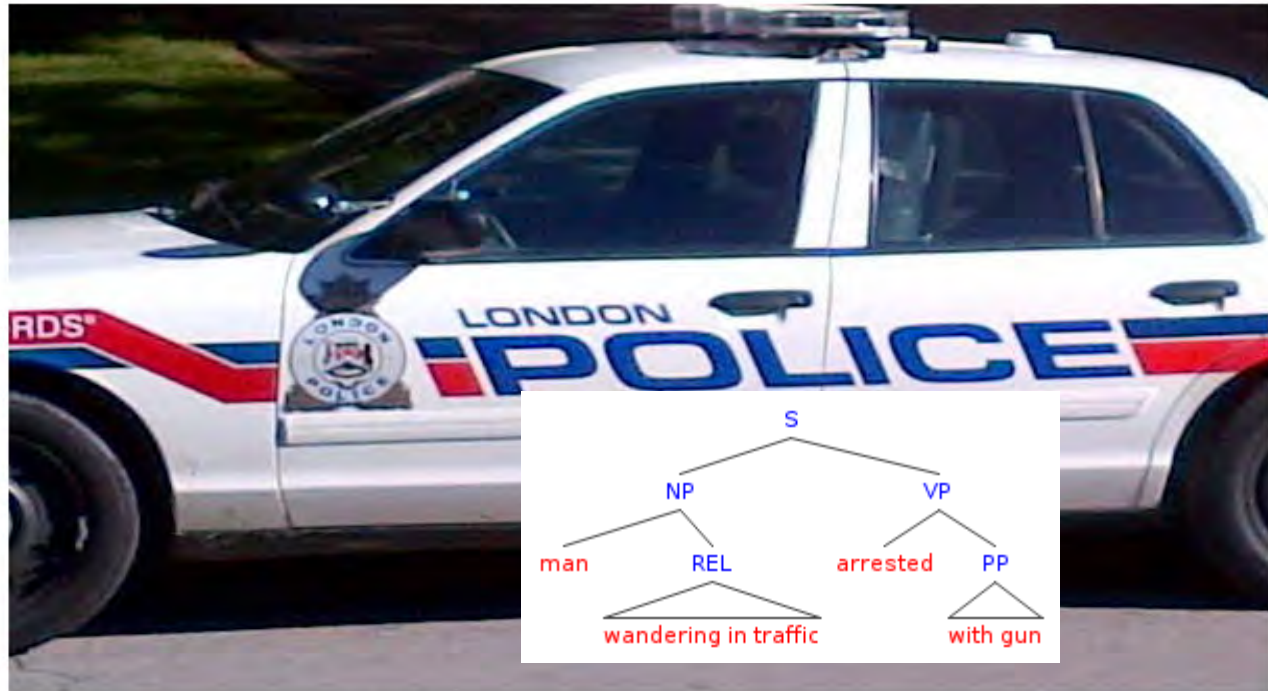
The London Free Press



Man wandering in traffic arrested with gun 36



By Jennifer O'Brien, The London Free Press
Wednesday, March 20, 2013 1:12:21 EDT PM



Structural Ambiguity

- “One morning I shot an elephant in my pajamas.”



Groucho Marx.mp4

- “How he got in my pajamas, I don't know.”
- Groucho Marx “Animal Crackers” (1930)

Structural Ambiguity

languageandlinguistics.tumblr.com

Structural ambiguity

“One morning, I shot an elephant in my pyjamas.
How he got into my pyjamas, I’ll never know”

So, let’s break this joke down.

The setup “I shot an elephant in pyjamas” has a structural ambiguity with the adjunct “in my pyjamas”

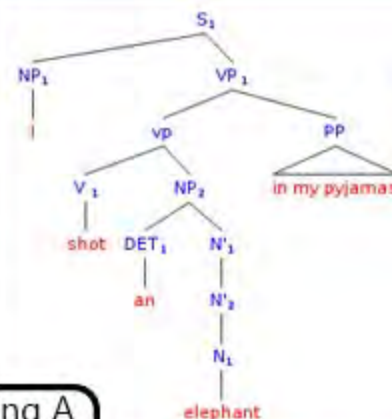
Depending on the position of this adjunct, two valid readings can be

An adjunct is part of the structure that is not required by the grammar but is there to add extra information

The speaker was wearing the pyjamas when he shot the elephant

The branching shows that the PP adjunct is outside of the NP headed by the noun ‘elephant’. This shows that the elephant cannot be wearing the pyjamas.

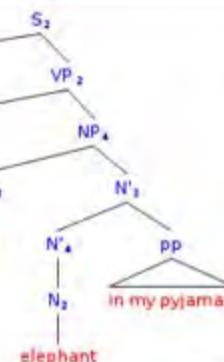
Meaning A



The elephant was wearing the pyjamas while being shot

The branching shows that the PP adjunct is inside the NP headed by noun ‘elephant’. This shows that the elephant is indeed wearing the pyjamas.

Meaning B



Note: Syntax trees are a tool for showing grammatical structures. These trees are simplified for the purpose of this image

Logically, we know elephants don't wear pyjamas. So, we automatically assume meaning A. But the punch line lets us know that the true meaning is meaning B, and hilarity ensues. The reason this joke works is because both forms are grammatically valid in English, but we use context and knowledge of the world to decide which structure must be the correct one.

Structural Ambiguity

Humorous ambiguity



- ✓ I just met the old Irishman and his son, coming out of the toilet.
- ✓ I wouldn't have thought there was room for the two of them.
- ✓ No silly, I mean / was coming out of the toilet. They were waiting.

Ambiguity is Ubiquitous

- Syntactic Analysis
 - “I ate spaghetti **with** chopsticks” vs. “I ate spaghetti **with** meatballs.”
- Semantic Analysis
 - “The dog is in the **pen**.” vs. “The ink is in the **pen**.”
 - “I put the **plant** in the window” vs. “Ford put the **plant** in Mexico”
- Pragmatic Analysis
 - From “The Pink Panther Strikes Again”:
 - Clouseau: Does your dog bite?
 - Hotel Clerk: No.
 - Clouseau: *[bowing down to pet the dog]* Nice doggie.
[Dog barks and bites Clouseau in the hand]
 - Clouseau: I thought you said your dog did not bite!
 - Hotel Clerk: That is not my dog.



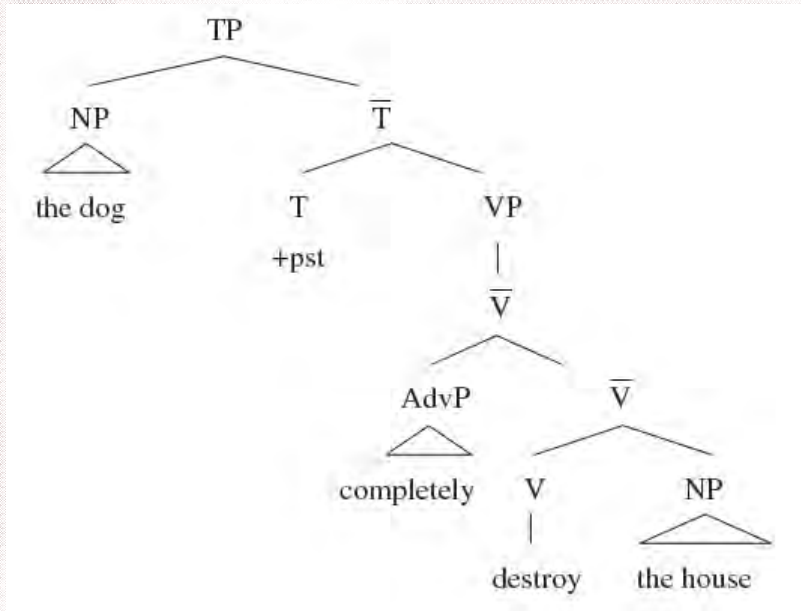
Pink Panther - Does your dog bite.mp4

Source: Akhtar Hussain “Natural Language Processing Introduction” (2012)

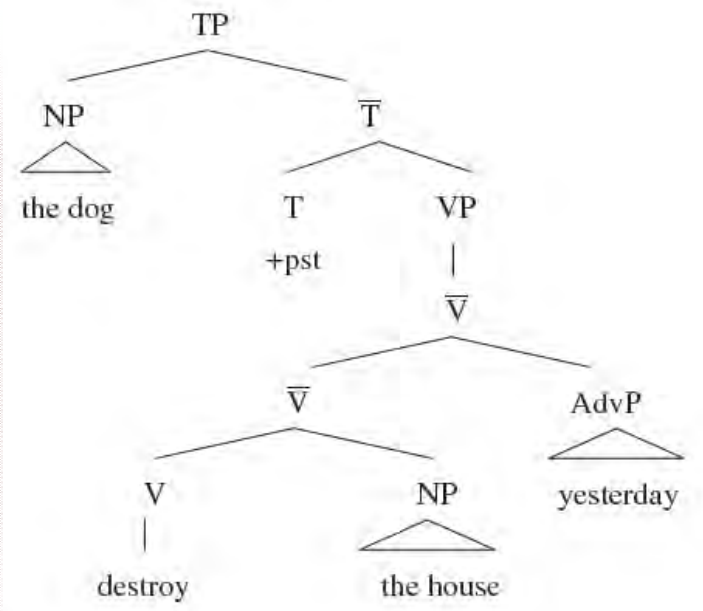
More Structures

- Adverbs are modifiers that can specify how (*quickly, slowly*) and when (*yesterday, often*) an event happens

17. $\bar{V} \rightarrow \text{AdvP } \bar{V}$



16. $\bar{V} \rightarrow \bar{V} \text{ AdvP}$



Transformational Analysis

- Recognizing that some sentences are related to each other is another part of our syntactic competence

The boy is sleeping.

Is the boy sleeping?

- The first sentence is a **declarative sentence**, meaning that it asserts that a particular situation exists
- The second sentence is a **yes-no question**, meaning that asks for confirmation of a situation
- The difference in meaning is indicated by different word orders, which means that certain structural differences correspond to certain meaning differences
 - For these sentences, the difference lies in where the auxiliary occurs in the sentence

Transformational Rules

- Yes-no questions are generated in two steps:
 - 1. The PS rules generate a declarative sentence which represents the basic structure, or **deep structure** (**d-structure**) of the sentence
 - 2. A **transformational rule** then moves the auxiliary before the subject to create the **surface structure** (**s-structure**)

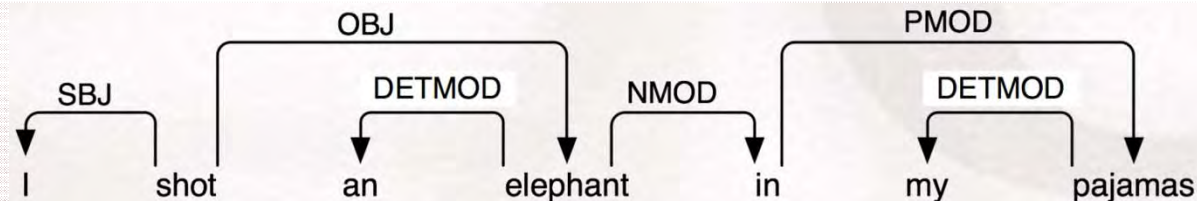


Transformational Rules

- Other sentence pairs that involve transformational rules are:
 - Active to passive
 - *The cat chased the mouse.* → *The mouse was chased by the cat.*
 - *there* sentences
 - *There was a man on the roof.* → *A man was on the roof.*
 - PP preposing
 - *The astronomer saw the quasar with the telescope.* → *With the telescope, the astronomer saw the quasar.*

The Structural Dependency of Rules

- Dependency grammar focusses on how words relate to other words. Dependency is a binary asymmetric relation that holds between a head and its dependents. The head of a sentence is usually taken to be the tensed verb, and every other word is either dependent on the sentence head, or connects to it through a path of dependencies.
- A dependency representation is a labeled directed graph, where the nodes are the lexical items and the labeled arcs represent dependency relations from heads to dependents.



- *Figure: Dependency Structure: arrows point from heads to their dependents; labels indicate the grammatical function of the dependent as subject, object or modifier.*
- From: <http://www.ling.helsinki.fi/kit/2009s/clt231/NLTK/book/ch08-AnalyzingSentenceStructure.html>

Wh Questions



Wh Questions

Example: *What will Max chase?*

- This *Wh* question is formed in three steps:
 - 1. The PS rules generate a basic declarative word order:
Max will chase what?
 - 2. Move shifts the word *what* to the beginning of the sentence: *What Max will chase?*
 - 3. Move shifts the modal *will* to occur before the subject NP: *What will Max chase?*

The Infinity of Language: Recursion

- Recursion is a computational procedure that calls itself, or that calls an equivalent kind of procedure. [...] In tail recursion, the procedure is invoked at the end of a sequence, as in the familiar story of *The House the Jack Built*:

This is the house that Jack built.

This is the malt that lay in the house

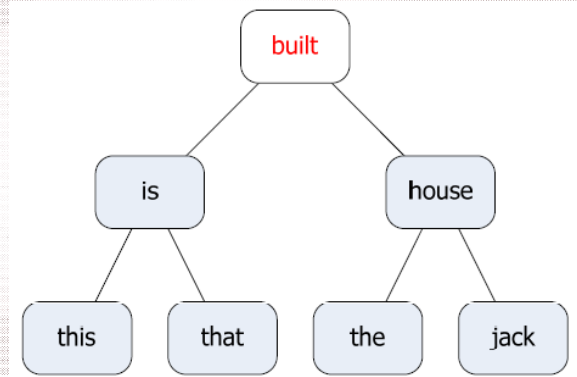
that Jack built.

This is the rat that ate the malt that lay

in the house that Jack built.

This is the cat that worried the rat that ate

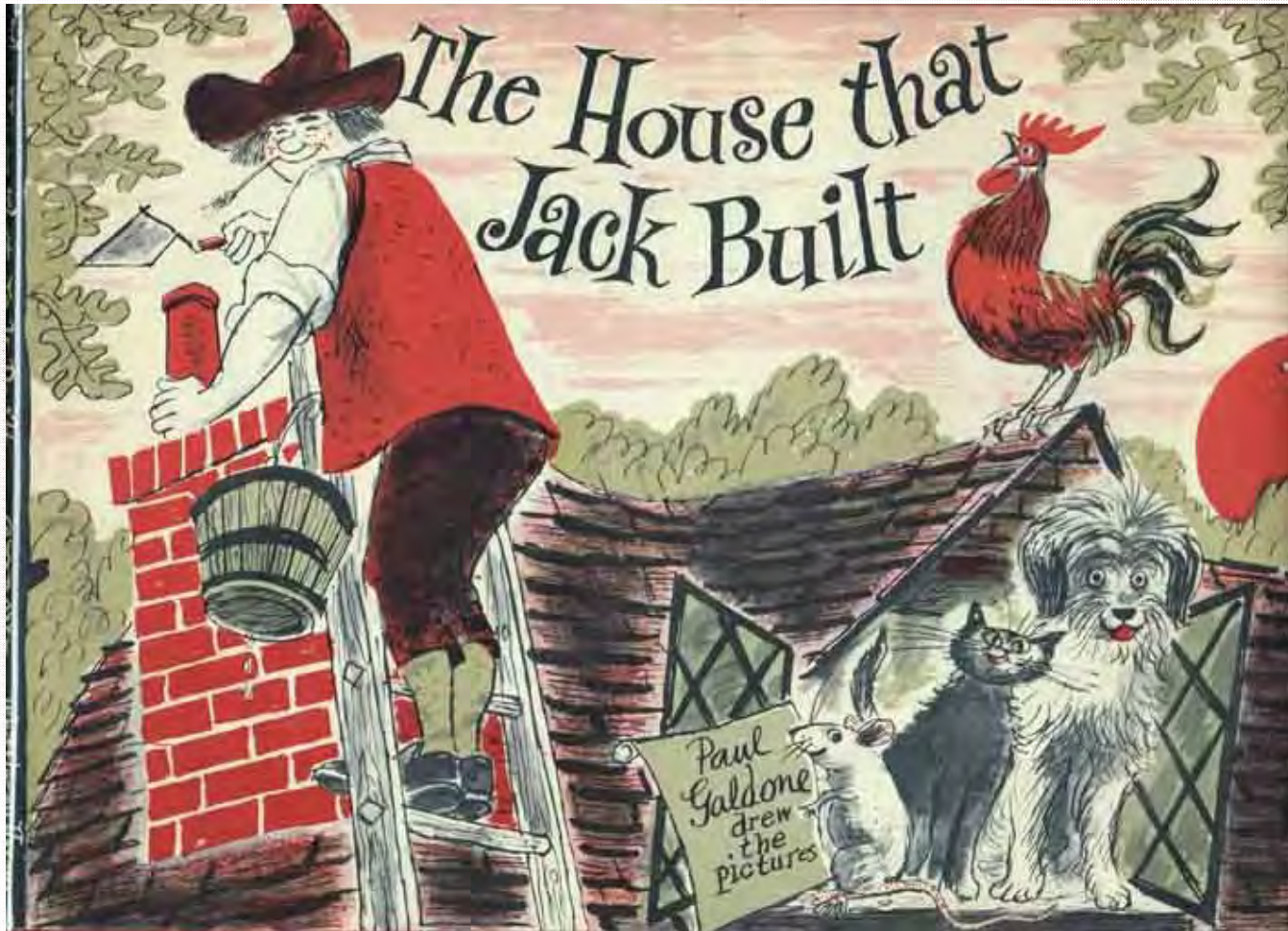
the malt that lay in the house that Jack built.



- In each sentence a constituent from the previous sentence is added to the end. As young children quickly understand, this recursive procedure allows us to create sentences of any desired length and complexity.
- In short, all constituents are necessary for full meaning, and the various constituents cannot be construed as unrelated.

Source: Michael C. Corballis “Recursion, Language, and Starlings” (2007)

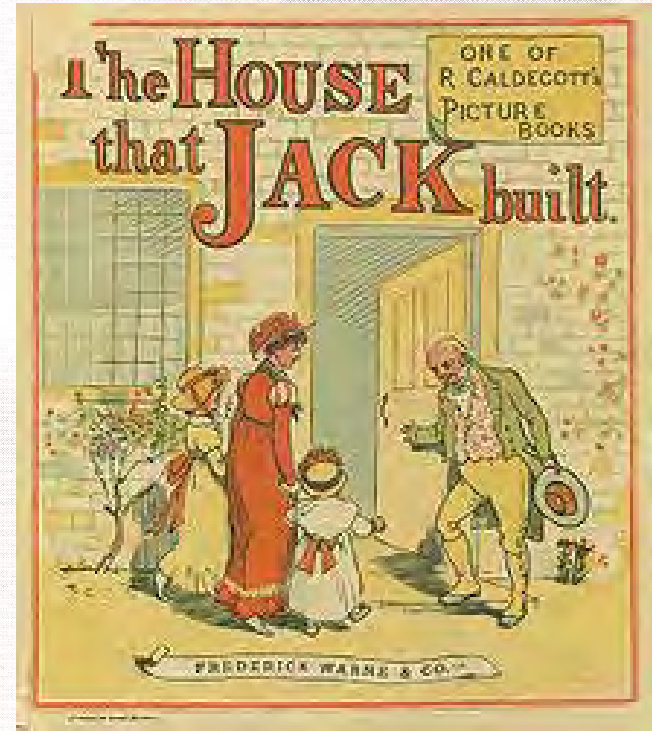
The Infinity of Language: *The House that Jack Built*



The Infinity of Language:

The House that Jack Built

- "This Is the House That Jack Built" is a popular British nursery rhyme and cumulative tale. It did not appear in print until it was included in *Nurse Truelove's New-Year's-Gift, or the Book of Books for Children*, printed in London in 1755.
- **Narrative Technique.** It is a cumulative tale that does not tell the story of Jack's house, or even of Jack who built the house, but instead shows how the house is indirectly linked to other things and people, and through this method tells the story of "The man all tattered and torn", and the "Maiden all forlorn", as well as other smaller events, showing how these are interlinked.
- **Syntactic Structure.** Each sentence in the story is an example of an increasingly deeply nested relative clause. The last version, "This is the horse...", would be quite difficult to untangle if the previous ones were not present.

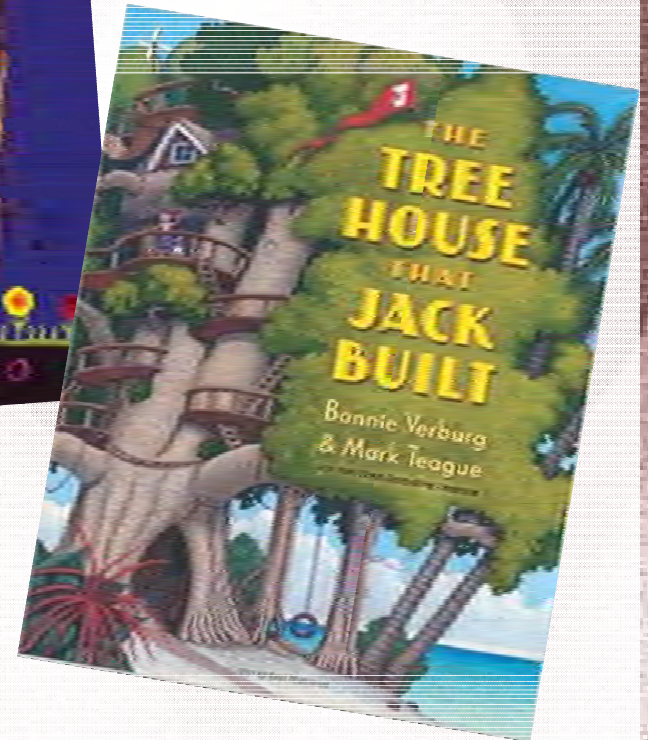
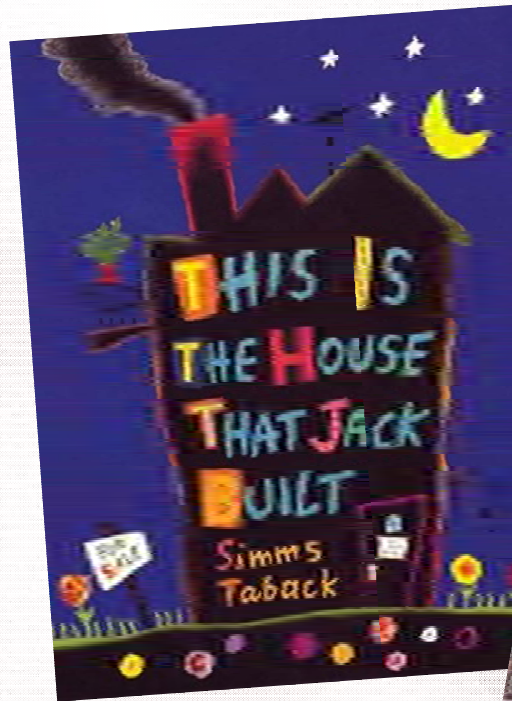


The Infinity of Language: *The House that Jack Built*

- 0 This is the house.
- 1 This is the house
that Jack built.
- 2 This is the malt
that lay in the house
that Jack built.



The house that Jack built.mp4



* Numbers indicate
the number of
embedded clauses

The Infinity of Language:

The House that Jack Built

3 This is the rat
that ate the malt
that lay in the house
that Jack built.

4 This is the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.



The Infinity of Language:

The House that Jack Built

- 5 This is the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.
- 6 This is the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.



The Infinity of Language:

The House that Jack Built

7 This is the maiden all forlorn
that milked the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.

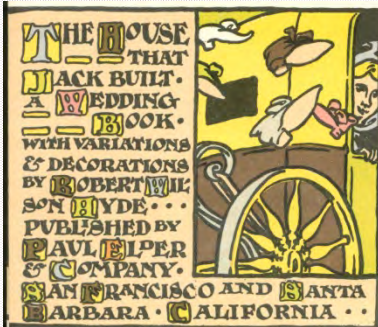
8 This is the man all tattered and torn
that kissed the maiden all forlorn
that milked the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.



The Infinity of Language:

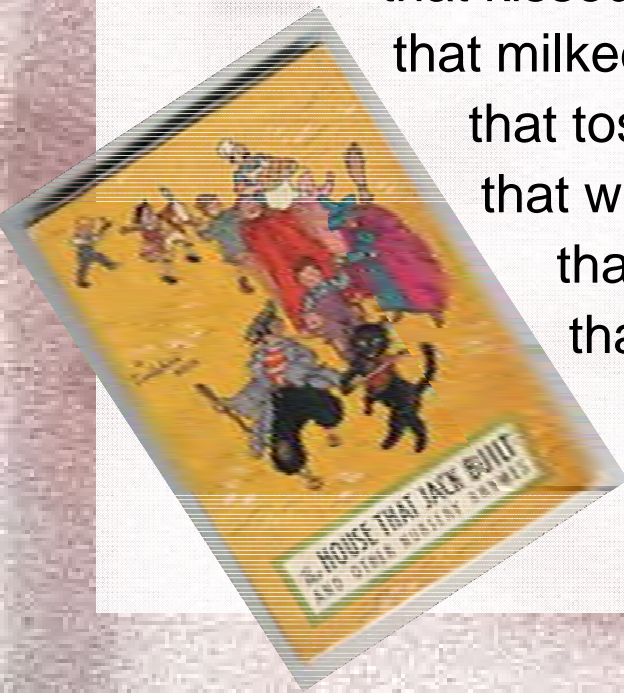
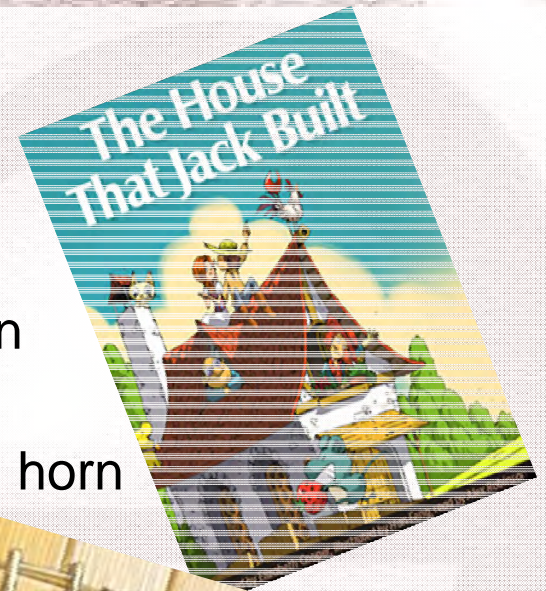
The House that Jack Built

9 This is the priest all shaven and shorn
that married the man all tattered and torn
that kissed the maiden all forlorn
that milked the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.



The Infinity of Language: *The House that Jack Built*

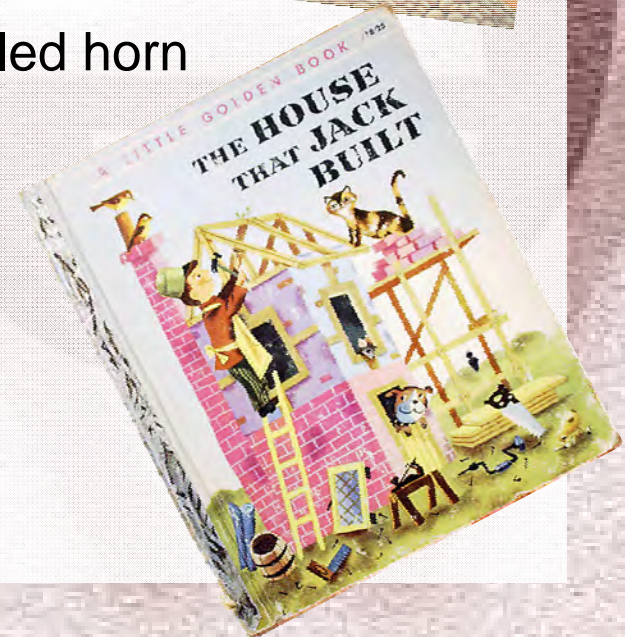
10 This is the cock that crowed in the morn
that waked the priest all shaven and shorn
that married the man all tattered and torn
that kissed the maiden all forlorn
that milked the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.



The Infinity of Language:

The House that Jack Built

11 This is the farmer sowing the corn
that kept the cock that crowed in the morn
that waked the priest all shaven and shorn
that married the man all tattered and torn
that kissed the maiden all forlorn
that milked the cow with the crumpled horn
that tossed the dog
that worried the cat
that killed the rat
that ate the malt
that lay in the house
that Jack built.

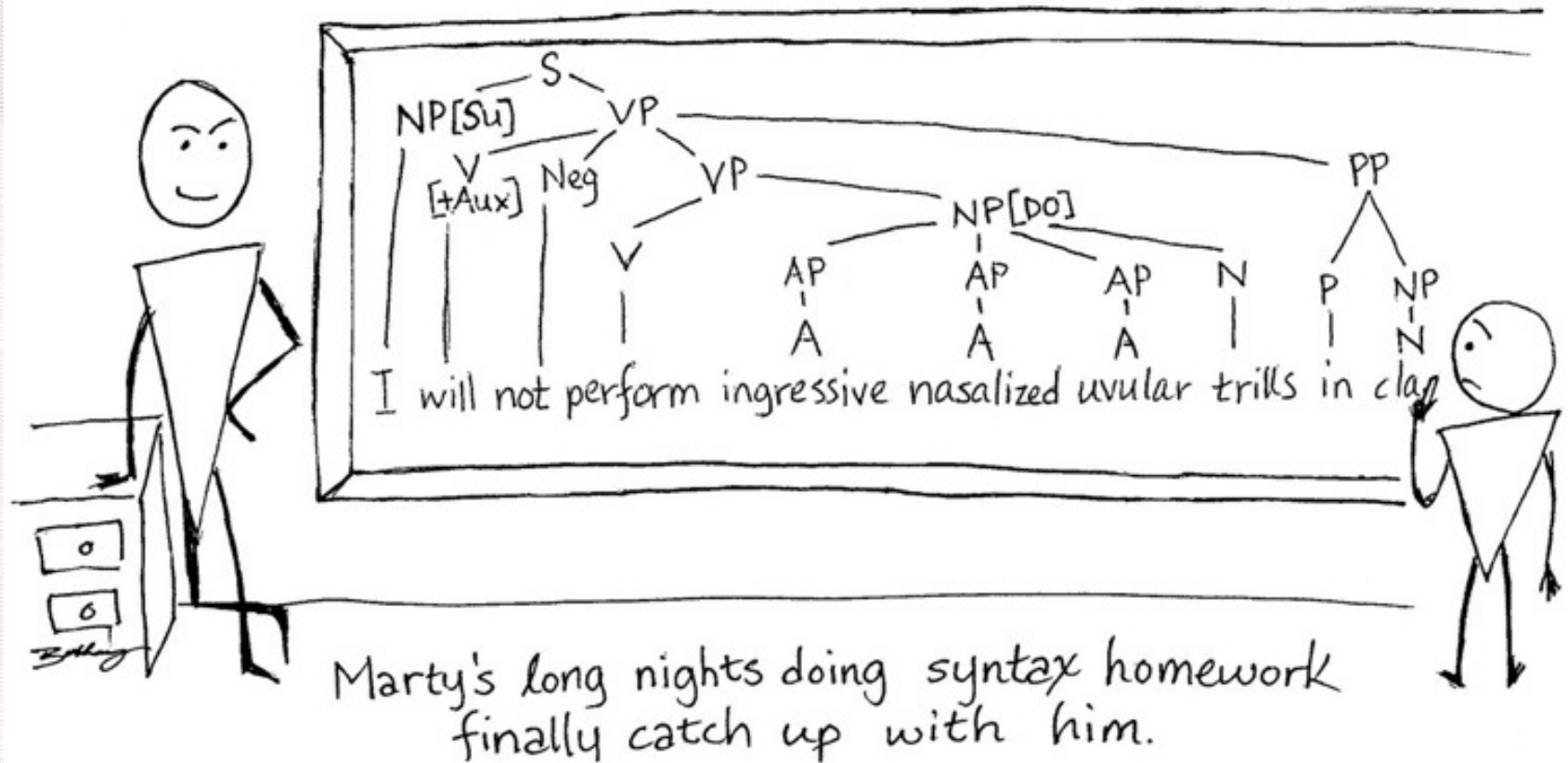


The Infinity of Language: ***The House that Jack Built***

<https://www.youtube.com/watch?v=OYHYhZ97Jac>



Syntax Homework



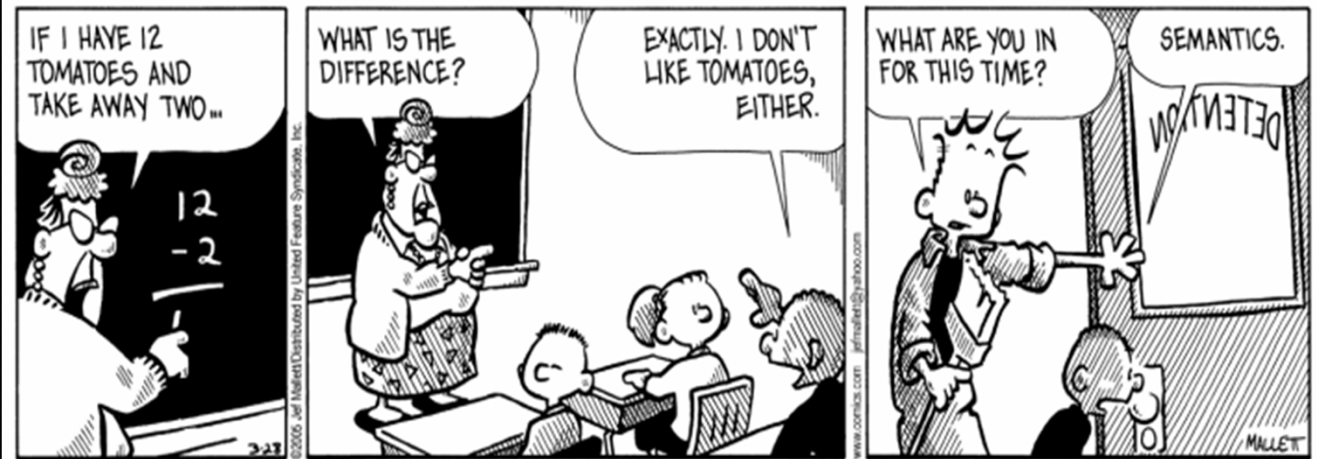
Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

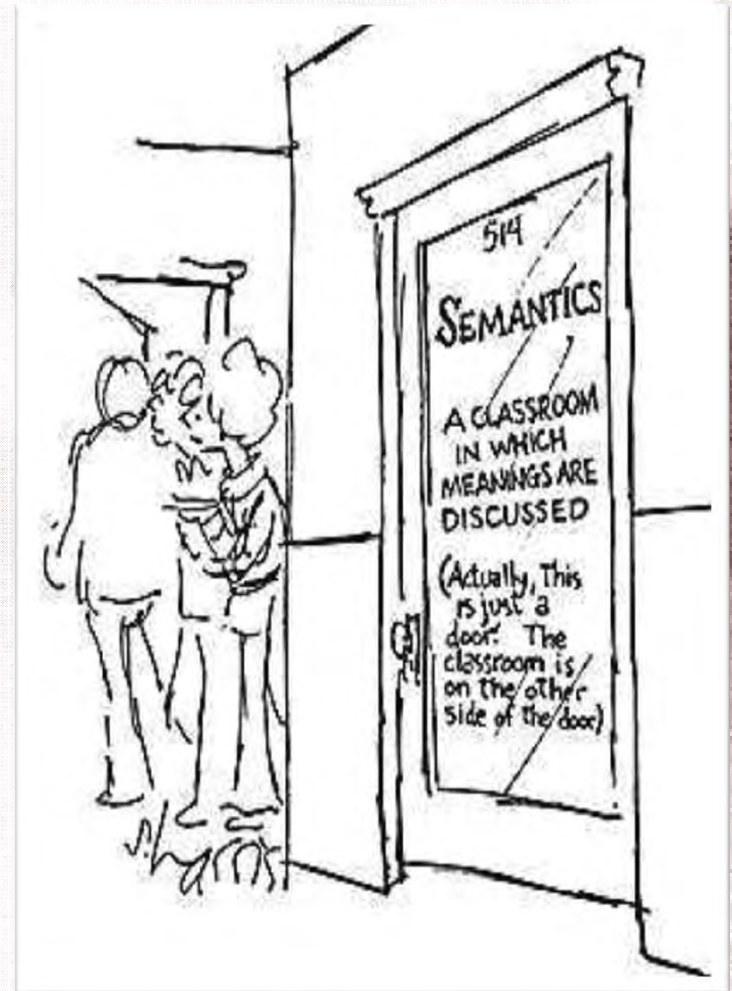
Chapter 4



The Meaning of Language

The Meaning of Language

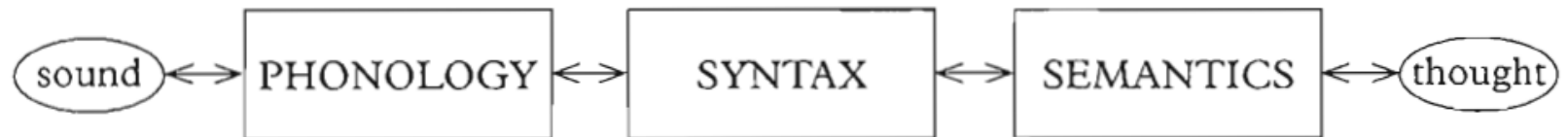
- When you know a language you know:
 - When *a word* is meaningful or meaningless, when a word has two meanings, when two words have the same meaning, and what words refer to (in the real world or imagination)
 - When *a sentence* is meaningful or meaningless, when a sentence has two meanings, when two sentences have the same meaning, and *whether a sentence is true or false* (the **truth conditions** of the sentence)



What is Semantics

- **Semantics**—the study of the linguistic meaning of morphemes, words, phrases and sentences. It forms a system within **grammar**, together with phonology, morphology, syntax, and the lexicon.

Figure 1.1 Components of grammar



- **Lexical Semantics**—the study of the meanings of words
- **Phrasal/Sentential Semantics**—the meaning of syntactic units larger than words
- **Pragmatics**—the study of how context affects meaning

Lexical Semantics

- **Lexical Semantics** — the study of the meanings of words

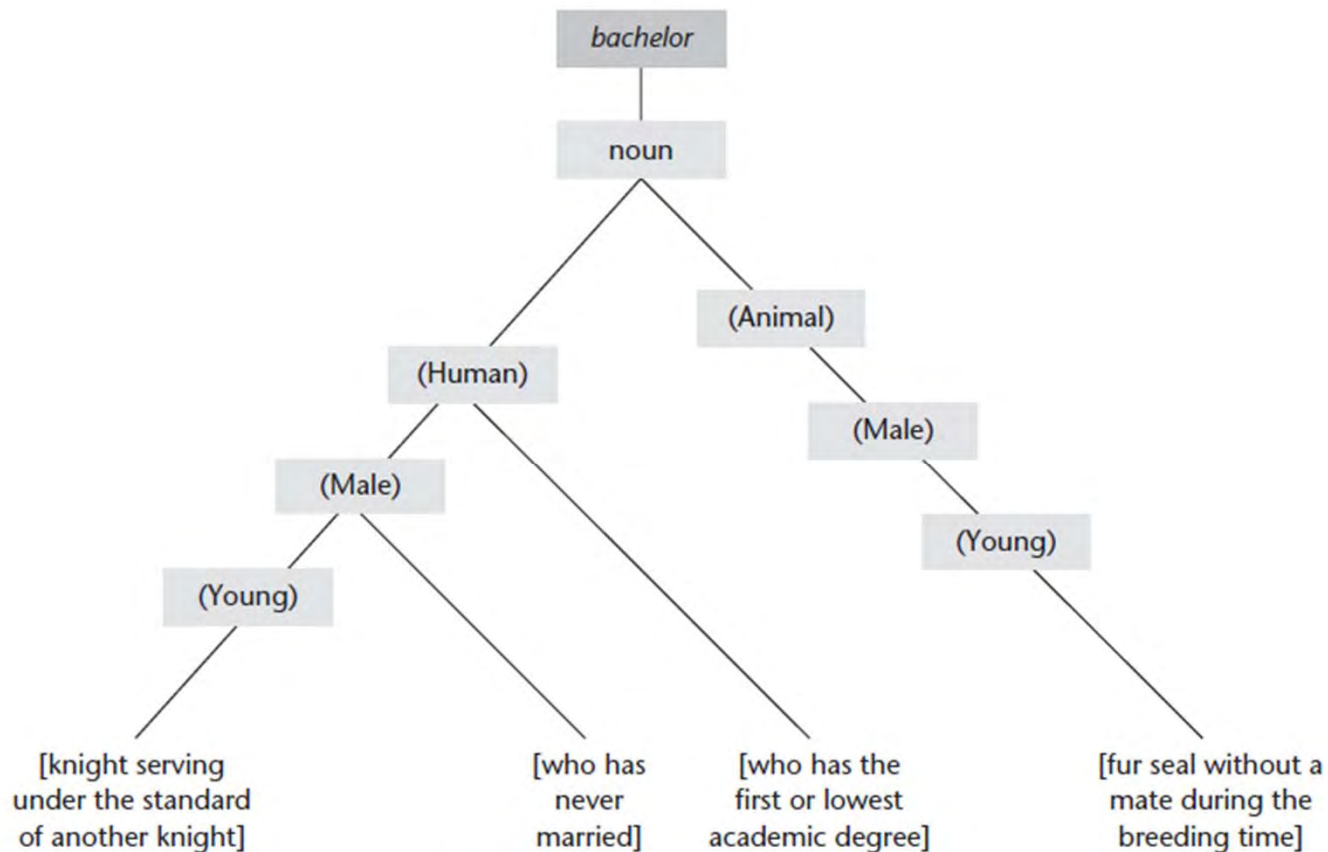
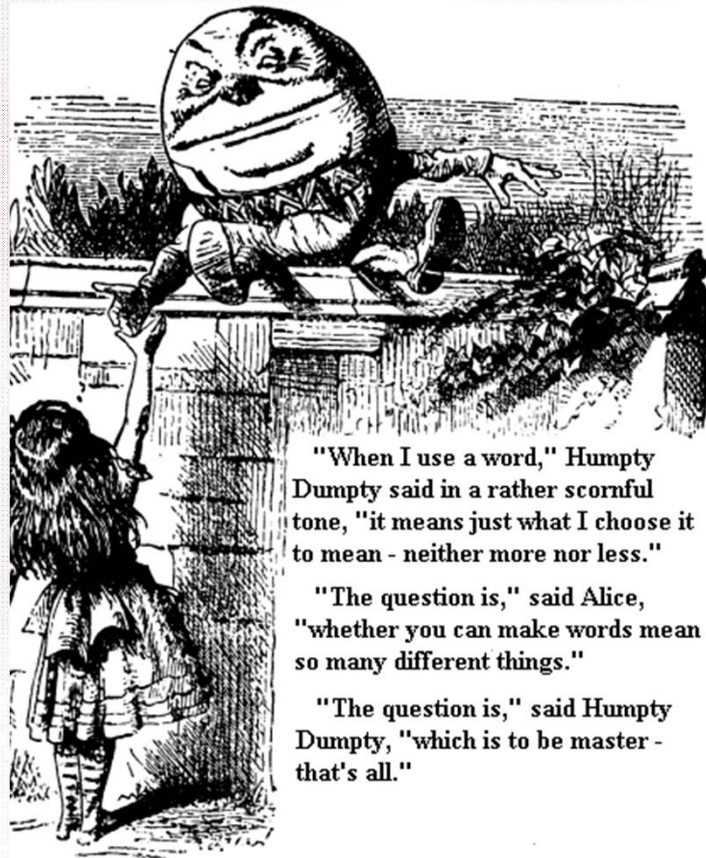


FIGURE 3.1. English *bachelor* according to Katz and Fodor

Sentence Meaning

- To know the meaning of a sentence means to know under what conditions / circumstances it would be true or false



- '... that shows that there are three hundred and sixty-four days when you might get un-birthday presents.'
- 'Certainly,' said Alice.
- 'And only one for birthday presents, you know. There's glory for you!'
- 'I don't know what you mean by "glory,"' Alice said.
- Humpty Dumpty smiled contemptuously. 'Of course you don't - till I tell you. I meant "there's a nice knockdown argument for you."'
- 'But "glory" doesn't mean 'a nice knockdown argument,' Alice objected.
- 'When I use a word,' Humpty Dumpty said in rather a scornful tone, 'it means just what I choose it to mean - neither more nor less.'
- 'The question is,' said Alice, 'whether you can make words mean so many different things.'
- 'The question is,' said Humpty Dumpty, 'which is to be master - that's all.'

- Lewis Carroll *Through the Looking Glass*.

Sentence Meaning: Truth

- *How many legs does a dog have if you call its tail a leg?*
 - *Four.*
 - *Calling a tail a leg doesn't make it one.*
- Attributed to Abraham Lincoln

Sentence Meaning: Truth

- To know the meaning of a sentence means to know under what conditions / circumstances it would be true or false, i.e.,

“a sentence is T, *if* _____ (circumstances)”

- Sentence meaning can be obtained through **truth-conditional semantics**, also called **compositional semantics**.
- The *INTENSION* or *sense* of a sentence is the **truth conditions** or **circumstances** against which the sentence will be regarded as true.
- The *EXTENSION* or *reference* of a sentence is **the truth value**—either **Truth** or **Falsehood**—that the sentence will obtain whether in real or in imaginative circumstances.

Truth Conditions vs. Truth Values

- Consider the following example:



Truth Conditions vs. Truth Values

- Consider the following example:

The moon is made of green cheese

- **Intension/sense/true condition:**

Green cheese is the ingredient of this natural satellite called Moon.



- **Extension/reference/true value:** “False”, from current scientific perspective; or “True,” in science fiction or fantasy. In general the **true value** is computed by the sense-based **truth condition** (itself an if-function) in a certain possible world.

Truth Conditions vs. Truth Values

- Let's take another example:

Ex. *Dogs are flying low today. It's going to rain.*

- In a certain possible world this sentences could satisfy the *truth condition*.
- Most sentences are true or false depending on the situation
- However, we will see later that:
 - some sentences are always true (**tautologies**)
 - and some are always false (**contradictions**)

Sentence Meaning Relations

- **Paraphrases**—two sentences have the same truth values, entail each other, or are **synonymous**:
 - *The bus has left.* \approx *The bus is no longer here.* ($T \blacktriangleright T$ or $F \blacktriangleright F$)
- **Entailment**—the truth of one sentence entails (= necessarily implies) the truth of another sentence.
 - Ex. *Judy sings beautifully.* \Rightarrow *Judy sings.* ($T \blacktriangleright T$)
- **Contradictory**—negative entailment; the truth of one sentence entails the falseness of another sentence.
 - Ex. *Jack is alive.* \Leftrightarrow *Jack is dead.* ($T \blacktriangleright F$ or $F \blacktriangleright T$)

Paraphrases

- Through **transformation** (different info structures nonetheless)
 - *The horse threw the rider.*
 - *The rider was thrown by the horse.*
 - *It is easy to play sonatas on this piano.*
 - *On this piano it is easy to play sonatas.*
 - *This piano is easy to play sonatas on.*
 - *Sonatas are easy to play on this piano.*
- Through **substitution** (different implications nonetheless)
 - *He can go. = He is able to go. = He has the ability to go.*
 - *John saw Mary. = John perceived Mary using his eyes.*

Entailment & Contradiction

- **Entailment:** one sentence entails another if whenever the first sentence is true the second one *must* be true also

Jack swims beautifully.

entails

Jack swims.

but

Jack swims

does not entail

Jack swims beautifully

- When two sentences entail each other, they are **synonymous**, or **paraphrases**

Jack postponed the meeting

Jack put off the meeting

- When one sentence entails the negation of another sentence, the two sentences are **contradictions**

Jack is alive

Elizabeth II is Queen of England.

Jack is dead

Elizabeth II is a man.

Fixed Truth Values

- **Tautology**—a sentence that is true by definition regardless of its truth condition, a.k.a. an **analytic** statement:
 - Ex. *Jane's husband is a married man.*



Fixed Truth Values

- **Contradiction**—a sentence that is necessarily false regardless of its truth circumstance:
 - Ex. *The disqualified won the tournament.* *My brother is an only child.*



Ambiguity & Truth Value

From “The Pink Panther Strikes Again”:

Clouseau: *Does your dog bite?*

Hotel Clerk: *No.*

Clouseau: [bowing down to pet the dog] *Nice doggie.*

[Dog barks and bites Clouseau in the hand]

Clouseau: *I thought you said your dog did not bite!*

Hotel Clerk: *That is not my dog.*

Compositional Semantics

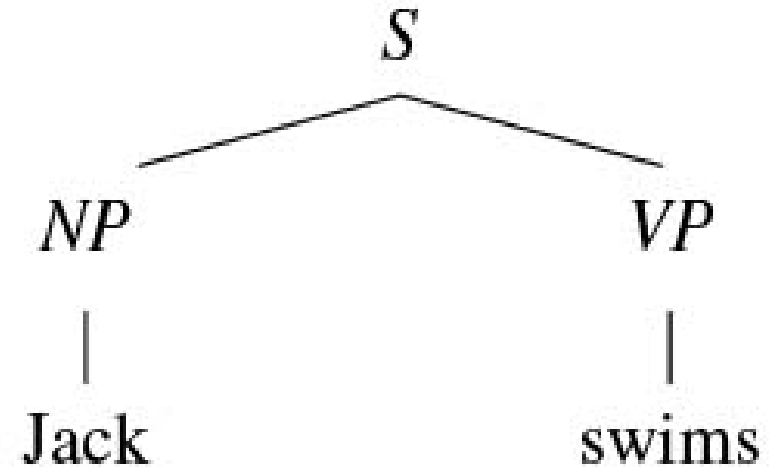
- **Compositional semantics**: to account for speakers' knowledge of truth, entailment, and ambiguity, we must assume that grammar contains semantic rules for how to combine the meanings of words into meaningful phrases and sentences
 - The **principle of compositionality** asserts that the meaning of an expression is composed of the meaning of its parts and how the parts are combined structurally
 - Semanticists think that the best way to define **predicates** (verbs, adjectives and common nouns) is in terms of the individuals that those predicates successfully describe. In particular, the best way to characterize the meaning of *swim* is by having it denote the *set* of individuals (human beings and animals) that swim.

Compositional Semantics

- The extension-based meaning of *proper names* refers to **individuals**:
 - *Jack* means Jack.
 - *Elvis* means Elvis.
- Semantic Rule I: The extension-based meaning of predicates (common NPs, VPs, and APs) refers to **a set of individuals**:
 - *My friend* means {Beth, Elsa, Helen, Lyn, and Maggie}.
 - *Dances* means {Al, Ben, Chuck, Dan, and Elvis}.
 - *Is a movie star* means {Jennifer, Leo, Meryl, and Johnny}.
 - *Kissed John* means {Nancy, Mary, O.J., and PerryAnn}.
- Semantic Rule II: The extension-based meaning of transitive verbs refers to **a set of pairs of individuals**:
 - *Kissed* means {(Mary, John), (Helen, David), (Sue, Justin), (Dawn, Guy), and (Stephanie, Dominique)}).

Semantic Rules

- **Semantic Rule I:** if the meaning of NP (an individual) is a member of the meaning of the VP (a set of individuals), then S is TRUE, otherwise, it is FALSE



<u>Word</u>	<u>Meaning</u>
<i>Jack</i>	refers to the individual Jack
<i>swims</i>	refers to the set of individuals that swim

- If the NP, Jack, is among the set of individuals that swims (the VP) then the sentence is TRUE

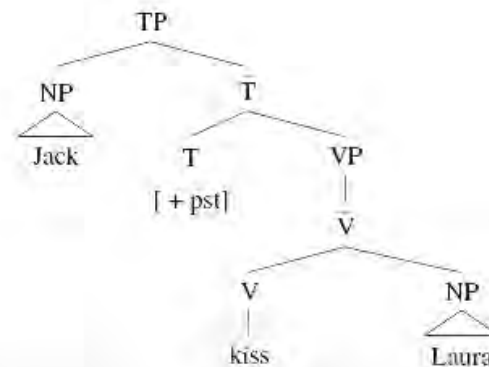
Semantic Rules

- **Semantic Rule II:**

Word	Meanings
<i>Jack</i>	refers to (or means) the individual Jack
<i>Laura</i>	refers to (or means) the individual Laura
<i>kissed</i>	refers to (or means) the set of <u>pairs of individuals</u> X and Y such that X kissed Y.

Jack kissed Laura.

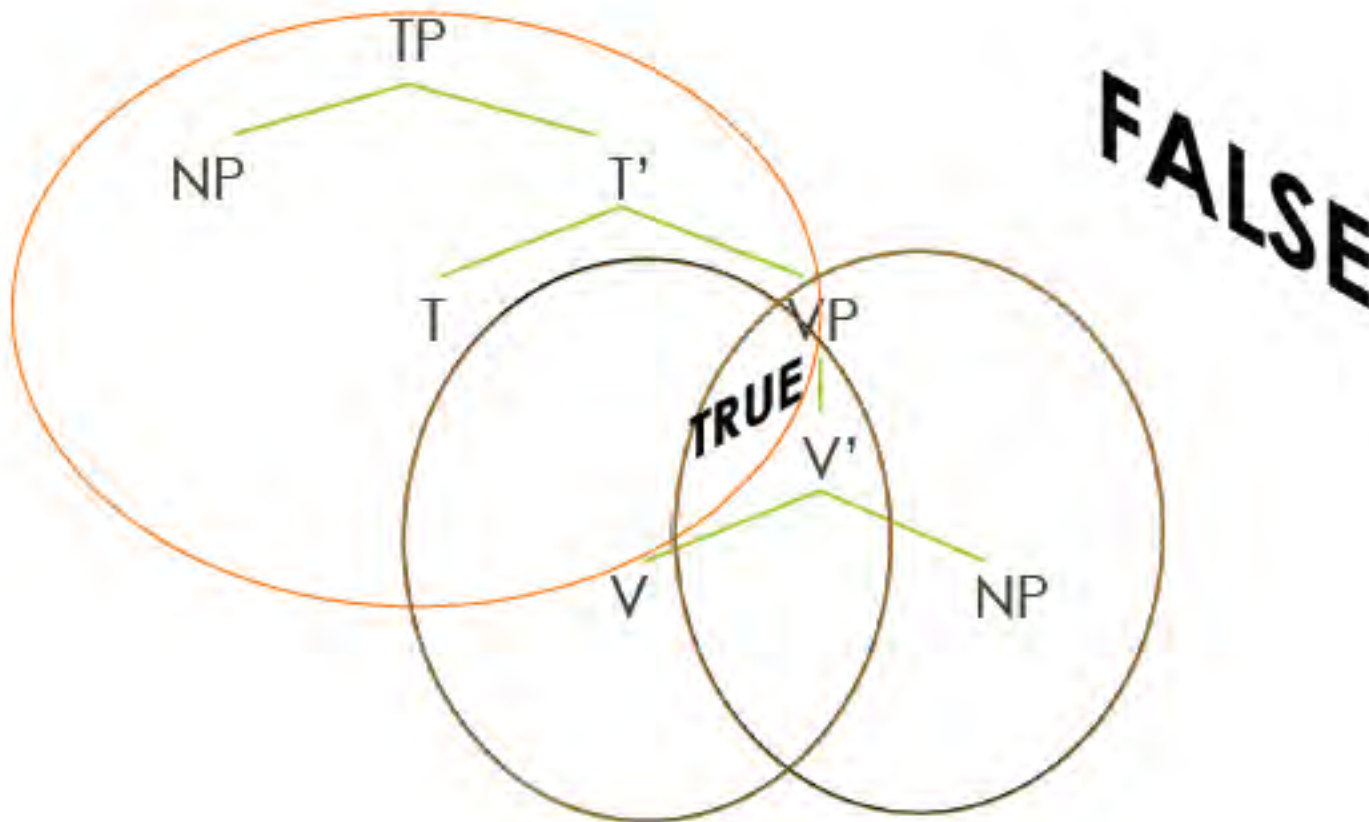
Here is the phrase structure tree:



- If the NP Jack is among the set of people who kissed Laura (the VP), then the sentence is TRUE

Semantic Rules I & II

- The rules can be diagrammed as follows:



This sentence is false.

- The semantic theory of sentence meaning that we just sketched is not the only possible one, and it is also incomplete, as shown by the paradoxical sentence

This sentence is false.

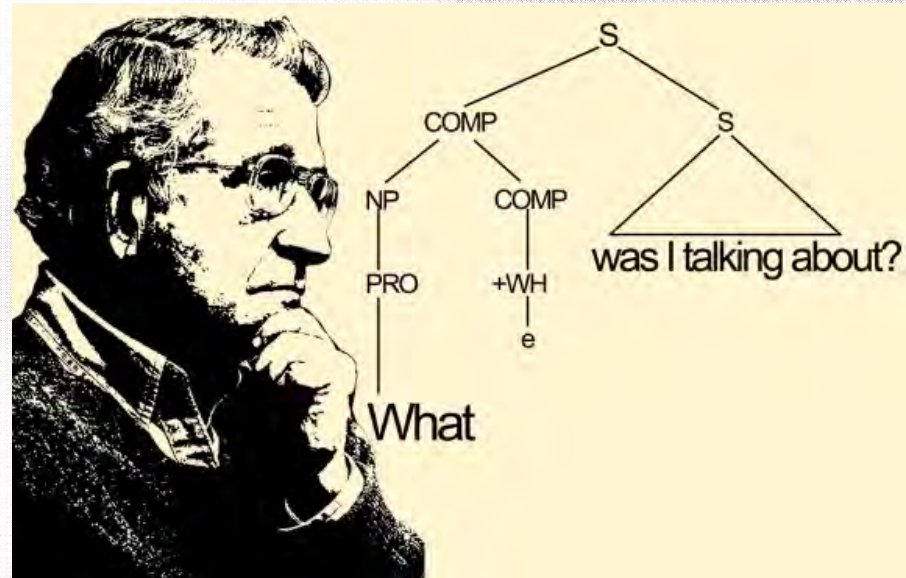


- The sentence cannot be true, else it's false; it cannot be false, else it's true. Therefore it has no truth value, though it certainly has meaning.

When Compositionality Goes Awry: Anomaly

- Semantically **anomalous** sentence:

*Colorless
green
ideas
sleep
furiously.*



- Noam Chomsky
- This sentence is syntactically fine, but contains semantic violations such as describing *ideas* as both *colorless* and *green*

When Compositionality Goes Awry: Anomaly

- Let's take another example:

Colorful white sale continues

OUR COLORFUL WHITE
SALE CONTINUES THRU
SATURDAY! EVERY SHEET
REDUCED!

Colorful White Sale

Famous Pepperell's pastel
colored sheets

DON'T SLEEP THROUGH OUR
WHITE SALE!

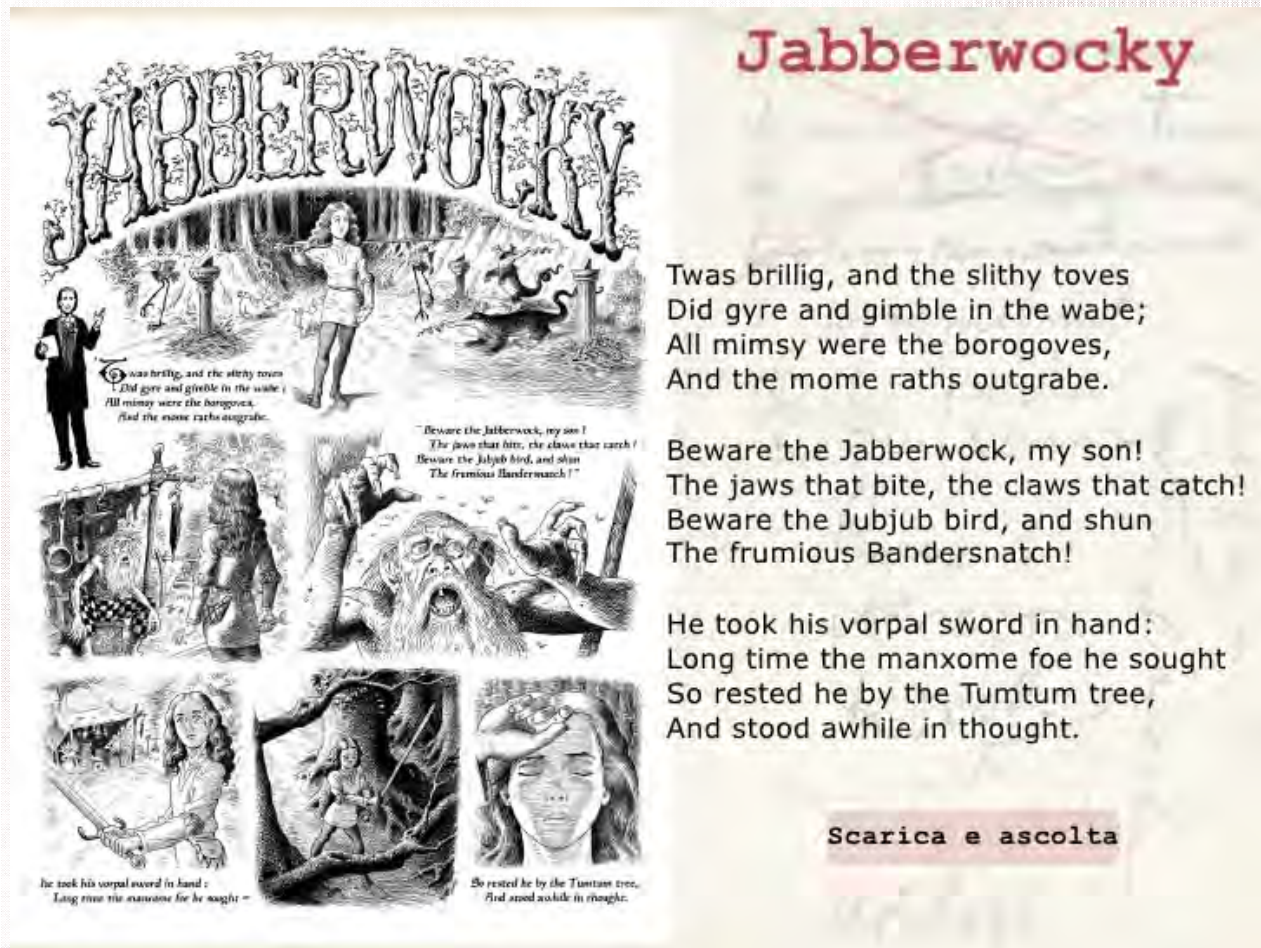
WAKE UP TO THE GIGANTIC SAVINGS ON EVERYTHING
TO MAKE YOUR HOME MORE COMFORTABLE
FOR YOU AND YOUR FAMILY

Hens & Kelly be chic!...save 

JANUARY COLORFUL WHITE SALE

When Compositionality Goes Awry: Anomaly

- Other syntactically correct sentences include (or are built up of) nonsense words:



When Compositionality Goes Awry: Metaphor

- **Metaphors** are figures of speech in which words are not meant to be interpreted literally. The general pattern of the metaphor is $A \equiv B$, where A is the *tenor* & B is the *vehicle*.

LIFE IS A JOURNEY

He's *without direction* in life.

I'm *at crossroads* in my life.

She's *gone through* a lot in life

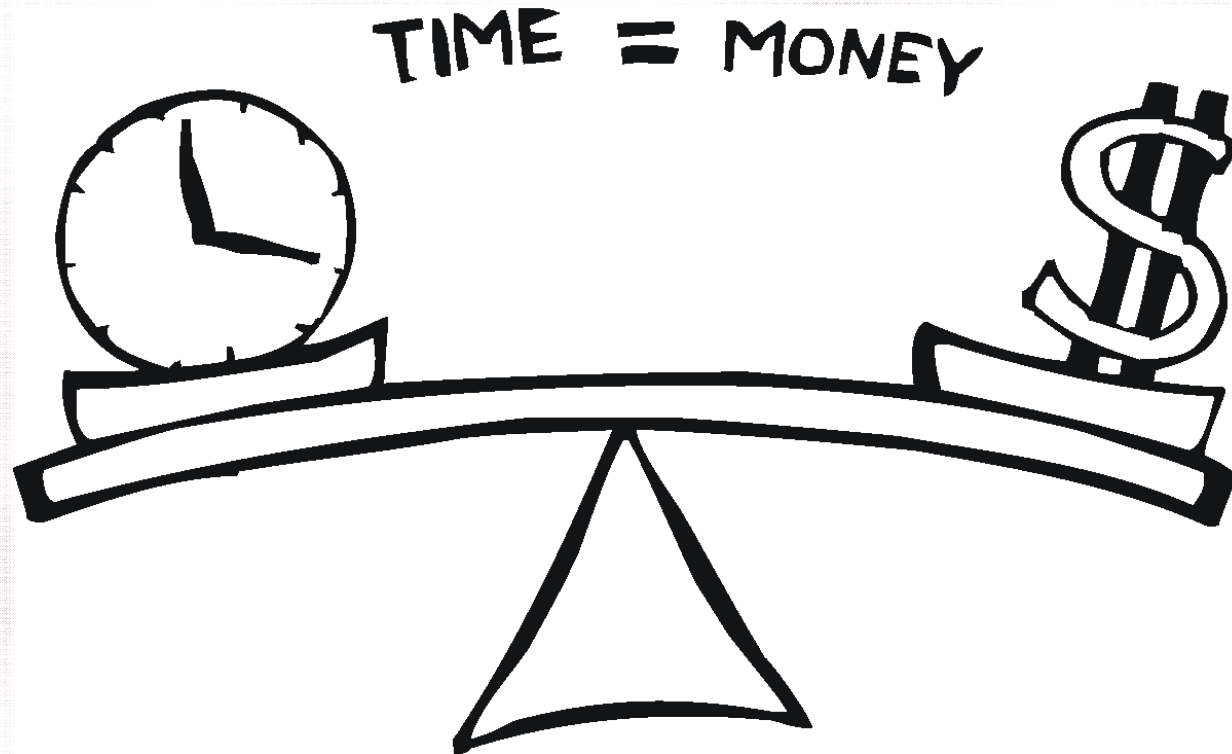
He's *never let anyone get in his way*.

I'm *where I want to be* in life.

She'll *go places* in life.

Time is money

- We “save time,” “waste time,” “manage time,” push things “back in time,” live on “borrowed time,” and suffer the “ravages of time” as the “sands of time” drift away.



When Compositionality Goes Awry: Idioms

- **Idiomatic phrases** are expressions fixed in form and meaning as single, noncompositional items; their meaning cannot be predicted based on the meanings of the individual words
 - The usual semantic rules for combining meanings do not apply

drop the ball

put his foot in his mouth

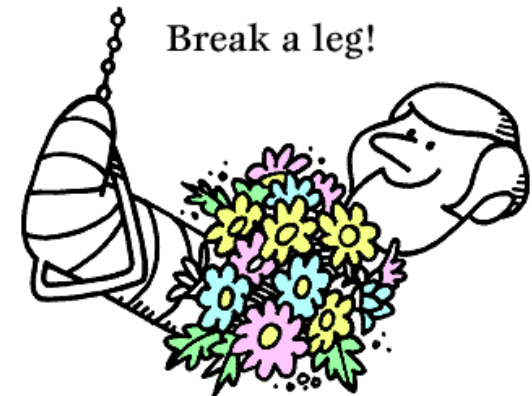
break a leg

bite your tongue

to pull someone's leg

to rain cats and dogs

I have butterflies in my stomach



- All languages have idioms, but idioms are rarely directly translatable

kick the bucket = *estirar la pata* “to stretch the (animal) leg”

Lexical Relations:

Family of *-nyms*

- ◉ *-(o)nym* < Fr. or Lt. < Gk. *-ὀμώνυμ* *-onumon* 'name'
- ◉ Homonym < *homos* 'same' + *onoma* 'name'
- ◉ Synonym < *sun-* 'with' + *onoma* 'name'
- ◉ Antonym < *anti-* 'against' + *onoma* 'name'
- ◉ Hyponym < *hypo* 'below' + *onoma* 'name'
- ◉ Hypernym < *hyper-* 'beyond' + *onoma* 'name'
- ◉ Metonym < *meta-* 'change' + *onoma* 'name'
- ◉ Retronym < *retro* 'backwards' + *onoma* 'name'
- ◉ Toponym < *topo-* 'place' + *onoma* 'name'

Lexical Relations: Synonyms

- **Synonyms:** words or expressions that have the same meaning in some or all contexts. In other words, synonymy is the semantic equivalence between lexical items.

big = large
couch = sofa
beginning = start

hide = conceal
to begin = to start
to cease = to stop

small = little
kind = courteous
fast = quickly = rapidly

- There are **no perfect synonyms** (i.e., two words with *exactly* the same meanings), particularly when the speech registers and regional preference are taken into account:
 - *Film/movie, sofa/couch, policeman/cop, etc.*

- After the Norman invasion of England in 1066, many French words of Latin origin entered the language, giving rise to synonymous pairs:

- English: *heal*
- English: *send*

Latin: *recuperate*
Latin: *transmit*



Lexical Relations: Antonyms

- **Antonyms** are words that in some respect are opposite in meaning

- Antonyms share **all but one** semantic property. The semantic feature that they do not share is present in one member of the pair and absent in the other:

girl

(+ animate
+ human
+ female
+ young
- adult)

woman

(+ animate
+ human
+ female
- young
+ adult)

- There are three major **types of antonyms**:
- **Complementary pairs**— $X = \text{not } Y$:
 - E.g., *male/female*, *alive/dead*, *upright/tilted*, etc.
- **Gradable pairs**—continuous on a scale:
 - E.g., *good/bad*, *warm/cold*, *black/white*, etc.
 - *tiny - small - medium - large - huge - enormous*
- **Relational pairs**—symmetrical or reversible in action or state:
 - E.g., *give/receive*, *buy/sell*, *teacher/pupil*, *taller/shorter*, *mentor/mentee*, *dress/undress*, etc.



Lexical Relations:

Homonyms ↔ Heteronyms

Homonyms ↔ Heteronyms

- Homonyms: *you/ewe; tax/tacks; left*^{1,2}
- Heteronyms: *lead* [lɪd]/[lɛd]; *bass* [beɪs]/[bæs]
- Homographs: *dove* [dɒ^wv]/[dʌv]; *can*^{1,2} [k^hæ̃n]

	Homonyms = Homophones	Heteronyms ⊂	Homographs = Homograms
Pronounced Identically	Yes	No	Yes/No
Spelled Identically	Yes/No	Yes	Yes

What to do if your dove dove

- **Homonyms (or homophones):** words that have different meanings but are pronounced the same: *bear* and *bare*
 - **Homographs** are words that are spelled the same: *bear* and *bear*, *dove* and *dove*
 - **Heteronyms** are words that are spelled the same but pronounced differently: *dove* ‘the bird’ and *dove* ‘plunge, submerge’
 - We can make sense of the riddle *Why are trees often mistaken for dogs?* by recognizing the homonymy in the answer: *Because of their bark.*

"Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo."

- Homonyms (or homophones)

"Buffalo buffalo Buffalo buffalo
buffalo buffalo Buffalo buffalo"
is a grammatical sentence in American
English, used as an example of how
homonyms and homophones can be
used to create complicated linguistic
constructs. It has been discussed in
literature, in various forms, since
1967 when it appeared in Dmitri
Borgmann's *Beyond Language*.

The sentence can be clarified by
substituting the synonym "bison" for
the animal "buffalo," "bully" for the
verb "buffalo," and "New York" to
refer to the state of the city Buffalo:

*"New York bison New York bison
bully, bully New York bison."*

Or:

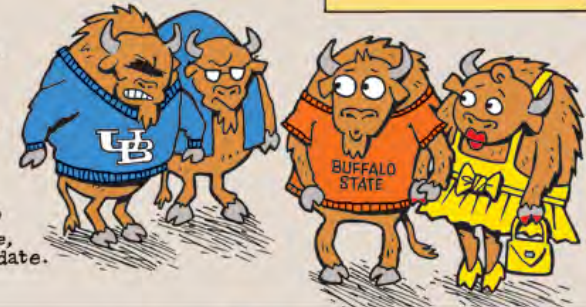
*"New York bison whom other
New York bison bully, themselves
bully New York bison."*

WIKI WORLD[®] by Greg Williams

Buffalo buffalo Buffalo buffalo buffalo Buffalo buffalo.

is a grammatically correct sentence used as an example of how homonyms and homophones can be used to create complicated constructs. The sentence is unpunctuated and uses three different readings of the word "buffalo." In order of their first use, these are:

- The city of Buffalo, New York.
- The animal "buffalo," in the plural (equivalent to "buffaloes"), in order to avoid articles.
- The verb "buffalo," meaning to confuse, deceive or intimidate.



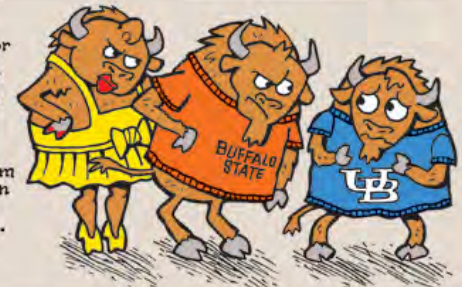
Homonym = a word form that has two or more distinct meanings

Homophone = a word which is pronounced the same as another word but differs in meaning



Substituting the synonym "bison" for "buffalo" (animal), "bully" for "buffalo" (verb) and leaving "Buffalo" to mean the city, yields:

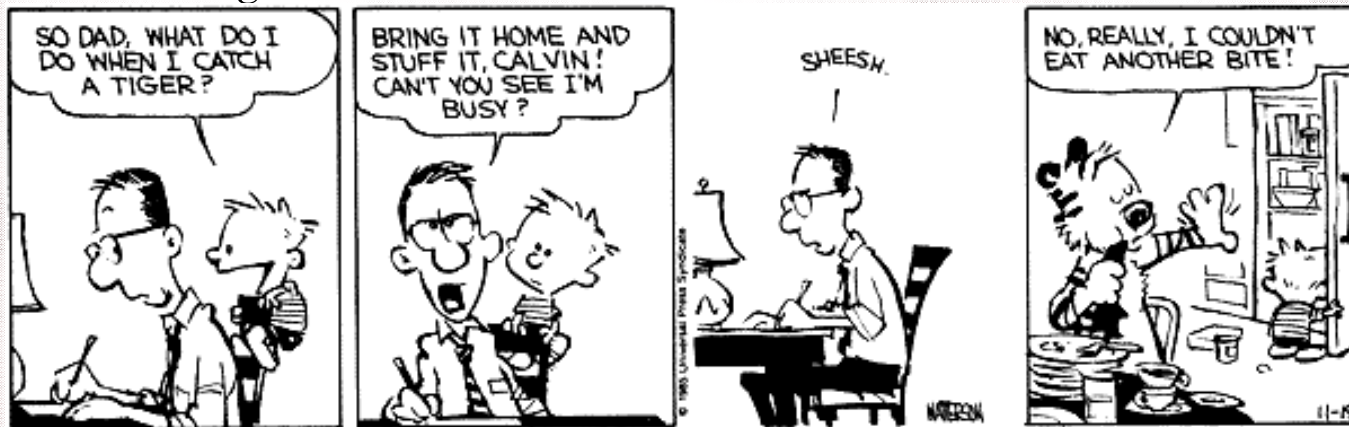
Buffalo bison, whom other Buffalo bison bully, themselves bully Buffalo bison.



Text excerpted from the Wikipedia articles *Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo*, *Homonym* and *Homophone*. 26 March 2007

Lexical Relations: Polysemy

- **Polysemous** words are words with multiple, conceptually or historically related meanings



- The OED has 17 definitions of *trunk* (n.):
 - The main part of sth. without its appendages;
 - The human or animal body without the head and limbs;
 - A chest, box, case, etc. orig. made out of a tree-trunk;
 - The elongated proboscis of the elephant;
 - (Pl.) Underpants with *long* [sic! > *short*] legs; etc.

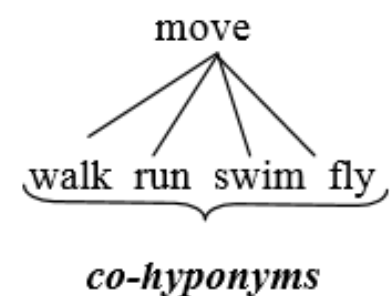
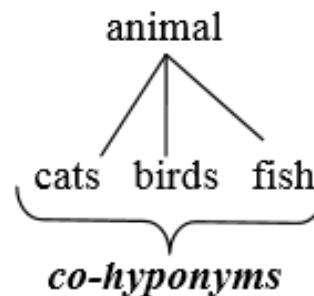
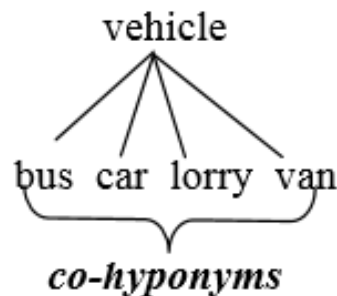
The word
meaning has
many meanings.

Lexical Relations: Hyponyms

- **Hyponyms** involve the relationship between a general term and specific instances of that term
- A set of superordinate expressions (**hypernyms**) and its individual members (**hyponyms**) all of which share one common prominent semantic feature:
 - *Color—red, white, blue, pink, yellow...*
 - *Cat—Siamese, Russian Blue, Persian...*
 - *Musical instrument—clarinet, guitar, horn, piano, trumpet, violin ...*

Superordinate:

Hyponyms



Semantic Features

- Semantic features are properties that are part of word meanings and reflect our knowledge about what words mean. There is a formal notational device to indicate the presence ([+]) or absence ([-]) of semantic properties:

- Read the following sentences:

The hamburger ate the boy.

The boy ate the hamburger.



- The first sentence is syntactically good, but semantically odd. The kind of noun that can be the subject of the verb *ate* must denote an entity that is capable of ‘eating’. The noun *hamburger* does not have this property and the noun *boy* does. Such property may be as general as ‘animate being’.
- The feature that the noun *boy* has is ‘+ animate’ (= denotes an animate being) and the feature that the noun *hamburger* has is ‘- animate’ (= denotes an inanimate being).
- *Source: George Yule “The Study of Language” (2010)*

Semantic Features

- Features such as ‘+ animate, - animate’, ‘+ human, - human’, ‘+ female, - female’ for example, can be treated as the basic elements involved in differentiating the meaning of each word in a language from every other word.
- If we had to provide the crucial distinguishing features of the meaning of a set of English words such as *table*, *horse*, *boy*, *man*, *girl*, *woman*, we could begin with the following diagram.

	table	horse	boy	man	girl	woman
animate	-	+	+	+	+	+
human	-	-	+	+	+	+
female	-	-	-	-	+	+
adult	-	+	-	+	-	+

- *Mare (N)* — [+female], [-human], [-young], [+equine] = ‘adult female horse’
- *Stalk (V)* — [+motion], [+slow], [+purposeful] = ‘to walk with long steps, to march’

Semantic Features

The _____ is reading the newspaper.

N [+ human]

- This approach gives us the ability to predict which nouns make this sentence semantically odd.
- Some examples would be *table*, *horse* and *hamburger*, because none of them have the required feature [+ human].



- *Source:* George Yule “The Study of Language” (2010)

Semantic Feature Analysis Grid

CONCEPT: MAMMALS

EXAMPLES	FEATURES									
	Has hair	Vertebrate	Lives on land (terrestrial)	Lives at sea (aquatic)	Able to fly	Herbivore (primary consumer)	Carnivore (secondary consumer)	Omnivore	Marsupial	Produces milk
Bear	+	+	+	-	-	-	-	+	-	+
Bat	+	+	+	-	+	+	+	-	-	+
Lion	+	+	+	-	-	-	+	-	-	+
Seal	+	+	-	+	-	-	+	-	-	+
Kangaroo	+	+	+	-	-	+	-	-	+	+
Whale	+	+	-	+	-	-	+	-	-	+
Ferret	+	+	+	-	-	-	+	-	-	+
Human	+	+	+	-	-	-	-	+	-	+

Semantic Features

- The Semantic Features approach is not without problems.
- For many words in a language it may not be easy to come up with neat components of meaning. If we try to think of the components or features to differentiate the nouns *advice*, *threat* and *warning*, for example, we would not be very successful.
- Part of the problem seems to be that the approach involves a view of words in a language as some sort of ‘containers’ that carry meaning components.
- There is clearly more to the meaning of words than these basic types of features.

Source (+ the following slides): George Yule “The Study of Language” (2010)

Semantic (Thematic, Theta-) Roles

- Instead of thinking of words as ‘containers’ of meaning, we can look at the ‘roles’ they fulfil within the situation described by a sentence.
- If the situation is a simple event, as in *The boy kicked the ball*, then the verb describes an action (*kick*). The noun phrases in the sentence describe the roles of entities, such as people and things, involved in the action.
- We can identify a small number of semantic roles (also called ‘thematic roles’) for these noun phrases.

agent and
theme

instrument
and
experiencer

location,
source and
goal

Thematic Roles

- **Thematic roles** express the relation between the arguments of the verb and the situation the verb describes
 - **Agent:** the ‘doer’ of the action
 - **Theme:** the ‘undergoer’ of the action
 - **Goal:** the endpoint of a change in location or possession
 - **Source:** where the action originates
 - **Instrument:** the means used to accomplish an action
 - **Experiencer:** one receiving sensory input

Thematic Roles: Agent and Theme

The boy kicked the ball.

- **Agent:** the entity that performs the action, e.g. *the boy*
- **Theme** (or the ‘patient’): the entity that is involved in or affected by the action, e.g. *the ball*
- The theme can also be an entity (*The ball*) that is simply being described (i.e. not performing an action), as in *The ball was red*.
- Although agents are typically human (*The boy*), they can also be non-human entities that cause actions, as in noun phrases denoting a natural force (*The wind*), a machine (*A car*), or a creature (*The dog*), all of which affect *the ball* as theme.

The wind blew the ball away.

A car ran over the ball.

The dog caught the ball.

- The theme is typically non-human, but can be human (*the boy*), as in *The dog chased the boy*. The same physical entity can appear in two different semantic roles in a sentence, as in *The boy cut himself*. Here *The boy* is agent and *himself* is theme.

Thematic Roles:

Instrument and Experiencer

- If an agent uses another entity in order to perform an action, that other entity fills the role of **instrument**.

The boy cut the rope with an old razor.

He drew the picture with a crayon.

- In the above sentences, the noun phrases *an old razor* and *a crayon* are being used in the semantic role of instrument.
- When a noun phrase is used to designate an entity as the person who has a feeling, perception or state, it fills the semantic role of **experiencer**.
- If we *see*, *know*, or *enjoy* something, we are not really performing an action (hence we are not agents). We are in the role of an experiencer.
- In the sentence *The boy feels sad*, the experiencer (*The boy*) is the only semantic role.
- In the question, *Did you hear that noise?*, the experiencer is *you* and the theme is *that noise*.

Thematic Roles:

Location, Source and Goal

- **Location:** where the entity is (*on the table, in the room*)
- **Source:** where the entity moves from (*from Chicago*)
- **Goal:** where the entity moves to (*to New Orleans*)

We drove from Chicago to New Orleans.

- Thematic roles remain the same in paraphrases because the thematic roles are in their proper place in deep structure

The dog bit the stick
agent theme

The stick was bitten by the dog
theme agent

Source: George Yule “The Study of Language” (2010)

Thematic Roles: Illustrations

Mary	saw	a fly	on the wall.
------	-----	-------	--------------

EXPERIENCER

THEME

LOCATION

She	borrowed	a magazine	from George.
-----	----------	------------	--------------

AGENT

THEME

SOURCE

She	squashed	the bug	with the book.
-----	----------	---------	----------------

AGENT

THEME

INSTRUMENT

She	handed	the magazine	back to George.
-----	--------	--------------	-----------------

AGENT

THEME

GOAL

"Gee thanks,"	said	George.
---------------	------	---------

AGENT

Theta Assignment

- The assignment of theta roles by a verb is a process performed in the lexicon:
 - *Open*, V, ___ NP, PP (Agent, Theme, Instrument)
 - Ex.: *The boy opened the door with the key*
- **Theta-criterion:** Universally, each thematic role can occur only once in a sentence:
 - *[_{IP} *The key_i opened the door with a lock-pick_i*]
Instrument **Instrument**
 - *[_{NP} *The boy_i's red hat of Bill_i*]
Possessor **Possessor**
- Transformations do not alter theta roles of verb arguments.

Ways of Looking at Words: Summary

Semantic Features

- Words as 'containers' of meaning

Semantic Roles

- Words as fulfilling 'roles' within the situation described by a sentence

Lexical Relations

- 'Relationships' between words

Pragmatics

- **Pragmatics** is concerned with how language is used in context



- **Linguistic context:** the **discourse** that precedes the phrase or sentence to be interpreted
- **Situational context:** everything nonlinguistic in the environment of the discourse

Pragmatics

- Dad: Very nice girl. What do you think, Hon?
- Mom: The turkey sure was moist.



- Dad: Very nice girl. What do you think, Hon?
- Mom: Not really.

Deixis

- **Deixis** refers to words and expression whose reference depend on the situational context
 - **Person deixis:** *I, you, she, that man, those girls*
 - The meaning depends on who is present or being discussed
 - **Time deixis:** *now, then, tomorrow, yesterday*
 - The meaning depends on when the utterance was said or what period of time is being discussed
 - **Place deixis:** *here, there, yonder mountains*
 - The meaning depends on where the utterance was said or what place was being discussed

Where Is Here?

- *you are not lost, you are here*



Implicatures

“Don’t listen to what I *say*; listen to what I *mean*”

- **Implicatures** are inferences that may be drawn from an utterance based on context
 - **SUE:**
 - **Does Mary have a boyfriend?**
 - **BILL:** She’s been driving to Santa Barbara every weekend.
- Bill asserts that Mary drives to Santa Barbara every weekend and implicates that she has a boyfriend living in Santa Barbara



Grice's Maxims of Conversation

- Grice's **Maxims of conversation** are conversational conventions that govern discourse (mainly for WASPs).

- **Maxim of Quality:** Truth
- **Maxim of Quantity:** Information
- **Maxim of Relation:** Relevance
- **Maxim of Manner:** Clarity



Grice's Maxims in 'The Big Bang Theory'.mp4

- WASPs tend to adhere to these maxims and expect others to do so also.
- Consider the following scene. A visitor to a city, carrying his luggage, looking lost, stops a passer-by.

VISITOR:

Excuse me. Do you know where the Ambassador Hotel is?

PASSER-BY:

Oh sure, I know where it is.

(and walks away)

- What is going on in this scene?

Source: George Yule "The Study of Language" (2010)

Speech Acts

- The study of **speech acts** describes how people do things with language
- **Performative** verbs accomplish an action when they are uttered
 - When you say, *I dare you* you have said something and you have dared someone
 - Some performative verbs: *bet, challenge, dare, fine, nominate, promise, resign*
 - A test for performativity: performative verbs usually sound good when you add *I hereby* to the sentence:
 - *I hereby resign*
 - *?I hereby know you*

❖ A prediction



❖ A warning



❖ A promise

Surrender!



Connecticut College

Spring 2015

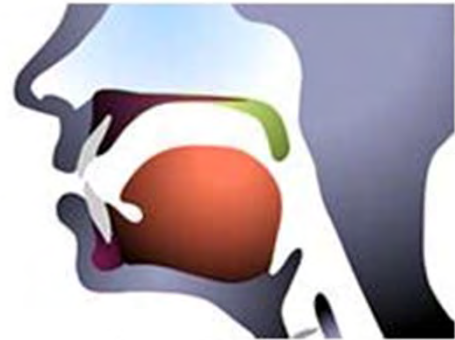


LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 5



fəˈnetiks



Phonetics: The Sounds of Language

"Say now *Shibboleth*"

“And the Gileadites took the passages of Jordan before the Ephraimites: and it was so, that when those Ephraimites which were escaped said, Let me go over; that the men of Gilead said unto him, art thou an Ephraimite? If he say Nay; Then said they unto him,

Say now *Shibboleth*: and he said *Sibboleth*:

for he could not frame to pronounce it right. Then they took him, and slew him at the passages of Jordan: and there fell at that time of the Ephraimites forty and two thousand.”

Source: The Book of Judges. Chapter 12, verses 1-15.

"Say now *Shibboleth*"

- *A shibboleth (/ˈʃɪbəlɛθ/) is a word or custom whose variations in pronunciation or style can be used to differentiate members of in-groups from those of out-groups.*
- The term originates from the Hebrew word *shibbólet* (שבֹּלֶת), which literally means the part of a plant containing grains, such as an ear of corn or a stalk of grain or, in different contexts, "stream, torrent." The modern usage derives from an account in the Hebrew Bible, in which pronunciation of this word was used to distinguish Ephraimites, whose dialect lacked a /ʃ/ phoneme (as in *shoe*), from Gileadites, whose dialect did include such a phoneme.

"Say now *lollapalooza*"

- During World War II, some United States soldiers in the Pacific theater used the word *lollapalooza* as a shibboleth to challenge unidentified persons, on the premise that Japanese people often pronounce the letter L as R or confuse Rs with Ls; the word is also an American colloquialism that even a foreign person fairly well-versed in American English would probably mispronounce or be unfamiliar with.[16] In George Stimpson's *A Book about a Thousand Things*, the author notes that, in the war, Japanese spies would often approach checkpoints posing as American or Filipino military personnel. A shibboleth such as "lollapalooza" would be used by the sentry, who, if the first two syllables come back as *rorra*, would "open fire without waiting to hear the remainder".

Source: Wikipedia

"You say tomato, I say tomahto"

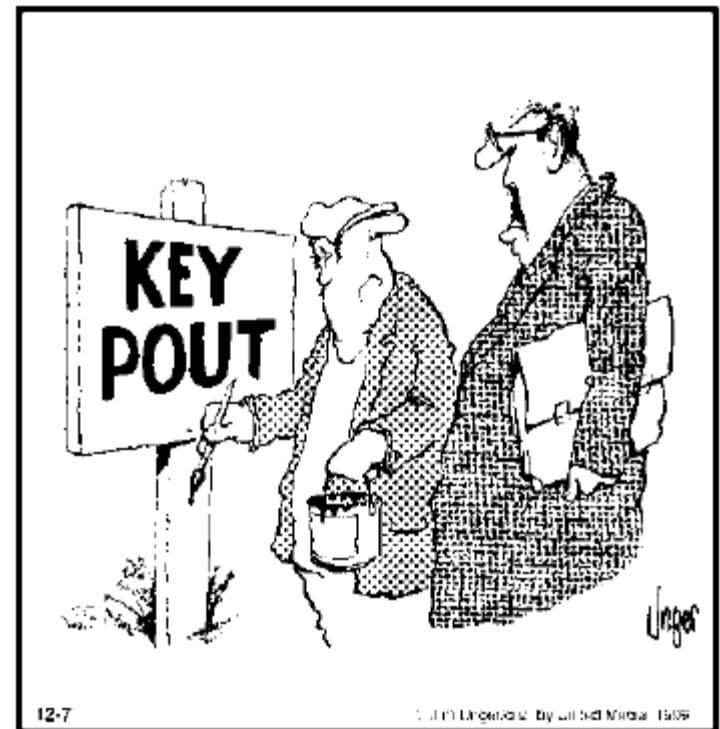


Sound Segments

- **Phonetics** is the systematic study of the sounds of speech, which is physical and directly observable.
- We are able to **segment** a continuous stream of speech into distinct parts and recognize the parts in other words
- Although speech sounds are perceived to be discrete, their physical productions often run continuously into each other.

HERMAN®

by Jim Unger



12-7

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"Keep out! Keep out! K-E-E-P O-U-T."

Prisencolinensinainciusol

- How English sounds to non-English speakers



Adriano Celentano - Prisencolinensinainciusol.mp4

Historically Attested Sound Re-Segmentation

- A case of metanalysis, just like back-formation and folk etymology:
- *A napron* > *an apron* (15th c). At an earlier stage of English, the word *apron* was *napron*. However, the phrase *a napron* was so often misperceived as *an apron* that the word lost its initial *n*.
- *Alone* < *all* + *one* > *lone-ly/lone-some/lone-li-ness*
- Mother: “Hold on!” Two y.o.: “I’m holing don.”
- “The sun’s rays meet.” > “The sons raise meat.”
- “Grade A” > “Gray day”
- “Type A personality” > “Taipei personality” (*Car Talk*)



Identity of Speech Sounds

- Not all sounds people (can) produce constitute *speech sounds* in a given language. We are capable of making sounds that are not speech sounds in English but are in other languages
- The click *tsk* that signals disapproval in English is a speech sound in languages such as Xhosa and Zulu where it is combined with other sounds just like *t* or *k* is in English



Xhosa Lesson.mp4

Identity of Speech Sounds

- The science of phonetics aims to describe all the sounds of all the world's languages
 - **Acoustic phonetics:** focuses on the *physical* properties of the sounds of language
 - **Auditory phonetics:** focuses on how listeners *perceive* the sounds of language
 - **Articulatory phonetics:** focuses on how the vocal tract *produces* the sounds of language

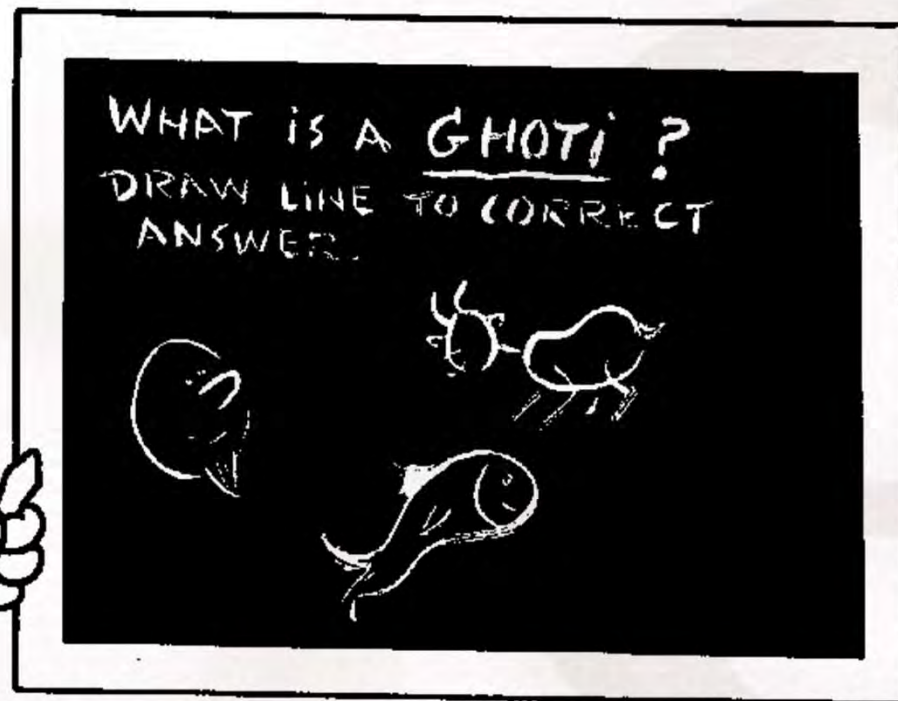
Mismatches Between Orthography and Phonology

- Spelling, or **orthography**, does not consistently represent the sounds of language
- The long /i:/ in English can be spelled in the following eleven ways:
City; people; peace; queen; zebra; key;
kiwi; receive; piece; Aesop; amoeba
- On the other hand, the letter *a* in English can represent seven different sounds
Car; campus; any; damage; bathe; about; walk
- Ligatures (2+ letters) that represent only one sound:
phone; teeth; psychiatrist; key; perceive;
heat; boot; thought, four; law, etc.

Mismatches Between Orthography and Phonology

- Spelling, or **orthography**, does not consistently represent the sounds of language
- A single letter may represent a combination of sounds
xerox
- Silent sounds still represented in spelling:
psycho; autumn; write; knight; isle; climb;
bough; blue, mnemonic; walk, could, etc.
- There may be no letter to represent a sound that occurs in a word
cute; use

Shaw's <ghoti>



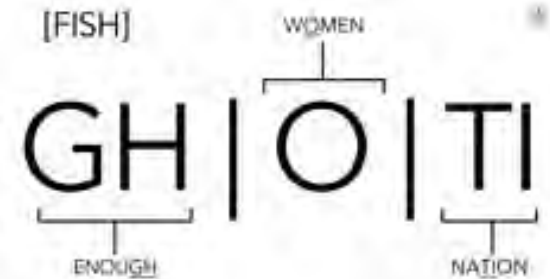
Shaw's <*ghoti*>

- **George Bernard Shaw** once claimed English spelling is so chaotic that *ghoti* could be pronounced *fish*.
- Can you identify words whose pronunciation and spelling could have led Shaw to his seemingly preposterous conclusion?
- What words can you identify in which <gh> is pronounced "f"?
- Can you cite any in which <gh> appears at the beginning, as in Shaw's *ghoti*?

Shaw's <ghoti>

Fish spelled <ghoti>:

- the <gh> as in *cough*,
- the <o> as in *women*,
- and the <ti> as in *nation*



- Words in which <gh> is pronounced as [f] include *cough*, *tough*, and *rough*.
- A word in which <gh> appears at the beginning is *ghost*, but the pronunciation is not as [f].
- No English word beginning with <gh> (there are only a few such as *ghetto*, *Ghana*, *ghee*) is pronounced like [f].
- Shaw was exaggerating.

Source: Edward Finegan “Language: Its Structure and Use” (4th ed., 2004)

Phonetic transcription

- A *phonetician* is a person who can describe speech, who understands the mechanisms of speech production and speech perception, and who knows how languages use these mechanisms. Phonetic transcription is no more than a useful tool that phoneticians use in the description of speech.
- When phoneticians transcribe an utterance, they usually do so by noting how the sounds convey differences in meaning. For the most part, they concern themselves with *describing only the significant articulations rather than the total set of movements of the vocal organs*. For example, when saying the English word *tie*, some people pronounce the consonant with the blade of the tongue against the alveolar ridge, others with the tip of the tongue. This kind of difference in articulation does not affect the meaning of the word and is not usually transcribed.

Pictures of Sound

- Waveform Reading of *‘Once Upon a Time’*



- Reflects how much air pressure is transmitted to the listener's ears.
- No individual sounds can be decoded as in spectrograms.

Source: Peter Ladefoged “Vowels and Consonants. An Introduction to the Sounds of Languages” (2001)

Pictures of Sound

- Spectrogram Reading of '*lash, face, vase*'

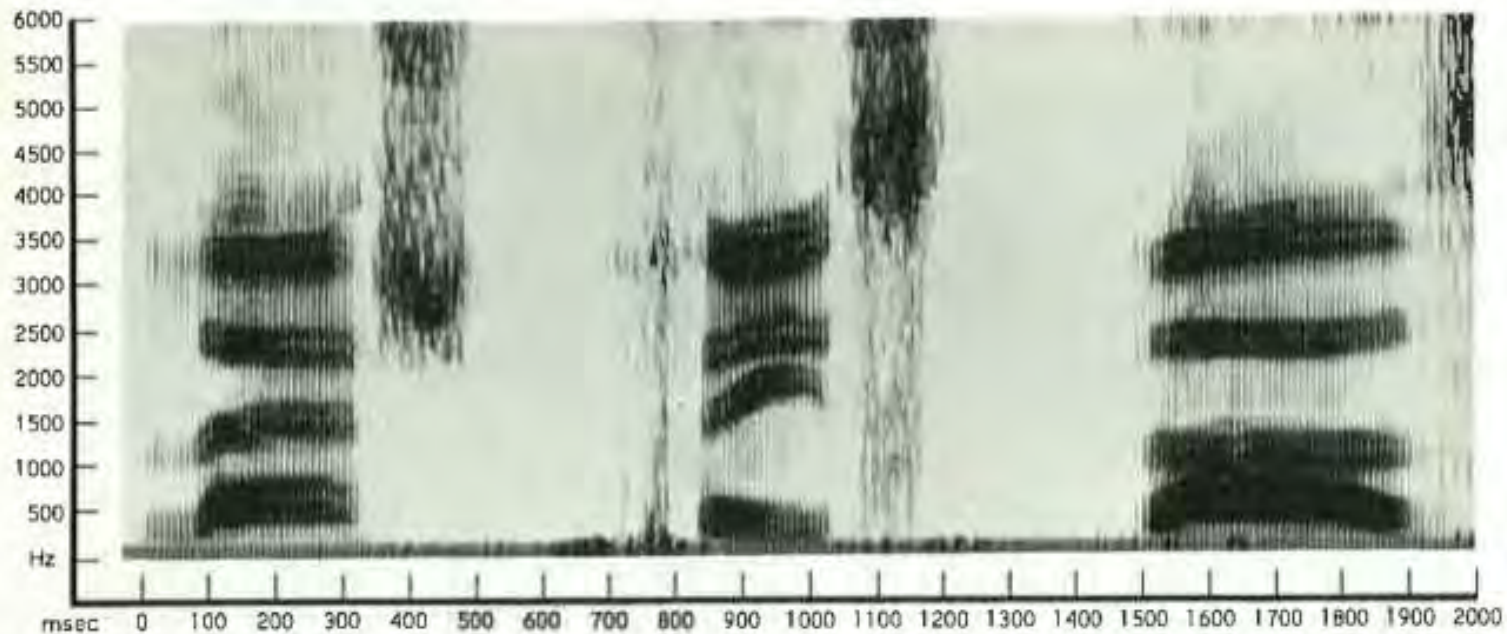


Figure 8.11 A spectrogram of "*lash, face, vase*" (British accent).

Source: Peter Ladefoged "Vowels and Consonants. An Introduction to the Sounds of Languages" (2001)

“The Rain In Spain”



My Fair Lady - The Rain In Spain.mp4



Phonograph recording session
with a Blackfoot chief, 1916

The Phonetic Alphabet

- Ronald Kingsley Read's (1960)

Shavian/Shaw Alphabet

↑	ɸ	l	↓	ɛ	g	7	ʌ	ð	e	ʃ	z	
up	be	to	do	can	go	think	the	for	of	so	is	
[p]	[b]	[t]	[d]	[k]	[g]	[θ]	[ð]	[f]	[v]	[s]	[z]	
ʌ	ʒ	ʃ	ʒ	ɸ	/	ɾ	✓	l	ɜ	ɔ	ʃ	θ
show	vision	which	just	you	we	have	what	ink	will	are	me	and
[ʃ]	[ʒ]	[tʃ]	[dʒ]	[j]	[w]	[h]	[hw]	[ŋ]	[l]	[r]	[m]	[n]
l	ɪ	ʌ	e	ɹ	g	ɜ	ʌ	ɹ	ə	ɾ		
busy	even	ever	able	as	my	calm	haul	on	oil	among/us		
[ɪ]	[i:]	[e]	[eɪ]	[æ]	[aɪ]	[ɑ:]	[ɔ:]	[ɒ]	[ɔɪ]	[ə/ʌ]		
ɸ	o	v	ʌ	h	ɔ	ɔ	ɔ	ɔ	r	ɔ		
now	toe	pull	boot	use	pair	ark	or	err/array	ian	ear		
[aʊ]	[əʊ]	[ʊ]	[u:]	[ju:]	[eə]	[ɑ:r]	[ɔ:r]	[ɜ:r/ər]	[ɪə]	[ɪər]		

The Phonetic Alphabet

- In 1888 the **International Phonetic Alphabet (IPA)** was invented in order to have a system in which there was a one-to-one correspondence between each sound in language and each phonetic symbol
- Someone who knows the IPA knows how to pronounce any word in any language

Phonetic Transcription I

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC)

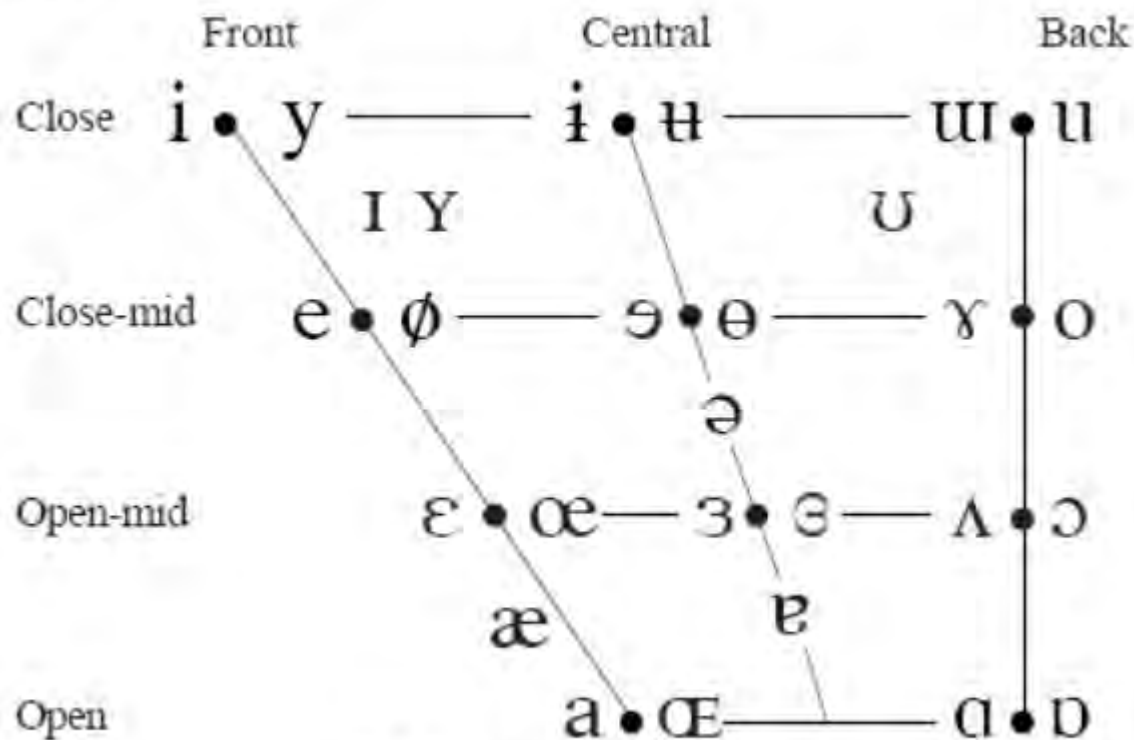
© 2005 IPA

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d			ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ	n			ɳ	ɲ	ŋ	ɴ		
Trill	ʙ		r						ʀ		
Tap or Flap		ⱱ	ɾ			ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative			ɬ ɮ								
Approximant		ʋ	ɹ			ɻ	j	ɰ			
Lateral approximant			l			ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

Phonetic Transcription II

VOWELS



Inventory of English Sounds

- 25 consonants and 15 vowels

Table 6.1 A Phonetic Alphabet for English Pronunciation

Consonants						Vowels			
p	pill	t	till	k	kill	i	beet	ɪ	bit
b	bill	d	dill	g	gill	e	bait	ɛ	bet
m	mill	n	nil	ŋ	ring	u	boot	ʊ	foot
f	feel	s	seal	h	heal	o	boat	ɔ	bore
v	veal	z	zeal	l	leaf	æ	bat	a	pot/bar
θ	thigh	ç	chill	r	reef	ʌ	butt	ə	sofa
ð	thy	ʝ	Jill	j	you	aj	bite	aw	bout
f/ʃ	shill	ʍ	which	w	witch	ɔj	boy		
ʒ/ʒ	azure								

The Phonetic Alphabet

- Using IPA symbols, we can now represent the pronunciation of words unambiguously:

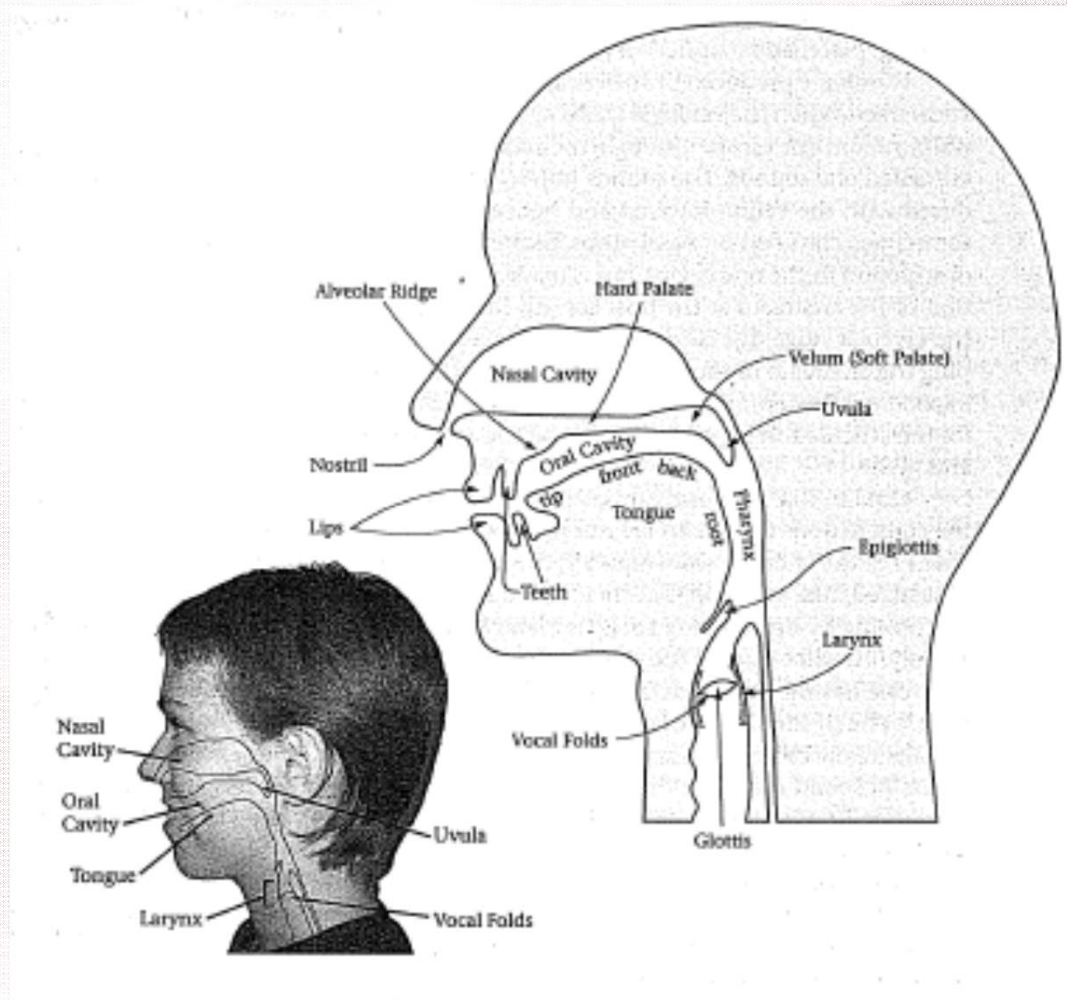
Spelling	Pronunciation
though	[ðo]
thought	[θɔt]
rough	[rʌf]
bough	[baʊ]
through	[θru]
would	[wʊd]

Articulatory Phonetics

- Most speech sounds are produced by pushing air through the vocal cords
 - **Glottis** = the opening between the vocal cords
 - **Larynx** = ‘voice box’
 - **Pharynx** = tubular part of the throat above the larynx
 - **Oral cavity** = mouth
 - **Nasal cavity** = nose and the passages connecting it to the throat and sinuses

Articulatory Phonetics

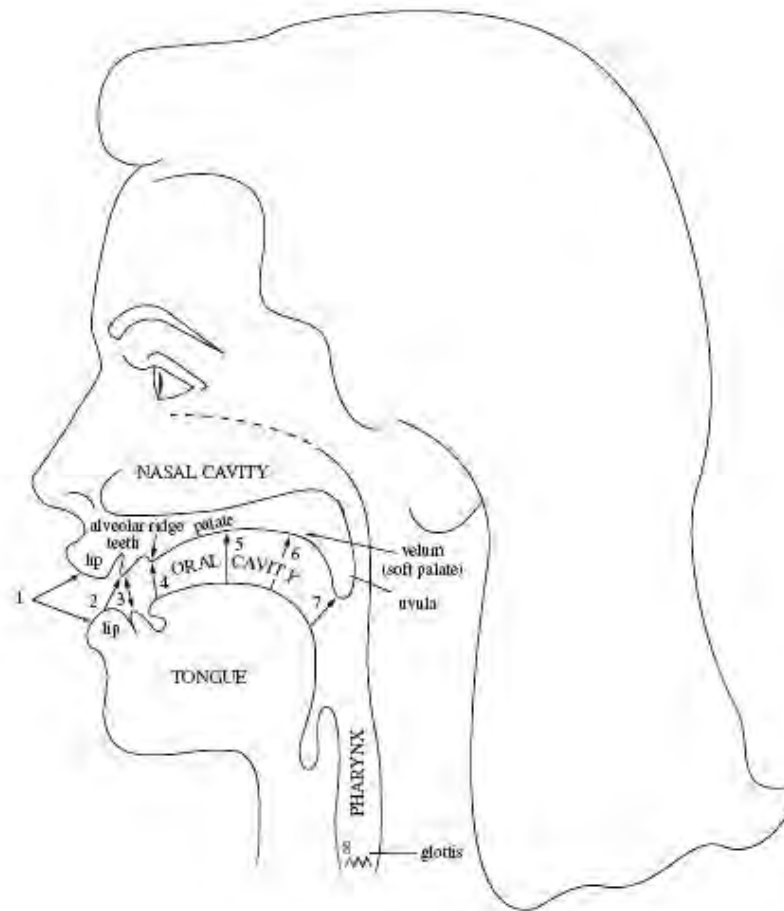
- The Vocal Tract



Consonants: Place of Articulation

- Consonants are sounds produced with some restriction or closure in the vocal tract
- Consonants are classified based in part on where in the vocal tract the airflow is being restricted (**the place of articulation**)
- The major places of articulation are:
bilabial, labiodental, interdental, alveolar, palatal, velar, uvular, and glottal

Consonants: Place of Articulation



The vocal tract. Places of articulation: 1. bilabial; 2. labiodental; 3. dental; 4. alveolar; 5. (alveo)palatal; 6. velar; 7. uvular; 8. glottal.

Consonants: Place of Articulation

Table 6.2 Place of Articulation of English Consonants

Bilabial	p	b	m				
Labiodental	f	v					
Interdental	θ	ð					
Alveolar	t	d	n	s	z	l	r
Palatal	ʃ	ʒ	ç	ʝ			
Velar	k	g	ŋ				
Glottal	h						

Consonants: Place of Articulation

- **Bilabials:** [p] [b] [m]
 - Produced by bringing both lips together
- **Labiodentals:** [f] [v]
 - Produced by touching the bottom lip to the upper teeth
- **Interdentals** [θ] [ð]
 - Produced by putting the tip of the tongue between the teeth

Consonants: Place of Articulation

- **Alveolars:** [t] [d] [n] [s] [z] [l] [r]
 - All of these are produced by raising the tongue to the **alveolar ridge** in some way
 - [t, d, n]: produced by the tip of the tongue touching the alveolar ridge (or just in front of it)
 - [s, z]: produced with the sides of the front of the tongue raised but the tip lowered to allow air to escape
 - [l]: the tongue tip is raised while the rest of the tongue remains down so air can escape over the sides of the tongue (thus [l] is a **lateral** sound)
 - [r]: air escapes through the **central** part of the mouth; either the tip of the tongue is curled back behind the alveolar ridge or the top of the tongue is bunched up behind the alveolar ridge

Consonants: Place of Articulation

- **Palatals:** [ʃ] [ʒ] [tʃ] [dʒ]
 - Produced by raising the front part of the tongue to the palate
- **Velars:** [k] [g] [ŋ]
 - Produced by raising the back of the tongue to the soft palate or velum
- **Uvulars:** [q] [ɢ] [ʀ]
 - Produced by raising the back of the tongue to the uvula
- **Glottals:** [h] [ʔ]
 - Produced by restricting the airflow through the open glottis ([h]) or by stopping the air completely at the glottis (a **glottal stop**: [ʔ])

Consonants: Manner of Articulation

Table 6.4 Minimal Set of Phonetic Symbols for American English Consonants

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stop (oral)							
voiceless	p			t		k	
voiced	b			d		g	
Nasal (stop)	m			n		ŋ	
Fricative							
voiceless		f	θ	s	ʃ		h ¹
voiced		v	ð	z	ʒ		
Affricate							
voiceless					č		
voiced					ǰ		
Glide							
voiceless	ɹ					ɰ	h ¹
voiced	w ²				j	w ²	
Liquid				l r			

Examples of English Consonants

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stop (oral) voiceless voiced	<i>pie</i> <i>buy</i>			<i>tie</i> <i>die</i>		<i>kite</i> <i>guy</i>	
Nasal (stop)	<i>my</i>			<i>night</i>		<i>sing</i>	
Fricative voiceless voiced		<i>fie</i> <i>vie</i>	<i>thigh</i> <i>thy</i>	<i>sue</i> <i>zoo</i>	<i>mission</i> <i>measure</i>		<i>high</i>
Affricate voiceless voiced					<i>chime</i> <i>jive</i>		
Glide voiceless voiced	<i>which</i> ¹ <i>wipe</i>				<i>yank</i>	<i>which</i> ¹ <i>wipe</i>	
Liquid				<i>lie, rye</i>			

Consonants: Manner of Articulation

- The **manner of articulation** is the way the airstream is affected as it flows from the lungs and out of the mouth and nose



We Are Sinking (German Coast Guard) (Berlitz Ad).mp4

- **Voiceless** sounds are those produced with the vocal cords apart so the air flows freely through the glottis



- **Voiced** sounds are those produced when the vocal cords are together and vibrate as air passes through

Consonants: Manner of Articulation

- The voiced/voiceless distinction is important in English because it helps us distinguish words like:

rope/robe

[rop]/[rob]

fine/vine

[faɪn]/[vaɪn]

seal/zeal

[sil]/[zil]

- But some voiceless sounds can be further distinguished as **aspirated** or **unaspirated**

aspirated

pool

[p^hul]

tale

[t^hel]

kale

[k^hel]

unaspirated

spool

[spul]

stale

[stel]

scale

[skel]

Consonants: Manner of Articulation

- **Oral sounds** are those produced with the velum raised to prevent air from escaping out the nose
- **Nasal sounds** are those produced with the velum lowered to allow air to escape out the nose

TABLE 5.3 | Four Classes of Speech Sounds

	Oral	Nasal
Voiced	b d g	m n ŋ
Voiceless	p t k	*

*Nasal consonants in English are usually voiced. Both voiced and voiceless nasal sounds occur in other languages.

- So far we have three ways of classifying sounds based on **phonetic features**: by *voicing*, by *place of articulation*, and by *nasalization*
 - [p] is a voiceless, bilabial, oral sound
 - [n] is a voiced, alveolar, nasal sound

Consonants: Manner of Articulation

- **Stops:** [p] [b] [m] [t] [d] [n] [k] [g] [ŋ] [ʔ]
 - Produced by completely stopping the air flow in the oral cavity for a fraction of a second
 - All other sounds are **continuant**s, meaning that the airflow is continuous through the oral cavity
- **Fricatives:** [f] [v] [θ] [ð] [s] [z] [ʃ] [ʒ] [x] [χ] [h]
 - Produced by severely obstructing the airflow so as to cause friction

Consonants: Manner of Articulation

- **Affricates:** [tʃ] [dʒ]
 - Produced by a stop closure that is released with a lot of friction
- **Liquids:** [l] [r]
 - Produced by causing some obstruction of the airstream in the mouth, but not enough to cause any real friction
- **Glides:** [j] [w] [ʌ]
 - Produced with very little obstruction of the airstream and are always followed by a vowel

Consonants: Manner of Articulation

- **Approximants:** [w] [j] [r] [l]
 - Sometimes liquids and glides are put together into one category because the articulators approximate a frictional closeness but do not actually cause friction
- **Trills and flaps:** [r]* [R] [ɾ]
 - Trills are produced by rapidly vibrating an articulator
 - Flaps are produced by a flick of the tongue against the alveolar ridge
- **Clicks:**
 - Produced by moving air in the mouth between various articulators
 - The disapproving sound *tsk* in English is a consonant in Zulu and some other southern African languages
 - The lateral click used to encourage a horse in English is a consonant in Xhosa

*The textbook uses [r] to represent the central liquid as in the word *ready* rather than as a trill

Consonants: Manner of Articulation

Get
around in

ENGLISH

Lesson Seventy-two
How to Pronounce the **th** sound

1.



PLACE TIP OF TONGUE
BEHIND TOP TEETH

2.



BREATHE OUT

3.



RETRACT TONGUE

4.



VIBRATE AIR BEHIND
TONGUE AND SAY:

5.



*"The Smiths wear thin clothes
throughout the winter months"*

6.



CONSULT DENTIST

Vowels

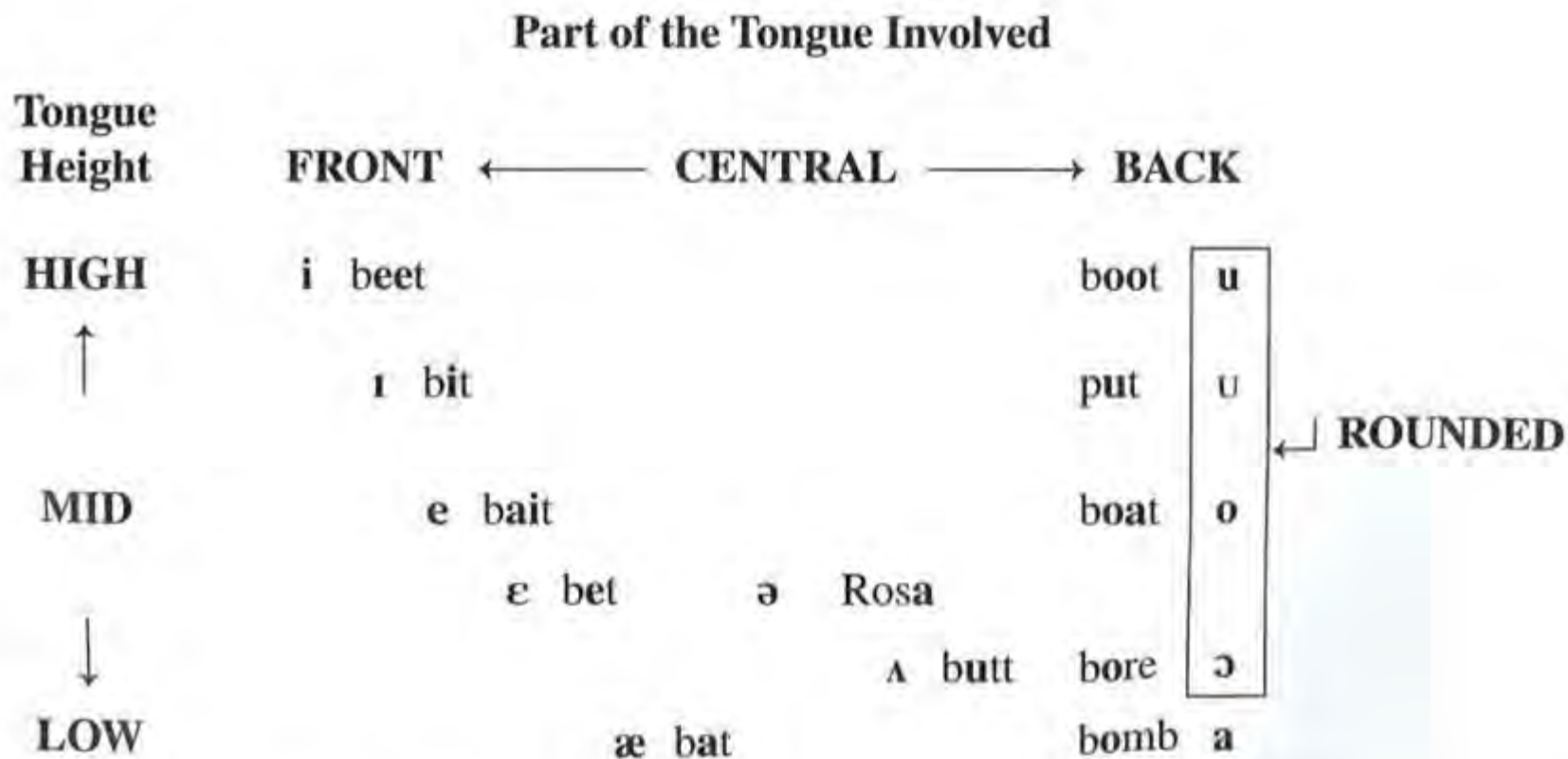


Figure 6.5 Classification of American English vowels.

Vowels

- Vowels are classified by how high or low the tongue is, if the tongue is in the front or back of the mouth, and whether or not the lips are rounded
 - **High vowels:** [i] [ɪ] [u] [ʊ]
 - **Mid vowels:** [e] [ɛ] [o] [ɔ] [ʌ] [ə]
 - **Low vowels:** [æ] [a]
 - **Front vowels:** [i] [ɪ] [e] [ɛ] [æ]
 - **Central vowels:** [ə] [ʌ]
 - **Back vowels:** [u] [ʊ] [o] [ɔ] [a]

Vowels

- **Round vowels:** [u] [ʊ] [o] [ɔ]
 - Produced by rounding the lips
 - English has only back round vowels, but other languages such as French and Swedish have front round vowels
- **Diphthongs:** [aɪ] [aʊ] [ɔɪ]
 - A sequence of two vowel sounds (as opposed to the **monophthongs** we have looked at so far)
- **Nasalization:**
 - Vowels can also be pronounced with a lowered velum, allowing air to pass through the nose
 - In English, speakers nasalize vowels before a nasal sound, such as in the words *beam*, *bean*, and *bingo*
 - The nasalization is represented by a diacritic, an extra mark placed with the symbol: *bean* [bɛ̃n]

Vowels

- **Tense vowels:**
 - Are produced with greater tension in the tongue
 - May occur at the end of words
- **Lax vowels:**
 - Are produced with less tongue tension
 - May not occur at the end of words

Tense		Lax	
i	beat	ɪ	bit
e	bait	ɛ	bet
u	boot	ʊ	put
o	boat	ɔ	bore
a	hah	ɔɪ	boy
aɪ	high	æ	hat
aʊ	how	ʌ	hut
		ə	about

Major Phonetic Classes

- **Noncontinuants:** the airstream is totally obstructed in the oral cavity
 - Stops and affricates
- **Continuants:** the airstream flows continuously out of the mouth
 - All other consonants and vowels
- **Obstruents:** the airstream has partial or full obstruction
 - Non-nasal stops, fricatives, and affricates
- **Sonorants:** air resonates in the nasal or oral cavities
 - Vowels, nasal stops, liquids, and glides

Major Phonetic Classes: Consonantal

- **Consonantal:** there is some restriction of the airflow during articulation
 - All consonants except glides
- Consonantal sounds can be further subdivided:
 - **Labials:** [p] [b] [m] [f] [v] [w] [ʌ]
 - Articulated with the lips
 - **Coronals:** [θ] [ð] [t] [d] [n] [s] [z] [ʃ] [ʒ] [tʃ] [dʒ] [l] [r]
 - Articulated by raising the tongue blade

Major Phonetic Classes

- Consonantal categories cont.:
 - Anteriors: [p] [b] [m] [f] [v] [θ] [ð] [t] [d] [n] [s] [z]
 - Produced in the front part of the mouth (from the alveolar area forward)
 - Sibilants: [ʃ] [ʒ] [tʃ] [dʒ]
 - Produced with a lot of friction that causes a hissing sound, which is a mixture of high-frequency sounds
- Syllabic Sounds: sounds that can function as the core of a syllable
 - Vowels, liquids, and nasals
 - dazzle* [dæzəl]
 - rhythm* [rɪðmə]

Prosodic Features

- **Prosodic**, or **suprasegmental** features of sounds, such as *length*, *stress* and *pitch*, are features above the segmental values such as place and manner of articulation
- **Length**: in some languages, such as Japanese, the length of a consonant or a vowel can change the meaning of a word:

- *biru* [biru] “building”
- *saki* [saki] “ahead”

biiru [bi:ru] “beer”
sakki [sak:i] “before”

Prosodic Features

- **Stress:** stressed syllables are louder, slightly higher in **pitch**, and somewhat longer than unstressed syllables
 - The noun *digest* has the stress on the first syllable
 - The verb *digest* has the stress on the second syllable
 - English is a stress-timed language, meaning that at least one syllable is stressed in an English word
 - French functions differently, so when English speakers learn French they put stress on certain syllables which contributes to their foreign accent

Tone and Intonation

- **Tone languages** are languages that use pitch to contrast the meaning of words
- For example, in Thai, the string of sounds [na:] can be said with 5 different pitches and can thus have 5 different meanings:

[ː]	L	low tone	[nà:]	“a nickname”
[ː]	M	mid tone	[nā:]	“rice paddy”
[ː]	H	high tone	[ná:]	“young maternal uncle or aunt”
[ː]	HL	falling tone	[nâ:]	“face”
[ː]	LH	rising tone	[nǎ:]	“thick”

Tone and Intonation

- **Intonation** languages (like English) have varied **pitch contour** across an utterance, but pitch is not used to distinguish words
 - However, intonation may affect the meaning of a whole sentence:
 - *John is here* said with falling intonation is a statement
 - *John is here* said with rising intonation is a question

"I Would Like to Buy a Hamburger"

- Pink Panther



The Hamburger.mp4

Quiz of the Day 1

Q1: This is a posterior image of the human larynx, the so-called voice box, copied from the site of the L.A.-based Cedars-Sinai Medical Center. Is it true or false that when vowels or voiced consonants are produced, the vocals cords are in contact and brought to vibration by the airstream passing between them?



www.cedars-sinai.edu

Quiz of the Day 1: Key

- The statement is **true**. Only when voiceless sounds are produced will the vocal folds be kept apart and not in contact.

Quiz of the Day 2

- Recover the following sentence transcribed in IPA to its authentic English orthography:

'wɪns ə 'phān ə tʰāīm ðə wəz ə 'vɛɹi
gʊd 'mʌðə kʰæt̚ | hɜ̃ nēm wəz 'kʰɪɹi
kʰæt̚

Quiz of the Day 2: Key

- Once upon a time there was a very good mother cat. Her name was Kitty Cat.

Quiz of the Day 3

- Transcribe the following English sentence to IPA:

To err is human; to forgive,
divine.

Quiz of the Day 3: Key

To err is human; to forgive, divine.

thə ɜː ɪz 'hjumən | thə fə'giv
di 'vāɪn

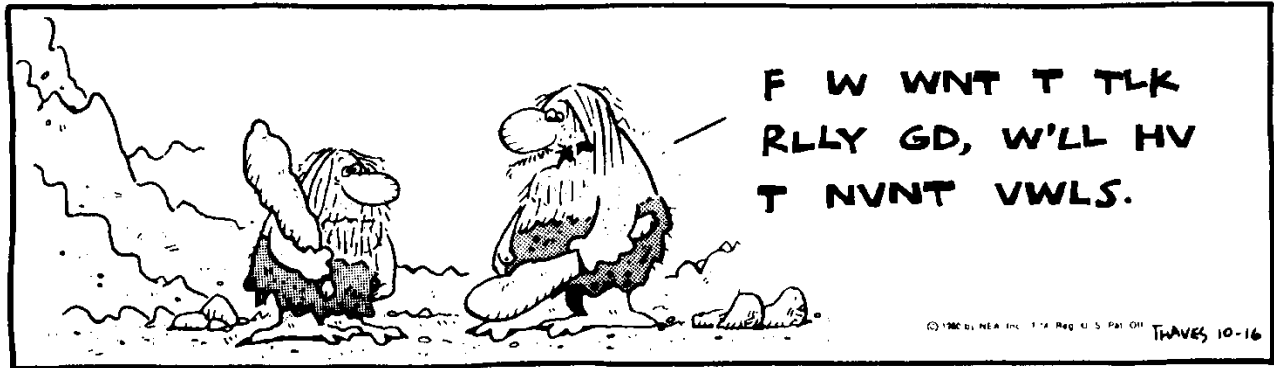
Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 6



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Phonology: The Sound Patterns of Language

What is Phonology?

Phonology is the study of telephone etiquette.

A HIGH SCHOOL STUDENT

- Actually, *phonology* is the study of how speech sounds are organized and used in natural languages.

Phonology: The Sound Patterns of Language

- There are only a dozen or so features needed to describe every speech sound in every human language
 - All the languages in the world sound so different because the way the languages use speech sounds to form patterns differs from language to language
- Phonology tells us what sounds are in a language, how they do and can combine into words, and explains why certain phonetic features are important to identifying a word

Goldilocks and the Three Bears

- Can you make sense of the following comic introduction to the story of Goldilocks and the Three Bears?
- *“Uans appona taim uas tri berres; mamma berre, pappa berre, e beibi berre. Live inne contri nire foresta. NAISE AUS. No mugheggia. Uanna dei pappa, mamma, e beibi go bice, orie e furghetta locche di dorra.*
- *Bai ene bai commese Goldilocchese. Sci garra natingha tu du batte meiche troble. Sci puscita olle fudde daon di maute; no live cromma. Den sci gos appesterrese enne slipse in olle beddse.”*
 - Bob Belviso, quoted in George Yule (2010)

Goldilocks and the Three Bears

Bob Belviso Translated

- *Once upon a time was three bears; mama bear, papa bear, and baby bear. Live in the country near the forest. NICE HOUSE. No mortgage. One day papa, mama, and baby go beach, only they forget to lock the door.*
- *By and by comes Goldilocks. She got nothing to do but make trouble. She push all the food down the mouth; no leave a crumb. Then she goes upstairs and sleeps in all the beds.*
- If we can manage to make sense of Bob Belviso's story, we must be using our phonological knowledge of likely combinations of sounds in English words to overcome some very unusual spellings of those words.

Phonology vs. Phonetics

- Phonology is based on a theory of what every speaker of a language unconsciously knows about the sound patterns of that language. Therefore, *phonology is concerned with the abstract or mental aspect of the sounds in language* rather than with the actual physical articulation of speech sounds.
- Phonology is about *the underlying design, the blueprint of each sound type*, which serves as the constant basis of all the *variations* in different physical articulations of that sound type in different contexts.
 - *Source:* George Yule “The Study of Language” (4th ed., 2010)

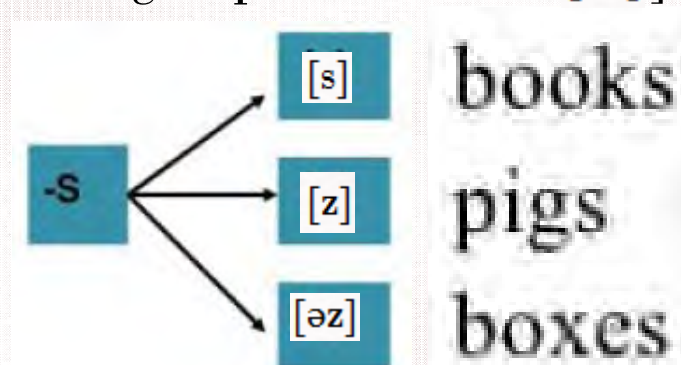
Phonology: The Sound Patterns of Language

When we think of the [t] sound in the words *tar*, *star*, *writer* and *eighth* as being “the same,” we actually mean that, in the phonology of English, they would be represented in the same way. In actual speech, these [t] sounds are all very different.



The Pronunciation of Morphemes: Plurals

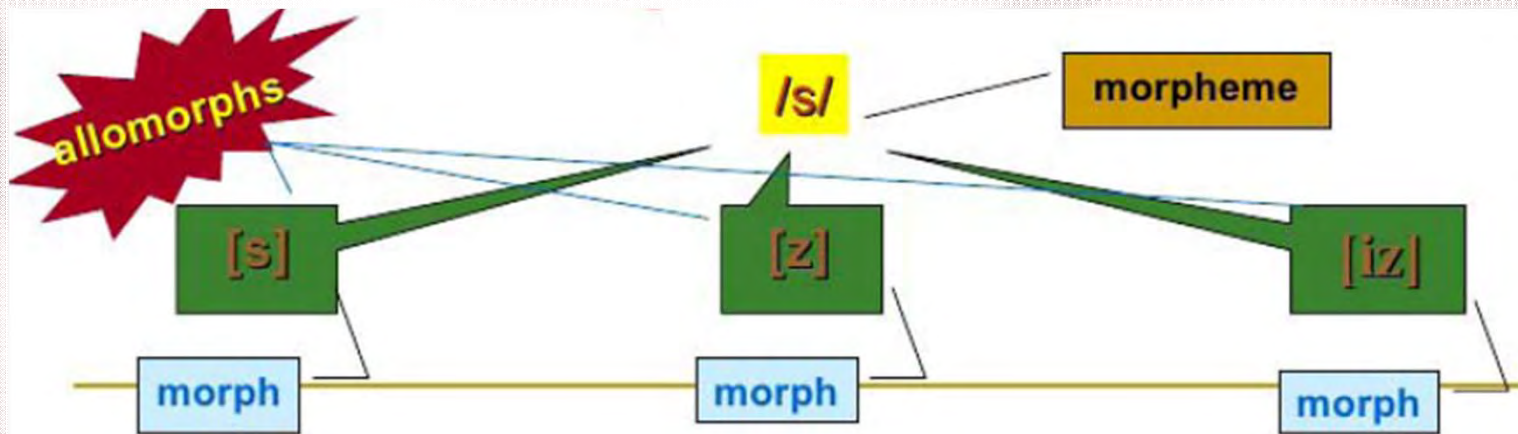
- Oftentimes certain morphemes are pronounced differently depending on their context
- For example, the English plural morpheme has three different pronunciations *depending on what noun you attach it to*:
 - It gets pronounced as a [z] for words like *cab*, *bag*, and *bar*
 - It gets pronounced as [s] for words like *cap*, *back*, and *faith*
 - It gets pronounced as [əz] for words like *bus*, *garage*, and *match*



two different spelling forms , and
three different phonological forms,
but these different forms represent
the same grammatical meaning
[Plural])

Morpheme, Morph, Allomorph

- English has a single morpheme to indicate plurality in nouns, but that morpheme is realized in different *allomorphs*



- A *morph* is a physical form representing a certain morpheme in a language.
- Sometimes different morphs may represent the same morpheme; i.e., a morpheme may take different forms. If so, they are called *allomorphs* of that morpheme.

The Pronunciation of Morphemes: Plurals

- To determine a rule for when each variant of the plural morpheme, or **allomorph**, is used, it is useful to create a chart to examine *the phonological environments* in which each allomorph occurs:

Allomorph	Environment
[z]	After [kæb], [kæd], [bæg], [lʌv], [leð], [kæm], [kæn], [bæŋ], [kɔl], [bar], [spa], [bɔɪ], e.g., [kæbz], [kædz] . . . [bɔɪz]
[s]	After [kæp], [kæt], [bæk], [kʌf], [feθ], e.g., [kæps], [kæts] . . . [feθs]
[əz]	After [bʌs], [buʃ], [bʌz], [gərəʒ], [mætʃ], [bædʒ], e.g., [bʌsəz], [buʃəz] . . . [bædʒəz]

The Pronunciation of Morphemes: Plurals

- To help us figure out what is different between the phonological environments of the words that take the [-s], [-z], and [-əz] allomorphs, we can look for **minimal pairs** (*more below*)
- Minimal pairs whose members take different forms of the plural allomorph are particularly helpful for our purposes
- For example, *cab* [kæb] and *cap* [kæp] differ only by their final sound, so since each word takes a different allomorph, we can assume that the allomorph is selected based on the final sound of the noun

The Pronunciation of Morphemes: Plurals

- Now we can make our chart a little more succinct since we know we are looking only at the final sound of each noun:

Allomorph	Environment
[z]	After [b], [d], [g], [v], [ð], [m], [n], [ŋ], [l], [r], [a], [ɔ]
[s]	After [p], [t], [k], [f], [θ]
[əz]	After [s], [ʃ], [z], [ʒ], [tʃ], [dʒ]

- Then we can make generalizations about the environment in which each allomorph occurs based on knowledge of natural classes
 - [z] occurs after *voiced* nonsibilant segments
 - [s] occurs after *voiceless* nonsibilant segments
 - [əz] occurs after sibilant (“hissing”) segments

The Pronunciation of Morphemes: Plurals

- We can simplify this even more by creating a rule that assumes /z/ is the basic or underlying form of the plural, then we have two rules to explain why the other allomorphs occur:
 - 1. Insert a [ə] before the plural morpheme /z/ when a regular noun ends in a sibilant (“hissing”), giving [əz]
 - 2. Change the plural morpheme /z/ to a voiceless [s] when *preceded* by a voiceless sound

The Pronunciation of Morphemes: Plurals

- This chart illustrates how the plurals of *bus*, *butt*, and *bug* are formed by applying these two rules:

	<i>bus</i> + pl.	<i>butt</i> + pl.	<i>bug</i> + pl.
<i>Basic representation</i>	/bʌs + z/	/bʌt + z/	/bʌg + z/
Apply rule (1)	↓ ə	NA* ↓	NA
Apply rule (2)	NA	s	NA
<i>Phonetic representation</i>	[bʌsəz]	[bʌts]	[bʌgz]

*NA means “not applicable.”

The Pronunciation of Morphemes: Plurals

- These rules must be ordered so that rule 1 applies before rule 2, otherwise we would derive an incorrect phonetic form

Basic representation

/bʌs + z/

Apply rule (2)

Apply rule (1)

Phonetic representation

↓ s
↓
ə

*[bʌsəs]

- The particular phonological rules that determine the phonetic form of morphemes are **morphophonemic rules**

Additional Examples of Allomorphs

- The English possessive morpheme and the 3rd Sg. morpheme have *allomorphs that take on the same phonetic form as the plural morpheme* and are governed by the same rules:

Possessive:

Add [z] to *woman* to get *woman's*

Add [s] to *ship* to get *ship's*

Add [əz] to *judge* to get *judge's*

Third person singular:

Add [z] to *need* to get *needs*

Add [s] to *eat* to get *eats*

Add [əz] to *rush* to get *rushes*

Phonemes: The Phonological Units of Language

- **Phonemes** are the basic unit of sound and are sensed *in your mind* rather than spoken or heard
- Each phoneme has one or more sounds called **allophones** associated with it, which represent *the actual sound* being produced in various environments

Phonemes vs. Allophones: An Analogy

- Phonemes & Allophones: a metaphor

Cookie Cutter

A cookie cutter is not a cookie.

But a cookie cutter defines a class of similar (not identical) cookies.

You can think of it as an idealized form of a particular type of cookie.



Phonemes vs. Allophones

- Phonemes & Allophones: not a speech sound!

Phoneme

A phoneme is not a speech sound.

A phoneme defines a class of similar (not identical) speech sounds.

It is an idealized form of a particular type of speech sound.

/p/

Ceci n'est pas une [p]

Phonemes vs. Allophones



Phonemes & Allophones:

Cookies



Each cookie inherits many features of the cookie cutter.

But each cookie differs from the idealization.

Some of this variation can be predicted from context. This variation is **rule based**.

Phonemes vs. Allophones

-

Phonemes & Allophones:

Our questions

★ What is a /phoneme/?

★ What is an [allophone]?

abstract

idealized

simplified

unchanging

insubstantial



concrete

real

complex

variable

measurable

Phonemes vs. Allophones

Phonemes are in your *head*,
Allophones are in your *mouth*

Illustration of Allophones

- Consider the following words:

top

stop

little

kitten

hunter

- The physical reality is that the "t" in those five examples is pronounced slightly differently from one example to the next. To illustrate this, pronounce the five words again.

Illustration of Allophones

- What differences did you notice? Compare, for example, the "t" of *top* to that of *stop*. You should be able to detect a short burst or puff of air after the "t" in *top* that is absent in *stop*. That *puff of air* is called **aspiration**, which we will transcribe with a superscripted [^h]. So while a native speaker would consider the "t" sound in *top* and *stop* to be the same sound, the 't' is actually pronounced differently in each word. This difference can be captured in the transcription, as in [^hap] and [stap].
- Now say the word *little* and *kitten*. We might say that the "t" in *little* for most speakers of American English (but not of British English), is pronounced as a flap [D], i.e., [liDl].
- For some speakers of American English, in casual speech words like *hunter* are pronounced with no "t" at all, but rather as [h[^]ne:].

Illustration of Allophones

- Unlike a speaker of English, a native speaker of Hindi could not ignore the difference between aspirated and unaspirated sounds when speaking or hearing Hindi. To a speaker of Hindi, *the aspirated sound* [p^h] is as different from unaspirated [p], as [p] is from [b] to our ears. Hindi contains many words that are pronounced in nearly the same way, except that one word will have an aspirated stop where the other has an unaspirated stop:

Hindi:	[kap ^h i] "meaningful"
	[kapi] "copy"
	[p ^h al] "knife edge"
	[pal] "take care of"

- Aspiration is "contrastive" in Hindi. In other words, saying [pal] for "knife edge" instead of [p^hal] is like saying "shave" instead of "save".

Illustration of Allophones

- So, while for English speakers, [p^h] and [p], or [t^h] and [t] are members of the same class, Hindi speakers cannot overlook these differences and distinguish meaning based on these differences.
- A class of speech sounds that are identified by a native speaker as the same sound is called a *phoneme*. The different phonetic realizations of a phoneme are called *allophones*.

Thus:

- [p^h] and [p] are **allophones of the same phoneme** in English.
- Whereas in Hindi, [p^h] and [p] are **different phonemes**.

Illustration of Allophones

Two or more languages might share the same sound or sounds but this does not mean that those languages **organize these sounds** in the same way.

Hindi: /p^h/ /p/ → phonemes

English: /p/ → phoneme
 ↙ ↘
 [p^h] [p] → allophones

Illustration of Allophones

- English contains an allophonic rule that determines contexts in which vowels are nasalized:
 - Vowels are nasalized before a nasal consonant within the same syllable structure

be	[bi]	bead	[bid]	bean	[bĩn]
lay	[le]	lace	[les]	lame	[lẽm]
baa	[bæ]	bad	[bæd]	bang	[bæŋ]

- You could change the nasalization when you pronounce these words (if you were aware that you did this) and although it would sound strange, it would not change the meaning of the words
- Because nasalized vowels are not used to make a meaning contrast we tend to not even notice them

Illustration of Allophones

- Consonants also have allophones:

tick [t^hɪk] *stick* [stɪk] *hits* [hɪts] *bitter* [bɪtər]

- /t/ is pronounced [t^h] before a stressed vowel
 - /t/ is pronounced [t] directly before or after [s]
 - /t/ is pronounced [ɾ] between a stressed and unstressed vowel
- If we pronounce *tick* as [tɪk] or [ɾɪk] instead of [t^hɪk], we are still speaking the same word, even if it sounds strange because these allophones of /t/ do not contrast
 - However, if we tried to pronounce *tick* as [sɪk], we would be saying *sick*, which has a different meaning
 - The meaning changes because /t/ and /s/ are separate phonemes and do contrast

How to Find Phonemes

- Substituting one sound for another in a word to see if the meaning changes is a good way to find phonemes
- When you do these substitutions you are creating *minimal pairs*, such as in this list:

beat	[bit]	[i]	boot	[but]	[u]
bit	[bɪt]	[ɪ]	but	[bʌt]	[ʌ]
bait	[bet]	[e]	boat	[bot]	[o]
bet	[bɛt]	[ɛ]	bought	[bɔt]	[ɔ]
bat	[bæt]	[æ]	bout	[baʊt]	[aʊ]
bite	[baɪt]	[aɪ]	bot	[bat]	[a]

- This list demonstrates most of the fourteen different vowel phonemes of English: /i/ ɪ e ɛ æ u ʊ o ɔ a ʌ/ and /aɪ/, /aʊ/ and /ɔɪ/ /ɔɪ/

Phonemes: Looking for Minimal Pairs

- To determine whether a given pair of sounds is contrastive, look for **minimal** pairs
- A *minimal pair* is two words with different meanings that are identical except for one sound that occurs in the same place in each word
- Here are four golden rules for minimal pairs:
 1. they must have the same number of sounds
 2. they must be identical in every sound except for one
 3. the sound that is different must be in the same position in each word
 4. the words must have different meanings

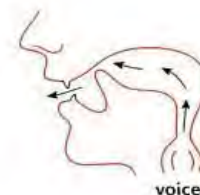
Phonemes: Looking for Minimal Pairs



1 Target sound /r/

D73

To make the target sound /r/, turn the tip of your tongue up as in the picture. Do not touch the roof of your mouth with your tongue. The sides of your tongue should touch your top back teeth. Listen and repeat: /r/.



2 Minimal pairs

Sound 1
/l/

long

It's the long road.

light

Is it light?

load

It's a long load.

jelly

Do you like jelly?

fly

I'd like to fly it.

glass

There's some glass.

Sound 2
/r/

wrong

It's the wrong road.

right

Is it right?

road

It's a long road.

Jerry

Do you like Jerry?

fry

I'd like to fry it.

grass

There's some grass.



Phonemes: Looking for Minimal Pairs

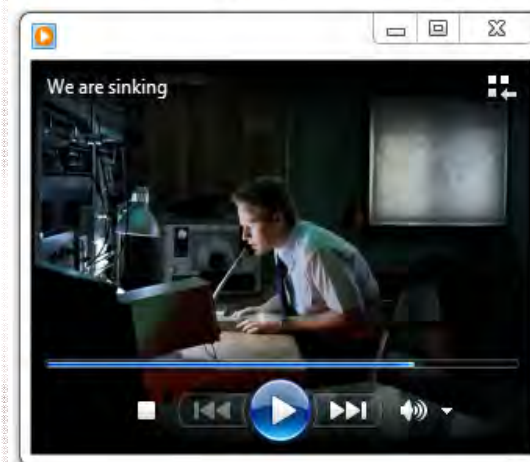
Minimal pairs B 🧠

	Sound 1 /ŋk/ wink	Sound 2 /ŋ/ wing	
	I'll give you a wink .	I'll give you a wing .	
	sink He's sinking .	sing He's singing .	
	rink The rink was a perfect circle.	ring The ring was a perfect circle.	
	stink What a terrible stink !	sting What a terrible sting !	
	bank Bank it quickly.	bang Bang it quickly.	

- Voice: Mayday, Mayday! Hello. Can you hear us? Can--you--hear us? Can you [static] ? Over. We are sinking. We are---sink--!
- Young man: Hallo, zis is ze German Coastguard.
- Voice: We're sinking! We're *sinking*!
- Young man: What are you *singing* about?

Minimal Pair

To sink vs. to sing (voiceless 'k' vs. voiced 'g')



What are you sinking about?



Minimal Pair (sinK vs. to sinG).mpg

Berlitz Language Schools

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Phonemes: Looking for Minimal Pairs

PROMPTS (STUDENT 1)

- a. Did you slip?
Did you sleep?
- b. Those were beautiful pitches.
Those were beautiful peaches.

RESPONSES (STUDENT 2)

- (Yes, on the ice.)
(Yes, for 10 hours.)
- (It was a great baseball game.)
(It was a good crop.)



Sheep
/ʃi:p/



Ship
/ʃɪp/



think



sink



Phonemes: Looking for Minimal Pairs

- This cartoon has four words that are identical except for one sound:



By permission of Johnny Hart and Creators Syndicate, Inc.

- crick, creek, crook, croak.* These words are identical except for one sound. Changing the sound results in completely new words. That means that [i], [i:], [u], and [o:] are phonemes, separate sounds because they create new words.

Phonemes: Looking for Minimal Pairs

Do [l] and [r] belong to the same phoneme in English? Look for minimal pairs!

[lɪf] "leaf"

[rɪf] "reef"

[læk] "lack"

[ræk] "rack"

Since we have minimal pairs that contain [l] and [r], we can say that [l] and [r] are contrastive. Thus they are separate phonemes and are NOT allophones of the same phoneme. Phonemes → /l/ /r/

Phonemes: Looking for Minimal Pairs

Are [r] and [l] contrastive in other languages? Let's look at Korean, a language spoken in Korea (some linguists classify it as a language isolate, others consider it an Altaic language).

Minimal pairs??

[pa^ram] "wind"

[i^rim] "name"

[pa^l] "foot"

[ma^l] "horse"

Phonemes: Looking for Minimal Pairs

- In Korean, minimal pairs can never be found for [l] and [r]; these sounds do not occur in the same position in words.
- The dataset reveals that [r] occurs between two vowels but [l] occurs at the end of words.

V__V

occurs between vowels

____#

occurs at the end of words

- Thus, [l] and [r] are in *complementary distribution* in Korean. They are mutually exclusive. In the same context, you can never find both.

Complementary Distribution

- Complementary distribution is the *mutually exclusive* relationship between two phonetically similar segments. It exists when one segment occurs in an environment where the other segment never occurs.
 - The situation where two sounds never occur in the *same* environment. In mathematical terms, X never occurs in Y's environment.
- **No minimal pairs for such sounds** = The replacement of one sound for the other will not change the meaning of the word

Complementary Distribution

- E.g., oral and nasal vowels in English are non-contrastive sounds. What's more, the oral and nasal allophones of each vowel phoneme never occur in the same phonological context, as Table 6.3 illustrates.
- Where oral vowels occur, nasal vowels do not occur, and vice versa.

TABLE 6.3 | Distribution of Oral and Nasal Vowels in English Syllables

	In Final Position	Before Nasal Consonants	Before Oral Consonants
Oral vowels	Yes	No	Yes
Nasal vowels	No	Yes	No

TABLE 6.1 | Nasal and Oral Vowels: Words and Nonwords

Words						Nonwords		
be	[bi]	bead	[bid]	bean	[bĩn]	*[bĩ]	*[bĩd]	*[bin]
lay	[le]	lace	[les]	lame	[lẽm]	*[lẽ]	*[lẽs]	*[lem]

Complementary Distribution

- Allophones of a phoneme are in **complementary distribution**
= they never occur in the same environment
 - Like Superman and Clark Kent

Superman: when there is
an emergency



Clark Kent: never in an
emergency



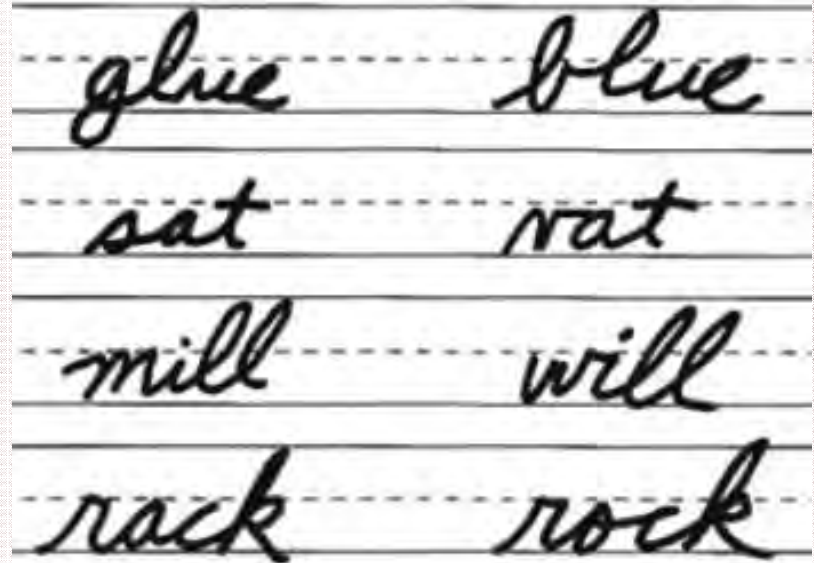
Complementary Distribution

- Superman and Clark Kent are two identities of the same person.
- We can say that they are in complementary distribution because they are not interchangeable.
- Superman is found in EMERGENCIES
- Clark Kent is always found elsewhere.



Complementary Distribution

- Examples from the writing system can help illustrate the idea of complementary distribution
 - 1. Each letter of English can appear in upper case or lower case form, but upper case only occurs in certain contexts, like the beginning of a word, and everywhere else we get the lower case
 - 2. In cursive handwriting, letters may get written differently depending on what comes before and after, and each variant (allograph) is dependent on context



Complementary Distribution

- When sounds are in complementary distribution, they do not contrast with each other
 - The replacement of one sound for the other will not change the meaning of the word
- If two sounds are allophones of a single phoneme, they must be in complementary distribution and be phonetically similar

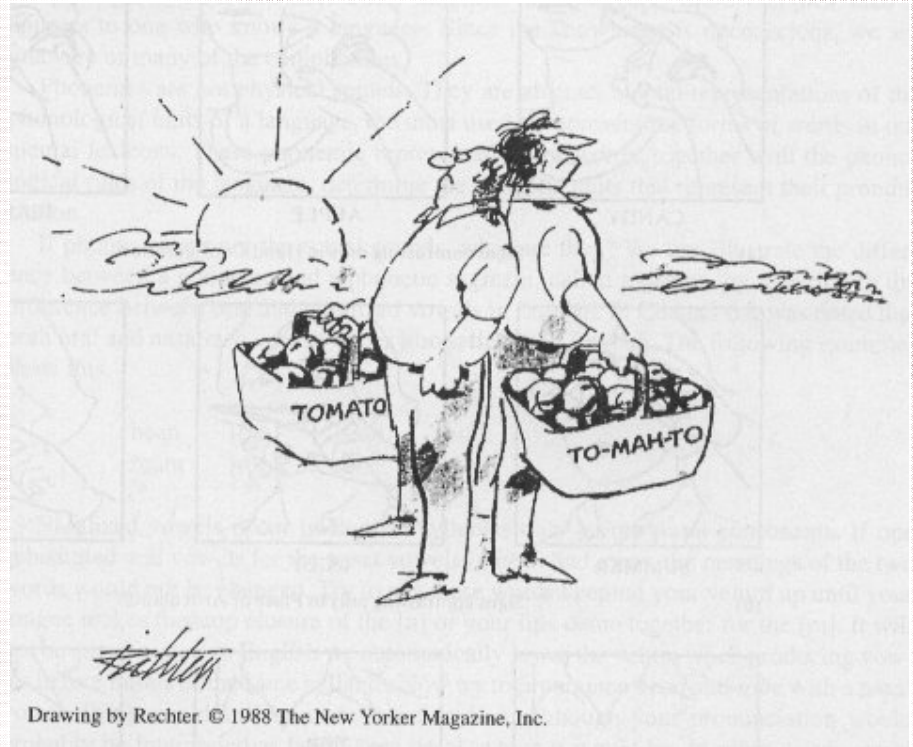


Different Types of Phonological Variation

- **Overlapping Distribution** – different sound in same environment (ex. /t^hap/ vs. /p^hat/).
- **Contrastive distribution** – changing sound changes meaning (ex. /mæn/ vs. /mɪn/).
- **Complementary distribution** – sounds in a language never found in the same phonetic environment (ex. /t^hap/ vs. /pat^h/*).
- **Free variation** – two sounds that occur in overlapping environments but doesn't change meaning (ex. /input/ vs. /ɪmpʊt/).

Complementary Distribution *vs.* Free Variation

- **complementary distribution** = allophonic variation dependent on the phonetic environment the phoneme occurs in
- **free variation** = allophonic variation *independent* of the phonetic environment the phoneme occurs in; random interchangeability



Free Variation:

“Let's Call The Whole Thing Off”

- Another example of free variation is the old song by Billie Holiday from the 1930s:



You Say 'Tomato', I say 'Tomato'....mp4

You say either [iðər] and I say [aɪðər],
You say [niðər] and I say [naɪðər],
[iðər] [aɪðər] [niðər] [naɪðər],
let's call the whole thing off.



You say
TOMATO
I say
TOMATO

**Doesn't make much sense
when you read it.**

Free Variation: English vs. Italian

English: /s/ and /z/

[sɪp] *sip*

[zɪp] *zip*

[bʌs] *bus*

[bʌz] *buzz*

Contrastive distribution

Italian /s/ and /z/

[rosa] *rose*

[roza] *rose*

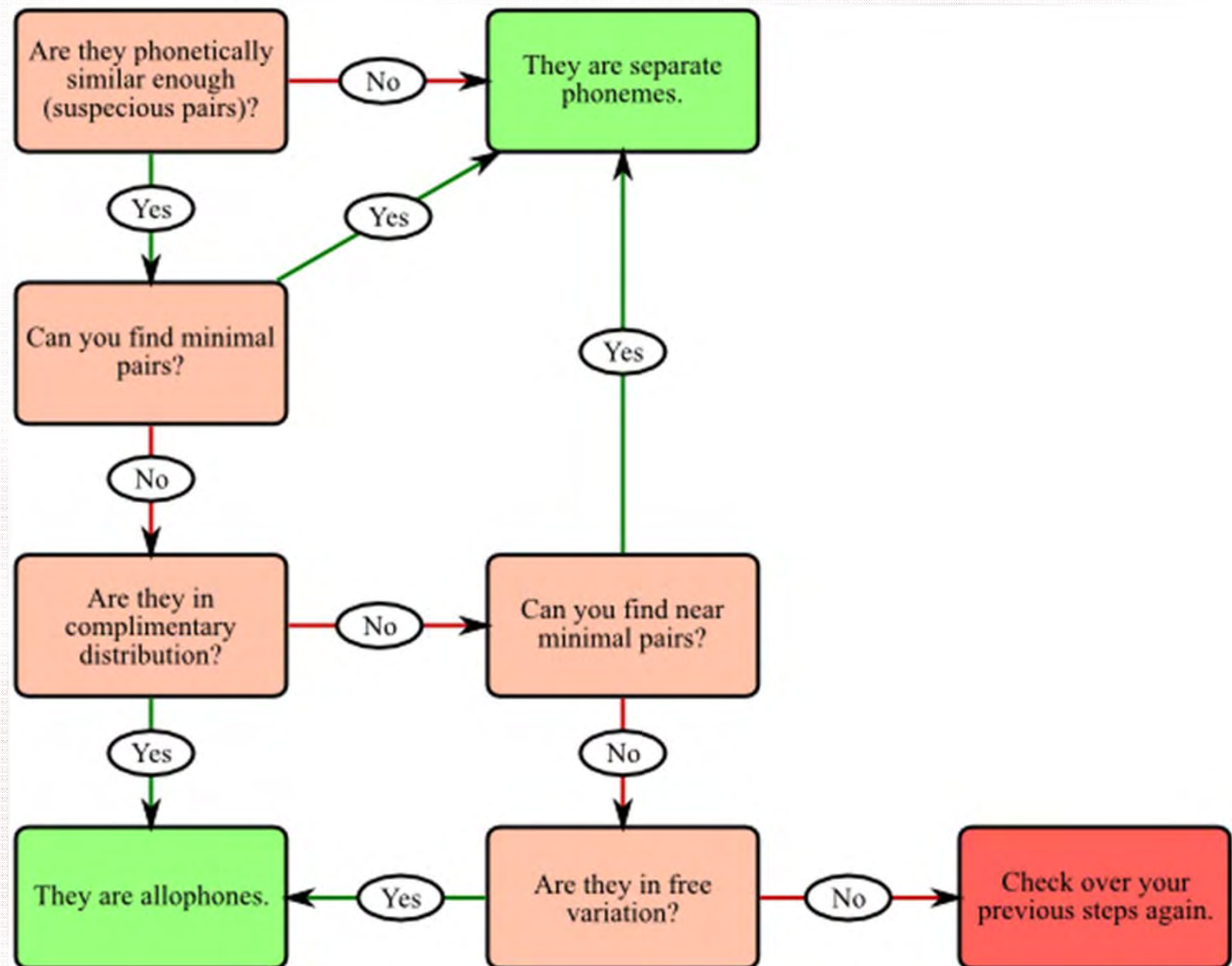
[viso] *face*

[vizo] *face*

Free variation

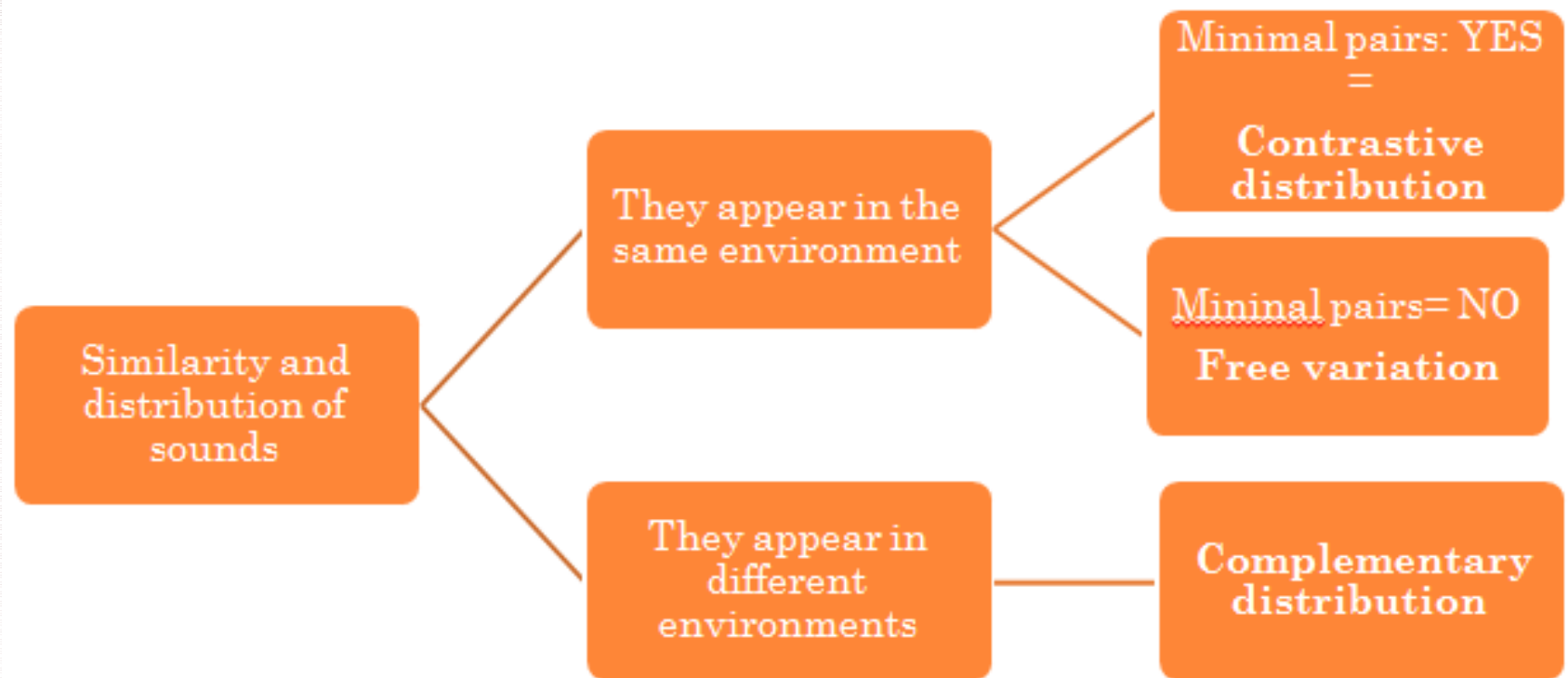
Determining Allophony

Basic procedure for determining whether two phones are allophones of a single phoneme or represent different phonemes.



Determining Allophony

Another flowchart for phonological analysis



Distinctive Features of Phonemes

- For two **phones**, or sounds, to contrast meaning there must be some difference between them
 - For example, the phonetic feature of voicing distinguishes [s] from [z]
- When a feature distinguishes one phoneme from another, it is a **distinctive feature** or a **phonemic feature**

What are **DISTINCTIVE** **FEATURES**?

General principles

- Phonetically based
- Binary (+/-).
- Break down sounds into smaller units.
- Uniquely represent each sound in a language.

/ p /

+consonantal
- syllabic
- sonorant
- continuant
- nasal
+ labial
- voice

What are **DISTINCTIVE** FEATURES?

EACH SOUND HAS A UNIQUE FEATURE MATRIX

/p/	/b/	/m/
<ul style="list-style-type: none">+ consonantal- syllabic- sonorant- continuant- nasal+ labial- voice *	<ul style="list-style-type: none">+ consonantal- syllabic- sonorant- continuant- nasal+ labial+ voice *	<ul style="list-style-type: none">+ consonantal- syllabic+ sonorant *- continuant+ nasal *+ labial+ voice *

Phonological contrast

- The feature “voice” is distinctive in English because it distinguishes /p/ and /b/ (but also all stops, fricatives and affricates)

[-voice]	/t/	/f/	/s/	/ʃ/
[+voice]	/d/	/v/	/z/	/ʒ/

- /p/ and /b/ are phonologically similar:

	/p/	/b/
continuant	-	-
labial	+	+
Voice	-	+



Phonological contrast

- Are /p/ and /b/ different sounds? Are /p/ and /b/ the same sound? Are they realizations of the same phone?
- *The minimal pair test:*
 - Word initial position:
pit /pɪt/ *bit* /bɪt/
 - Word final position
slap /slæp/ *slab* /slæb/
- /p/ and /b/ are **contrastive sounds** in English because interchanging the two changes the meaning of the words
- /p/ and /b/ are **phonemes**

Feature Values

- Features have two values: [+feature] and [-feature] to indicate the presence or absence of that particular feature
 - For example, [b] is [+voiced] and [p] is [-voiced]

- At least one feature difference must distinguish each phoneme of a language

	b	m	d	n	g	ŋ
Stop	+	+	+	+	+	+
Voiced	+	+	+	+	+	+
Labial	+	+	–	–	–	–
Alveolar	–	–	+	+	–	–
Velar	–	–	–	–	+	+
Nasal	–	+	–	+	–	+

Nondistinctive Features

- When a feature is predictable by a rule for a certain class of sounds, that feature is a **nondistinctive** (or **redundant** or **predictable**) feature for that class
 - For example, *nasalization* is a redundant feature for English vowels but is distinctive for English consonants
 - But in Akan and French nasalization is a distinctive feature for vowels
 - Also, *aspiration* is a nondistinctive feature for voiceless stops in English

Contrast is language-specific: English vs. Italian

- Consider two similar sounds in English

	/n/	/ŋ/
nasal	+	+
labial	-	-
alveolar	+	-
velar	-	+

- Contrast in final position: *sin* [sɪn] ~ *sing* [sɪŋ]
- No contrast in initial position
- /n/ and /ŋ/ are *different phonemes*
- In Italian**, however, [n] and [ŋ] are non-contrastive phonemes (no minimal pairs)
- They are two predictable variants of one sound.
 - [ŋ] occurs before [k] and [g]
 - [n] occurs elsewhere

Contrast is language-specific: English vs. Italian

- In Italian, therefore:
 - /n/ and /ɲ/ are **allophones** of the same **phoneme**
 - /n/ and /ɲ/ are in **complementary distribution**
- When two allophones are in complementary distribution we can write a phonological rule.

- Simple Basic Rule :

/n/ → [ɲ] before [k], [g]
→ [n] elsewhere

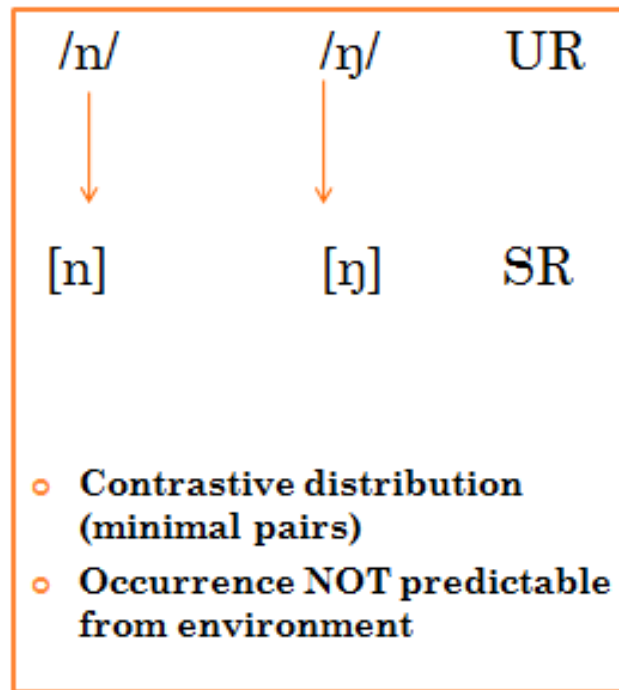
- Rule using distinctive features:

$$\left[\begin{array}{l} +\text{nasal} \\ -\text{velar} \end{array} \right] \longrightarrow [+ \text{velar}] / \text{ ______ } [+ \text{velar}]$$

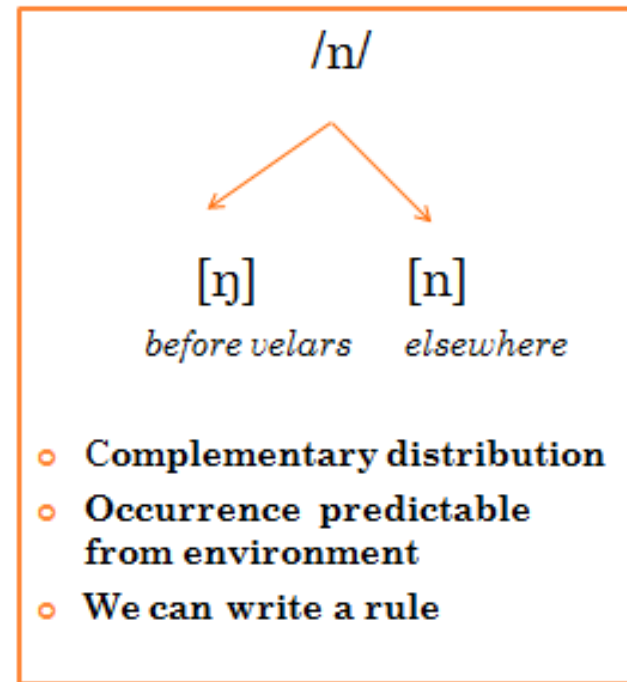
Contrast is language-specific: English vs. Italian

- To summarize:

ENGLISH: ALLOPHONES OF DIFFERENT PHONEMES



ITALIAN: ALLOPHONES OF THE SAME PHONEME



- UR = the underlying representation (*phonemes*)
- SR = the surface representation (*allophones*)

Phonemic Patterns May Vary Across Languages

- The same phones may occur in two languages but pattern differently because the phonologies of the languages are different
- While aspiration is not distinctive in English, it is distinctive in Thai:

Voiceless Unaspirated

[paa]	<i>forest</i>
[tam]	<i>to pound</i>
[kat]	<i>to bite</i>

Voiceless Aspirated

[p ^h aa]	<i>to split</i>
[t ^h am]	<i>to do</i>
[k ^h at]	<i>to interrupt</i>

Natural Classes of Speech Sounds

- Phonological rules often apply to **natural classes** of sounds
 - A natural class is a group of sounds described by a small number of distinctive features
 - Natural classes can be defined by + and – feature values

| Feature Specification of Major Natural Classes of Sounds

Features	Obstruents	Nasals	Liquids	Glides	Vowels
Consonantal	+	+	+	–	–
Sonorant	–	+	+	+	+
Syllabic	–	+/–	+/–	–	+
Nasal	–	+	–	–	+/–

Co-articulation Effects

- **Co-articulation effects:** the process of making one sound almost at the same time as the next sound
- **Assimilation** - becoming more like a neighboring sound
- **Elision** - the deletion of a sound segment; not pronouncing it

Assimilation Rules

- An **assimilation rule** is a rule that makes neighboring segments more similar by duplicating a phonetic property
 - For example, the English vowel nasalization rule states that *vowels become nasalized before a nasal consonant within the same syllable*

V	→	[+nasal]	/	—	[+nasal]	\$
Vowels	become	nasalized	in the	before	nasal	within a
			environment		segments	syllable

$$V \rightarrow [+nasal] / \text{ — } [+nasal] \$$$

Assimilation Rules:

Phonology is a lot like High School, really...

- **Assimilation = Peer Pressure**
- In High School, assimilation is an incredibly common process, and is usually referred to as “peer pressure” or “trying to fit in”. If all the other kids in a social group smoke, chances are, new additions will start smoking too. Similarly, if all the sounds around a given segment are voiced, there’s a strong pressure for that segment to become voiced as well.



- *Assimilation Complete*

- This analogy is really useful for phonological analysis, believe it or not. If a parent can’t figure out why her child is suddenly snorting lines of Vitamin C, chances are, if the parent examines the friends surrounding her child, she’ll find that they all are doing it too. Similarly, if you can’t figure out why this sound is being nasalized here, just look at its friends. Chances are, they’re all hanging out behind the gym and giving nasality a try.

Assimilation Rules in Russian: *VODKA*



Assimilation Rules in Russian: *VODKA*

Voiced vs. Voiceless Consonants in Russian

written:

vodka



Voiceless

п б
т д
к г
ф в
с з
ш ж



п б
т д
к г
ф в
с з
ш ж



п б
т д
к г
ф в
с з
ш ж

Voiced



pronounced:

votka

The **k** is causing the **d** to become more like itself.

- When a cluster of consonants occurs (mostly two consonants), the final element in the cluster determines if the whole cluster is voiced or voiceless.

Elision (deletion)

- **Elision (deletion):** the process of not pronouncing a sound segment (consonant, vowel, or whole syllable) that might be present in careful pronunciation

'You and me' [ju ænd mi]
[juənmi]

'above his hat' [əbʌv hɪz hæt]
[əbʌvɪzhæt]

Phonological Analysis

- In order to determine the phonemes and allophones in a language other than English, you should answer the following questions while you examine data:
 - 1. Are there any minimal pairs in the data in which these sounds contrast?
 - 2. Are any noncontrastive sounds in complementary distribution?
 - 3. If noncontrasting phones are found, what are the underlying phonemes and their allophones?
 - 4. What are the phonological rules by which the allophones can be derived?

To sum up:

- A phonological system consists of sounds.
- If the sounds are in contrast they are realizations of **different phonemes**.
- If they are not in contrast they are realizations of the **same phoneme** and are called allophones.
- If the allophones are in **complementary distribution** we write a rule for what is predictable from environment.
- The smallest unit of phonological analysis are the **distinctive features**.

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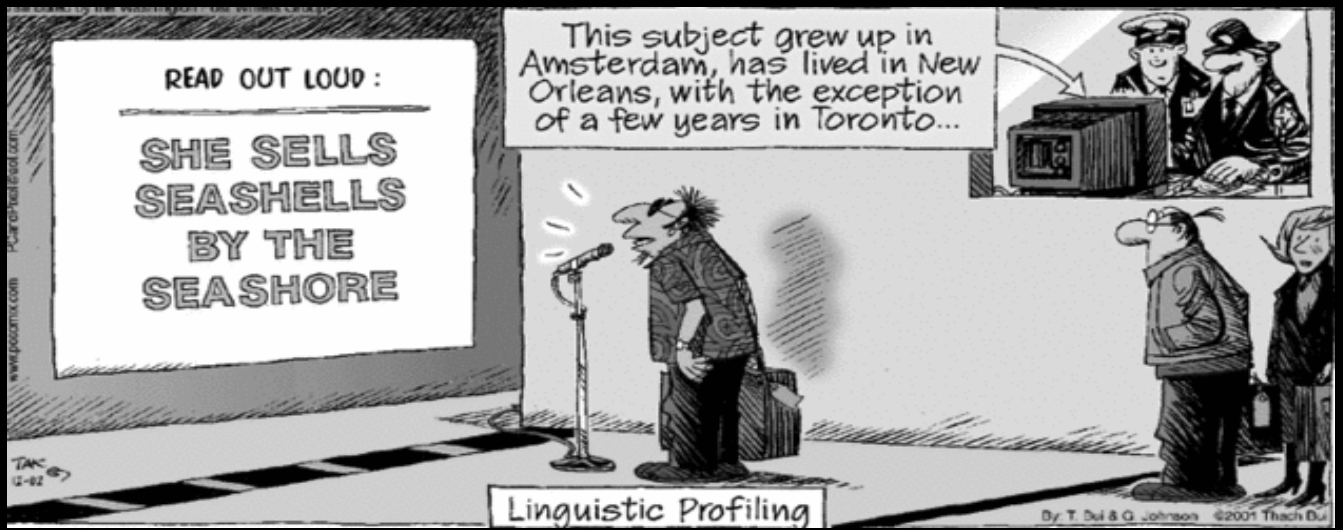
Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 7



Language in Society

Idiolects

- No two persons speak exactly alike. There are as many **idiolects** as there are people = Every speaker has an idiolect.
- The language of an individual speaker with its unique characteristics is called an **idiolect**



- Key differentiating factors of idiolects—age, gender, speech rates, emotional state, L1 vs. L2, and personal word choices, pronunciation, and grammatical rules.

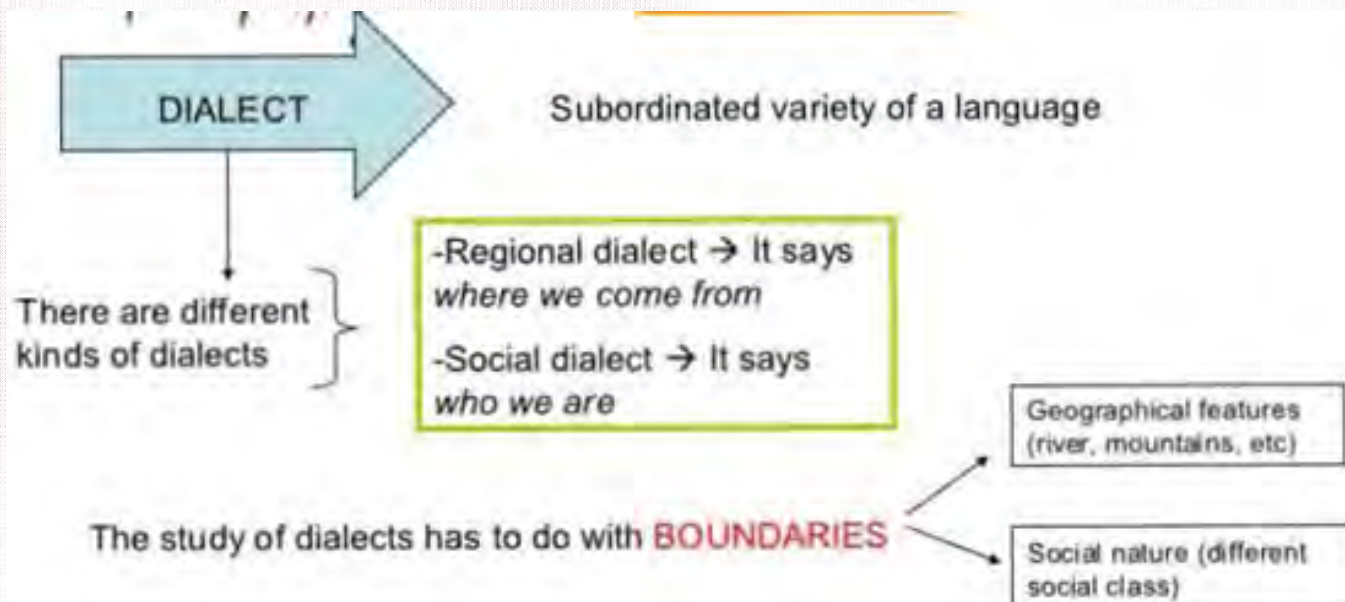
Dialects

- Varieties of the same language spoken by a group of people that show systematic grammatical differences from each other are called a **dialect**.
- **Dialects**: mutually intelligible forms of a language that differ in systematic ways
- When systematic distinctions are phonologically or phonetically based but do not involve lexical or syntactic choices, they form an **accent** group.



Regional vs. Social Dialects

- Dialect/Accent groups can be geographically or socially based.
- **Regional dialect/accent**—sufficient distinguishable features amassed due to geographic separation.
- **Social dialect/accent**—gender-, ethnicity-, or class-based characteristics resulted from social stratification.



A Dialect or a Language?

- When dialects become mutually unintelligible, then they become separate languages. But, it can be difficult to draw the line between dialects and separate languages.

**Language is a dialect
that has its
own army and
navy**

~ Max Weinreich ~



- That “*a language is a dialect with an army and a navy*” (attributed to Max Weinreich) reveals the arbitrariness of any non-linguistic division between the two.
- A broadly-defined language is a composite of dialects, among them the **prestige** form that is held as the standard.

A Dialect or a Language?

- Political autonomy may promote the status of dialects:
 - **Danish, Norwegian, and Swedish** all exhibit the so-called *inter-Scandinavian mutual comprehensibility*.
 - **Hindi-Urdu** can be considered one single Indo-Aryan language, indistinguishable colloquially but differing on the literary and formal registrars.
- A powerful central government can demote the status of provincial languages:
 - Sinitic languages: **Mandarin, Cantonese, Hakka, Taiwanese**, etc.—a situation reinforced by their common writing system.

A Dialect or a Language?

Classic cases:

- The West Romance dialects
- Germanic dialects continua.

Stretches through rural communities from the Atlantic coast of France through Italy, Spain and Portugal.

Intelligibility between adjacent villages

Find each other mutual intelligibility

In SCANDINAVIA if a tourist knows:

Danish, Swedish, Norwegian

Dialects of one language

It is possible to communicate across language boundaries



A Dialect or a Language?

- Danish V/S Norwegian

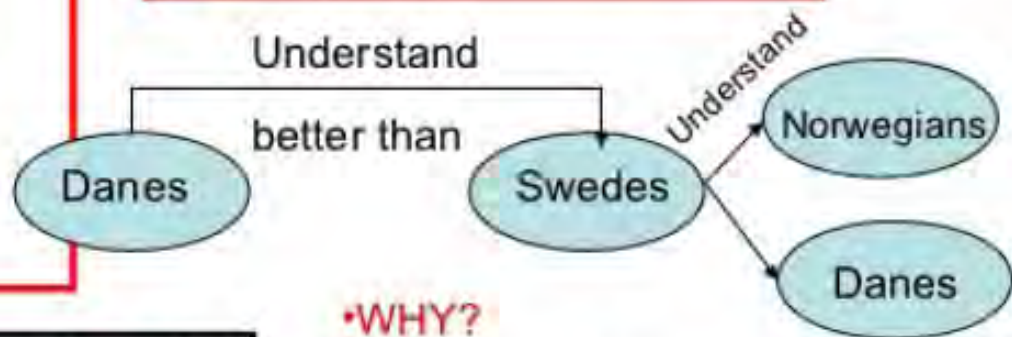
- Have a great deal of vocabulary in common but differ in pronunciation.

- Swedish V/S Norwegian

- Better more in vocabulary
- have more similar pronunciation

- Modern languages derived from **Nordic ancestor**. Their increasing fragmentation reflects **political history**

- Separate languages** due to political reasons.



Danish:	<i>Hun sidder i vinduet og ser ud over gaden.</i>
Norwegian:	<i>Hun sitter i vinduet og ser ut over gatan.</i>
Swedish:	<i>Hon sitter i fönstret och ser ut över gatan.</i>

- WHY?**

- Because more Norwegians have been in Sweden than Danes.

- Swedes have been in the other two countries.

Dialect Continuum

- For the most part, dialects share rules and lexicon to a large extent, and are thus **mutually intelligible**.
- Due to the cumulative effect of linguistic differences, successive dialects may see their **mutual intelligibility** decrease across geographic or social distance.
- **Geographic dialect chain/continuum:**
 - Ex. The South Slavic dialect continuum includes such standard languages as Slovenian, Croatian, Bosnian, Serbian, Macedonian and Bulgarian.
- **Social dialect chain/continuum**
 - Ex. Indivisible layers of contact between English on the upper social strata and the day-to-day Jamaican Creole.

American vs. British English

- Is American English a dialect of English or a separate language?
- It depends on your point of view.

•George Bernard Shaw→ England and America as two nations divided by a common language

•Noah Webster→ Authored a dictionary containing different spellings in American and British words (color, criticize)



Regional Dialects



Regional Dialects

- A dialect of British English spoken in southern England systematically deleted [r] before consonants and at the end of a word

- *farm* [fa:m]
- *farther* [fa:ðə]
- *father* [fa:ðə]



- Commercial ties between major cities in New England and England were close, and Southern families were sending their children to England to be educated



Boston Accent - Witness to Fatal Stabbing.mp4

- This [r] dropping spread to the US and can now be found in dialects of the South, Boston, and New York

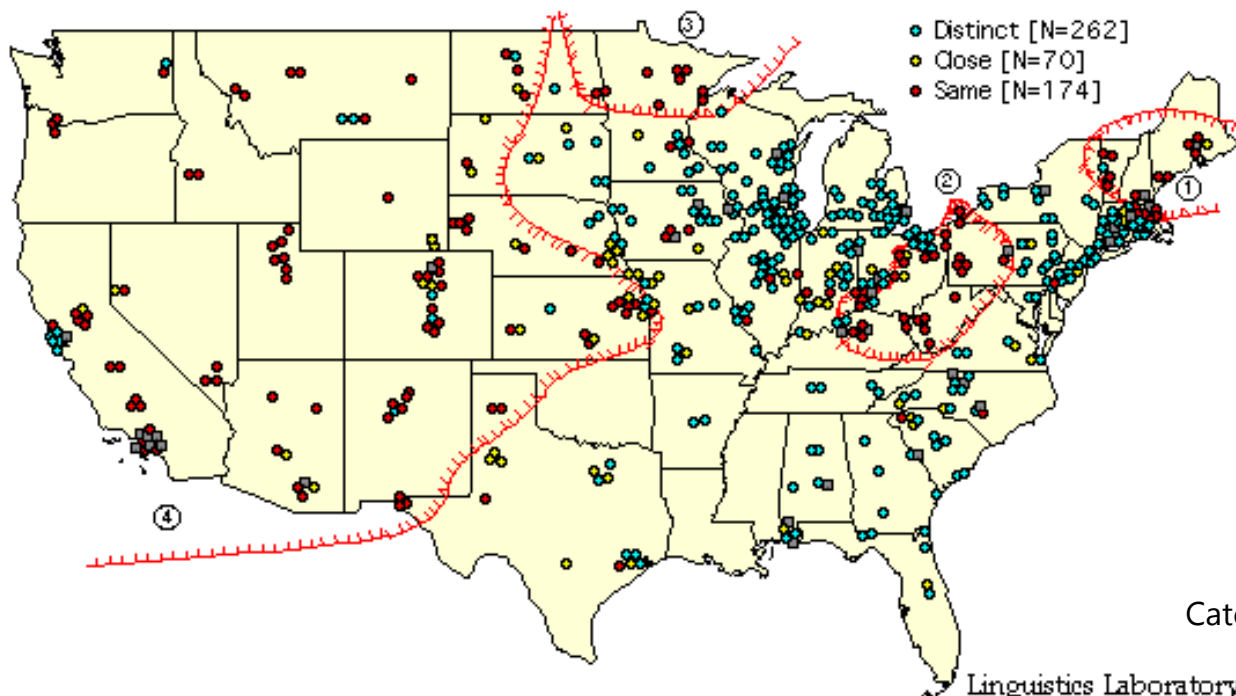
Phonological Differences

- *COT* vs. *CAUGHT*

Updated: Oct 4, 1996

Map 1. The Merger of /o/ and /oh/:

Contrast in production of /b/ and /bh/ before /t/ in COT vs. CAUGHT.



The Phonological Atlas of North America

Linguistics Laboratory
U. of Pennsylvania



Catching Cots.wmv

Lexical Differences: *Busking*



Lexical Differences: *Busking*

- While English is spoken in many parts of the world, all English words are not mutually intelligible.
- This London tube (subway) sign say that anyone performing there (e.g., singing or playing for money) is subject to a fine of subsection.



- Are *tube* and *busking* dialect words?



Lexical Differences

- Regional dialects may also differ lexically

- British: *lift*
- British: *pants*
- Boston: *tonic*

American: *elevator*

American: *underpants*

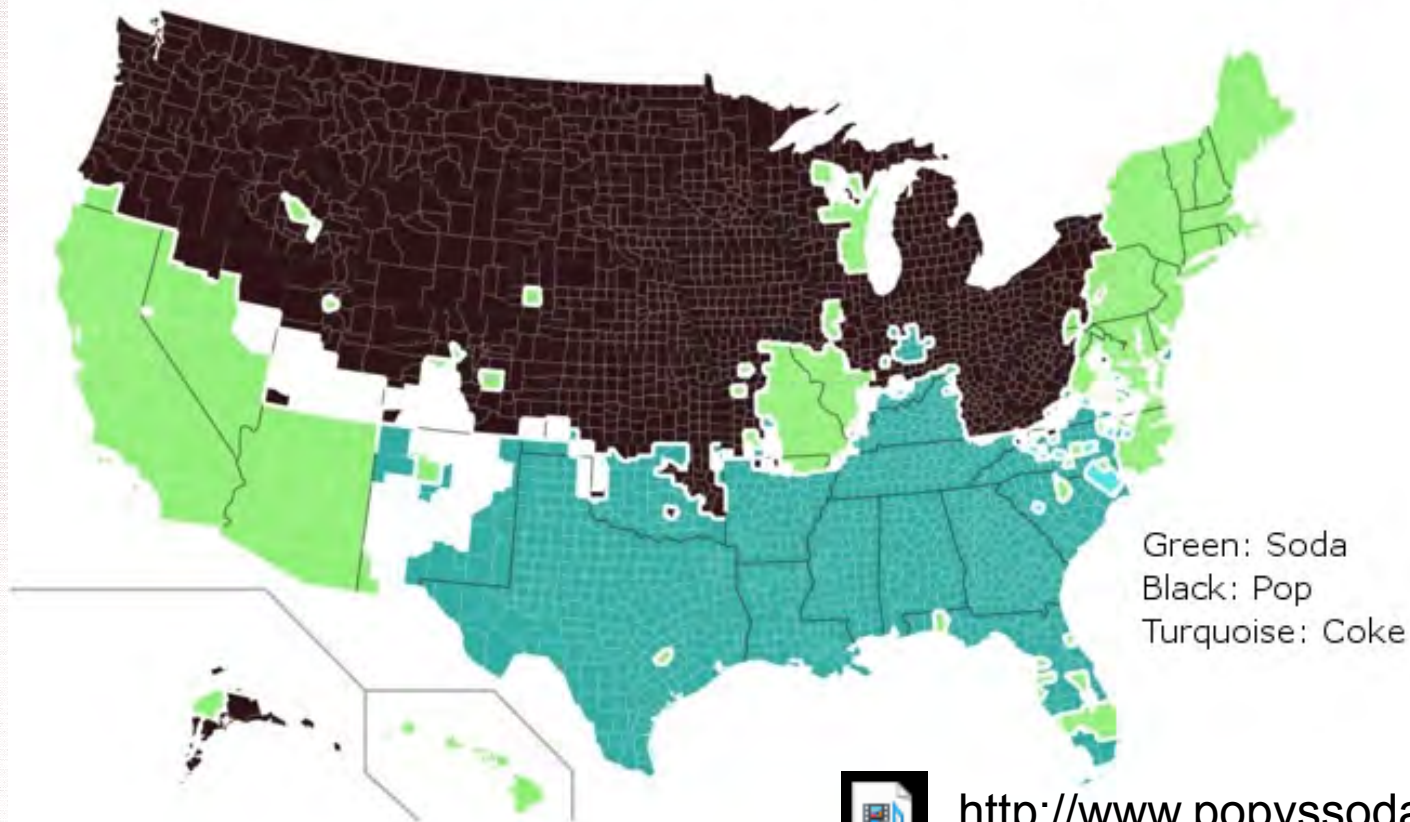
Los Angeles: *soda*

- Los Angeles: *freeway*
- New York: *thruway*
- New Jersey: *parkway*
- England: *motorway*



Lexical Differences

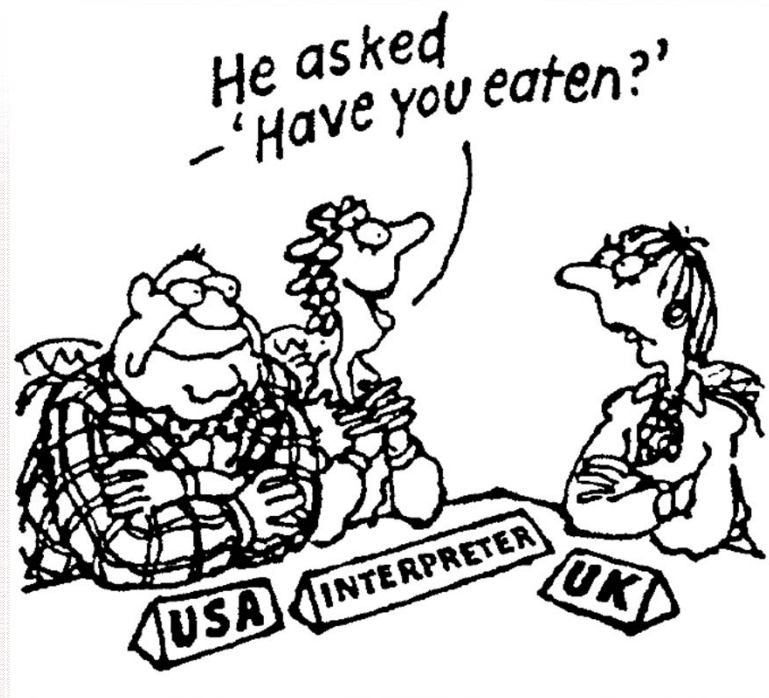
The Soft Drink Borders: Soda, Pop, or Coke?



<http://www.popvssoda.com/>

Syntactic Differences

- Appalachian English has several syntactic differences from Standard English
 - Double modals
 - *You might should go home.*
 - *He might could do it.*
 - Double objects
 - *I caught me a fish.*
 - Progressives
 - *He came a-runnin'.*



Dialect Atlases & Isoglosses

- **Dialect maps** and **dialect atlases** plot dialect differences geographically
- **Dialect areas** can be seen by concentrations of linguistic differences
- *“Try to show the geographical boundaries of the distribution of a particular linguistic feature by drawing a line on a map”* (Wardhaugh 134)
- Such a line is called an **isogloss**
 - On one side of the line people say one thing, on the other they say a different thing.

Isoglosses

- The *YAT* (Ѣ = E/Я) isogloss in Bulgarian



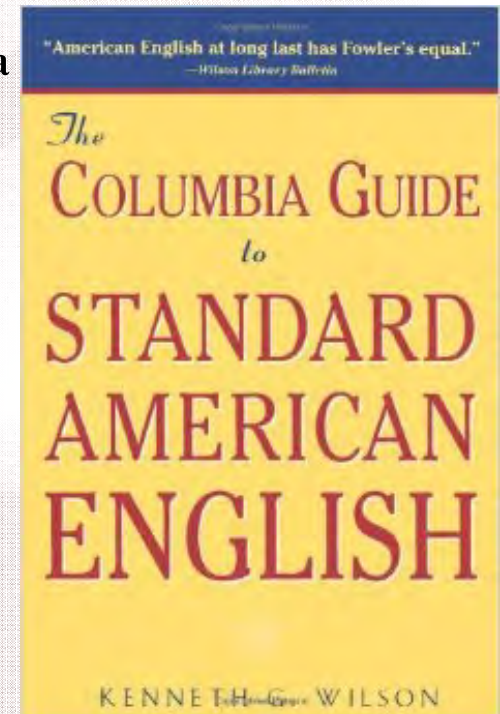
Social Dialects

- Dialects can also stem from social divisions
- The social divisions that can lead to different social dialects include gender, socioeconomic status, religion, race and ethnicity, and country of origin
 - Christians, Muslims, and Jews all speak different varieties of Arabic in Baghdad
 - In India, people often speak different dialects based on social caste



The “Standard”

- **Standard (or *Mainstream*) American English (SAE / MAE)** is the dominant (or **prestige**) dialect in America
- Nobody actually speaks SAE (it’s an *idealization*), and it is not defined precisely
- When a standard is the dialect of the wealthy and powerful, people may be required to speak that dialect in order to get ahead.
- All dialects represent a set of rules or lexical items in the minds of speakers, and any value judgments on dialects are social judgments
- British *received pronunciation* (RP) omits *r* in certain environments and is considered the standard pronunciation
- In the American northeast, dialects that omit the *r* are considered to be “substandard” and the prestige dialect maintains the *r*



British Accent Samples, Conservative RP.wav

<http://www.soundcomparisons.com/Eng/Direct/Englishes/SgLLgRPStandard.htm>

Rachel Jeantel's English

- Rachel Jeantel [prosecution's witness]'s Language is English — It's Just Not Your English (Florida v. Zimmerman, 2013)



Rachel Jeantel's English

- One problem Jeantel is not having is with English itself. It's just that it's Black English, which has rules as complex as the mainstream English. They're just different rules. If she says to the defense lawyer interrogating her "I had told you" instead of "I told you" it's not because it's Haitian—black people around the country use what is called the preterite "had."
- If you think Black English is primitive, here's a test – is it "I ain't be listening that much" or "I don't be listening that much"? It's *don't*, and Jeantel and millions of other black people nationwide could tell immediately that using "ain't" in that sentence is "off."

Rachel Jeantel's English

- This was what defense attorney Don West failed to understand yesterday when he asked Jeantel:
 - “Are you claiming in any way that you don’t understand English?”
 - *I don’t understand you, I do understand English,”* said Jeantel.
 - “When someone speaks to you in English, do you believe you have any difficulty understanding it because it wasn’t your first language?” asked West.
 - “I understand English really well,” said Jeantel.
- She understands it as well as West or anyone. So now who’s the dumb one?

African American English

- **African American English (AAE, Black English)** is the linguistic variety of English (“a social dialect” [Fromkin 2014]) spoken by many African-Americans in the USA. Their language has been stigmatized because of racism and/or prejudicial ignorance.



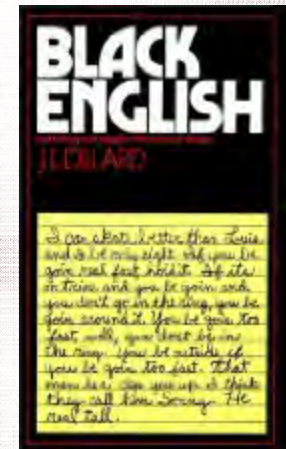
English Comes to America



African American English

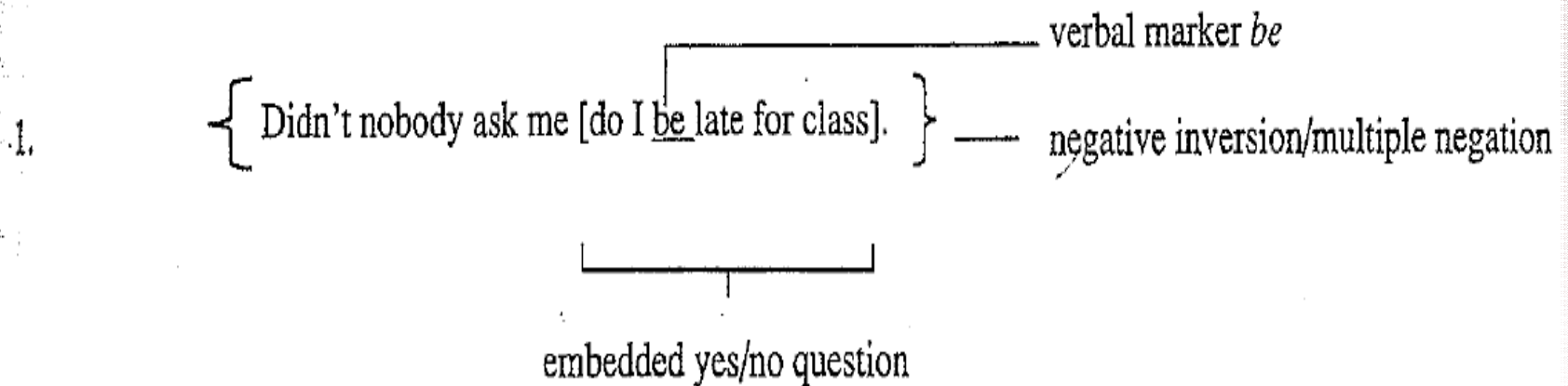
- The Problem:

- A) All who speak differently, are taught to feel bad about their language patterns. Thus, AAE is “considered” bad English.
- B) We forget that “standard English” is nothing but a dialect that developed alongside the 7 other American dialects.
- C) AAE, or Black English, is not a bastardized version of standard English; it has its own linguistic forms with its own laws. It is every bit as legitimate as any other language.



African American English

Many characteristic features of AAE are from that part of the linguistic system that puts words together to form sentences (technically called “syntax”). Speakers of AAE form sentences according to the rules of its syntax. The point can be illustrated with the negative sentence, *Didn't nobody ask me do I be late for class* ('Nobody asked me if I am usually late for class').



• Source: Lisa Green “African American English” (2004)

Phonological Differences between AAE and SAE

- R-Deletion: like several dialects of British and American English, AAE includes a rule that deletes /r/ everywhere except before a vowel
 - Pairs such as *guard* and *god*, *nor* and *gnaw*, and *poor* and *Poe* may be pronounced the same in AAE
- Consonant Cluster Reduction: AAE speakers may simplify consonant clusters particularly at the end of words and when one of the consonants is alveolar
 - *past* and *passed* may both be pronounced as *pass*, but this deletion rule is not as common when the deleted consonant represents a morpheme (as in the past tense)
 - This also occurs in SAE: for example, in SAE the medial [d] in *didn't* is often omitted
- Neutralization of [ɪ] and [ɛ] before Nasals: like many regional dialects, AAE neutralizes [ɪ] and [ɛ] before nasals
 - Pairs such as *bin* and *Ben*, *tin* and *ten* are pronounced the same
- Diphthong Reduction: AAE has a rule in which the diphthong [ɔɪ] is reduced to [ɔ] (especially before /l/)
 - The word *boy* is pronounced as [bɔ]
 - This feature is common for many speakers in the South regardless of race or class

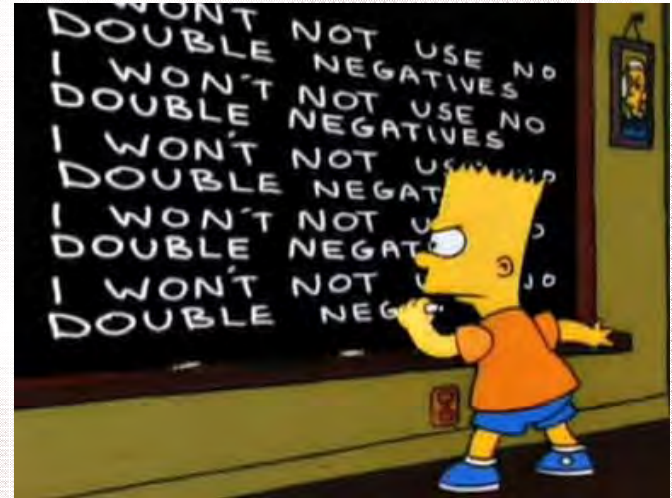
Phonological Differences between AAE and SAE

**All of the phonological
features of AAE are
systematic, rule-governed, and
similar to phonological
variations found in languages
all over the world**

Syntactic Differences between AAE and SAE

- Multiple Negatives: AAE allows multiple negatives (such as *He don't know nothing*), as does French and Italian

A parody of the SAE rule ►



- Deletion of “Be”: AAE speakers may delete the word “be”; the deletion rule corresponds to the contraction rule in SAE

AAE

He nice

**He as nice as he say he*

He as nice as he say he is

SAE

He's nice

**He's as nice as he says he's*

He's as nice as he says he is

Syntactic Differences between AAE and SAE

- Habitual “Be”: AAE has rules to mark habitual states syntactically by using the uninflected form of *be*

AAE

John be happy

John happy

**John be happy at the moment*

SAE

John is always happy

John is happy right now

- “There” Replacement: Some AAE dialects may replace *there* with *it*’s in positive sentences and *don’t* or *ain’t* in negative sentences

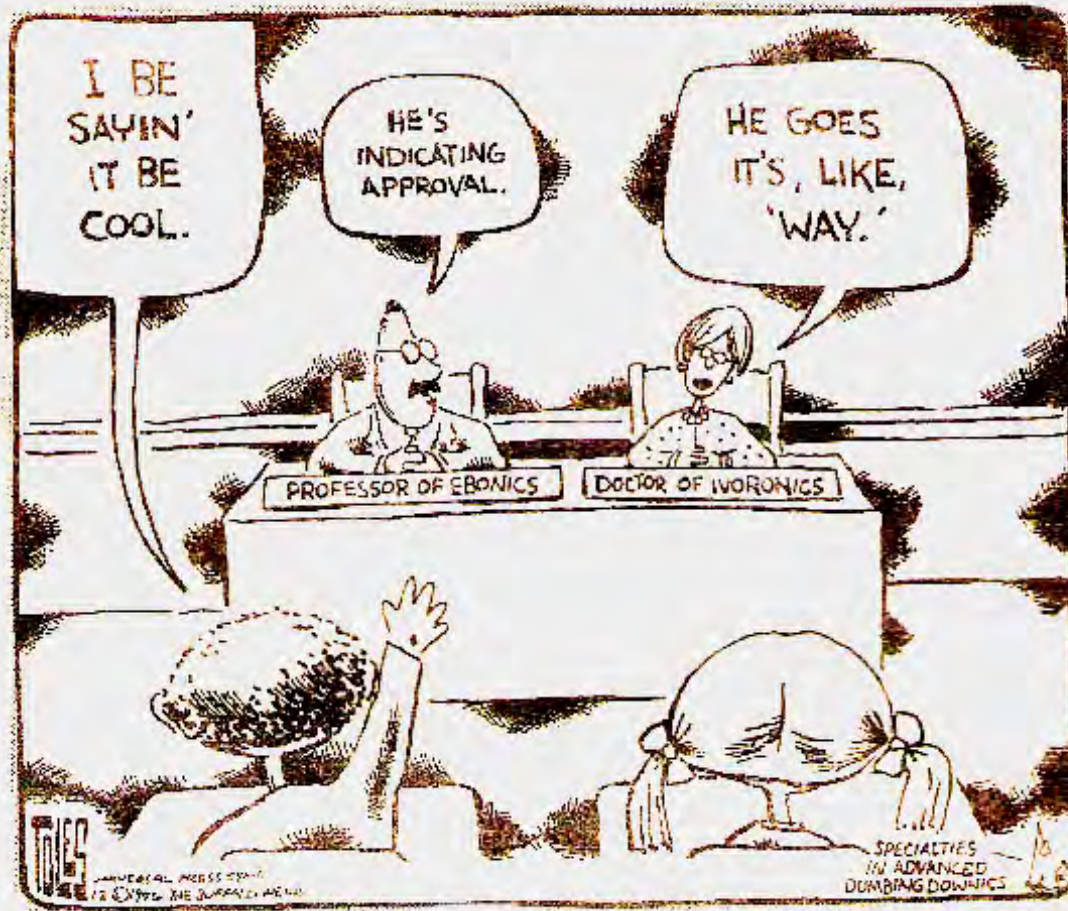
- *It’s a fly messing with me.*

- *Ain’t no one going to help you*

“There’s a fly messing with me”

“There’s no one going to help you”

Syntactic Differences between AAE and SAE



- * *Ivoronics* - language used primarily by whites; not necessarily discriminatory, e.g.:
“What is he, Texan? Tennessee, maybe? I can barely follow his *ivoronics*.”)

Syntactic Differences between AAE and SAE

TABLE 1.1. Contrasting Uses of *Be* in AAE

Feature	AAE	Standard English
Habitual <i>be</i> :	<i>He be busy.</i>	= <i>He is always busy.</i>
Future <i>be</i> :	<i>He be busy soon.</i>	= <i>He will be busy soon.</i>
Absent <i>be</i> :	<i>He busy.</i>	= <i>He is busy right now.</i>
Past <i>be</i> :	<i>He was busy.</i>	= <i>He was busy.</i>

Teresa M. Redd &
Karen Schuster
Webb “A Teacher's
Introduction to African
American English”
(2005)

Geneva Smitherman
“Word from the Mother:
Language and African
Americans” (2006)

In the following scenario, Smitherman illustrates how the AAE usage of *be* can confuse teachers who do not understand it:

SCENE: First-grade classroom, Detroit

TEACHER: Where is Mary?

STUDENT: She not here.

TEACHER (exasperatedly): She is *never* here!

STUDENT: Yeah, she be here.

TEACHER: Where? You just said she wasn't here. (*Talkin That Talk* 25)

When the student said *she be here*, the intended meaning was “she is habitually here” (but just not today). But the teacher, who did not know this rule of AAE, interpreted it according to the rules of standard American English.

Chicano English

- Chicano English (ChE) is a dialect of English spoken by many Mexican Americans



- It is not English with a Spanish accent, but is a rule-governed dialect of English that differs from SAE in systematic ways

Chicano English

- *History:* Emerging from the contact between Mexican Spanish and English, Chicano English has now developed as an independent, systematic, and rule-governed language that can count itself among the various original language varieties found in the U.S.

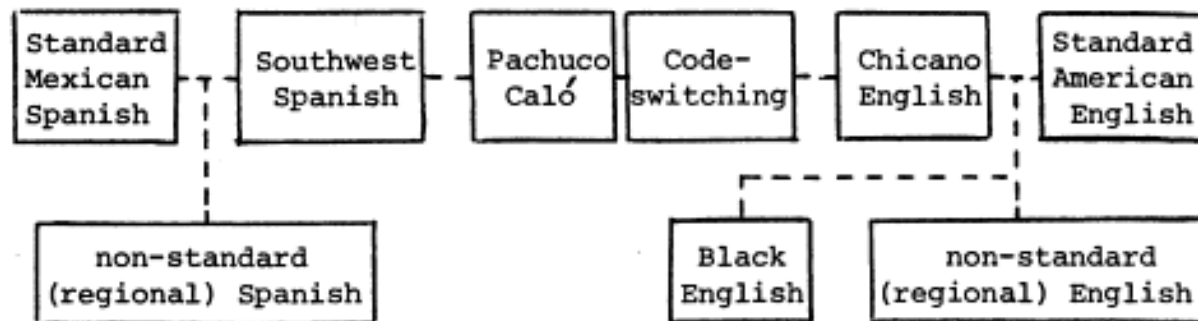


Fig.2 Hispanic-English Language Contact in the Southwest

- *Status:* Chicano English is a native dialect of English, not learner English or interlanguage. It is sometimes spoken by people who know little or no Spanish.

Phonological Variables of ChE

- The ChE vowel inventory may include the 5 vowels found in Spanish but not the additional 6 vowels used in English
 - This results in word pairs that are homophonous in ChE but not in SAE: *ship* and *sheep* are both pronounced as [ʃip]

- The affricate /tʃ/ and the fricative /ʃ/ are interchanged so that *shook* is pronounced as [tʃuk] and *check* is pronounced as [ʃɛk]

ex: /ch/	→	teacher	→	/sh/	teasher
		watch			wash
		chop			shop
		chair			share

ex: /sh/	→	shake	→	/ch/	chake
		shy			chy
		shame			chame
		shop			chop
		share			chair

Source: Carlos C. Barrón & Javier San Román “The Characteristic Linguistic Features of Mexican American Language” (2012)

Phonological Variables of ChE

- ChE also has word-final consonant cluster reduction so that *start* may sound like *star*, *he loves her* may be pronounced as *he love her*, and *fast* may be pronounced [fæs]

For example: mind → nd → n = mine.

consonant cluster variation

- Due to the influence of ChE phonological rules, many words that are not homophones (words that sound alike but are spelled differently) in SAE are homophonous in ChE, e.g.:

find	fine
ten	tin
fuzz	fuss
pen	pin

- Ex.: *When I don't race my hand the teasher make a fuzz.*
- Many ChE speakers will add a vowel before words that begin with an /s/ cluster so that *school* would be pronounced as if it were spelled *eschool*
 - Spanish does not allow words to begin with /s/ clusters

Syntactic Variables of ChE

- Spanish is an inflected language, so it relies less on word order than English does. As a result, the sentence *Macarena ate the apple* can be expressed in two ways in Spanish:
 - Macarena comió la manzana. (Macarena ate the apple.)
 - or
 - Comió la manzana Macarena. (literally: Ate the apple Macarena.)
- Although CE does not allow the structure shown in the second sentence, it does allow for a variation that involves pleonasm, or redundancy, that is related to the freer word order we see in Spanish. A pronoun marks the subject, which is repeated as a noun at the end of the sentence, as in:
 - He hit the ball, Fred.
 - She gave me a ride, my mother.

Source: James D. Williams “The Teacher's Grammar Book” (2005)

Syntactic Variables of ChE

- ChE uses multiple negatives, like AAE and like standard Spanish
 - ChE: *I don have no money.*
 - SAE: *I don't have any money.*
- ChE: *I no want nothing.*
 - SAE: *I don't want anything.*

I didn't have no birthday party or nothing.

I don't know no stories.

The little kid don't have no shoes of his own.

- Prepositional substitution. Chicanos have a tendency to substitute the following prepositions with other prepositional combinations:

on

in

He's putting a towel in his head.

He write in the paper.

to

One day that teacher took her to a trip.

- There are also some lexical differences:

– ChE: *borrow*

SAE: *lend*

– ChE: *barely*

SAE: *just*

Vocabulary includes words like

simon 'yes', *firme* 'good',

flika 'picture', *valo* 'guy', *feria* 'money'

Spanglish

- Spanglish is a hybrid dialect of *Spanish, not English*, that typically is used by recent immigrants from Mexico who have acquired only little of English.
- It is similar but not quite the same thing as *code-switching* (= acts of using different language varieties) and/or *interlanguage* (= learner language in L2 acquisition).
- We can get a sense of the differences between Spanish and Spanglish by comparing the sentences below, which translate into “I’m going to park my car”:
 - Voy a estacionar mi auto. (Standard Spanish)
 - Voy a parquear mi caro. (Spanglish)
- Neither “parquear” (“park”) nor “caro” (“car”) exist in Standard Spanish; the equivalent words are *estacionar* and *auto*.



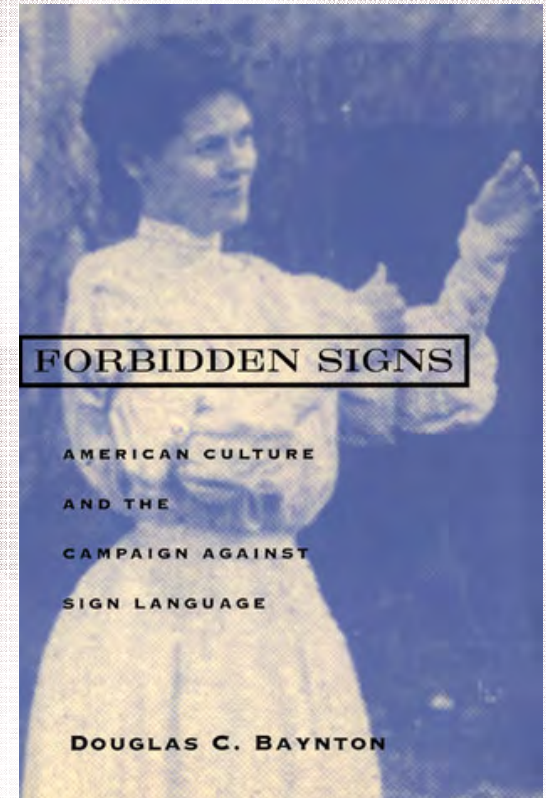
Source: James D. Williams “The Teacher's Grammar Book” (2005)

Chinglish



Banned Languages

- Sometimes languages are banned because of the false notion that some languages are better than others, or for political control
 - Cajun English and French were once banned in Louisiana
 - Many American Indian languages were once banned in the US
 - Korean was banned in Korea during the Japanese occupation
 - Faroese was once banned on the Faroe Islands
 - Sign languages were banned in many places in the world (including the US)



“Babel Proclamation”

Gov. William Harding of Iowa issued in 1918 his so-called “Babel Proclamation,” banning foreign languages in public. Commenting on the ban, Harding added, “There is no use in anyone wasting his time praying in other languages than English. God is listening only to the English tongue.”



First. English should and must be the only medium of instruction in public, private, denominational or other similar schools.

Second. Conversation in public places, on trains and over the telephone should be in the English language.

Third. All public addresses should and must be in the English language.

Fourth. Let those who cannot speak or understand the English language conduct their religious worship in their homes.

In voicing his approval of the recent proclamation by Governor Harding, ordering that English be the only medium of instruction in public or private schools in Iowa, Colonel Roosevelt said:

“This is a nation—not a polyglot boarding house. There is not room in the country for any fifty-fifty American. There can be but one loyalty—to the Stars and Stripes; one nationality—the American—and therefore only one language—the English language.”



If you can read this, thank a teacher.

If you can read it in English, thank a soldier.

English Only Movement



English Only Movement



Distribution of state language laws in U.S. (2003)

Genderlects

- Lakoff (1973) identified several linguistic features that were used by women more than men:
 - **Hedges**
(*might, maybe*)
 - **Tag questions**
(*don't you think?*)
 - **Politeness words**
(*please, thank you*)
 - **Use of intensifiers**
(*so, extremely, very*)
- It has also been found that women use a more standard speech style, and that contrary to popular belief, mixed gender conversations are dominated by men



Semiotics of the Kitchen

- *Semiotics of the Kitchen* is a feminist parody video and performance piece released in 1975 by Martha Rosler.



- "An anti-Julia Child [Julia Child's cooking show *The French Chef* (1962-1970)] replaces the domesticated 'meaning' of tools with a lexicon of rage and frustration."
- Rosler states: "*when the woman speaks, she names her own oppression.*"

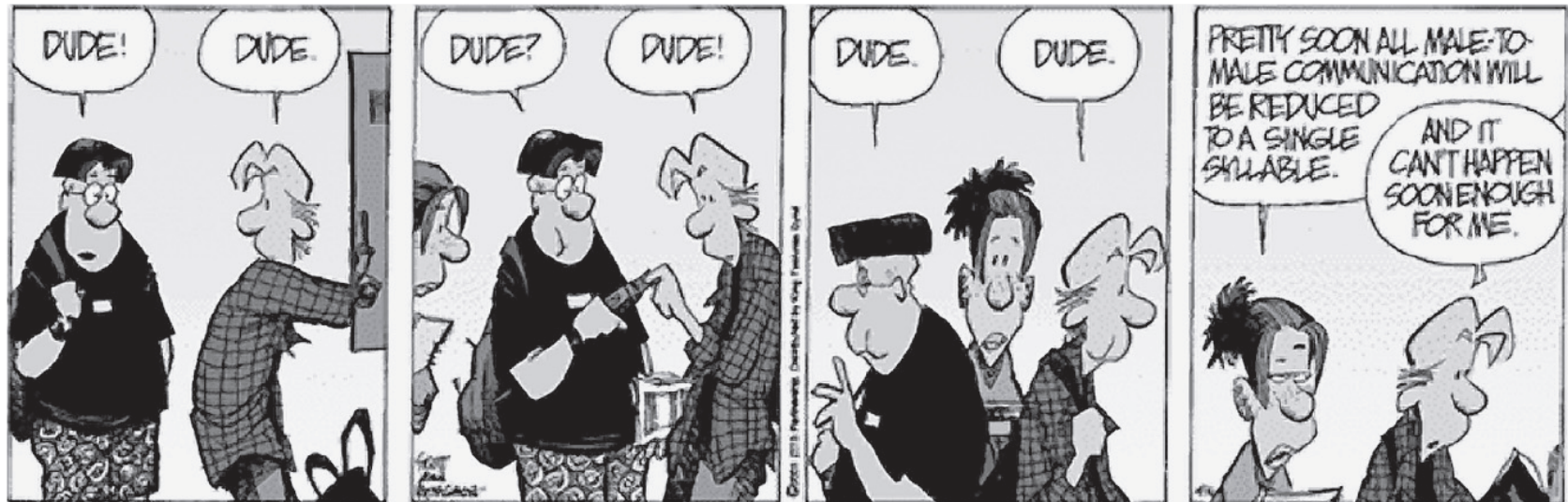


Martha Rosler's Semiotics of the Kitchen - 1975.mp4



Pam Valois "Don't Call Me Sweetheart: A Poster Exhibition of Women's Images and Issues" 1978

Genderlects



**“So then
I said...”**

*“so then
I was like...”*

Cathy, 20, Santa Barbara:

“I'd like to, like, have, like, better grades. But when I, like, talk in the, like, like, classroom, I, like, say a lot of, like, things that my, like, teacher and my, like, classmates don't find, like, convincing.

Is it, like, because I, like, say 'like', like, so much?

I, like, don't want, like, people to, like, make fun of, like, me. I, like, don't go to, like, class, like, regularly, like, any more. I, like, won't be, like, able to finish, like, college in, like, four years.” *

Genderlects: *The L-Word*

- The following conversation occurred between two girls from Southern California.
- “So, **like** uhh, what do you want to **like**, do today?”
“I don’t know, **like**, its such a beautiful day out, we should, **like**, go to the beach.”
“That sounds **like** a good idea, but **like**, how are we going to get there?”
“**Like**, uh, let’s call Mike and see if he’ll **like** give us a ride.”
“Are you sure that’s **like**, a good idea? **Like** didn’t you two just **like** break up?”
“Well, I mean, **like**, the last time we talked he was **like**, “I think we should see other people,” and then I was **like**, “But Mike, I **like** really **like** you.”
“**Like** oh my god, and then **like** what did he say next?”
“He was **like**, “I **like** you too, but I just can’t be with someone who says ‘**like**’ so much.”

Genderlects: *Valspeak*

- Valleyspeak or Valspeak is an American sociolect, originally of the San Fernando Valley in Southern California, in particular Valley girls.
- The term "Valley Girl" and the Valley manner of speech was given a wider circulation with the release of a hit 1982 single by Frank Zappa entitled "Valley Girl".



Moon Zappa Valley Girl.mp4



Clueless Movie CLIP (1995).mp4

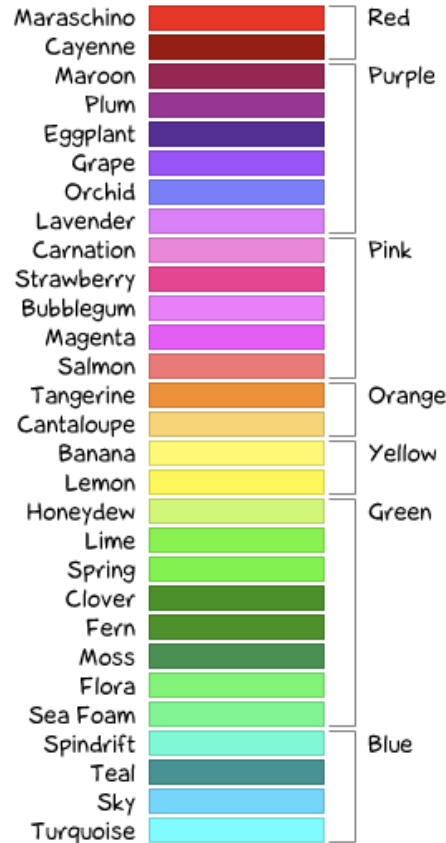
I suppose you speak uptalk?

- The British journalist Matt Seaton, writing in *The Guardian* (21 September 2001), described what happened when he took his children on holiday to the USA. Both had been raised in London, and both spoke only the vernacular London form called ‘Estuary English’, with no trace of uptalk.
- After only several days at an American summer camp, his daughter was responding to ‘So what did you do today?’ as follows. ‘Well, we went canoeing on the lake? Which was, like, really really fun? And then we had storytelling in the barn? And we all had to tell a story about, like, where we’re from or our family or something?’
- In short, his daughter had acquired and mastered uptalk almost instantly, along with several other features of American speech. In great contrast, Seaton’s son never acquired uptalk at all. This is consistent with the observation, often made, that uptalk is far more prevalent among females than among males – though there are certainly some males who have it.

R. L. Trask “Why do Languages Change?” (2010)

Genderlects: *Colors*

Color names if
you're a girl...



Color names if
you're a guy...

Doghouse Diaries
"We take no as an answer."

Source: Robert Kosara "You Only See Colors You Can Name" (2011)

Genderlects

- In Japanese there are distinct words for female and male speakers. Speech patterns associated with women are referred to as *onna no kotoba* (女の言葉, "women's words, or words of woman") or *joseigo* (女性語, "women's language").

<u>Women's Word</u>	<u>Men's Word</u>	
<i>onaka</i>	<i>hara</i>	"stomach"
<i>oishii</i>	<i>umai</i>	"delicious"
<i>watashi</i>	<i>boku</i>	"I/me"



- Japanese has honorifics and formal and informal verbal inflections
 - Women use the formal verbal forms and the honorifics more frequently than men

Genderlects

- There are also languages in which the language used by men and women differ in their grammar rules
 - In Yana, men's words have a suffix not found on words that women use
 - In Thai, men and women use different politeness particles
 - In Koasati, men and women use different word endings

In the 1930s a classic study was undertaken of Koasati, a language of Louisiana, which revealed sex differences with verb forms (Haas, 1944; see also Trudgill, 2000). In the phrase 'You are building a fire', men used the term *osch* while women said *ost*; in 'I am saying', the male variant was *kahal*, the female *kahas*; and so on. Vocabulary differences are seen in Japanese too, where women say *ohiya*, *onaka* and *taberu* for 'water', 'stomach' and 'eat', while men say *mizu*, *hara* and *kuu* (Holmes, 1992).

Source: John Edwards "Language and Identity: An introduction" (2009)

Sociolinguistic Analysis: Class

- Labov set out to study [r] deletion as a social variable based on socioeconomic class
- He asked employees questions to get them to direct him to the fourth floor of three department stores catering to three classes
 - Sak's Fifth Avenue (upper class)
 - Macy's (middle class)
 - S. Klein (working class)



- He analyzed how each employee pronounced *fourth floor* the first time and when he pretended not to understand
 - This allowed him to gather natural data of both casual utterances and utterances that were more carefully planned

Sociolinguistic Analysis

- Labov found that pronunciation of [r] was different at each store, and therefore pronunciation of [r] was socially stratified
 - Sak's Fifth Avenue: 62% [r] use
 - Macy's: 52% [r] use
 - S. Klein: 21% [r] use

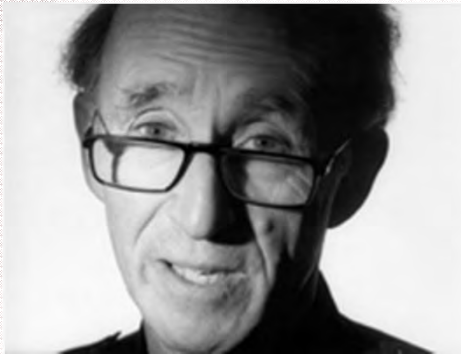


Table 7.4. Percentage of *r*-use in three New York City department stores

	<i>Saks</i> (%)	<i>Macy's</i> (%)	<i>S. Klein</i> (%)
All [r]	32	31	17
Some [r]	30	20	4
No [r]	38	49	79
Number	68	125	71

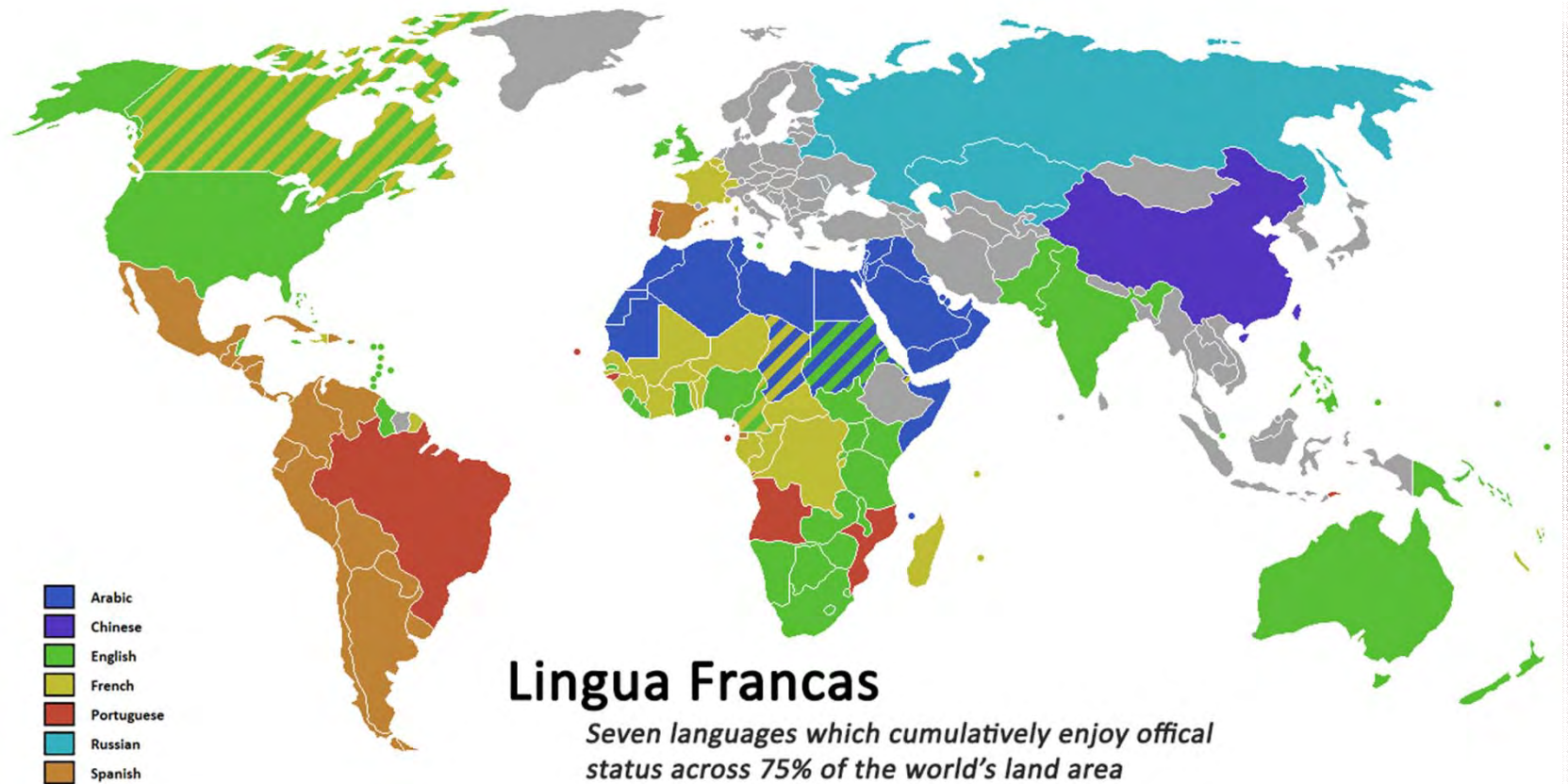
Source: based on Labov (1972b, p. 51)

- Labov's findings demonstrate that systematic differences among dialects are not restricted to just the presence or absence of a rule, but can also be described in terms of statistical frequency of rule application



Lingua Francas

- A **lingua franca** is a language common to speakers of diverse languages that can be used for communication and commerce



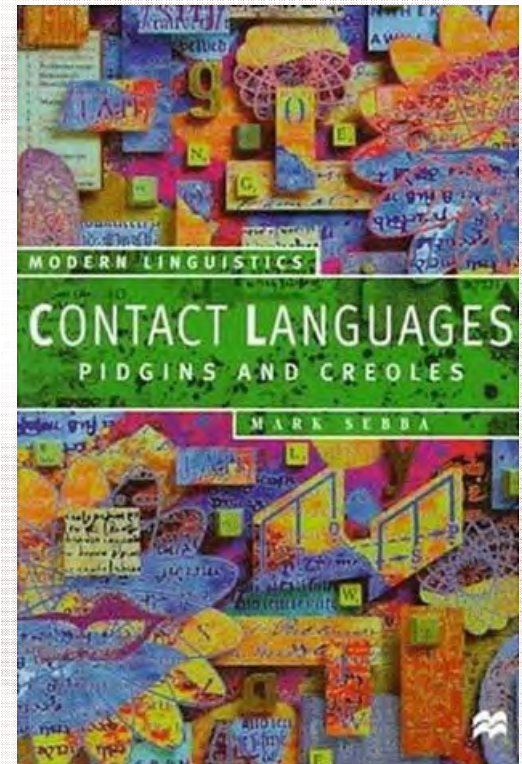
“Long Time No See”: Contact Languages

- “Long time no see” is an English expression used as a greeting by people who have not seen each other for a while. Its origins in American English appear to be an imitation of pidgin English (such as that spoken by Chinese), and despite its ungrammaticality it is widely accepted as a fixed expression. The lexicographer Eric Partridge notes that it is akin to the phrases “no can do” and “*chop chop*.”

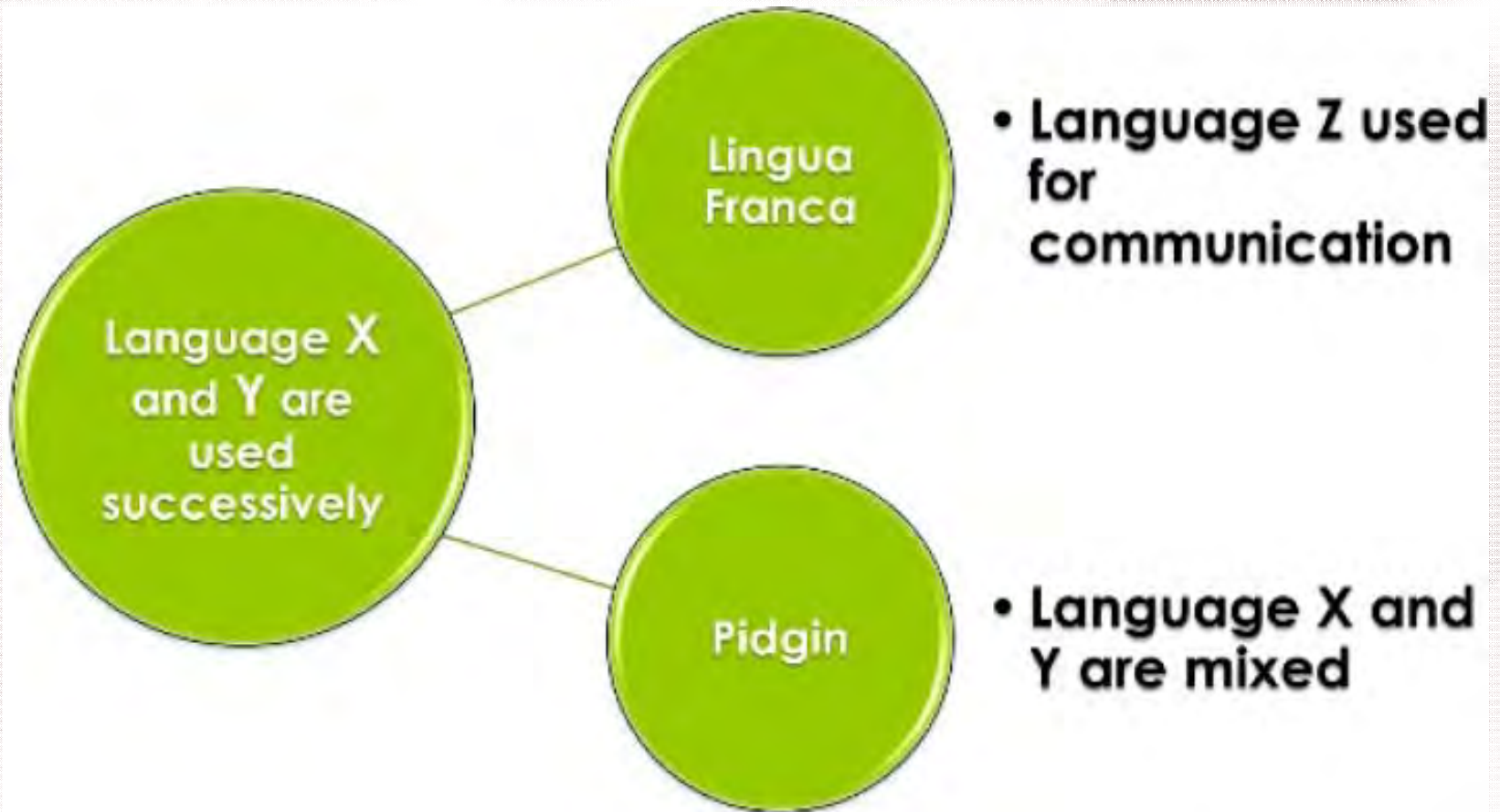


Contact Languages: Pidgins and Creoles

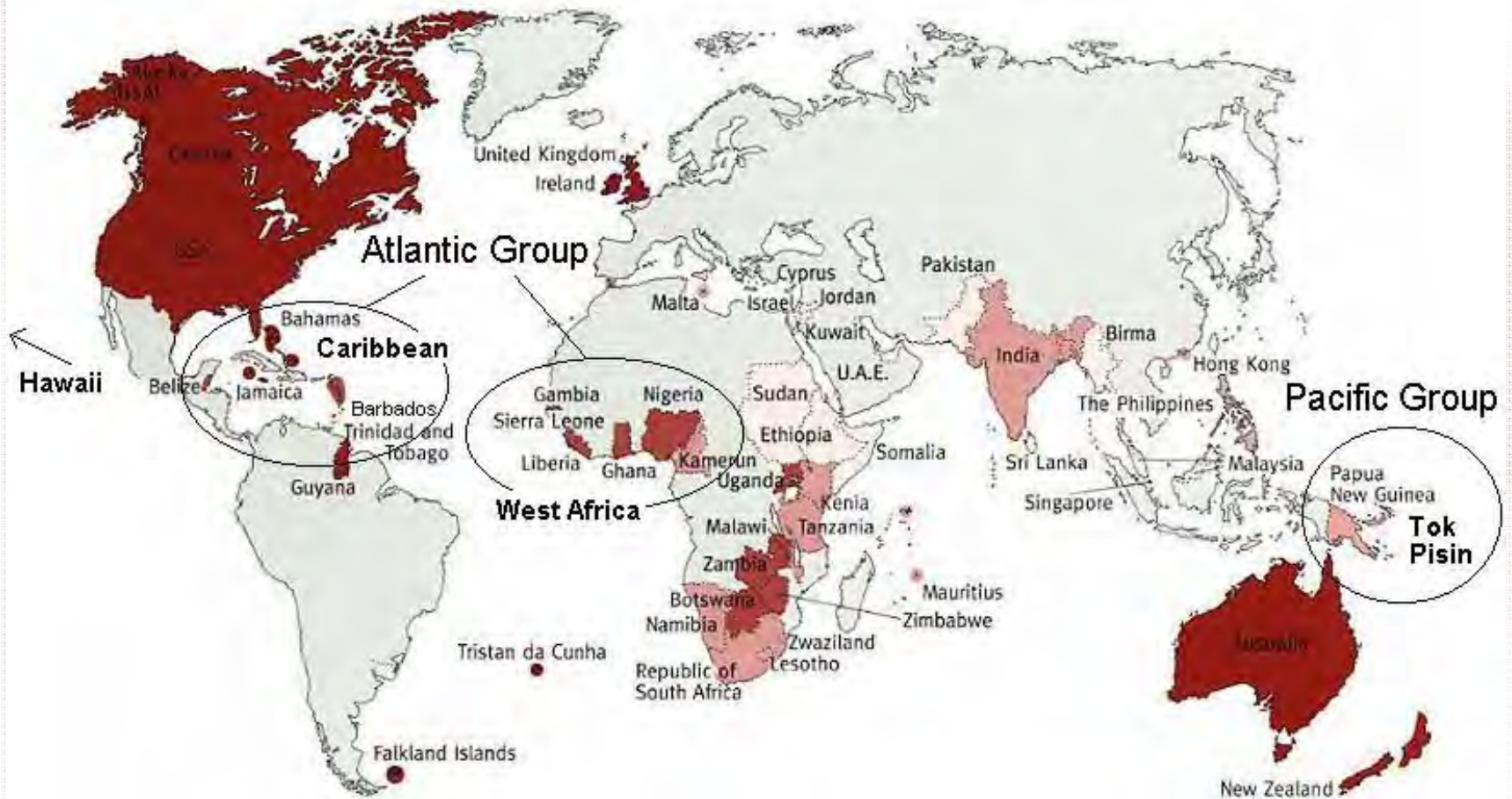
- When speakers of different languages come together for trade, or through colonization or immigration, they may create a new language to serve as a rudimentary lingua franca
 - This created communication system is called a **pidgin**
 - Pidgins are rule-governed but have simplified grammatical systems and lexicons
 - Most of the *vocabulary* of a pidgin comes from the dominant language (the **superstrate** or **lexifier language**)
 - The other languages are the **substrate languages** and contribute to the grammatical system



Contact Languages: Pidgins and Creoles



Contact Languages: Pidgins and Creoles



Contact Languages: Pidgins and Creoles

- Many linguists believe that pidgins have a life cycle:
 - First the pidgin has no native speakers, is strictly a contact language reserved for special functions, and has very few clear grammatical rules and few words
 - Later, if need for the pidgin continues, the pidgin becomes stabilized
 - If children begin to learn this stabilized pidgin as a native language, then it becomes a **creole**
- **Pidginization** involves a simplification of some language and a reduction of the number of domains of its use
- **Creolization** involves the expansion of a lexicon and grammar and an increase of the number of contexts of use

Contact Languages: Pidgins and Creoles

Understanding the Languages

Term	1 st /2 nd Language	Background/ History	Vocabulary	Rules	Other Notes
Pidgin	<ul style="list-style-type: none">• Second only	<ul style="list-style-type: none">• Contact language• People from two different languages trying to communicate• Communication is the key	<ul style="list-style-type: none">• Limited	<ul style="list-style-type: none">• Not consistent	<ul style="list-style-type: none">• Usually one language tends to be more dominant than another
Creole	<ul style="list-style-type: none">• 1st language	<ul style="list-style-type: none">• The next generation of pidgin speakers	<ul style="list-style-type: none">• Extensive vocabulary	<ul style="list-style-type: none">• More consistent rules	<ul style="list-style-type: none">• Generic word but can apply to a specific language
Kriol	<ul style="list-style-type: none">• 1st language	<ul style="list-style-type: none">• Mixture of traditional Aboriginal languages & English• Is a creole found in the Kimberley, NT and North Queensland	<ul style="list-style-type: none">• Extensive• Some words may sound like English but could have different meanings	<ul style="list-style-type: none">• More consistent rules	<ul style="list-style-type: none">• Marker of Aboriginal identity• Heavy to light Kriol
Aboriginal English	<ul style="list-style-type: none">• 1st language	<ul style="list-style-type: none">• Dialect rather than a language	<ul style="list-style-type: none">• Extensive• Some words may sound like English but could have different meanings	<ul style="list-style-type: none">• More consistent rules	<ul style="list-style-type: none">• Marker of Aboriginal identity• May differ depending on region

Contact Languages: Pidgins

- The term *pidgin* was originally used to describe Chinese Pidgin English, was later generalized to refer any pidgin
- Usually have limited use and do not last long (Pidgin Russian in Manchuria disappeared when Russian settlers left China after WWII)
- Pidgins are somewhat rudimentary, but do have rules
 - Phonemes may have multiple allophonic pronunciations
 - Pidgins typically have fewer function morphemes
 - Auxiliary verbs, prepositions, articles, tense, case endings, plurals, etc.
 - Reduplication and compounding are very common in pidgins to expand an otherwise small lexicons (data from Komsok):

• <i>big-big</i>	“enormous”
• <i>luk-luk</i>	“stare at”
• <i>gras bilong fes</i>	“beard”
• <i>han bilong pisin</i>	“wing (of a bird)”
 - Syntactically, people may create sentences based on the word order of their native language until the pidgin becomes stabilized

Contact Languages: Pidgins

Hawaiian Pidgin

- Was influenced by: English, Portuguese, Cantonese, Hawaiian, Korean, Philippine, Mexican
- "People no like t'come fo' go wok." =
People don't want to have him go to work
- "Inside dirt and cover and blanket, finish" =
"They put the body in the ground and covered it with a blanket and that's all."

Creoles and Creolization

- Creole languages developed in colonial European plantation settlements in the 17th and 18th centuries as a result of contact between groups that spoke mutually unintelligible languages.
- Since the 1930s some linguists have claimed that creoles emerged from pidgins
- Pidgins have no native speakers; creoles have native speakers.
- Pidgins have a limited range of uses; creoles have a considerably expanded range of uses.
- Where a pidgin is simplified, a creole is just as expressive and complex as any human language
 - Creoles may have inflections, more complex pronoun systems, and the number of compounds may be reduced
 - For example, *wara bilong skin* (“sweat”) becomes *skinwara*

Creoles and Creolization

- Road sign in Guadeloupe Creole meaning *Slow down. Children are playing here.* ►
The literal translation is "Lift your foot [from the accelerator]. There are small people playing here".



- Creole in use at car rental counter, USA ▲

Creolization: *Barbadian*

- Barbadian (Bajan) is a English-based creole spoken in Caribbean island of Barbados
- The slaves were forced to learn English and together with their own African languages they created the Bajan language as a way of communicating without being understood by their slave masters. The word “Bajan” is short for “Barbadian” (bar-bayyd-ian), the official term to describe the people and things from Barbados. Native Barbadians refer to themselves as Bajans.

- “*I am Bajan*” in Barbadian



**iza
bajan.®**

FROM BAJAN TO STANDARD ENGLISH

by E. Jerome Davis



“IMPROVE YOUR SPEECH IN NEXT TO NO TIME”

Creolization: *Barbadian*

10 Most Common Expressions You'll Hear

1. *I in got none* – I do not have any
2. *Wuh part you is?* – Where are you?
3. *Wuh you want?* – What do you want?
4. *I in know* – I do not know.
5. *Stan day* – Stand there
6. *Weh you gine?* – Where are you going?
7. *Dah in mine* – That is not mine
8. *He got nuff money* – He has a lot of money
9. *Who wun dah is?* – Whose is that?
10. *Skin out the bag* – Empty the bag.

“To Be” Not Used

In Bajan English, the verb to be is not used, so you will often hear these sort of expressions:

He tall (He is tall); *I coming* (I am coming); *The sun hot* (the sun is hot); *I hungry* (I am hungry)

The Subject Pronouns (I, you, he/she, we, they) are over-used
Example:

call she (call her); *we house* (our house); *he book* (his book)

Simplified Past Tense

Example:

I tell he so (I told him so); *I see she yesterday* (I saw her yesterday)



Creolization: *Tok Pisin*

- *Tok Pisin*
(= talk Pidgin)
was creolized
throughout the
20th century and
is spoken in
Papua
New Guinea

Language and Dialect in Papua New Guinea



- North West new Britain in Pacific region → It contains many indigenous languages.



In Papua New Guinea languages
are spoken by small groups, 40%
have fewer than 500 speakers

→ Great concentration
of diversity
→ 1.500 languages
are spoken

People live in small
villages all are
multilingual people
speak 4 or 5
languages



- Tok Pisin has its own writing system, literature, mass media and is used for debate in Papua New Guinea's parliament

Creolization: *Gullah*

- **Gullah** (also called **Sea Island Creole English** and **Geechee**) is a creole language spoken by the Gullah people (also called "Geechees" within the community), an African-American population living on the Sea Islands and in the coastal region of the US states of North Carolina, South Carolina, Georgia and northeast Florida.



- The Gullah language is based on English with strong influences from West and Central African languages.

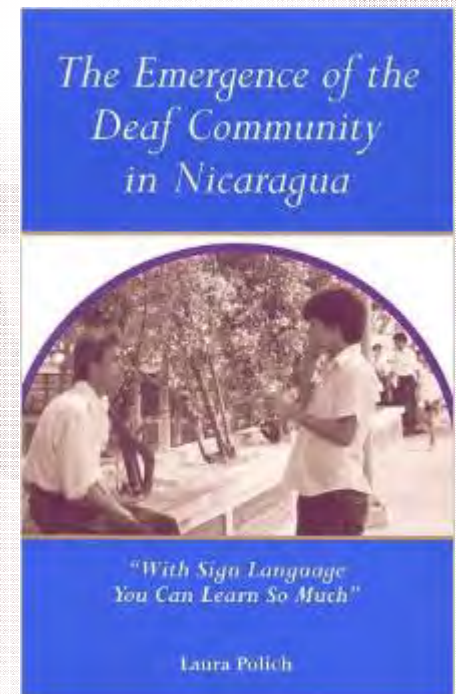


Creolization of Sign languages

- Sign languages can also be pidgins
 - In the 1980s adult deaf people came together in Nicaragua and constructed a pidgin for communication
 - But when children joined the group they creolized the pidgin and it became the full-fledged sign language Idioma de Signos Nicaragüense (ISN)

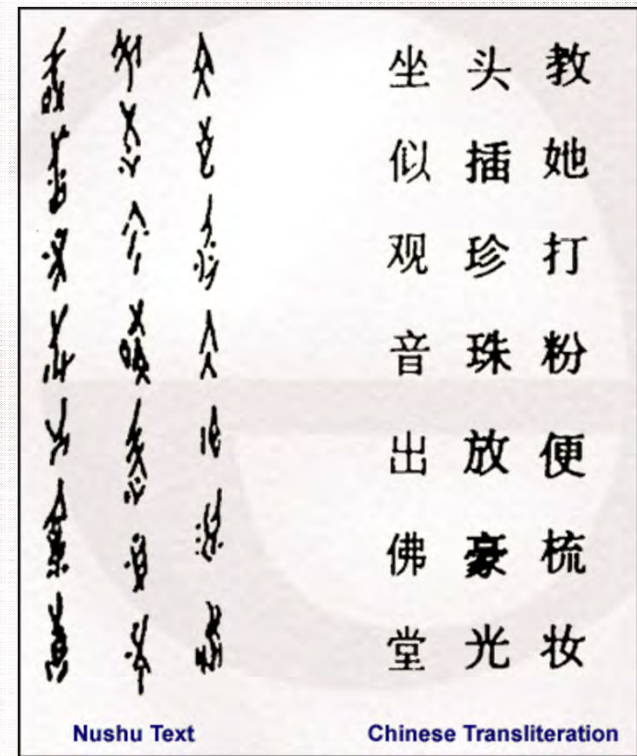


At the Escuelita de Bluefields, 9-year-old Yuri Mejia signing the story of Babar. The young elephant is riding on his mother's back (left) when she is shot. He runs away (center) and then dissolves into tears (right).



Secret Languages & Language Games

- Throughout history and all over the world people have invented secret languages and language games to identify with a group and to prevent outsiders from understanding
- Nushu** was a secret written language used by women in sexually repressive imperial China. The origin of Nushu is not known but may date back to the A.D. 3rd century and is believed to have developed to facilitate the local custom of ‘sworn sisterhood’ in which friends promised to be loyal to one another forever and wrote their sorrows for their missed friends after the friends got married and were forced to move away.
- The **Walbiri** in Australia play a language game in which nouns, verbs, pronouns and adjectives are replaced by semantically contrastive words
 - Those men are small* would mean *This woman is big*



Secret Languages: Boontling

Boontling in Boonville

- “Wes Smoot was *bahl harpin'* the other day with some *kimmies* at a *gormin' region*” (i.e., chatting with pals at a restaurant)



Secret Languages: Boontling

- **Boontling** is a jargon spoken only in Boonville in Northern California. It was invented in the late 19th century and had quite a following at the turn of the 20th century. There are several differing versions as to the origin of Boontling. Some assert that the jargon was started by the children of Boonville as a language game which enabled them to speak freely in front of elders without being understood. Boontling has over a thousand unique words and phrases.



Boontling in Boonville.mp4

- *belhoon* - a dollar.
- *blooch* - to prattle on, to talk aimlessly.
- *blue-birded* - to be bucked off a horse: One of the boys got bucked off a horse and afterwards said, "I got thrown so high that a blue-bird could have built a nest on my ass."
- *chigrel* - (n.) a food or a meal; (vrb.) to eat: blend of child's gruel.
- *donicker* or *donagher* - a toilet or rest-room.
- *gorm* - to eat or overeat: from the French word *gourmandise* meaning to eat greedily.
- *high heel* - to arrest. The local sheriff had one leg shorter than the other so he wore one high-heeled boot.
- *madge* - a prostitute: Madge was a brothel madame in Ukiah.
- *nonch* - no good; bad: blend of "not much".
- *walter* - a telephone. Named after Walter Levi, the first person in town to have one installed.

Bilingualism

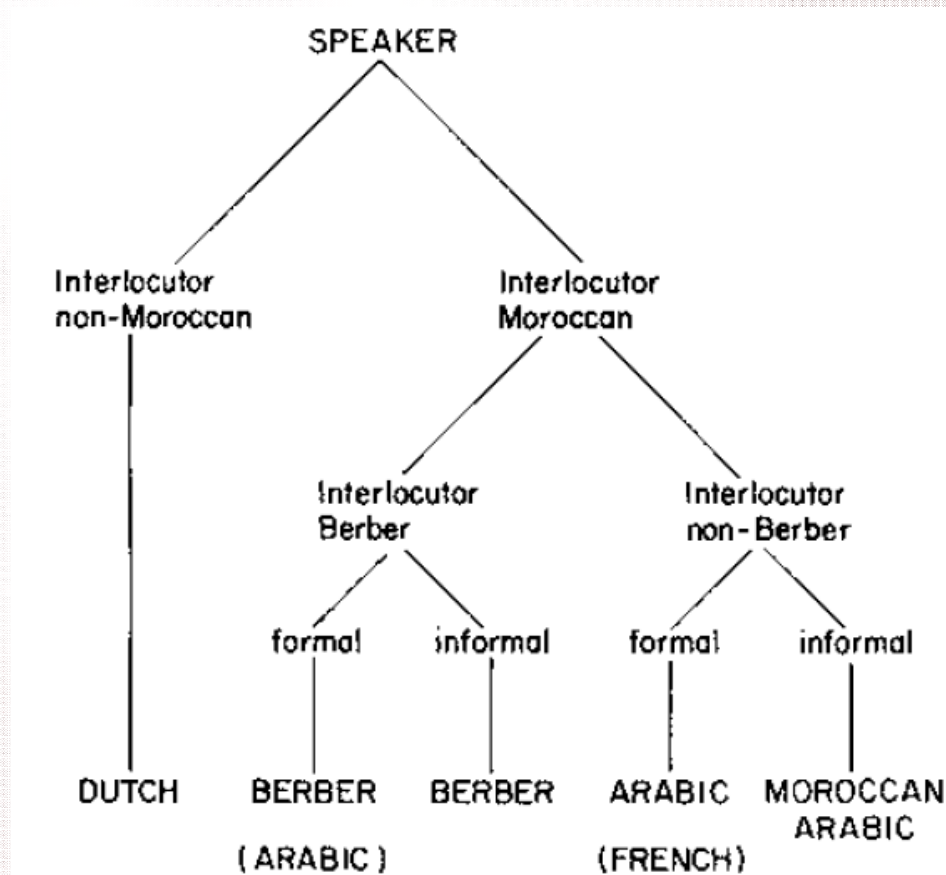
- **Bilingualism** refers to the ability to speak two (or more) languages
 - **Individual bilingualism:** within one person
 - There are various degrees of bilingualism and various situations under which a person may become bilingual
 - **Societal bilingualism:** within a society
 - Canada and Switzerland are two examples of nations that recognize more than one official language



Street signs in Ottawa, Canada ►

Bilingualism

- The Decision Tree model for the language choices of Moroccans in the Netherlands:



Source: René Appel & Pieter Muysken “Language Contact and Bilingualism” (2005)

Codeswitching

- **Codeswitching** is a speech style in which fluent speakers switch languages between or within sentences
 - *I mean, c'est un idiot, ce mec-là* (French-English)
 - *Women zuotian qu kan de movie was really amazing* (Mandarin-English)
 - *Chigum ton-uls ops-nunde, I can't buy it* (Korean-English)
- **Codeswitching** reflects the grammars of both languages simultaneously and occurs wherever groups of bilinguals speak the same languages. It does not constitute “broken” English and is not a language disability in which bilinguals try to cope with incomplete mastery of either language
 - Codeswitching follows the word order rules of both languages
 - *My mom fixes tamales verdes*
 - **My mom fixes verdes tamales*
 - *Mi mamá hace green tamales*
 - **Mi mamá hace tamales green*



Codeswitching: *Scripts*

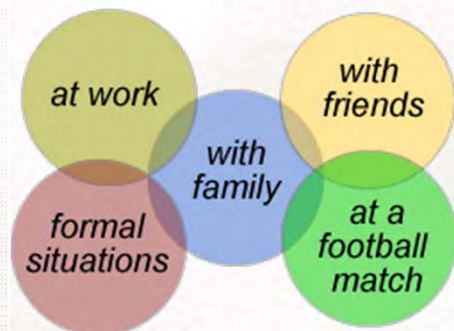


- Vukovar, Croatia, Feb. 2013: “Ne Ćirilici! = “No to Cyrillic!”

Language in Use: Registers

- **Registers, or styles,** are different ways of speaking based on the context
 - For example, people usually speak differently with friends than they do in a job interview or when speaking to small children

an individual's registers



The Levels of Standard American English

		SPOKEN	WRITTEN	
Conversational (Colloquial) Levels		Oratorical	Formal	Edited English
		Planned		
		Impromptu	Semiformal	
		Casual		
		Intimate	Informal	

- Informal registers are rule-governed
- For example, questions can be shortened by deleting the subject you and the auxiliary verb, or just the auxiliary verb, but not by just deleting the subject:
 - *Running the marathon?*
 - *You running the marathon?*
 - **Are running the marathon?*

Language in Use: Registers

- Some languages have social rules that govern register, for example, *Thai* (the national language of Thailand) has four registers based on the social status of the speaker and listener:

Ex.: “to eat” =

- **Royalty:**
- **Monks:**
- **Commoners:**
- **Crude communication:**

*Saweuy
Chan
Tarn
Kin*



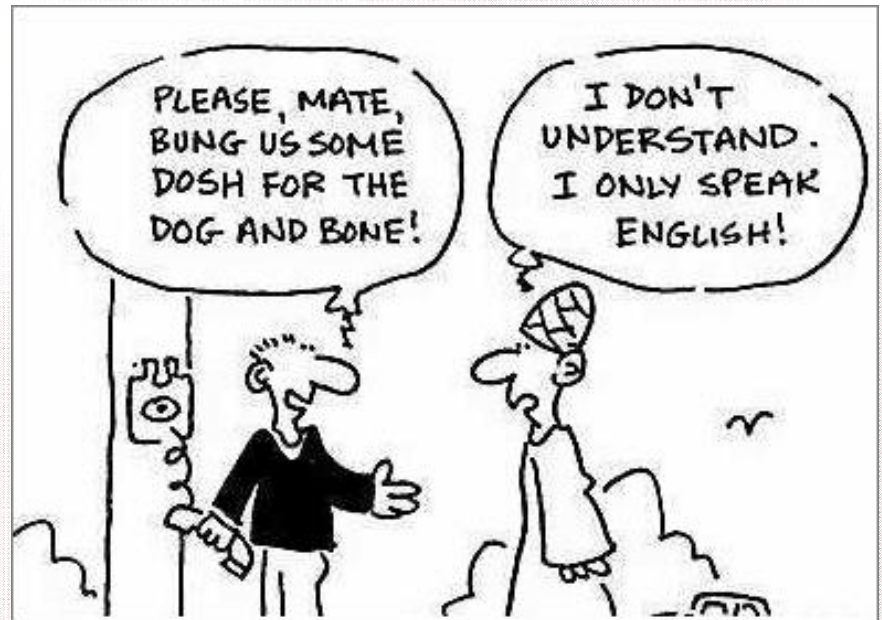
English gloss	Standard Thai	Clerical vocabulary	Royal vocabulary
'hand'	<i>mư:</i> (มือ)	<i>mư:</i> (มือ)	<i>phrá-hàt</i> (พระหัตถ์)
'house'	<i>bá:n</i> (บ้าน)	<i>kù-tì</i> (กุฏิ)	<i>wāŋ</i> (วัง)
'mother'	<i>mĕ:</i> (แม่)	<i>jō:m-mĕ:</i> (โยมแม่)	<i>phrá-tshōn-ná-nī:</i> (พระชนนี)
'to give'	<i>háj</i> (ให้)	<i>thà-wǎ:j</i> (ถวาย)	<i>thà-wǎ:j</i> (ถวาย)
'to speak'	<i>phû:t</i> (พูด)	<i>phû:t</i> (พูด)	<i>tràt</i> (ตรัส)
'to sleep'	<i>no:n</i> (นอน)	<i>tshām-wàt</i> (จำวัด)	<i>bān-thōm</i> (บรรทม)

Language in Use: Slang



Language in Use: Slang

- Colloquial language considered **not respectable** enough to be used outside of certain closed, informal group of interlocutors.
- Usually **short** and **novel**, slang words may have been invented in keeping with new ideas and customs or come from an in-group (e.g., the underworld), to convey humorous, sharp, and often hidden meaning.
- Slang expressions may succeed in getting accepted into a language's standard vocabulary, or may never achieve this status.
- <http://onlineslangdictionary.com/> and <http://www.urbandictionary.com/>
- **Jargon** or **argot** refers to technical terms used in particular fields, occupations or professions.



College Slang (Synonyms)

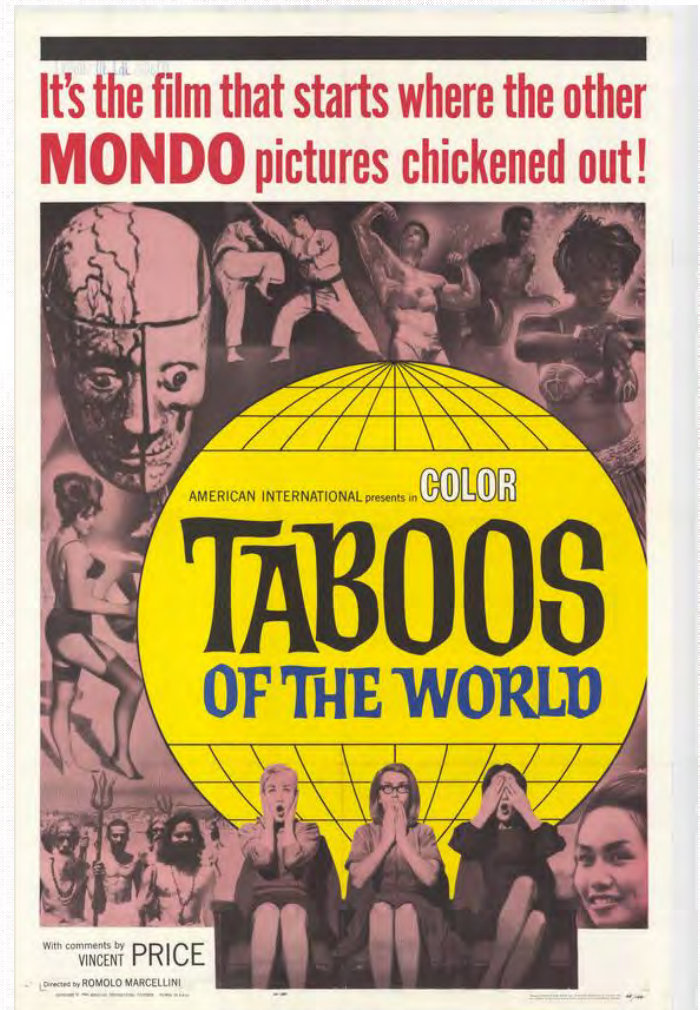
General meaning	Slang Words: 1972-1993	Slang Words: 2008	Slang Words: 2010
Excellent	Sweet, killer, bad, cool, awesome	Sick, sweet, cool, nice, wicked, ill, <u>bitchin'</u> , <u>ballin'</u>	Sweet, awesome, <u>ballin'</u> , cool, legit, <u>rockin'</u> , right on!, epic, intense, sick, wicked, nice, legit
Socially inept person	Dweeb, geek, turkey	Dork, creeper, loser, freak, sketch, tard, nerd, goob	Creeper, sketch, weirdo, dork, loser, tool, freak, tard, nerd, geek
To be or get drunk	Wasted, catch a buzz, trashed	Shitarded, wasted, bombed, hammered, black-out, crunked, gone, tanked, schwasted, pissed	Hammered, tanked, wasted, destroyed, plastered, crunked (crazy + drunk), bombed, shwasted, tipsy, trashed, fucked up, smashed, blacked out, shit show, destroyed, shit-faced, gone
To relax	Chill out, veg	Chillax, chill, hang out, hang,	Chill, hang out, chillax, lazy, veg, chill pill
Fraternity/sorority member	Bagger, Suzi	Fratter, frat whore, fratastic, sorostitute, bro, broseph	Fratty, sorositute, bro, broseph, frat boy, fratter, frat whore,
Disregard	Bag, blow off	Screw over, ditch, bounce, sexiled, negged, shot down, mean-mug	Shot down, ditched, sexiled, blown off, screw over, leave hangin', bail
To kiss passionately	Grub, hook (up)	Hook up, make out, hit that, suck face	Hook up, make out, tonsil hockey, hooks it
Attractive	hot	Hot, bangin', bossy, spittin' game, smokin'	A ten, hot, bangin', hot as balls, cute, fine, lookin' good
Attractive person	Fox/foxy	Piece of ass, a ten, hottie	A ten, hottie, goddess, babe, hunk, cutie, eye candy
To have a good time	jam	Rage, party, good times, good times (always twice)	Crazy fun, party, rage
To do well	ace	Own, kick ass, kill it, nail it, sting it, dominate, rape it, demolish, rocked that, smoked that bitch	Own, ace, kill it, dominate, rape it, rock that, kick ass, poned, nailed it
To have a bizarre experience	Trip out	Bug out, buggin', wig out, tweak out, freaky, high as shit,	Tweak, trip, wig out, spazz, freaky, weird, trippin', tripped, trippy, bug out, blaze up,
Friend	Homeboy, homegirl/homey	Dude, biff, biffer, homeslice, boy, bro, dude, homeboy, girlfriend, lovey	Chica, amiga, friendses, bro, peeps, dude, man, hun, love, girlfriend, homegirl/homeboy, girl, boy, bitch, BFF
Male, any person	dude	Dude, guy, bro, man, son	Dude, guy, bro, man, son, the man,

Taboos

- Words themselves cannot be intrinsically bad or dirty, yet all societies have **taboo words**
- Words relating to sex, sex organs, and bodily functions can be taboo in many languages. Often there are multiple terms with the same meaning, with one being accepted and one being taboo

For example, words borrowed from Latin into English are considered scientific, but the Anglo-Saxon words for the same concepts are considered taboo:

vagina/cunt, penis/cock, feces/shit



Euphemisms

- A **euphemism** is a word or phrase that replaces a taboo word or to avoid unpleasant subjects (e.g., *passing away* rather than *dying*).
- This sign in Gijón, Asturias, Spain, uses a euphemism in the form of an acronym for *Conducta Adecuada Ciudad Aseada*.
 - Although a pair of Latinate and Anglo-Saxon words have the same **denotative meaning** (i.e., reference), their **connotative meaning** (i.e., sense) may determine that one of them is acceptable whereas the other is not (*feces* vs. *shit*, *breasts* vs. *tits*, *testicles* vs. *balls*, etc.).



Language Sexism

- Language is not sexist or racist, but the society is.
- Examples of language sexism include:
 - *Manly courage* vs. *womanly tears*,
 - *masculine charm* vs. *feminine wiles*, etc.
 - *bunny*, *chick*, *cow*, *doll*, *pussy*, etc.



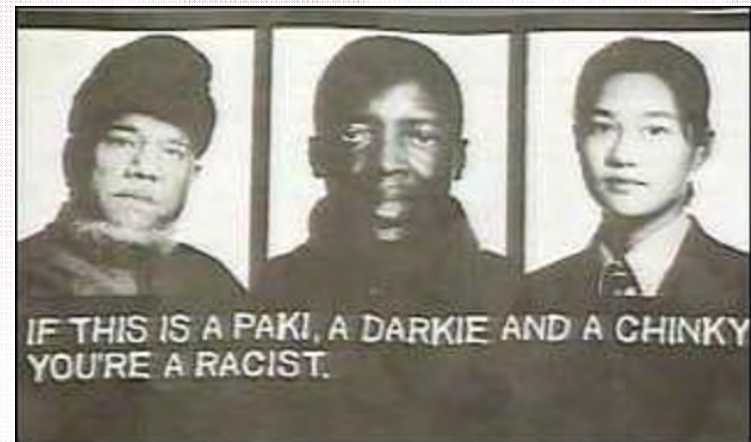
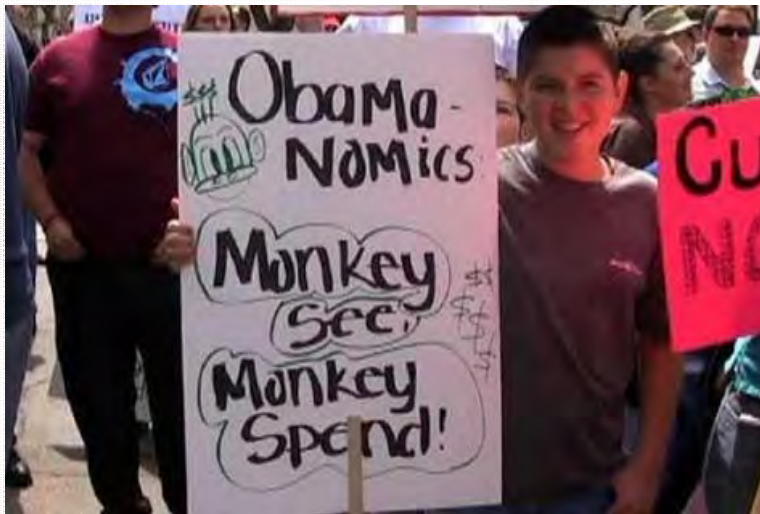
Words that cloud your judgment about women



- Male/female gender pairs show semantic asymmetry:
 - Male form is unmarked: *prince/princess*, *actor/actress*, *host/hostess*, *hero/heroine*, etc.
 - Male denotations rank higher in society:
 - *governor/governess*, *master/mistress*,
 - *major/majorette*, etc.

Language Racism

- *Language is not sexist or racist, but the society is.*



Language Racism: *The N-Word*

- The euphemism *the N-word* became mainstream American English usage during the racially contentious murder trial of ex-football player O. J. Simpson in 1995.

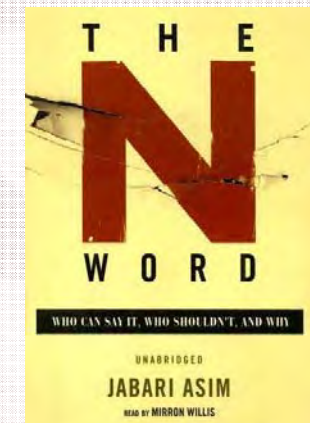


Notable usage^[84]

“ The prosecutor [Christopher Darden], his voice trembling, added that the “N-word” was so vile that he would not utter it. “It’s the filthiest, dirtiest, nastiest word in the English language.” ”

—Kenneth B. Noble, January 14, 1995 *The New York Times*^[85]

- “The n-word” *Washington Post* < <http://www.washingtonpost.com/wp-dre/features/the-n-word>>



- Some* epithets may be reclaimed by *some* members of a minority group to index group membership and affection

Racist Emails by Ferguson Officials

- Apr.3, 2015. The City of Ferguson, Mo., responding to Freedom of Information requests, has released the full contents of racist emails circulated by the chief court clerk and two police supervisors that were disclosed by the Justice Department in a report last month.

- In a message dated Tuesday, April 19, 2011, Ms. Twitty forwarded a message titled “Very Rare Photo” that included an image of former president Ronald Reagan feeding a baby monkey. Beneath the photo is the caption: ►



Rare photo of Ronald Reagan babysitting Barack Obama in early 1962

- Yet another sent from Mr. Mudd to Ms. Twitty showed a picture of two dogs lying on a floor:

Last week I went to sign my dogs up for welfare. At first the lady said, "Dogs are not eligible to draw welfare." So I explained to her that my dogs are mixed in color, unemployed, lazy, can't speak English and have no frigging clue who their Daddies are. They expect me to feed them, provide them with housing and medical care. So she looked in her policy book to see what it takes to qualify. My dogs get their first checks Friday.

Damn, this is a great country!!



DOJ report reveals racist emails sent by Ferguson PD - CNN.mpg

Source: John Eligon “Racist Emails by Ferguson Officials Released “ NYTimes, Apr.3, 2015

NO HATE SPEECH



**NO HATE
SPEECH
MOVEMENT**



Sources

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- E. Jerome Davis “From Bajan to Standard English” (2003)
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<http://englishwithatwist.com/2014/07/>

- *Many Other Internet Sources*

Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 8

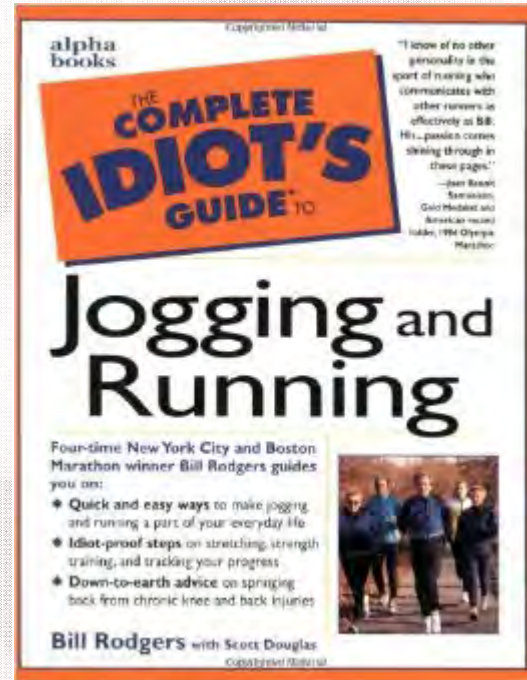


Grimm meets a Primitive Indo-European.

Language Change: The Syllables of Time

Languages are Always Changing

- In central Australia, where the rivers Murray and Darling meet, there lives a small group of aborigines who were *forced to change their word for water nine times in five years*, each time because the man had died whose name had been the accepted word for water while he was alive.
- We find it difficult to imagine such a situation. Australian aborigines, on the other hand, would probably find it difficult to understand why *numerous people in Germany started to run ► after the English word jogging had come into fashion*.
- Languages are always changing. Twenty generations separate us from Chaucer. If we could board a time machine and visit him in the year 1390, we would have great difficulties in making ourselves understood — even roughly.



Source: Rudi Keller "On Language Change: The Invisible Hand in Language" (1994)

Old English as a Foreign Language

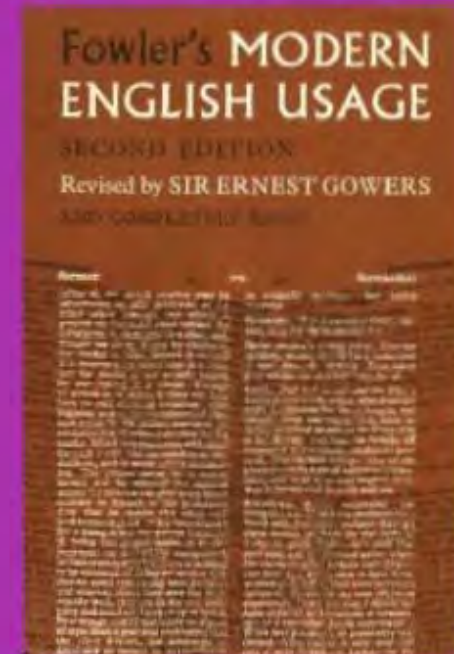
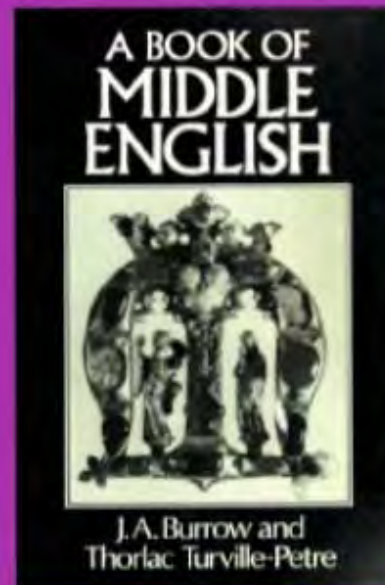
- All languages change continuously. Old English could be studied as a foreign language!
 - Old English (449-1100 C.E.):
 - Ex. *Wolde guman findan þone þe him on sweofote sare geteode. (Beowulf)*
He wanted to find the man who harmed him while he slept.
 - Middle English (1,100-1,500):
 - Ex. *Whan that Aprille with his shoures soote
The droght of March hath perced to the roote ... (TCT)*
 - Early Modern English (1,500-1,700):
 - Ex. *A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm. (Hamlet)*



Historical and Comparative Linguistics

- **Historical and comparative linguistics** is the study of how languages change, what kinds of changes occur, and why they occurred.

- Old English period → 5th to 11th century
- Middle English period 11th to → 15th century
- Modern English → 15th century up today

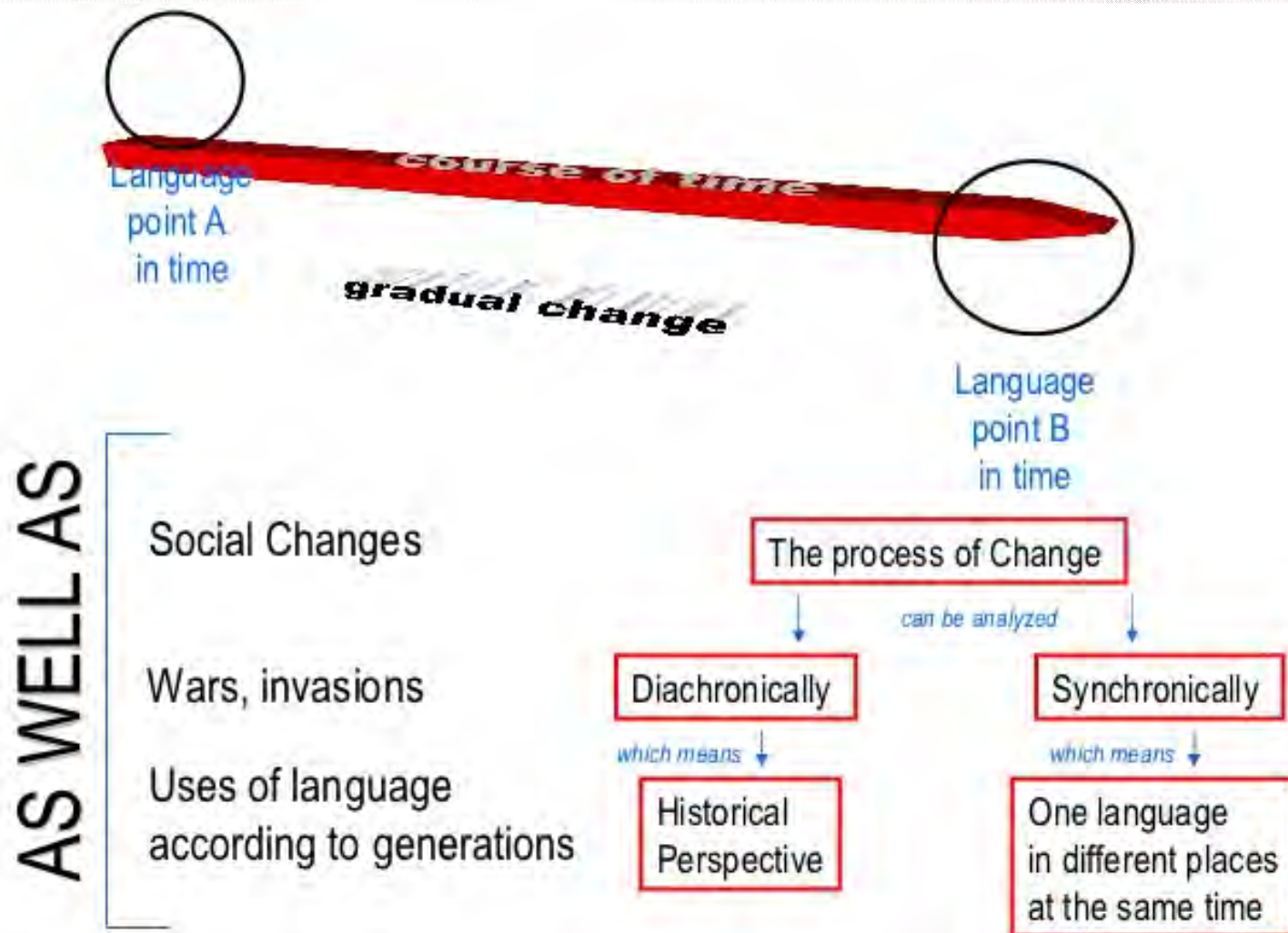


Language Change: Good, Bad, or Neither?



*Neither
progress
nor
decay,
but
inevitable*

The Process of Language Change



Diachronic & Synchronic Approaches

- **Diachronic** linguistics studies change **over time**
- Many linguists believed that it is impossible to observe change as it is taking place: “the process of linguistic change has never been directly observed – such observation is inconceivable.” (Leonard Bloomfield, 1933)
- Historical or diachronic studies used evidence from various points in time and studied changes which had taken place
- **Synchronic** linguistics studies the state of a language **at a given point in time**, usually the present day
- Two problems for synchronic studies:
 1. **Language variation:** geographical (local accents & dialects); social (class, age, gender differences); and individual (our own varieties of styles in different situations)
 2. **Language fuzziness:** those occasions when we are not sure if an utterance is ‘right’ or not e.g. “Who did the postman bring the letter?”
- So it is difficult to accurately describe the way language is used

The Regularity of Sound Change:

Synchrony vs. Diachrony

- *Synchrony = space*: Sound differences between dialects are usually regular and not confined to just a few words
 - Words that are pronounced with an [aɪ] diphthong in many regions of the US are pronounced as [a:] in the South
 - And this is true for all words, not just a few, so this is a **regular sound correspondence**
- *Diachrony = time*: The regular sound correspondences we observe between older and modern forms of a language are the result of sound changes that affected certain sounds, or certain classes of sounds, rather than individual words
 - English underwent a sound shift a few hundred years ago that caused every instance of the sound [u:] to be pronounced as [aʊ] like it is today:
 - *house* used to be pronounced as [hu:s]
 - *mouse* used to be pronounced as [mu:s]
 - *south* used to be pronounced as [su:θ]

The Regularity of Sound Change

- *Sound change* to a surprisingly large degree turns out to be regular.
- The **regularity of sound change** implies that when a certain sound *X* changes to a slightly different sound *X'* in one word, the same change tends to take place in all words where sound *X* occurs, or in all words where sound *X* occurs in a particular context.
- *The regularity of sound change is the prerequisite for the comparative method.*



The Regularity of Sound Changes

- Latin /h/ > Italian Ø

LATIN			ITALIAN		
ORTHOGRAPHY	PRONUNCIATION	MEANING	ORTHOGRAPHY	PRONUNCIATION	MEANING
<i>habere</i>	/ha'be:re/	'to have'	<i>avere</i>	/a've:re/	'to have'
<i>herbam</i>	/ˈherbã/	'grass'	<i>erba</i>	/ˈerba/	'grass'
<i>hora</i>	/ˈho:ra/	'time, hour'	<i>ora</i>	/ˈo:ra/	'time, hour'
<i>homo</i>	/ˈhomo:/	'man'	<i>uomo</i>	/ˈwomo/	'man'

- Italian is a direct descendant of Latin, and we can see that the words have changed in several ways. What interests us is the unexceptional fate of the Latin *h* /h/: it has disappeared in all Italian words. This is a completely regular sound change from Latin to Italian.

Source: Halvor Eifring & Rolf Theil
“Linguistics for Students of Asian and African Languages” (2009)

The Regularity of Sound Changes

- But Latin has more descendants than Italian, among others Portuguese, Castilian (Spanish), Catalan, French, and Romanian. Let us take some Latin words and see what has happened to them in Portuguese, Castilian, Italian, and Romanian:

MEANING	LATIN	PORTUGUESE ²	CASTILIAN	ITALIAN	ROMANIAN
'eight'	<i>octo</i> /'okto:/	<i>oito</i> /'ojtu/	<i>ocho</i> /'otʃo/	<i>otto</i> /'otto/	<i>opt</i> /'opt/
'milk'	<i>lactem</i> /'laktẽ/	<i>leite</i> /'lejɾə/	<i>leche</i> /'letʃe/	<i>latte</i> /'latte/	<i>lapte</i> /'lapte/
'fact'	<i>factum</i> /'faktũ/	<i>feito</i> /'fejtu/	<i>hecho</i> /'etʃo/	<i>fatto</i> /'fatto/	<i>fapt</i> /'fapt/

- The modern languages differ from Latin and from each other in several ways, and all of it is highly regular. We shall concentrate on one single change: the development of the Latin consonant cluster *ct* /kt/. It turns out that one regular sound change can be established from Latin to each of the four modern languages:

Four regular sound changes

- Latin /kt/ > Portuguese /jt/
- Latin /kt/ > Castilian /tʃ/
- Latin /kt/ > Italian /tt/
- Latin /kt/ > Romanian /pt/

Regular Sound Correspondences: English

- Sound changes or correspondences that affect an entire dialect area with no lexical exceptions at one time
 - [a^j]-[a:] correspondence in General vs. S. AmE:
 - *High*: [ha^j] vs. [ha:], *eye*: [a^j] vs. [a:], *pie*: [p^ha^j] vs. [p^ha:]
 - [u:]-[a^w] correspondence in ME vs. PDE: *
 - *House*: [hu:s] vs. [ha^ws], *out*: [u:t] vs. [a^wt], *how*: [hu:] vs. [ha^w]
 - [h]-[o] correspondence (“h-dropping”):
 - *Hardly*: [ha:dli:] vs. [a:dli:] (Cockney), *hit*: [hit] vs. [It] (Appalachian)
 - [p]-[f] correspondence:
 - *Père* and *padre* [p] vs. *father* and *Vater* [f] (Grimm’s Law)
 - *Sleep* and *ship* [p] vs. *schlafen* and *Schiff* [f] (OHG)

*ME = Middle English; PDE = Present-Day English

Ancestral Protolanguages

- Languages that are documented to share a common ancestry are said to be **genetically related**:
 - English, Frisian, Norwegian, Afrikaans, and Yiddish are all offspring of **Proto-Germanic**.
 - Portuguese, Spanish, Catalan, French, Italian, and Romanian are all descendants of **Vulgar** (i.e., Common) **Latin**.
 - **Proto-Indo-European** languages are divided according to the phonetic value of the onset for the word *hundred*—the so-proposed **centum-satem isogloss**. Anatolian, Celtic, Hellenic, Italic, Germanic, and Tocharian form the [k] or western branch, whereas Albanian, Armenian, Balto-Slavic, Indo-Iranian the [s] or eastern branch.



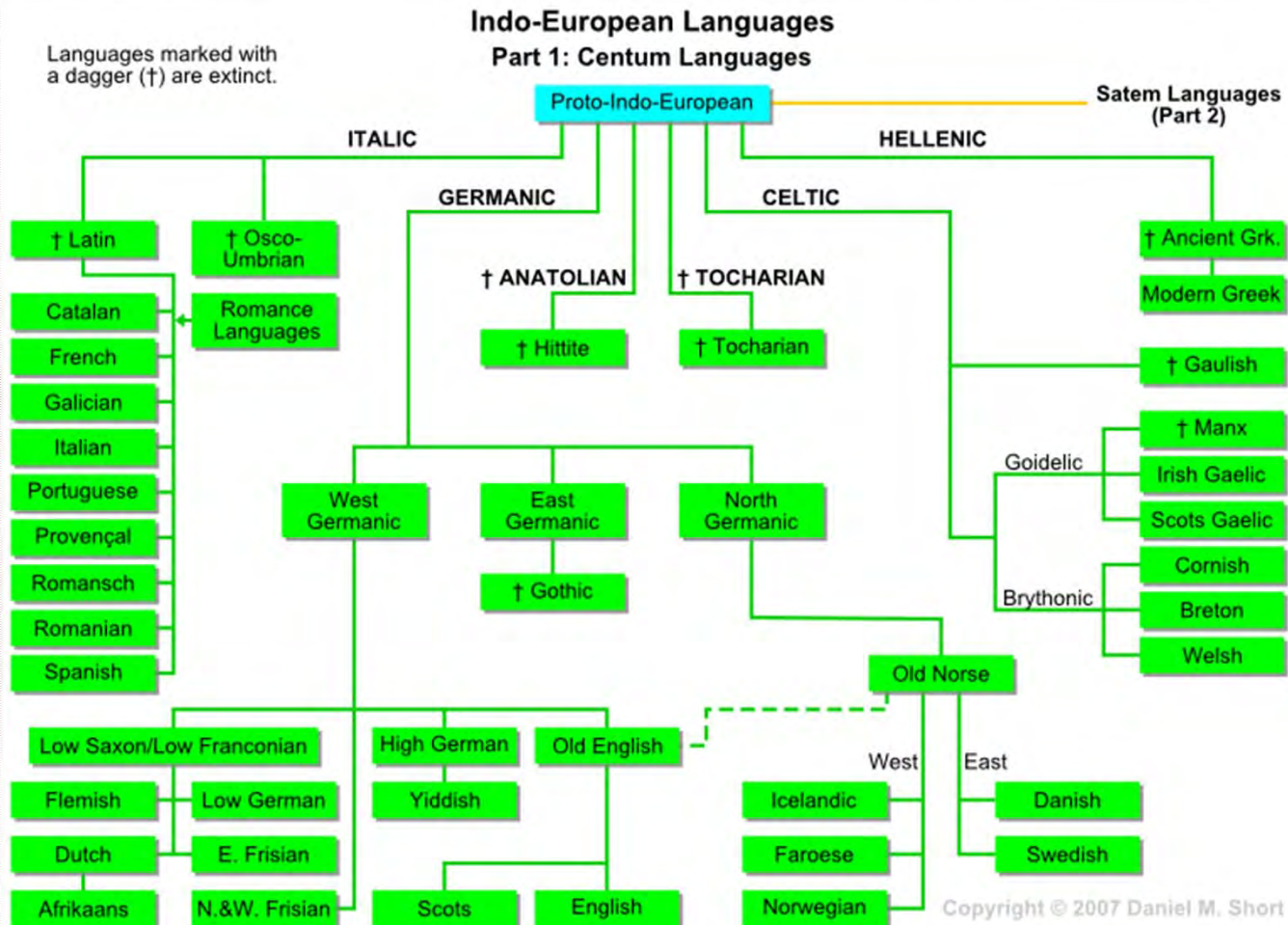
Centum / Satem Isogloss

Numerals

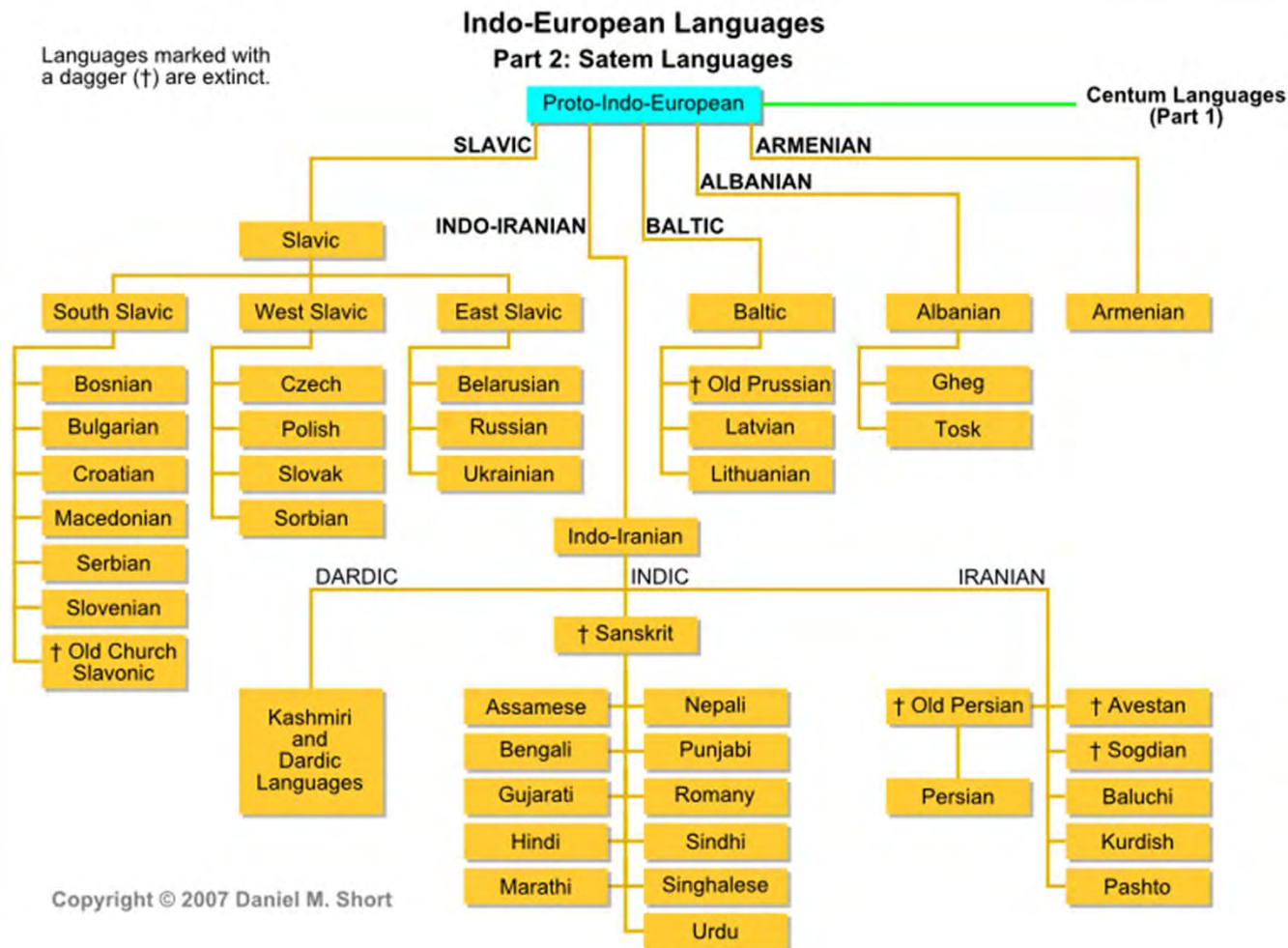
	Irish	Welsh	Greek	Latin	Italian	Spanish	French	German	Dutch	Swedish
1	aon	un	hen	unus	uno	uno	un	einz	een	en
2	do	dau	duo	duo	due	dos	deux	zwei	twee	tva
3	tri	tri	treis	tres	tre	tres	trois	drei	drie	tre
4	ceathair	pedwar	tetrares	quattuor	quattro	cuatro	quatre	vier	vier	tyra
5	cuig	pump	perite	quinque	cinque	cinco	cinq	fünf	vijf	fem
6	se	chwech	hex	sex	sei	seis	six	sechs	zes	sex
7	seacht	saith	hepta	septem	sette	siete	sept	sieben	zeven	sju
8	ocht	wyth	okto	octo	otto	ocho	huit	acht	acht	atta
9	naol	naw	ennea	novem	nove	nueve	neuf	neun	negen	nio
10	deich	deg	deka	decem	dieci	diez	dix	zehn	tien	tio
100	cead	cant	hekaton	centum	cento	ciento	cent	hundert	honderd	hundra
	Danish	Old English	Polish	Russian	Berigali	Persian	Lithuanian	Albanian	Armenian	Tocharian A
1	en	an	jeden	odin	ek	yak	vienas	një	mi	sas
2	to	twa	dwie dwa	dva	dvi	do	du	dy	erku	wu
3	tre	thrie	trzy	tri	tri	se	trys	tre	erek	tre
4	fire	feowre	cztery	chetyre	car	cahar	keturi	katër	cork	stwar
5	fem	fil	piec	pyat	pac	panj	penkti	pesë	hing	pän
6	saks	siex	szesc	shesht	chay	shesh	sesi	glashtë	vec	säk
7	syv	seofon	siedem	sem	sat	haft	septyni	shtatë	ewt'n	spät
8	otte	eahta	osiem	vosem	at	hasht	astuoni	letë	ut	okät
9	ni	nigon	dziewiec	devyat	nay	noh	devyni	nëntë	inn	nu
10	ti	ten	dziesięc	desyat	das	dah	desimt	dhjetë	tasn	säk
100	hundrede	hund	sto	sto	sa	sad	simtas	qind	harlwr	känt

3. The 'Japhetic' numerals abridged from James Parsons' list and expanded to include Lithuanian, Albanian, Armenian and Tocharian.

Centum / Satem Isogloss

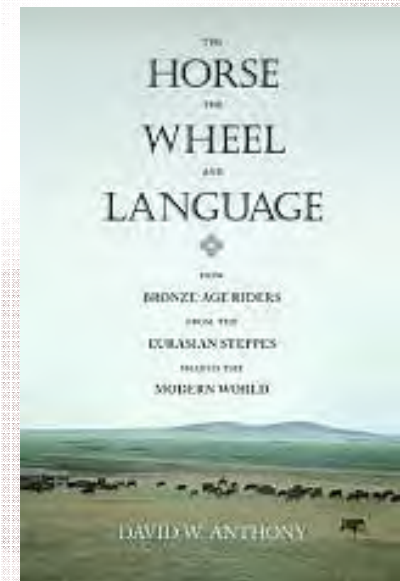


Centum / Satem Isogloss



Reconstruction of Protolanguages

- Philologists examine **basic vocabulary** and **grammatical structures** of similar-looking languages as well as their parent languages.
- Basic vocabulary includes numbers, body parts, kinship terms, natural objects, and function words or morphology.
- Finding of **internally sustained systematic sound correspondences** that cannot be attributed to contact analogy or borrowing will reveal their genealogical relatedness.
- Protolanguages can be hypothesized this way. This method is called the **comparative method**.



Reconstruction of Protolanguages

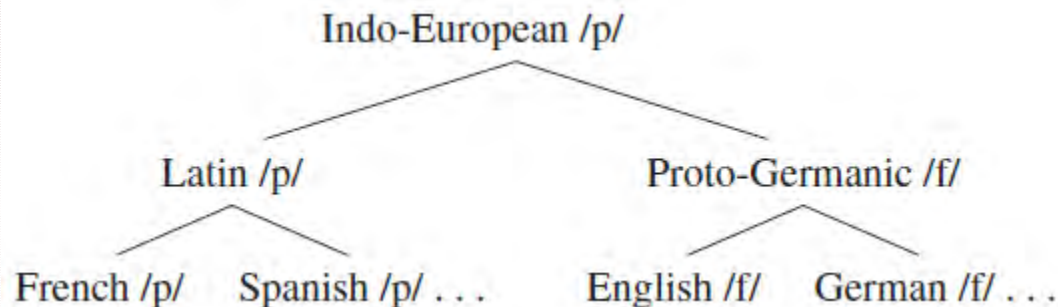
- One way we can tell if languages are genetically related is if they have a large number of sound correspondences
 - Where an English word begins with an *f*, the corresponding word in French and Spanish begins with a *p*:

English /f/
father
fish

French /p/
père
poisson

Spanish /p/
padre
pescado

- From these correspondences, we can hypothesize that Indo-European had a /p/ since more related languages have the /p/ form, and that at some point the /p/ became /f/ in the Germanic group



Examples of Systematic Correspondence

- Basic vocabulary comparison

Eng	Dut	Ger	MChn	Can	TW
<i>one</i>	<i>een</i>	<i>eins</i>	<i>yi</i>	<i>yət</i>	<i>dʒɪt</i>
<i>two</i>	<i>twee</i>	<i>zwei</i>	<i>er</i>	<i>yi</i>	<i>ʒi</i>
<i>three</i>	<i>drie</i>	<i>drei</i>	<i>san</i>	<i>sam</i>	<i>sã</i>
<i>four</i>	<i>vier</i>	<i>vier</i>	<i>si</i>	<i>sei</i>	<i>si</i>
<i>five</i>	<i>vijf</i>	<i>fünf</i>	<i>wu</i>	<i>ŋ</i>	<i>ŋɔ</i>
<i>mouth</i>	<i>mond</i>	<i>Mund</i>	<i>zui</i>	<i>tʃøɥ</i>	<i>tʃʰui</i>
<i>hand</i>	<i>hand</i>	<i>Hand</i>	<i>shou</i>	<i>səw</i>	<i>tʃiʷ</i>
<i>brother</i>	<i>broer</i>	<i>Bruder</i>	<i>ge</i>	<i>kɔ</i>	<i>kɔ</i>
<i>sun</i>	<i>zon</i>	<i>Sonne</i>	<i>ri</i>	<i>yət</i>	<i>ʒɪt</i>
<i>moon</i>	<i>maan</i>	<i>Mond</i>	<i>yue</i>	<i>ɥyt</i>	<i>ŋʷɪt</i>

Examples of Systematic Correspondence

- Comparison of the verb 'to bear'

<i>English</i>	<i>Sanskrit</i>	<i>Greek (Doric)</i>	<i>Latin</i>	<i>Old High German</i>	<i>Old Slavonic</i>
I bear	bharami	phero	fero	biru	bera
(thou bearest)	bharasi	phereis	fers	biris	berasi
he bears	bharati	pherei	fert	birit	beretu
we bear	bharamas	pheromes	ferimus	berames	beremu
you bear	bharata	pherete	fertis	beret	berete
they bear	bharanti	pheronti	ferunt	berant	beratu

Table 1 Comparisons of the verb 'to bear'

Indo-European Language Family

- The following illustration indicates that Indo-European languages generally have common words for the various elements shown ►

Source: Word Info Image

- Some of the words which various languages have in common include: **snow, winter, freezing cold, oak, beech, pine, birch, willow, bear, wolf, beaver, otter, fish, polecat, marten, weasel, deer, rabbit, mouse, horse, ox, cattle, sheep, goat, pig, dog, eagle, hawk, owl, jay, wild goose, wild duck, partridge or pheasant, snake, tortoise, crab, ant, bee (and honey), religion (polytheistic), copper, salmon, grain, etc.**



Common Indo-European Vocabulary

- The Indo-Europeans had cattle and sheep, but neither ass or camel — the latter a Semitic loanword.
- A rich vocabulary for horses—though not for hunting and fishing—and wheel, axle, nave, and yoke, all denoting vehicle components.
- Common words for tools, weapons, and metal
- They knew wolves, bears, otters, mice, and beavers, but not lions, tigers, or elephant.
- Rivers and streams were common, but no word for the sea or the ocean.
- A large common vocabulary for family relationships, of male descent, such as relatives on the husband's side.



A partially reconstructed, wheeled toy from the Cucuteni Tripolye B2 culture

Source: Barber 2000: 74ff

Home of the PIEs: Nomadic or Agricultural?

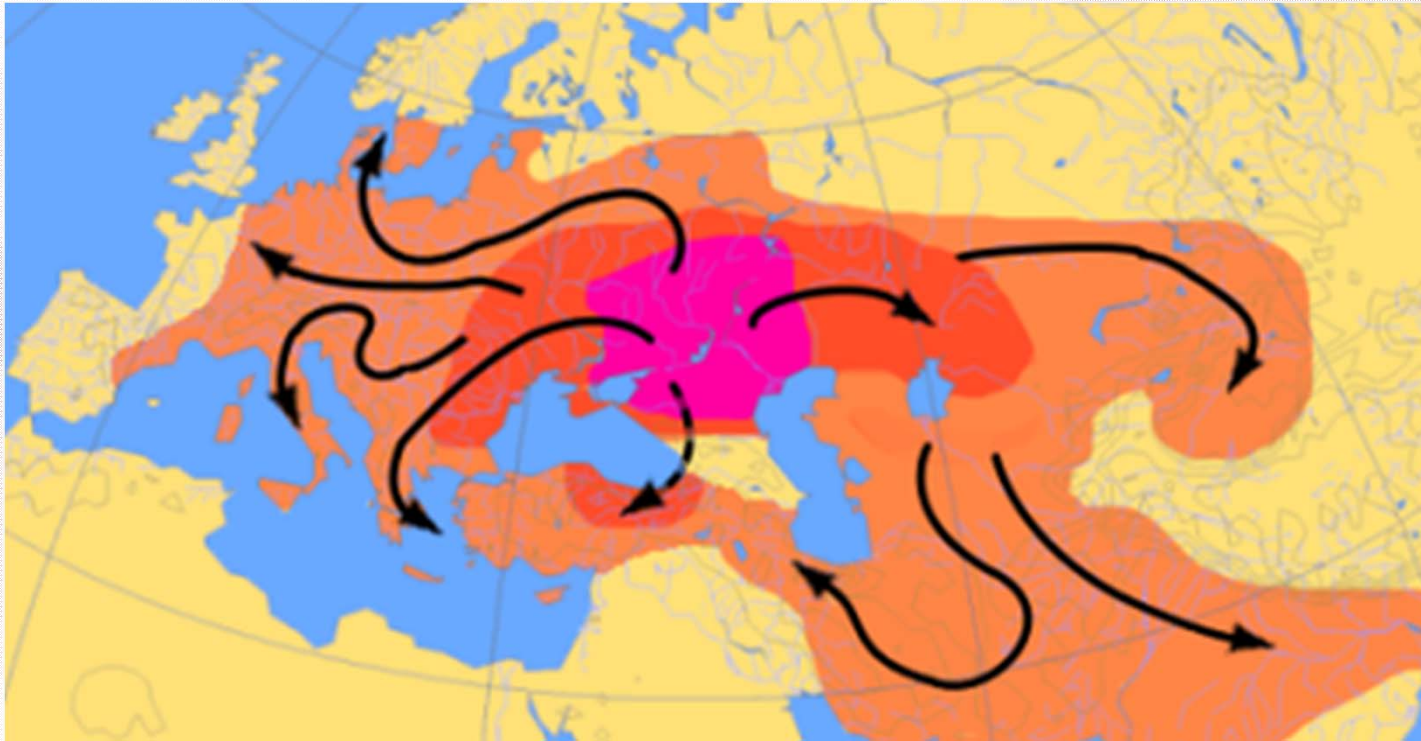
Marija Gimbutas's Leading Hypothesis

- An invasionist theory of the “Kurgan” culture, versus Colin Renfrew's diffusionist model on Anatolia-based (today's Turkey) agricultural spreading.
- Matching between linguistic and material evidence: corded ware, battle-axes and horse domestication.
- A semi-nomadic people of pastoral living on the South Russian steppes (North of the Caspian Sea) in the fifth millennium BC.
- Horse-drawn chariots assisted the Kurgan people in their invasions.
- They expanded in different directions and conquered high-level civilizations in Iran, India and most parts of Old Europe.



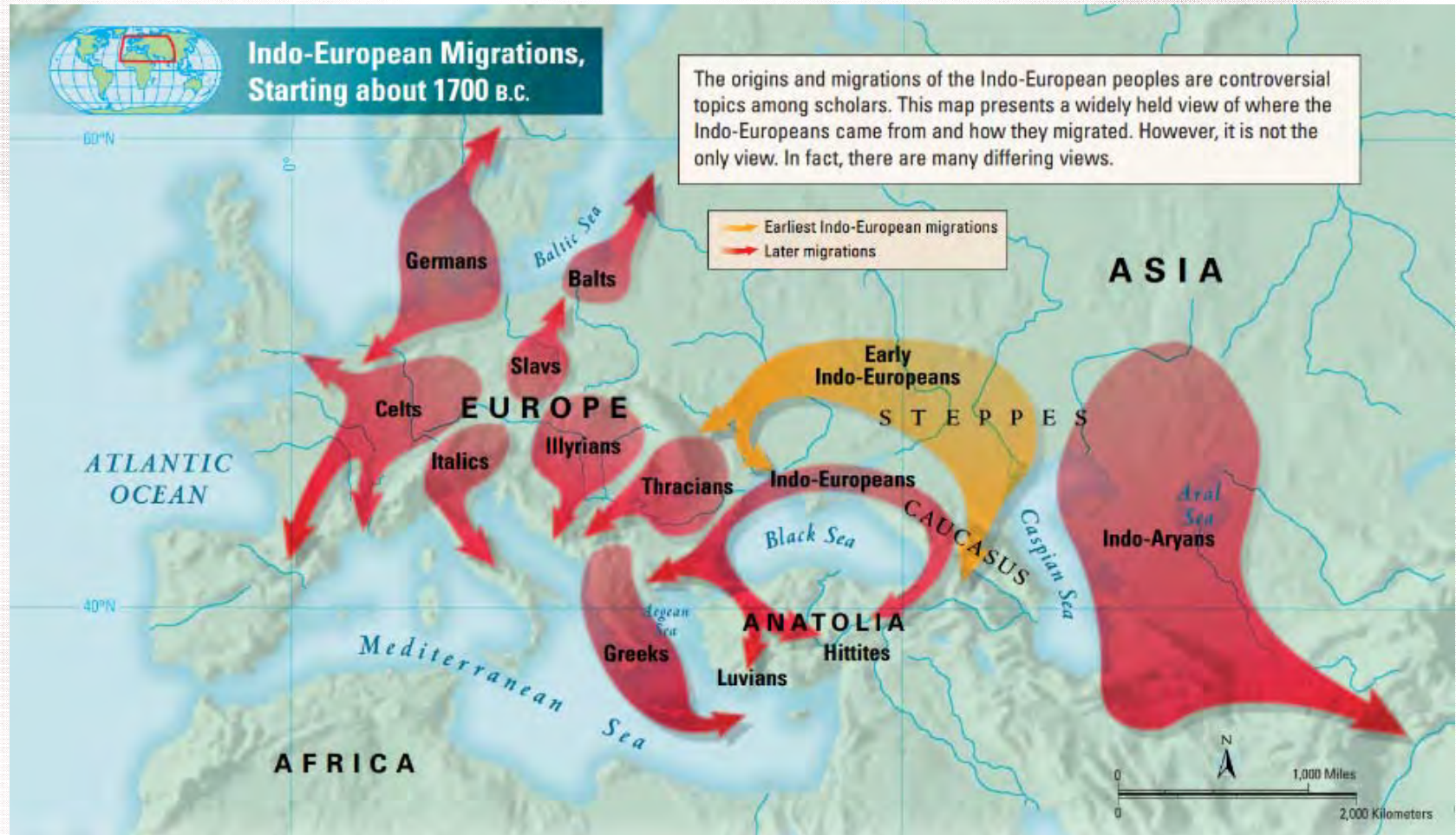
Home of the PIEs: Nomadic or Agricultural?

- The Kurgan expansion



- Map of Indo European migrations from ca. 4000 to 1000 BC according to the Kurgan model. The Anatolian migration (indicated with a dotted arrow) could have taken place either across the Caucasus or across the Balkans. The purple area corresponds to the assumed *Urheimat* (Samara culture, Sredny Stog culture). The red area corresponds to the area which may have been settled by Indo-European-speaking peoples up to ca. 2500 BC, and the orange area by 1000 BC.

Indo-European Migrations

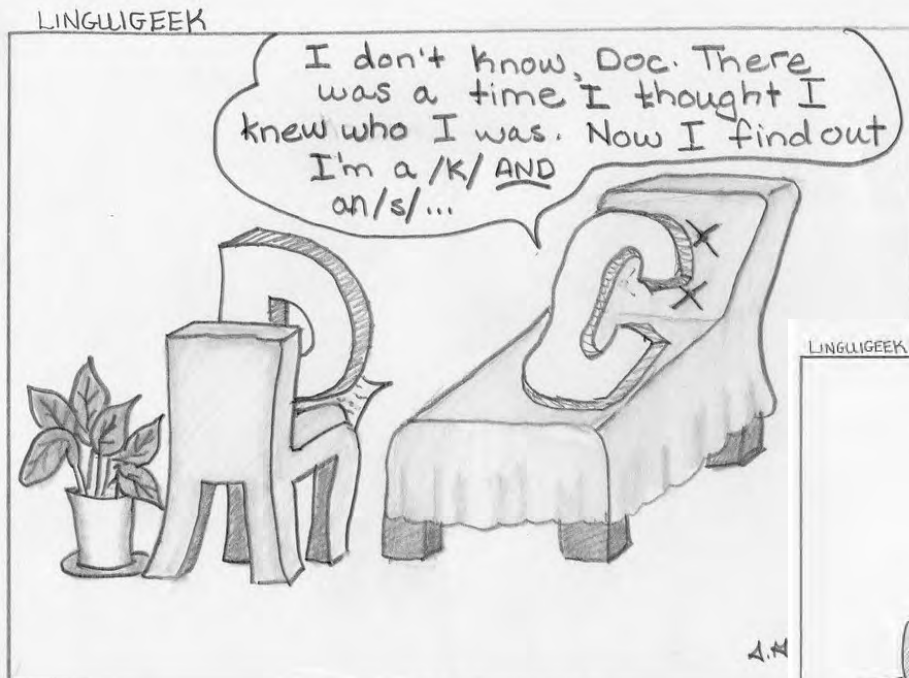


Happy Mother's Day

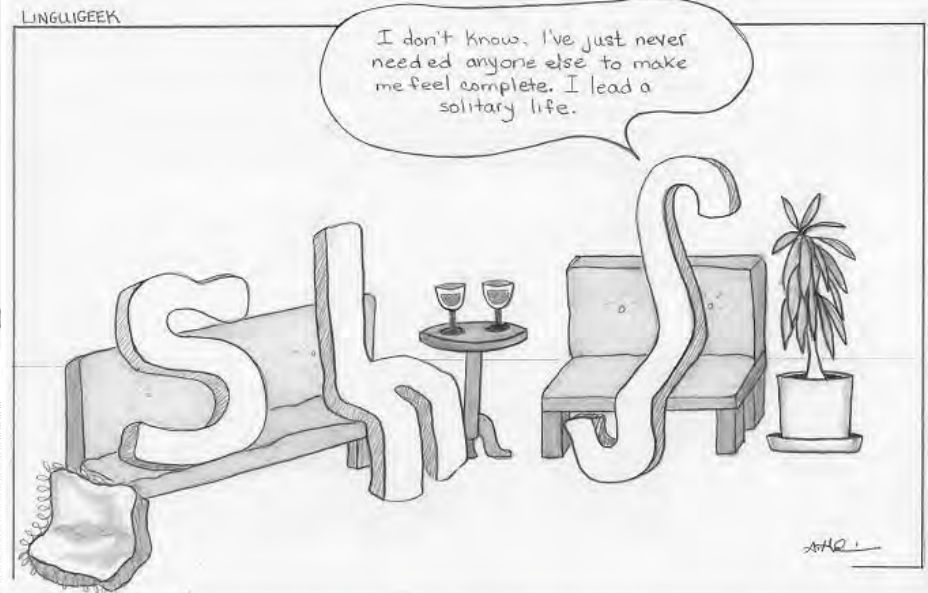
How the word 'mother' changed as it travelled



Phonological Change



Phonological Awareness



Once again, our quiet phonemic hero explains why he never married

Phonological Change

- The phoneme inventory of a language can change in several ways

- *A phoneme can disappear*, e.g., the loss of /x/ in most English dialects between the times of Chaucer and Shakespeare. All words that were once pronounced with an /x/ no longer include this sound, e.g., *night* used to be pronounced [nixt].



- Dialects of Modern English spoken in Scotland have retained the /x/ sound in some words, such as loch [lox] meaning "lake." ▲
- *A phoneme can be added*. Old English did not have the phoneme /z/ of leisure[lizər]. Through a process of palatalization—a change in place of articulation to the palatal region—certain occurrences of /z/ were pronounced [ʒ].

Phonological Change

- The phoneme inventory of a language can change in several ways
 - An allophone of a phoneme may, through sound change, become a separate phoneme, thus adding to the phonemic inventory. *Old English lacked a /v/ phoneme.* The phoneme /f/, however, had the allophone [v] when it occurred between vowels. Thus ofer /ofer/ meaning "over" was pronounced [ɔvər]. Old English also had a long consonant phoneme /f:/ that contrasted with /f/ between vowels. The name Offa /of:a/ was pronounced [ɔf:a]. A sound change occurred in which the pronunciation of /f:/ was simplified to [f]. Now /f:/ was pronounced [f] between vowels so it contrasted with [v].

Phonological Rules

- An interaction of phonological rules may result in changes in the lexicon
 - The **nouns** *house* and *bath* were once differentiated from the **verbs** *house* and *bathe* by the fact that the verbs ended with a short vowel sound. Furthermore, the same rule that realized /f/ as [v] between vowels also realized /s/ and /θ/ as the allophones [z] and [ð] between vowels. This general rule added voicing to intervocalic fricatives. Thus the /s/ in the verb *house* was pronounced [z], and the /θ/ in the verb *bathe* was pronounced [ð].
 - A contrast between the voiced and voiceless fricatives resulted, and the new phonemes /z/ and /ð/ were added to the phonemic inventory. The verbs *house* [haʊz] and *bathe* [beð] were now represented in the mental lexicon with final voiced consonants.



The Great Vowel Shift

- If you examine the following list of words carefully, you can see both the differences and the similarities.

Old English

bairn
bat
ece
fisc
fold
ful
gar
ic
manian
manig
mece
mid
mus/mys
nu

Modern English

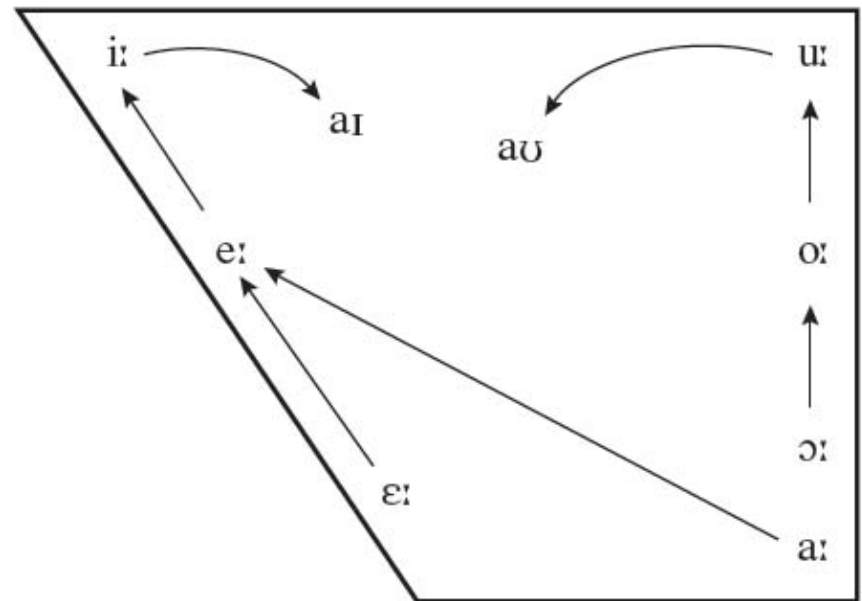
son
boat
forever
fish
earth
foul
spear
I
admonish
many
sword
with
mouse/mice
now

If you didn't know that these words represented two different stages of the same language, separated only by 1,000 years, you would most certainly want to conclude that they were words from two different but related languages. A few look familiar, such as *mus* : *mouse*, *mys* : *mice*, *nu* : *now*, *manig* : *many*, *cwen* : *queen*, *fisc* : *fish*, *scyp* : *ship*, and so on. These familiar-looking pairs help us to see the similarities between the two varieties (or in this case, stages) of English and to conclude that they are related. We can see, for example, that an <sc> in Old English has often become a <sh> in contemporary English and that a lot of the vowels have changed as well: *mus* has become *mouse*, *mys* has become *mice*, and so on. Historical linguists call this particular shift in vowels the Great English Vowel Shift. This shift in the way that vowels were

Source: Harriet Ottenheimer “The Anthropology of Language: An Introduction to Linguistic Anthropology” (2014)

The Great Vowel Shift

- The **Great Vowel Shift** occurred in English between 1400 and 1600
- In the Great Vowel Shift, the seven long vowels of Middle English shifted so that each sound underwent an increase in tongue height and the highest sounds [i:] and [u:] became the diphthongs [aɪ] and [aʊ]



Jürgen Handke "History of English: The Great Vowel Shift" (2012)

The Great Vowel Shift

- As a result of this vowel shift, the pronunciation of many English words have changed:

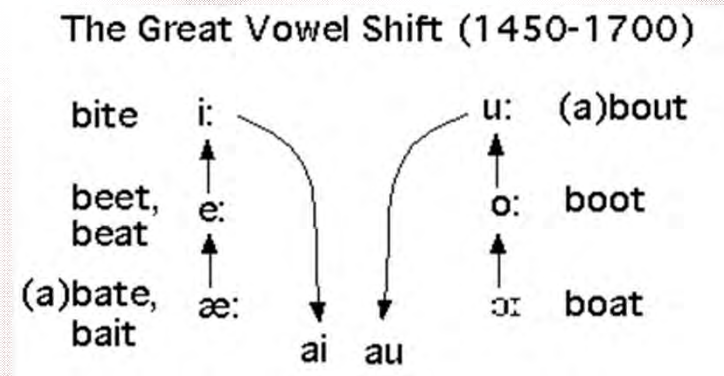
Shift		Example			
Middle English	Modern English	Middle English	Modern English		
[i:]	→	[aɪ]	[mi:s]	→	[maɪs] mice
[u:]	→	[aʊ]	[mu:s]	→	[maʊs] mouse
[e:]	→	[i:]	[ge:s]	→	[gi:s] geese
[o:]	→	[u:]	[go:s]	→	[gu:s] goose
[ɛ:]	→	[e:]	[brɛ:ken]	→	[bre:k] break
[ɔ:]	→	[o:]	[brɔ:ken]	→	[bro:k] broke
[a:]	→	[e:]	[na:mə]	→	[ne:m] name

The Great Vowel Shift

- Before the Great Vowel Shift, the vowels in each of the following pairs of words were pronounced the same:

- *please/pleasant, serene/serenity, sane/sanity, crime/criminal*

- Then the **Early Middle English Vowel Shortening** rule shortened the vowels in the second word of each pair



- When the Great Vowel Shift occurred, it only affected long vowels (the vowel in the first word of each pair), and now these morphologically related words are pronounced differently
- The Great Vowel Shift is a cause of a great many spelling inconsistencies because the written language tends to change more slowly than spoken language

The Great Vowel Shift

This is a simplified picture of the changes that happened between late Middle English and today's English.

Word	Vowel pronunciation			
	late ME	EModE		ModE
	1400	1500	1600	2000
bite	🔊 /i:/	/ei/	/ei/	🔊 /aɪ/
meet	🔊 /e:/	🔊 /i:/	/i:/	/i:/
meat	🔊 /ɛ:/	/ɛ:/	🔊 /e:/	🔊 /i:/
mate	🔊 /a:/	/a:/	🔊 /ɛ:/	🔊 /eɪ/
out	🔊 /u:/	/ou/	/ɔu/	🔊 /aʊ/
boot	🔊 /o:/	🔊 /u:/	/u:/	/u:/
boat	🔊 /ɔ:/	/ɔ:/	🔊 /o:/	🔊 /oʊ/, 🔊 /əʊ/

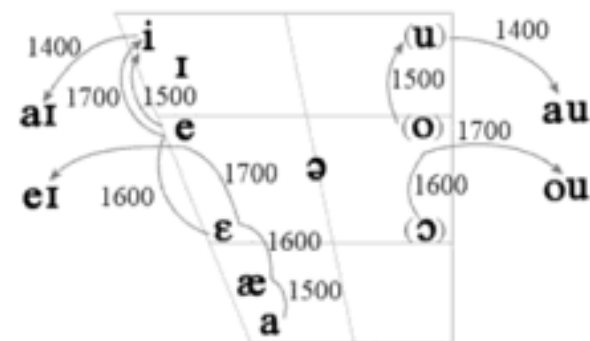


FIGURE 9.1 The Great English Vowel Shift

Source: Courtesy of www.peak.org.



The Great Vowel Shift changes.wav

• Source: Wikipedia

http://en.wikipedia.org/wiki/Great_Vowel_Shift

Morphological Change: The Case(s) of *Lupus*



Morphological Change:

The Case(s) of *Lupus*

- Declension of Latin nouns—the case of *lupus* < PIE *w^lq^wos:

Noun Stem	Suffix (Sg.)	Suffix (Pl.)	Case	English
<i>lup</i>	+ <i>us</i>	+ <i>ī</i>	Nominative	'wolf/wolves'
<i>lup</i>	+ <i>ī</i>	+ <i>ōrum</i>	Genitive	'of the wolf(s)'
<i>lup</i>	+ <i>ō</i>	+ <i>īs</i>	Dative	'to the wolf(s)'
<i>lup</i>	+ <i>um</i>	+ <i>ōs</i>	Accusative	'wolf/wolves'
<i>lup</i>	+ <i>ō</i>	+ <i>īs</i>	Ablative	'from the wolf(s)'
<i>lup</i>	+ <i>e</i>	+ <i>ī</i>	Vocative	'Wolf(s)!'

- Latin has a total of six cases, three genders, and two numbers.
- PIE has two more cases: locative and instrumental.
- All present-day Romance languages have lost their case endings.

Morphological Change:

The Case(s) of *Lupus*

- Rules of morphology also change; Indo-European languages have undergone extensive morphological change
- Latin had **case endings**, suffixes on each noun that marked the thematic role or grammatical relationship to the verb:

Noun	Noun Stem	Case Ending	Case	Example
lupus	lup	+ us	nominative	The <i>wolf</i> runs.
lupī	lup	+ ī	genitive	A sheep in <i>wolf's</i> clothing.
lupō	lup	+ ō	dative	Give food to <i>the wolf</i> .
lupum	lup	+ um	accusative	I love <i>the wolf</i> .
lupō	lup	+ ō	ablative	She walked with <i>the wolf</i> .
lupe	lup	+ e	vocative	<i>Wolf</i> , come here!

- But these are no longer in use in Romance languages

English Morphological Change

- Paradigm of Old English masculine noun declension:

Case	Sg.	Pl.	ModE
Nominative	<i>stān</i>	<i>stānas</i>	'stone(s)'
Genitive	<i>stānes</i>	<i>stāna</i>	'of the stone(s)'
Dative	<i>stāne</i>	<i>stānum</i>	'to the stone(s)'
Accusative	<i>stān</i>	<i>stānas</i>	'stone(s)'

- Modern English nouns only retains the genitive case, written as 's
- English pronouns still show a few case traces
 - Nominative: *I/we/you/he/she/it/they*
 - Genitive: *My/our/your/his/her/its/their*
 - Dative/Accusative: *Me/us/you/him/her/it/them*

English Morphological Change

- English has retained traces of the genitive case, which is written as 's as in *John's book*, but that is the only case marking left on nouns
- Pronouns have a few more case distinctions
 - *He/she* are nominative, *him/her* are accusative and dative, and *his/hers* are genitive

Table 10.2: Personal pronouns by case

Nominative case	Objective case	Possessive case
I	me	my/mine
you	you	your/yours
he	him	his/his
she	her	her/hers
it	it	its/its
we	us	our/ours
you (pl.)	you (pl.)	your/yours (pl.)
they	them	their/theirs



What does thee
wish
(Philadelphia
Story, 1940).mpg

- English has replaced the case system with a system of prepositions and word order to express the same relationships

Old English Pronouns:

“Eight Days a Week”

Old English had several different **YOU**s —

FOR ONE PERSON

ÐU
“thoo”



FOR TWO PEOPLE

GIT
“yeet”



FOR MORE

GE
“yeah”



There were also more versions of **YOU** for different grammatical cases, which would tell what **YOU** were doing in the sentence.

TAKE, FOR EXAMPLE, “EIGHT DAYS A WEEK” BY THE BEATLES. THERE ARE DIFFERENT GRAMMATICAL CASES OF **YOU** HAPPENING —

OOH, I NEED YOUR LOVE BABE



THE OLD ENGLISH VERSION (BY THE VENERABLE BEDLES) WOULD HAVE USED A DIFFERENT WORD FOR EACH CASE —

OOH, IC **ÐINNE** LUFU BIDEARF LEOF



GENITIVE CASE
SOMETHING BELONGS TO **YOU**



Old English Pronouns: “Eight Days a Week”



Syntactic Change

- When the case system of English became simplified, speakers needed to rely more heavily on word order to convey the thematic roles of NPs
- The case system of Old English allowed the following sentence to be understood as “The man slew the king”:

sē	man	þone	kyning	sloh
the (nominative)	man	the (accusative)	king	slew

For example, English – a strictly SVO language today – allowed for all six of the logically possible orderings of subject, object, and verb in the Old-English period about thirteen hundred years ago. The following six sentences all mean ‘The man slew the king.’

- (53) (a) SVO: *Se man sloh thone kyning.* Old English
(b) SOV: *Se man thone kyning sloh.*
(c) VSO: *Sloh se man thone kyning.*
(d) VOS: *Sloh thone kyning se man.*
(e) OSV: *Thone kyning se man sloh.*
(f) OVS: *Thone kyning sloh se man.*

Syntactic Change



- Downtown
New London,
April 2015

Syntactic Change

- Old English used to have an SOV word order like German and Dutch, but unlike German and Dutch, the English VP changed from VP → NP V to VP → V NP
- In Modern English, we form questions by moving the auxiliary to the front of the sentence, and if there is no auxiliary we add *do*
 - But older forms of English had a rule to move the first verbal element which would allow the question *Kisses the girl the boy often?*
 - The case markings would have made it clear who was kissing whom
- Old and Middle English allowed split genitives in which words that describe the possessor occur on both sides of the head noun (*The Wife's tale of Bath* meant "The Wife of Bath's tale" [from Geoffrey Chaucer's *The Canterbury Tales*])
 - Modern English does not allow this, but does allow very complex genitive expressions before head nouns (*The girl whose sister I'm dating's roommate*)



The Wife of Bath

Lexical Change: Change in Category

A SELECTION OF MARTINI VARIANTS FROM THE MENU OF A "MARTINI BAR"

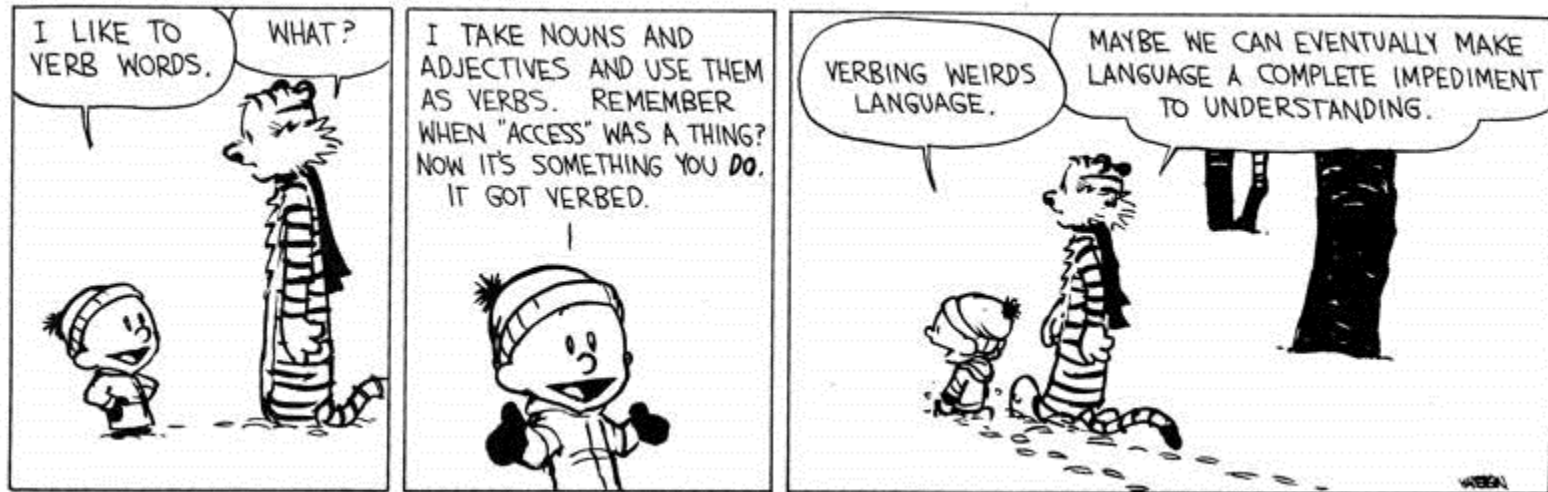
- *appletini*
- *chocotini*
- *crantini*
- *flirtini*
- *frostini*
- *mintatini*
- *mochatini*
- *peachatini*
- *peartini*
- *VeeV treetini*



a Partini!

Lexical Change: Change in Category

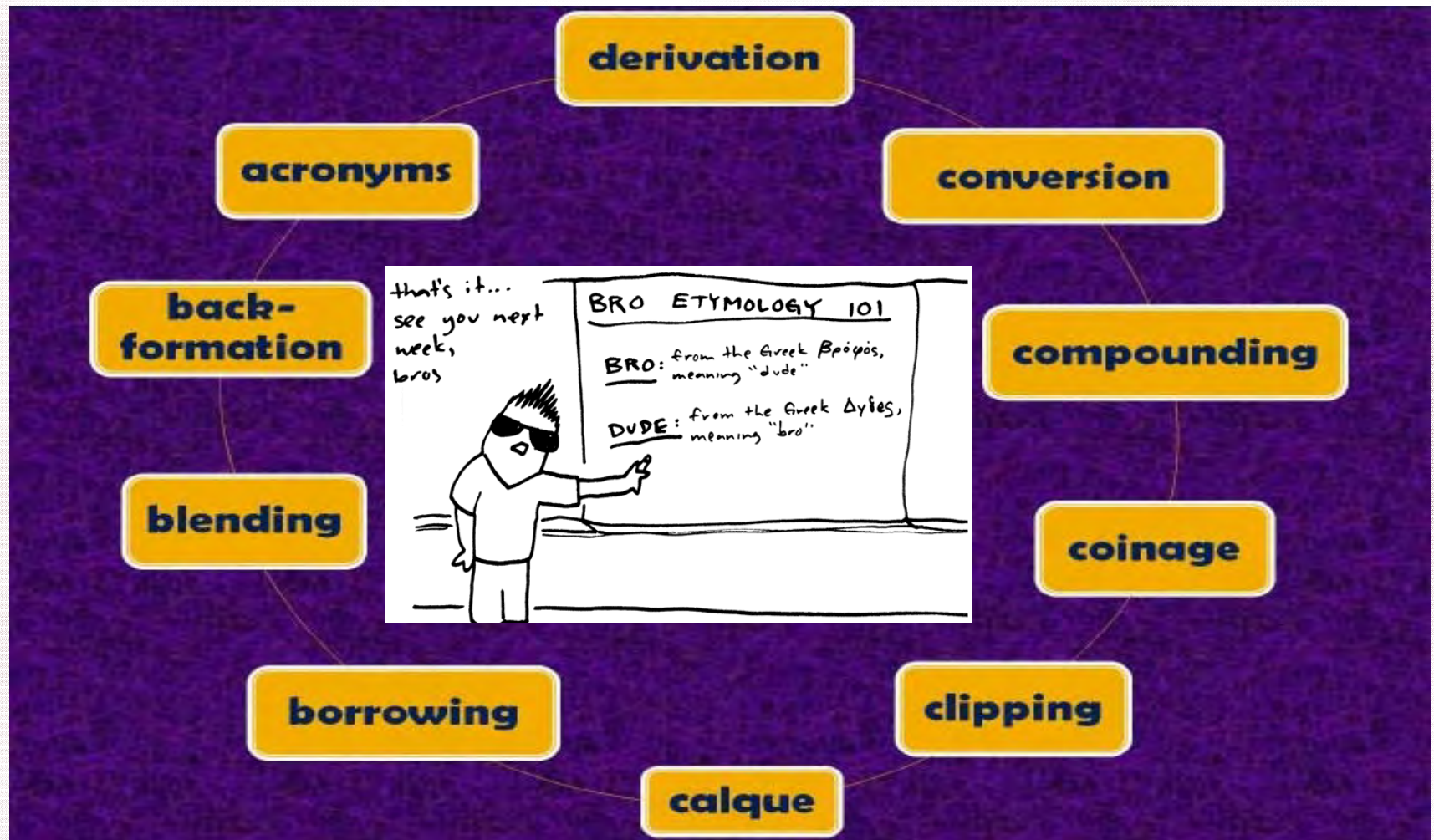
- Changes in the lexicon of a language also occur



- For example, words can change their lexical category:
 - Noun *text* becomes verb *text*
 - Verb *twitter* becomes noun *Twitter*
 - Adverb *to* and *fro* becomes verb *to-ing* and *fro-ing*

Etymology:

“Every Word Has a Story”



Addition of New Words

- One of the ways a language can change is through the addition of new words, and unlike other linguistic changes, new words are readily apparent

Going out of use:

- Vinyl?
- LP
- Cassette
- Betamax
- Floppy Disk
- Video



Words disappear over time as things change, e.g. Technology and Science.

Coming into use:

- USB
- MP3
- DVD
- Flash drive
- Blu-ray
- iPod
- Laptop

- Societies require new words to describe new ideas and to reflect social changes

Word Coinage

- Words may be created outright to serve some communicative purpose
 - The advertising industry creates words such as *nylon*, *Vaseline*, and *Jell-O*
 - Science gives us new words such as *asteroid*, *neutron*, and *vaccine*
- Greek and Latin morphemes borrowed into English have provided a means to create new words
 - *thermometer* is from a combination of the Greek *thermos* (“hot”) and *metron* (“measure”)
 - The prefix *ex-* is from Latin and gives us words like *ex-husband*, *ex-sister-in-law*, and *ex-teacher*



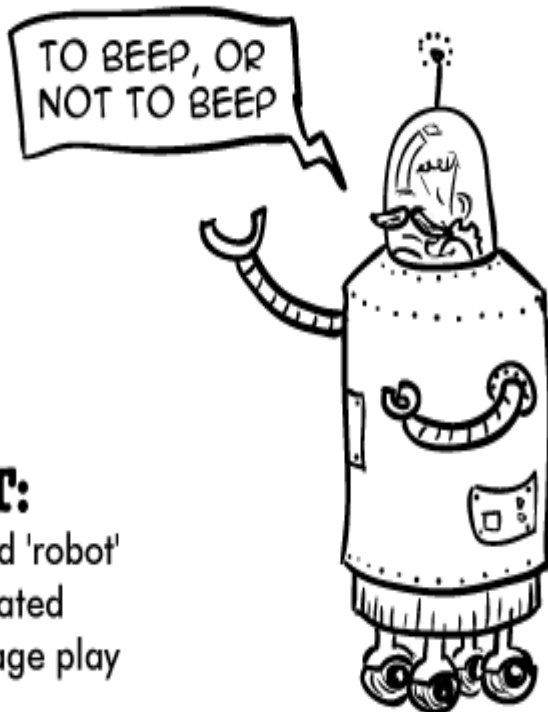
1935

Nylon

Wallace Carothers, Ph.D., invents nylon, the world's first true synthetic fiber and one of the most successful DuPont products.

Word Coinage

- “Robot” was first used in a Czech science fiction play called *R. U. R.* (*Rossum’s Universal Robots*) by Karel Čapek.



FACT:

the word 'robot'
was created
for a stage play

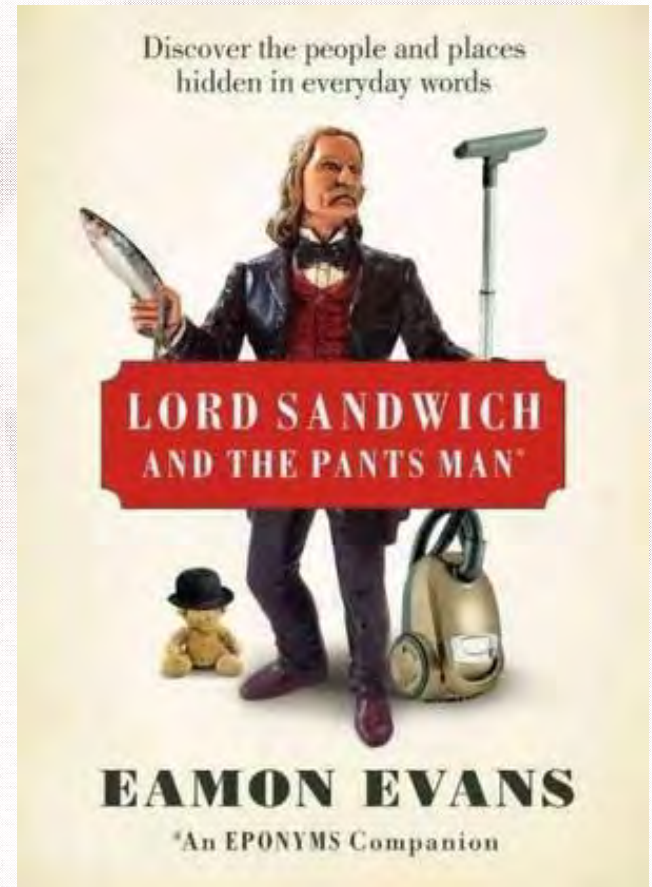
Learn Something New Every Day at LSNE.com



- Source: Oxford English Dictionary

Words from Names & Blends

- **Eponyms** are words formed from proper names
 - *sandwich* is named for the fourth Earl of Sandwich who put his food between two slices of bread so that he could eat while he gambled
- **Blends** are produced by combining two words such that parts of the combined words are deleted
 - *smog* is a blend of *smoke* and *fog*
 - *brunch* is a blend of *breakfast* and *lunch*



Words from Names & Blends

- **Nicotine** - borrowing from French *nicotine*, named after *Jean Nicot*, French ambassador to Portugal, who sent tobacco seeds back to France in 1561.



Words from Names

Etymology: English "guy"

- **Guido (Guy) Fawkes, the leader of a plot to blow up the English Houses of Parliament in 1605**
 - > a person of grotesque appearance – after the burning of Fawkes' effigy
 - > 20th century, general reference for a man
 - > replaced "fellow," "bloke," "chap" and other such words throughout the English-speaking world
 - > **both genders** : "I like being with you guys!" (refers to a group of men and women).



- Four hundred and eight years ago, a Catholic plot to blow up the British Houses of Lords and with it the King of England failed completely.
- Although a non-event, the attempted bombing had a huge legacy. There was the historical impact, with King James I using it as an excuse to crack down on England's non-conforming Catholics and lay the foundations of a unified British state. There was the cultural impact, with Nov. 5 celebrated ever since with fires and fireworks as Bonfire Night or, in tribute to the plotter caught red-handed, as Guy Fawkes Night. There is a significant linguistic legacy too: the creation of the word "guy."

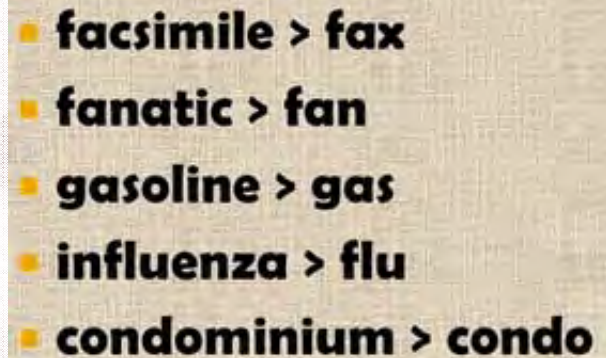
Task: Research the Etymology of Your Name

- The *ouija*, also known as a **spirit board** or **talking board**, is a flat board marked with the letters of the alphabet, the numbers 0–9, the words "yes", "no", "hello" (occasionally), and "goodbye", along with various symbols and graphics. It uses a *planchette* (small heart-shaped piece of wood or plastic) as a movable indicator to indicate the spirit's message by spelling it out on the board during a séance. Participants place their fingers on the *planchette*, and it is moved about the board to spell out words.



Reduced Words

- **Clipping** is the abbreviation of longer words into shorter ones
 - *Fax* for *facsimile*, *gym* for *gymnasium*
- **Acronyms** are words derived from the initials of several words, and such words are pronounced as the spelling indicates
 - *NASA* [næsə] for *National Aeronautics and Space Administration*
 - *scuba* from *self-contained underwater breathing apparatus*
- **Alphabetic abbreviations** are like acronyms in that they are composed of the initials of several words, but are pronounced by sounding out each letter
 - *NFL* [ɛnɛfɛl] for *National Football League*



• **facsimile > fax**
• **fanatic > fan**
• **gasoline > gas**
• **influenza > flu**
• **condominium > condo**

Borrowings or Loan Words

- **Borrowing** occurs when one language adds a word or morpheme from another language into its own lexicon
 - These words are called loan words
- Loan words are often altered to fit the phonological rules of the borrowing language
 - English borrowed *ensemble* [ãsãbəl] from French but pronounces it as [ãnsãmbəl]
- Some loan words are borrowed and then translated directly into the borrowing language, these are known as **loan translations**
 - English borrowed German *Weltanschauung* and translated it to English as *worldview*

Cigarette

- “A slender roll of cut tobacco enclosed in paper and meant to be smoked ...”
- Etymology: French cigarette, diminutive of *cigare* cigar, from Spanish *cigarro* ... possibly from the Mayan *sik'ar*, from *sik*, tobacco.

History through Loan Words

- *Loan words can reveal much about the history of language speakers*
 - During the 9th and 10th centuries, Scandinavian raiders brought words such as *they*, *their*, and *them*
 - After the Norman Conquest of 1066, English borrowed many words from French for government, cuisine, and art
 - *government, nation, religion,*
 - *prince, croissant, bouillon,*
 - *brie, ragout, quiche, beef,*
 - *mutton, pork*



The Raw & the Cooked

- Animals' names change when English-speakers eat them:

- "beef" for "cow", "cattle"
- "veal" for "calf"
- "pork" for "pig"
- "mutton" for "sheep"

Food – Match the meat to the animal.



Chicken

Pork (bacon)

Beef (steak)

Fish

Lamb



Chicken

Sheep

Fish

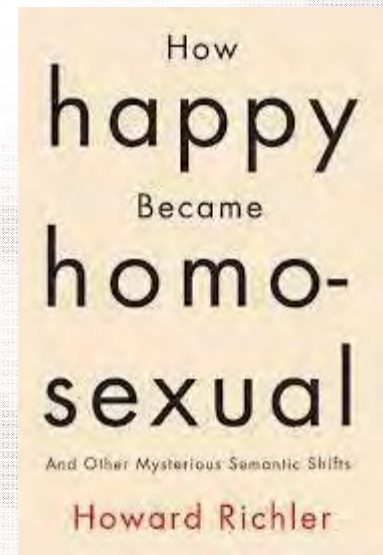
Cow

Pig

- The word for raw meat or the animal it comes from tends to be Anglo-Saxon, but the cooked food tends to be Norman: like cow, which becomes beef (from the French *boeuf*).

Semantic Change

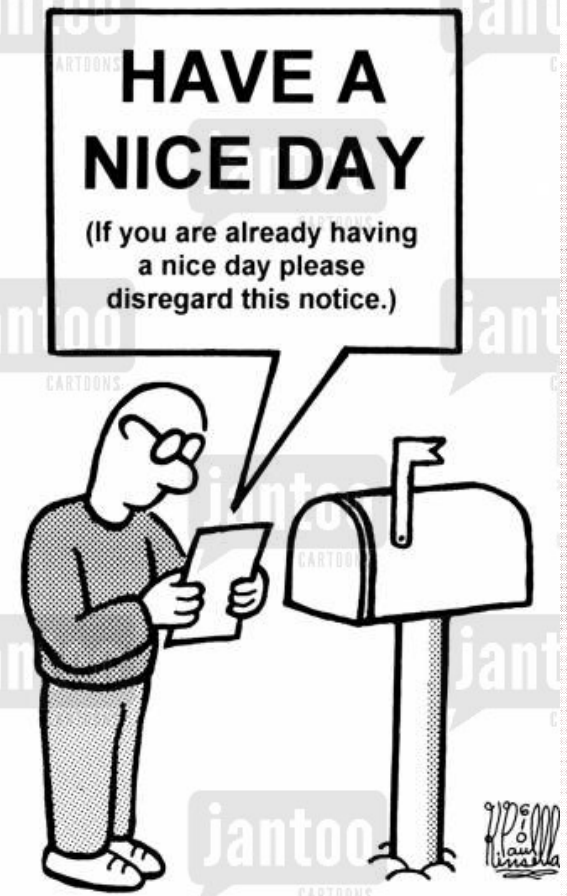
- **Broadening:** the meaning of a word gets broader, to incorporate more referents
 - *dogge* used to refer to a specific breed of dog, but now refers to all dogs; *picture* used to mean “painted representation”
- **Narrowing:** the meaning of a term narrows to have fewer possible referents
 - *meat* used to mean “food” (now it is a certain kind of food); *deer* used to mean “animal” (now it is a certain kind of animal)
- **Meaning Shifts:** a lexical item may undergo a shift in meaning
 - *knight* used to mean “youth”; *silly* used to mean “happy”; *nice* used to mean “foolish”



Semantic Change

- The word [nice](#), derived from Latin *nescius* meaning ‘ignorant’, began life in the fourteenth century as a term for ‘foolish’ or ‘silly’. From there it embraced many a negative quality, including wantonness, extravagance, and ostentation, as well as cowardice and sloth. In the Middle Ages it took on the more neutral attributes of shyness and reserve. It was society’s admiration of such qualities in the eighteenth century that brought on the more positively charged meanings of ‘nice’ that had been vying for a place for much of the word’s history, and the values of respectability and virtue began to take over. Such positive associations remain today, when the main meaning of ‘nice’ is ‘pleasant’ (if with a hint of damning with faint praise; it may yet turn full circle).

Source: Susie Dent “What Made the Crocodile Cry?” (2007)



Semantic Change: *Glamour* is *Grammar*

- Though you may be astonished to hear this, *grammar* and *glamour* are the same word. But glamour is fashionable, sexy and utterly desirable, while grammar is just about the least fashionable and least sexy piece of the universe that non-linguists can think of.
- So how did this happen? Well, the ancestor of the word grammar was coined in Ancient Greek and applied to the study of writing. This word was taken over by the Romans into their Latin, and from Latin it spread into much of Europe.
- In medieval times, few people in Europe could read and write; literacy was seen as a rare, almost fabulous, achievement. To most people, book-learning, referred to simply as *grammar*, appeared simply magical and indeed was hardly distinguished from magic at all. In English, the variant form *gramarye* was an everyday word for ‘magic’ or ‘conjuring’.



Semantic Change: *Glamour* is *Grammar*

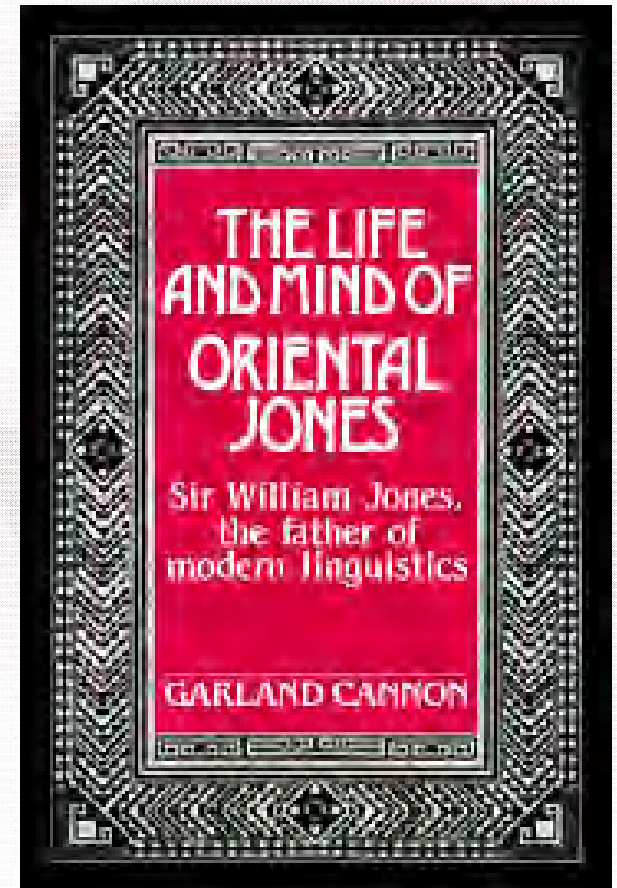
- Our story moves now to Scotland, where the word grammar underwent a small change of pronunciation to glamour, reflecting the awkwardness of having two instances of /r/ in one word. In Scots, this form glamour, often compounded as glamour-might, acquired the sense of ‘enchantment’, ‘magic spell’, and eventually it came to be applied specifically to a kind of enchantment upon the eye, so that the victim sees things differently from the way they really are.
- In the late nineteenth century glamour came to be applied more and more regularly and finally only to women. With time, *glamour* became a term of enthusiastic approval, as it still is today.

Source: R. L. Trask “Why do Languages Change?” (2010)



The Nineteenth-Century Comparativists

- Nineteenth century historical and comparative linguists aimed to establish the genetic relationships between languages and establish the major language families of the world
 - Sir William Jones noticed that Sanskrit, Greek and Latin had some striking similarities that could not be accidental and that they had stemmed from a common ancestor language



The Nineteenth-Century Comparativists: Sir William Jones

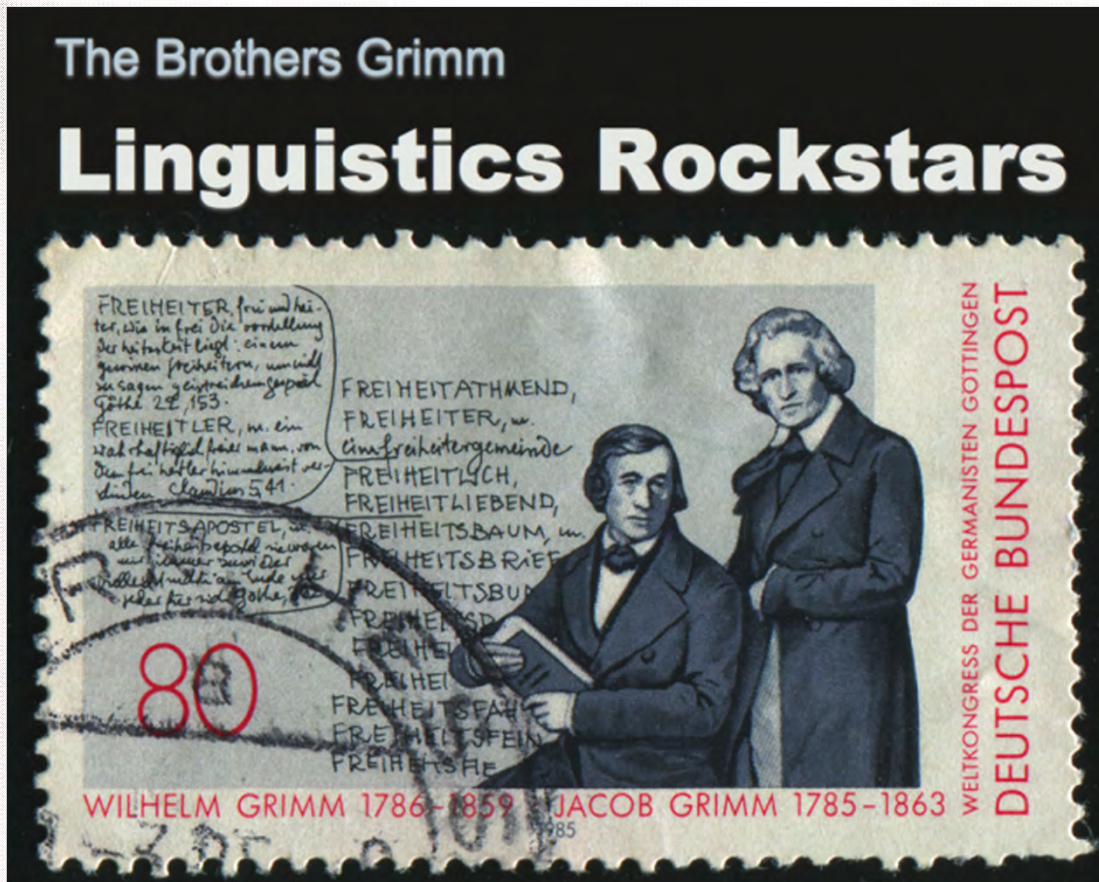


The Sanskrit language, whatever be its antiquity, is of a wonderful structure; more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either, yet bearing to both of them a stronger affinity, both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps, no longer exists.

(William Jones)

izquotes.com

The Nineteenth-Century Comparativists: Jakob Grimm



Grimm's Law

- Jakob Grimm identified several regular sound correspondences between Sanskrit, Latin, Greek, and the Germanic languages
 - Where Latin has a [p], English has a [f], where Latin has a [t], English has a [θ], where Latin has a [k] English often has an [h]
 - This correspondence is known as Grimm's Law

<i>Earlier stage:</i> ^a	bh	dh	gh	b	d	g	p	t	k
	↓	↓	↓	↓	↓	↓	↓	↓	↓
<i>Later stage:</i>	b	d	g	p	t	k	f	θ	x (or h)

FIGURE 11.2 | Grimm's Law, an early Germanic sound shift. Grimm's Law can be expressed in terms of natural classes of speech sounds: Voiced aspirates become voiceless stops; voiceless stops become fricatives.

^aThis "earlier stage" is Indo-European. The symbols bh, dh, and gh are breathy voiced stop consonants. These phonemes are often called "voiced aspirates."

Grimm's Law

Table 5.1 *Some Grimm's Law changes*

(a) PIE (and Latin) /p t k/ > Germanic /f θ h/
(/θ/ is the sound of English *th* in *think*)

<u>Latin</u>	<u>English</u>
<i>pater</i>	<i>father</i>
<i>piscis</i>	<i>fish</i>
<i>ped-</i>	<i>foot</i>
<i>tres</i>	<i>three</i>
<i>tenuis</i>	<i>thin</i>
<i>turdus</i>	<i>thrush</i>
<i>cornu</i>	<i>horn</i>
<i>cord-</i>	<i>heart</i>
<i>collis</i>	<i>hill</i>

Source:
R. L. Trask
“Why do
Languages
Change?”
(2010)

Grimm's Law

Grimm's Law. Beginning some time in the first millennium B.C. and perhaps continuing over several centuries, all the Indo-European stops underwent a complete transformation in Germanic. At the end of the complete cycle of changes, the following pattern had emerged.

<i>IE</i>	<i>Gmc</i>	<i>IE</i>	<i>Gmc</i>	<i>IE</i>	<i>Gmc</i>
p	> f	b	> p	bh	> b
t	> θ	d	> t	dh	> d
k	> x(h)	g	> k	gh	> g
k ^w	> x ^w	g ^w	> k ^w	gh ^w	> g ^w

In short, all the IE voiceless stops had become voiceless fricatives, the IE voiced stops had become voiceless stops, and the IE voiced aspirated stops had become voiced stops.² (Later changes in the individual Germanic languages have modified this pattern in certain environments, but we need not be concerned about these details at this point.)

Although certain correspondences between the consonants in Germanic languages and those in other IE languages had been observed earlier, it was Jakob Grimm (of fairy-tale fame) who codified them in 1822. Therefore the change is often termed **Grimm's Law**. Figure 4–3 illustrates resulting correspondences in cognate words between Germanic and Latin. The IE labiovelars such as [k^w] are omitted from the chart because their development was identical to that of the velars.

Source: C.M. Millward “A Biography of the English Language” (1996)

Grimm's Law

Jakob Grimm, of the Brothers Grimm who collected fairy tales, formulated "Grimm's Law" to explain the systematic differences between the Germanic language group and the Indo-European source language



Stops	IE	Germanic
-voice	p, t, k	f, θ, h
+voice	b, d, g	p, t, k
+voice +aspiration	bh, dh, gh	b, d, g

Source: Dr. Jacobsen

"Electronic Resources for Linguistics"

<http://www.wtamu.edu/~mjacobsen/>

Grimm's Law: Fricativization p>f

Pater noster, qui es in coelis:
(Latin)

Fæder ure,
þu þe eart on heofonum
(OE)

Unser Vater in dem Himmel
(German)

Faðer várr sá þú ert í hifne
(Old Norse)

Grimm's Law: Fricativization k>h

Pater noster, qui es in coelis:
(Latin)

Fæder ure,
þu þe eart on heofonum
(OE)

Unser Vater in dem Himmel
(German)

Faðer várr sá þú ert í hifne
(Old Norse)

Cognates

- **Cognates** are words in related languages that developed from the same ancestral root

Indo-European	Sanskrit	Latin	English
*p	p pitar-	p pater	f father
*t	t trayas	t trēs	θ three
*k	ś śun	k canis	h hound
*b	b No cognate	b labium	p lip
*d	d dva-	d duo	t two
*g	j ajras	g ager	k acre
*bh	bh bhrātar-	f frāter	b brother
*dh	dh dhā	f fē-ci	d do
*gh	h vah-	h veh-ō	g wagon

Verner's Law

- Grimm noted that there were some exceptions to the regular sound changes he identified
 - So he concluded that sound changes were general tendencies
- Karl Verner formulated Verner's Law to account for these irregularities
 - **Verner's Law:** When the preceding vowel was unstressed, *f*, *θ*, and *x* underwent further change to *b*, *d*, and *g*

Verner's Law

- When **no accent on vowel** preceding, **voiceless spirants** become **voiced**.

centum (La)-->hundred (Germanic)



Verner's Law, Part 1 of 3.mp4



Verner's Law, Part 2 of 3.mp4



Verner's Law, Part 3 of 3.mp4

- The **Neo-Grammarian hypothesis** states that sound shifts are not merely tendencies but apply in all words that meet their environments

Comparative Reconstruction

- Once linguists suspect that languages are related, their ancestral protolanguage can be partially reconstructed using the **comparative method**
- To use the comparative method, analysts identify regular sound correspondences in cognates of related languages and then deduce the most likely sound in the parent language
 - Sometimes analysts choose the sound that appears most frequently in the correspondence (the “majority rule” principle)
 - But the likelihood of certain phonological changes outweigh the majority rule principle

Comparative Reconstruction

Language A	Language B	Language C	Language D
hono	hono	fono	vono
hari	hari	fari	veli
rahima	rahima	rafima	levima
hor	hor	for	vol

- Wherever Languages A and B have *h*, Language C has *f* and Language D has *v*, so the correspondence is *h-h-f-v*
- The majority rule principle would lead us to reconstruct *h* as the sound in the proto-language
- But, from data on historical reconstruction and phonological rules, we know that *h* rarely changes into *v*; however /f/ and /v/ becoming [h] occurs historically and in phonological rules, so we reconstruct an **f* in the parent language

Comparative Reconstruction

Language A	Language B	Language C	Language D
hono	hono	fono	vono
hari	hari	fari	veli
rahima	rahima	rafima	levima
hor	hor	for	vol

- The other correspondences are not problematic:
o-o-o-o n-n-n-n a-a-a-e r-r-r-l m-m-m-m
- These correspondences lead us to reconstruct **o*, **n*, **a*, **r*, and **m* as proto-sounds, and the sound changes “*a* becomes *e*” and “*r* becomes *l*” in Language D
- The words of the proto-language were probably **fono*, **fari*, **rafima*, and **for*

Comparative Reconstruction

- The previous example illustrates an **unconditioned sound change**, in which the changes occurred regardless of the context
- The following example from Italian illustrates a **conditioned sound change**, in which the sounds only change in specific contexts

Standard	Northern	Lombard	
fi:s:o	fiso	fis	“fixed”
ka:s:a	kasa	kasə	“cabinet”

- The correspondence sets are: $f-f-f$ $i-i-i$ $s:-s-s$ $o-o-<>$ $k-k-k$
 $a-a-a$ $a-a-\partial$

Comparative Reconstruction

Standard	Northern	Lombard	
fi:s:o	fiso	fis	“fixed”
ka:s:a	kasa	kasə	“cabinet”

- It is straightforward to reconstruct **f*, **i*, and **k*, and knowing that a long consonant like *s:* commonly becomes *s*, we reconstruct **s:* in the proto-language
- We construct **o* and **a* and recognize a vowel weakening trend happening in Lombard
 - In Lombard a conditioned sound change occurred in which vowels were weakened (*a*) or deleted (*o*) word-finally

Historical Evidence

- In addition to the comparative method, linguists examine written records to figure out how words were pronounced
 - Especially documents written by naïve spellers who wrote words as they pronounced them
 - Writings from prescriptivists about “improper” pronunciation also provide clues
 - Puns and rhymes also provide evidence regarding pronunciation
- The examination of written evidence is combined with the comparative method to reconstruct the pronunciations of proto-languages and previous forms of languages

Extinct and Endangered Languages

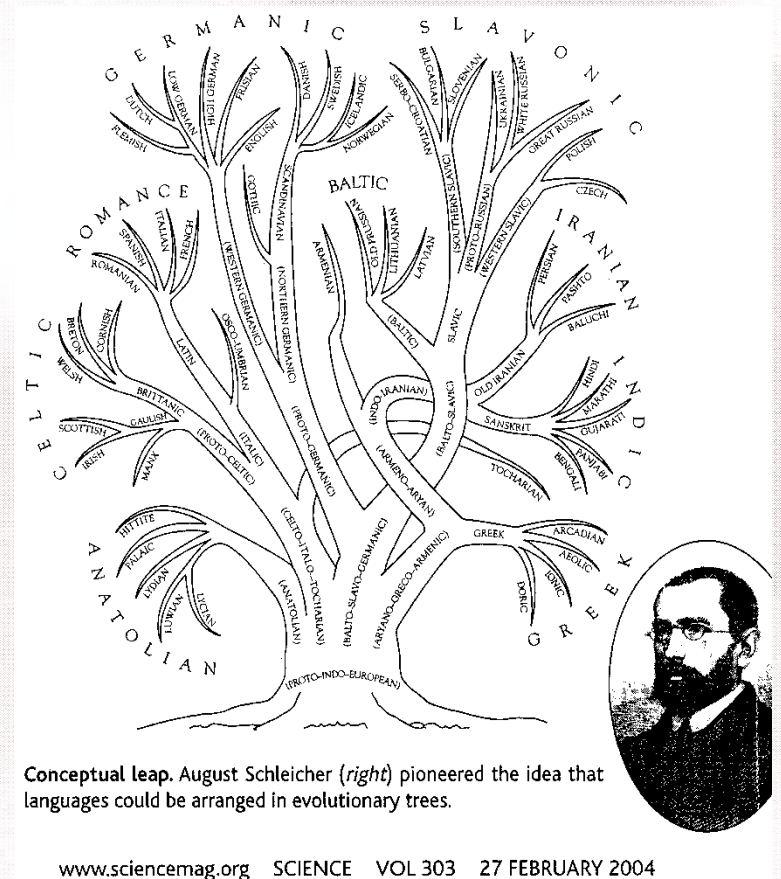
- A language becomes extinct when no children learn it
 - A language may die suddenly when all of the speakers of a language die or are killed
 - A language may die quickly when all the speakers of a language choose to stop speaking their language (often because of political repression or genocide)
 - A language may also die gradually, over generations, as more and more speakers of each generation switch to a different language
 - This is the most common scenario

Extinct and Endangered Languages

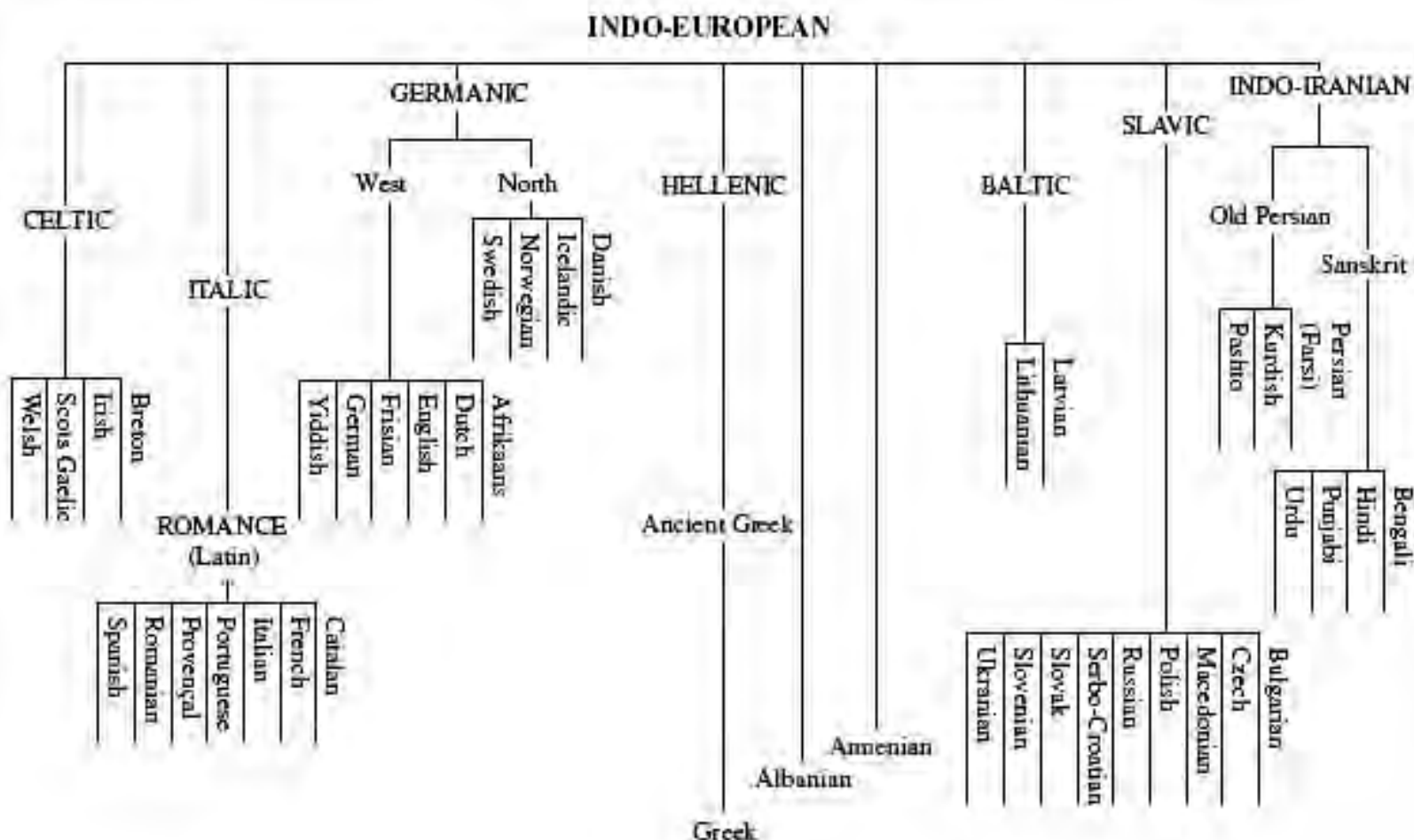
- Some languages may suffer “partial death” and will only be used in certain contexts, such as Latin
- Linguists attempt to preserve dying languages and dialects for posterity
- Sometimes people learn an endangered language as a symbol of culture
 - Irish Gaelic for adults and children
 - Hebrew in Israel
 - Hawaiian in Hawaii

The Genetic Classification of Languages

- When linguists speak of language families, they can speak of degrees of relatedness in languages like in human families
 - English, German, Norwegian, Danish, Swedish, and Icelandic are sister languages because they all come from a single parent language (Proto-Germanic)
 - The Romance languages such as Spanish and Portuguese would be cousins to English because the parent languages (Latin and Proto-Germanic) are sisters
 - Other languages within Indo-European would be distant relatives



The Genetic Classification of Languages



OLD WORLD LANGUAGE FAMILIES

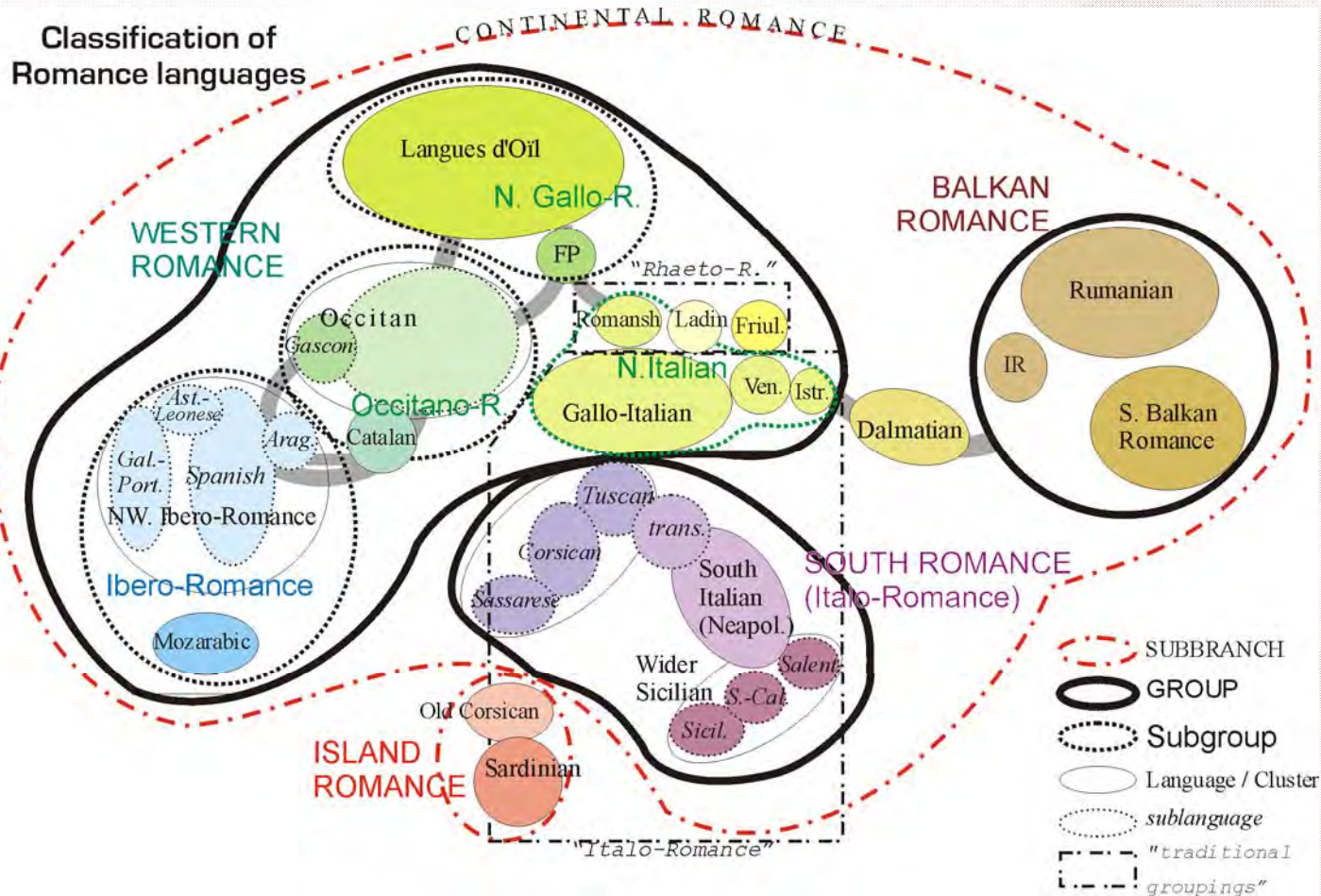
A COMPREHENSIVE OVERLOOK OF THE NORDIC LANGUAGES IN THEIR

Sizes of the branches represent the recorded native speakers before year 0.

The diagram illustrates the following language families and their branches:

- INDO-EUROPEAN**
 - INDO-IRANIAN**
 - INDIC**
 - Bengali
 - Assamese
 - Chittagonian
 - Rangpuri
 - Sylheti
 - Bhojpuri
 - Maithili
 - Rohingya
 - Sadri
 - Magahi
 - Deccan
 - Konkani
 - Goan
 - Marathi
 - Chhattisgarhi
 - Bagheli
 - Awadhi
 - Romani
 - Fijian Hindi
 - Sanskrit
 - Bhili
 - Bhilali
 - Wagadi
 - Oriya
 - Kumaoni
 - Garhwali
 - Nepali
 - Dogri
 - Kangri
 - Mandali
 - Mahasui
 - Sinhala
 - Maldivian
 - Sindhi
 - Kashmiri
 - Punjabi
 - Seraiki
 - Mirapuri
 - Hindko
 - Mina
 - Ossietian
 - Pashto
 - Talysh
 - Dimli
 - Gilaki
 - Baluchi
 - Kurdish
 - Likai
 - Persian
 - Hazaragi
 - Tajiki
 - Luri
 - EUROPEAN**
 - SLAVIC**
 - Polish
 - Czech
 - Slovak
 - Bosnian
 - Croatian
 - Serbian
 - Bulgarian
 - Slovene
 - Macedonian
 - Albanian
 - Gaelic
 - Welsh
 - Cornish
 - Breton
 - ROMANCE**
 - Portuguese
 - Spanish
 - Italian
 - French
 - German
 - English
 - Ukrainian
 - Romanian
 - Belarusian
 - Lithuanian
 - Latvian
 - Coriscan
 - Sardinian
 - Luxembourgish
 - Limburg
 - Main-fränkisch
 - Saxon
 - Armenian
 - Swabian
 - Hunrik
 - Bavarian
 - Swiss
 - Yiddish
 - Low German
 - High German
 - West Germanic
 - North Germanic
 - South Germanic
 - Afrikaans
 - Dutch
 - Flemish
 - Scots
 - Frisian
 - Low Frisian
 - Scots Gaelic
 - Irish Gaelic
 - Welsh
 - Cornish
 - Breton
 - Gaelic
 - Welsh
 - Cornish
 - Breton
 - GERMANIC**
 - Danish
 - Swedish
 - Norwegian
 - Finnish
 - Sami
 - Hungarian
 - Khanty
 - Uralic
 - Finno-Ugric
 - Samoyedic
 - Mari
 - Moksha
 - Ezeya
 - Komi
 - Udmurt
 - AFRICAN**
 - Swahili
 - Zulu
 - Xhosa
 - Shona
 - Ndebele
 - Venda
 - Tswana
 - Sotho
 - Zulu
 - Xhosa
 - Shona
 - Ndebele
 - Venda
 - Tswana
 - Sotho
 - ASIAN**
 - Hindi
 - Urdu
 - Marathi
 - Devanagari
 - Chhattisgarhi
 - Bagheli
 - Awadhi
 - Romani
 - Fijian Hindi
 - Sanskrit
 - Bhili
 - Bhilali
 - Wagadi
 - Oriya
 - Kumaoni
 - Garhwali
 - Nepali
 - Dogri
 - Kangri
 - Mandali
 - Mahasui
 - Sinhala
 - Maldivian
 - Sindhi
 - Kashmiri
 - Punjabi
 - Seraiki
 - Mirapuri
 - Hindko
 - Mina
 - Ossietian
 - Pashto
 - Talysh
 - Dimli
 - Gilaki
 - Baluchi
 - Kurdish
 - Likai
 - Persian
 - Hazaragi
 - Tajiki
 - Luri

The Genetic Classification of Languages



Languages of the World

- It's difficult to say how many languages there are in the world, but the best guess is somewhat less than 7000
- Some languages do not seem to be related to any other living language (called **language isolates**)
 - Basque and Ainu are examples
- It is possible that all human languages are descended from the same ancestral language that some have termed **Nostratic**

Languages of the World

- Other major language families of the world besides Indo-European include:
 - Uralic: Hungarian, Finnish, Estonian
 - Afro-Asiatic: Hebrew, Arabic
 - Sino-Tibetan: Mandarin, Tibetan
 - Niger-Congo: Swahili, Zulu
 - Austronesian: Hawaiian, Malay, Tagalog

Types of Languages

- Languages are also classified by their linguistic traits regardless of genetic relationship
- Phonologically, languages may be classified based on their vowel inventory, the use of tones, and syllable structure
- Lexically, languages may be classified by pronoun system type, what distinctions are made regarding person, number, and gender, what classifications are made for kinship terms, etc.

Types of Languages

- Languages may be sorted according to their type of morphological system
 - **Isolating** or **analytic** systems: little to no affixation
 - **Synthetic** systems: affixation does occur and words may contain more than one morpheme
 - **Agglutinative** synthetic systems: words may be formed by a root and multiple affixes where the affixes are easily separated and retain the same meaning
 - **Fusional** synthetic systems: morphemes are fused together so it's hard to identify their basic shape
 - **Polysynthetic** systems: very rich morphological systems in which a single word may have ten or more affixes and may carry the semantic load of an entire English sentence

Types of Languages

- Languages can also be classified syntactically, and 90% of the world's languages are SOV or SVO
 - In SVO languages, the auxiliary verb come before the main verb, adverbs follow the main verb, and prepositions precede the head noun
 - In SOV languages the opposite tendencies exist
- Linguists have observed that two syntactic principles are favored:
 - 1. Subjects precede objects
 - 2. The verb is adjacent to the object

Why Do Languages Change?

- Languages change as they are passed from generation to generation
- Assimilation for ease of articulation may account for some sound changes
 - Vowels are frequently nasalized before nasal consonants, and then the nasalization on the vowel may be enough to carry the nasality and so the nasal consonant may be dropped
- Sound change also occurs to maintain contrasts

Why Do Languages Change?

- **Analogic change** is the generalization of rules that reduces the number of irregular morphemes
 - The plural form of *cow* used to be *kine*, but based on analogies to *plow/plows* and *vow/vows*, speakers started regularizing the plural to *cows*
 - The past tense rule is also undergoing generalization
 - Children now often say *lighted* instead of *lit* and *waked* instead of *woke*
 - These regularized forms are now so common that they appear in the dictionary next to the irregular forms because both are in use

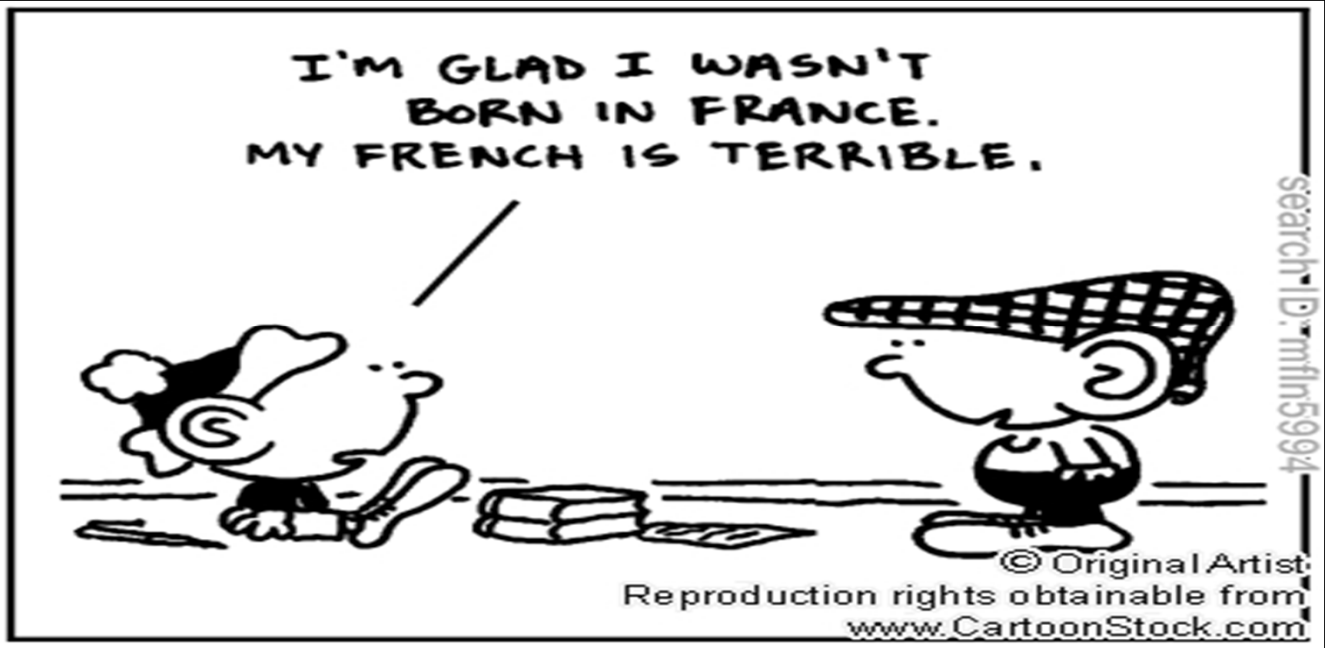
Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 9



Language Acquisition

Language Acquisition

- Language is extremely complex, yet children already know most of the grammar of their native language(s) before they are five years old
- Children acquire language without being taught the rules of grammar by their parents



"This is a good one. It means, 'Until my every need is met, your life will be hell.'"

Language Acquisition

Babytalk, Babytalk

Child's language acquisition is
"The greatest intellectual feat
any one of us is ever required to
perform."

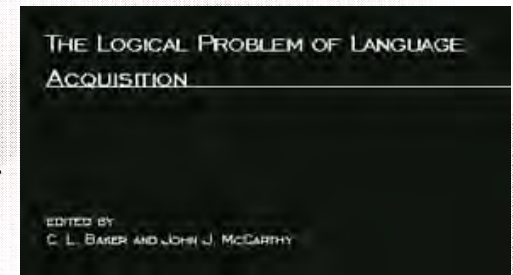
-- Leonard Bloomfield (1933)

The Logical Problem of Language Acquisition

- One of the central goals of linguistic theory is to solve *the logical problem of language acquisition*:
 - Children have linguistic knowledge which they are never taught. How do infants learn so much in so little time?
 - What accounts for the ease, rapidity, and uniformity of language acquisition in the face of impoverished data, i.e., against the backdrop of “noisy” data input — sentence fragments, false starts, speech errors...

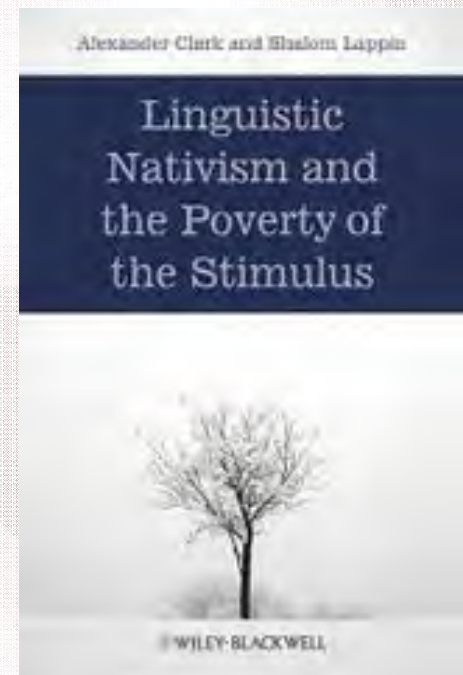
“The central problem is to characterize how children can master their native languages. The problem is one of the deficiency of the stimulus: people come to have a very rich, complex and varied capacity that goes far beyond what they can derive only from their childhood experience; i.e. from the experience that stimulates the growth of their languages.”

David Lightfoot “The language lottery: Toward a biology of grammars” (1982)



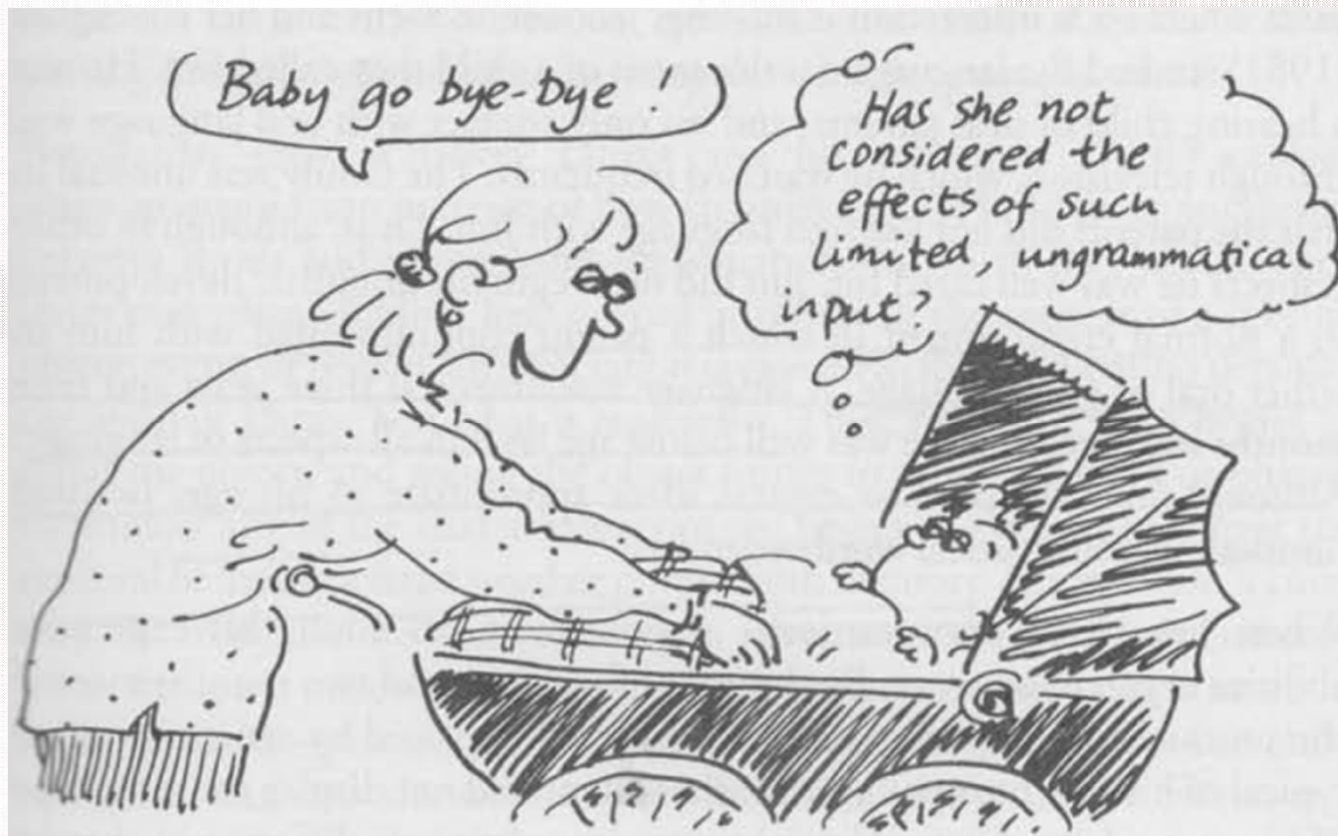
The Logical Problem of Language Acquisition

- Children's knowledge of language goes beyond what could be learned from the input they receive. Children hear a lot of 'defective' (incomplete or ungrammatical) utterances, and in some societies are recipients of simplified input from adults.
- Despite of only hearing a small number of possible grammatical sentences, children are able to abstract general principles and constraints which allow them to interpret and produce an infinite number of sentences which they have never heard before.
- Children's linguistic competence includes knowledge of which sentences are not possible, although input doesn't provide them with this information.
- Chomsky (1980) argued that the child's acquisition of grammar is "hopelessly underdetermined by the fragmentary evidence available."



Baby-Talk Lexicon (*Motherese*)

- In some societies children are recipients of simplified input from adults



Source: Patsy Lightbown & Nina Spada "How Languages Are Learned" (2006)

Chomsky's Argument: Language Is Innate

- The basic form of Chomsky's argument may be given as follows:

- (1a) The human brain is finite, but
- (1b) an infinity of sentences exists,
- (1c) which can be generated by rule, proving language is infinite.

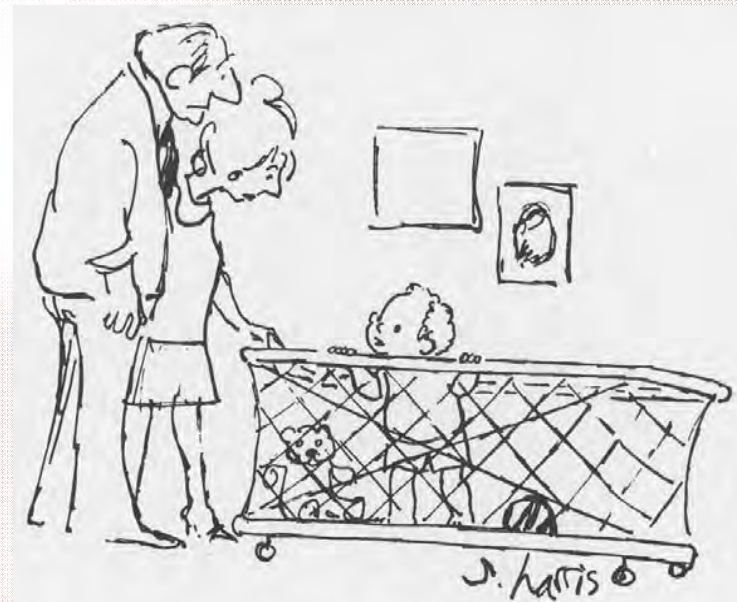
- Nevertheless,

- (2a) normal human children acquire language quickly and effortlessly,
- (2b) even though no one teaches language to young children,
- (2c) and only human children so acquire language.

- Therefore,

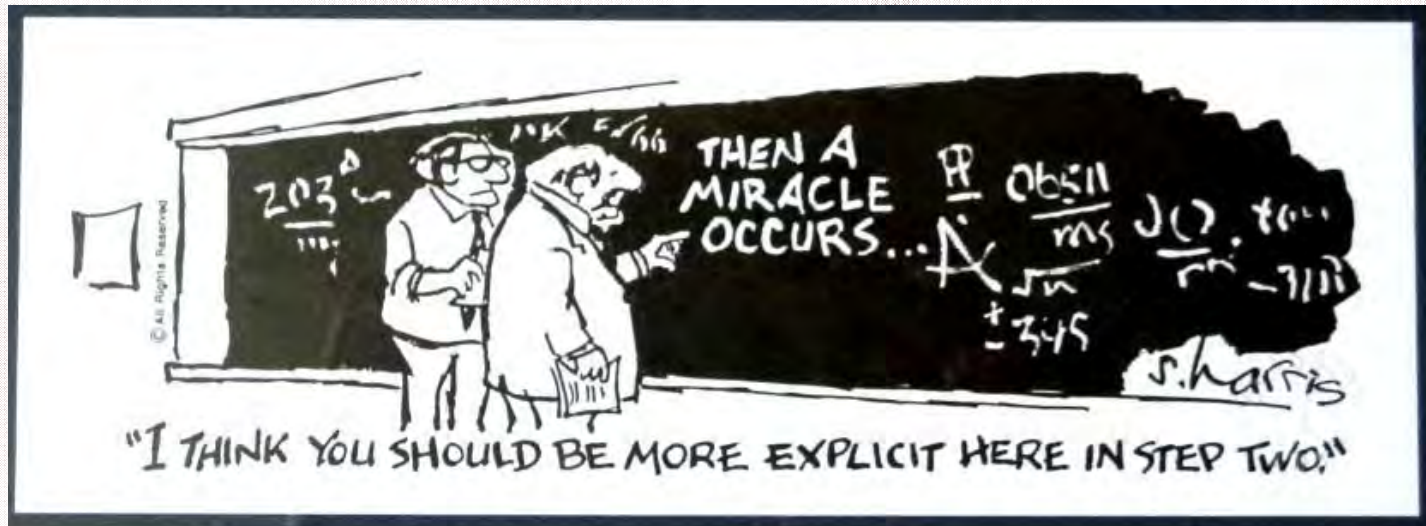
- (3) language is innate. It is not so much learned as it is “acquired.”

Source: Donald Loritz “How the Brain Evolved Language” (1999)



Remarks by Chomsky

- “We are designed to walk... That we are taught to walk is impossible. And pretty much the same is true of language. **Nobody is taught language.** In fact you can’t prevent the child from learning it.” (N. Chomsky, 1994)



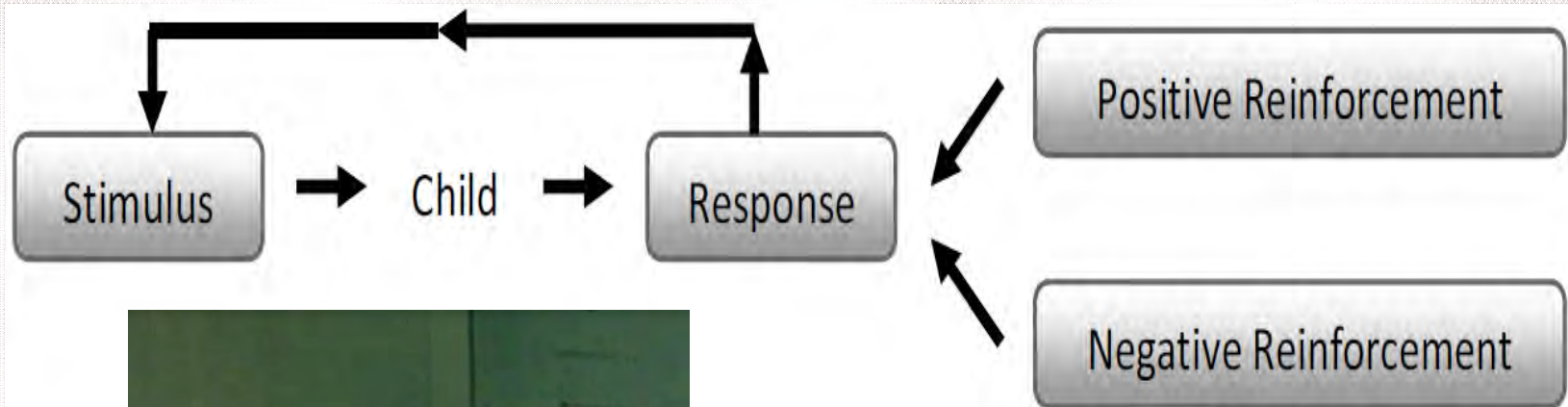
- “Language learning is not really something that the child does; it is **something that happens to the child**... much as the child’s body grows and matures... with appropriate nutrition and environmental stimulation.” (N. Chomsky, 1988)

Wars on Language Acquisition

- B.F. Skinner's *Verbal Behavior* (1957)—
 - Language is a system of verbal **behavior** that is directly **observable**.
 - Children acquire L1 via paths of *imitation, reinforcement, and analogy*.
- N. Chomsky's *Review of Verbal Behavior* (1959)—
 - Language is a **cognitive** system and the learning of it involves processes and principles that are **innate** and **unobservable**.
 - Children simply “wake up to” their language knowledge, a biologically pre-programmed blueprint, or **Universal Grammar**.

Behaviorism (B.F. Skinner)

– B.F. Skinner's *Verbal Behavior* (1957)



B.F. Skinner's factors:
stimulus
response
reinforcement

Chomsky's Review of B.F. Skinner

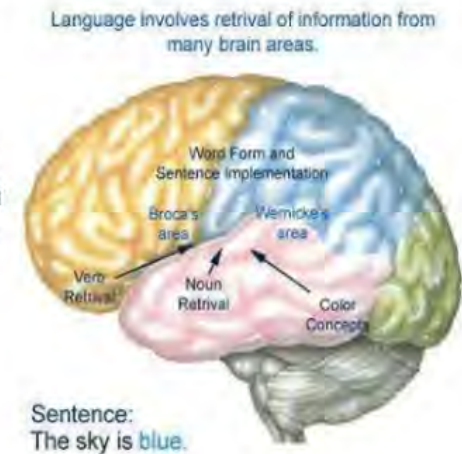
- It is not easy to accept the view that a child is capable of constructing an extremely complex mechanism for generating a set of sentences, some of which he has heard, or that an adult can instantaneously determine whether (and if so, how) a particular item is generated by this mechanism, which has many of the properties of an abstract deductive theory. Yet this appears to be a fair description of the performance of the speaker, listener, and learner. [...] The fact that all normal children acquire essentially comparable grammars of great complexity with remarkable rapidity suggests that human beings are somehow specially designed to do this [...].”
- *Source:* Noam Chomsky “A Review of B. F. Skinner's *Verbal Behavior*” (1959)

Language Acquisition Device (LAD)

- Chomsky theorized that children were born with a hard-wired language acquisition device (LAD) in their brains.
- LAD is a set of language learning tools, intuitive at birth in all children.
- Chomsky later expanded this idea into that of universal grammar, a set of innate principles and adjustable parameters that are common to all human languages.
- The LAD is a pre-programmed box.
- LAD is a function of the brain that is specifically for learning language. It is an innate biological function of human beings just like learning to walk.

THE “LAD” (Chomsky, 1965)

- The language acquisition Device (LAD) is a postulated organ of the brain that is supposed to function as a congenital device for learning symbolic language (i.e., language acquisition).



Language Acquisition Device (LAD)

- LAD encodes the major principles of a language and its grammatical structures into the child's brain.
- It enables the children to analyze language and extract the basic rules.

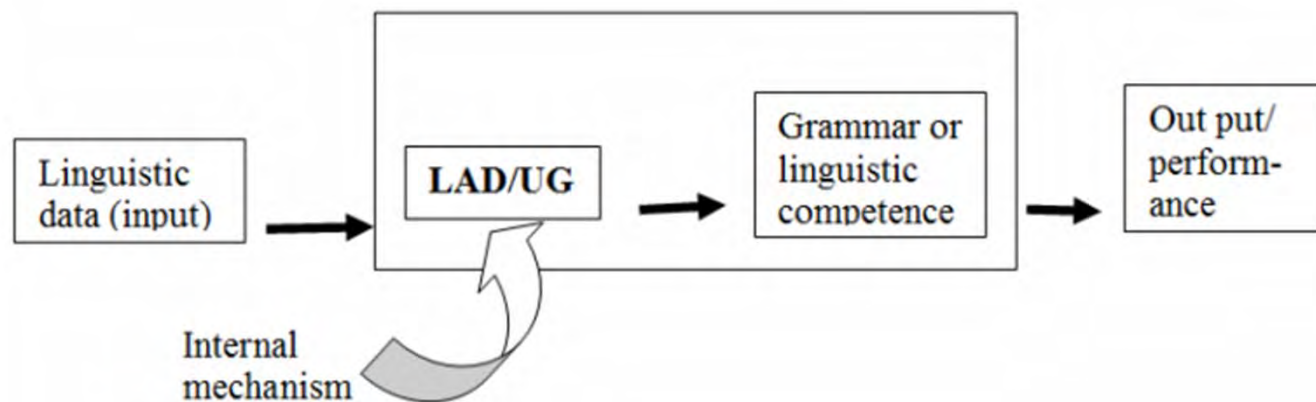


Figure 1 LAD in Language Acquisition

- "Children are equipped with an innate template or blueprint for language and this blueprint aids the child in the task of constructing a grammar for their language."
- This is known as "Innateness Hypothesis."

Lev Vygotsky:

Language Learning = Social Interaction

- Vygotsky created a model of human development now called the sociocultural model. He believed that all cultural development in children is visible in two stages:
- First, the child observes the interaction between other people and then the behavior develops inside the child. This means that the child first observes the adults around him communicating amongst themselves and then later develops the ability himself to communicate.
- Vygotsky also theorized that a child learns best when interacting with those around him to solve a problem. At first, the adult interacting with the child is responsible for leading the child, and eventually, the child becomes more capable of problem solving on his own. This is true with language, as the adult first talks at the child and eventually the child learns to respond in turn. The child moves from gurgling to baby talk to more complete and correct sentences.



Theories of 1st Language Acquisition: Summary

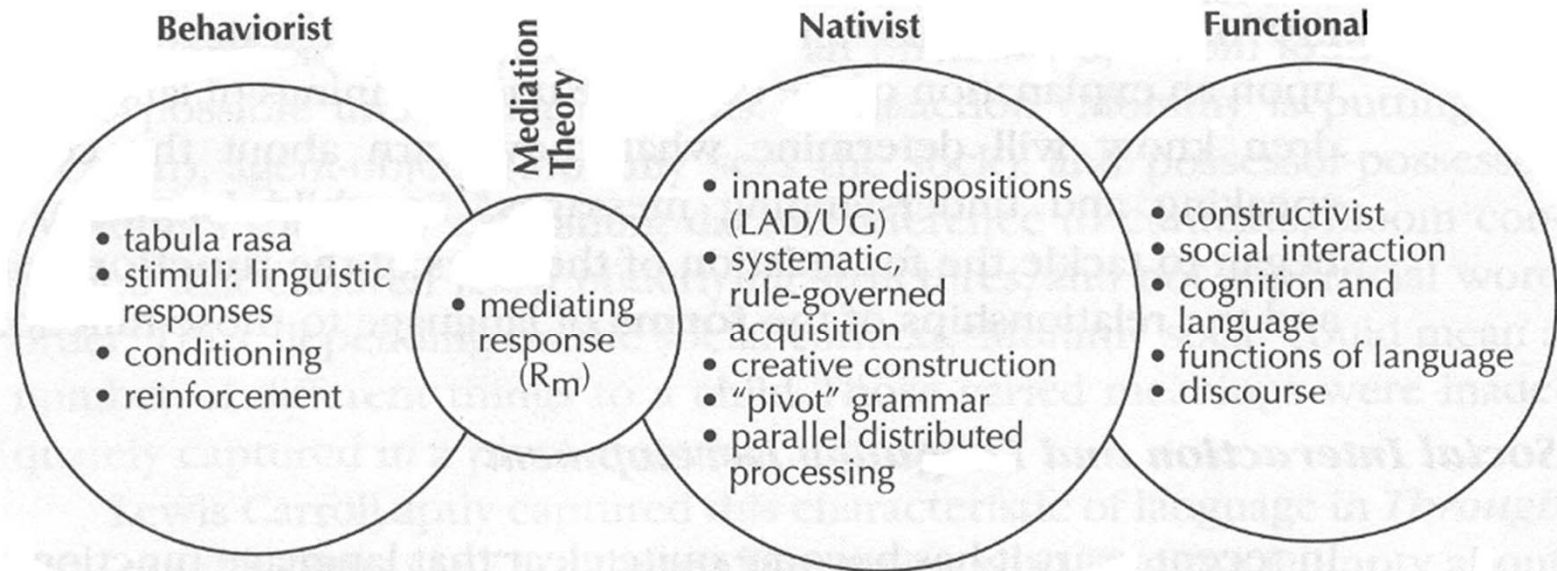


Figure 2.1. Theories of first language acquisition

Source: H. Douglas Brown "Principles of Language Learning and Teaching" (2000)

Let's Look at Some Data

Child: My teacher holded the baby rabbits and we petted them.

Parent: Did you say your teacher *held* the baby rabbits?

Child: Yes.

Parent: What did you say she did?

Child: She holded the baby rabbits and we petted them.

Parent: Did you say she held them tightly?

Child: No, she holded them loosely.

Brown, R. (1973). *A First Language: The Early Stages*.

Father: Where's Mommy?

Child: Mommy **goed** to the store. [Ziel: went]

Father: Mommy goed to the store?

Child: NO! (*genervt*) Daddy, I say it that way, not you.

Child: Want other spoon, Daddy.

Father: You mean you want THE OTHER SPOON?

Child: Yes, I want other one spoon please Daddy.

Father: Can you say "the other spoon"?

Child: Other... one... spoon.

Father: Say... "other".

Child: Other.

Father: "Spoon."

Child: Spoon.

Father: "Other... spoon."

Child: Other... spoon. Now give me other one spoon?

M. Braine, "On Two Types of Models of the Internalization of Grammars," In D. Slobin, editor, *The Ontogenesis of Grammar*. Academic Press, 1971.

Let's Look at Some Data

Another example was overheard in a nursery class of three to four-year-olds. A little girl had been icing her birthday cake and announced to the teacher:

Child: I wroted my name in icing.

Teacher: You mean you wrote your name in icing.

Child: Yes, I wroted my name in icing.

Teacher: Say 'I wrote my name in icing.'

Child: I ... wroted my name in icing.



When parents try to correct grammar mistakes, their attempts usually fail:

Child: *Nobody don't like me.*

Mother: *No, say "Nobody likes me."*

Child: *Nobody don't like me.*

(dialogue repeated eight times)

Mother: *Now, listen carefully, say "Nobody likes me."*

Child: *Oh, nobody don't likes me.*

Stages in Language Acquisition

- Children acquire language in similar stages across the world: **babbling** → **holophrastic** → **two-word stage** → **telegraphic speech**

- When children are acquiring language, they do not speak a degenerate form of adult language

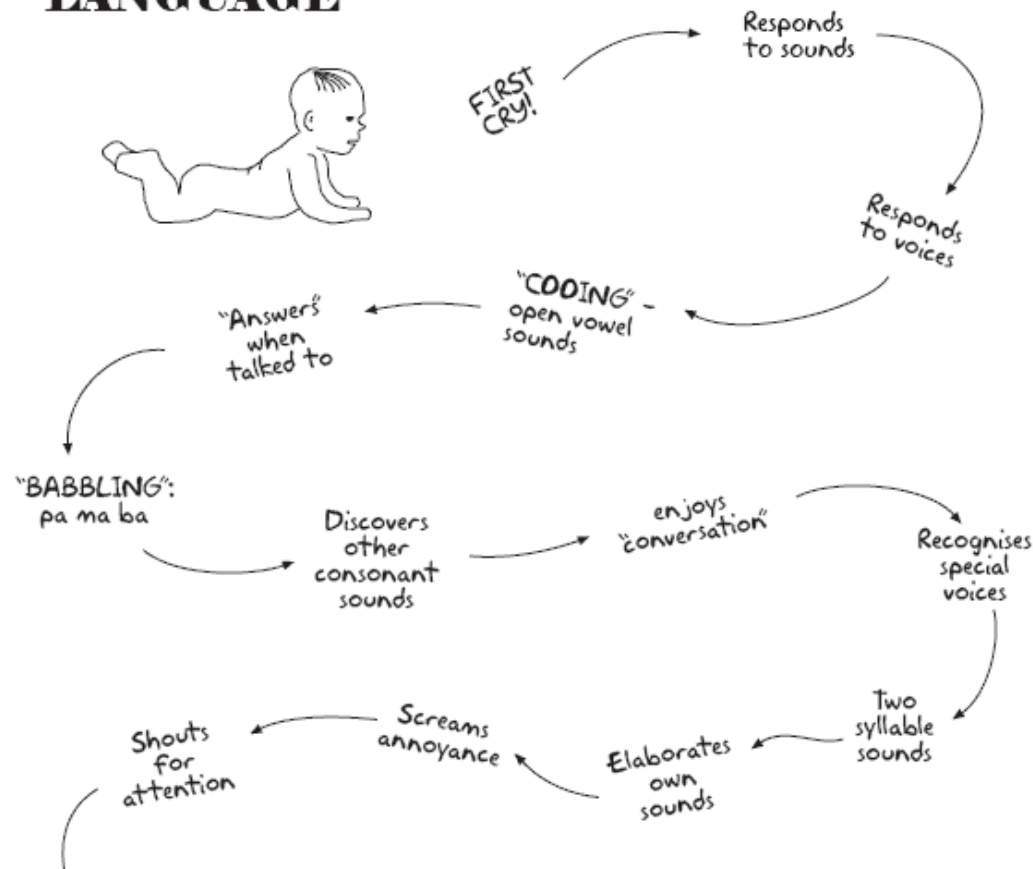
- Rather, they speak a version of the language that conforms to the set of grammatical rules they have developed at that stage of acquisition

MAIN STAGES OF CHILD LANGUAGE ACQUISITION:

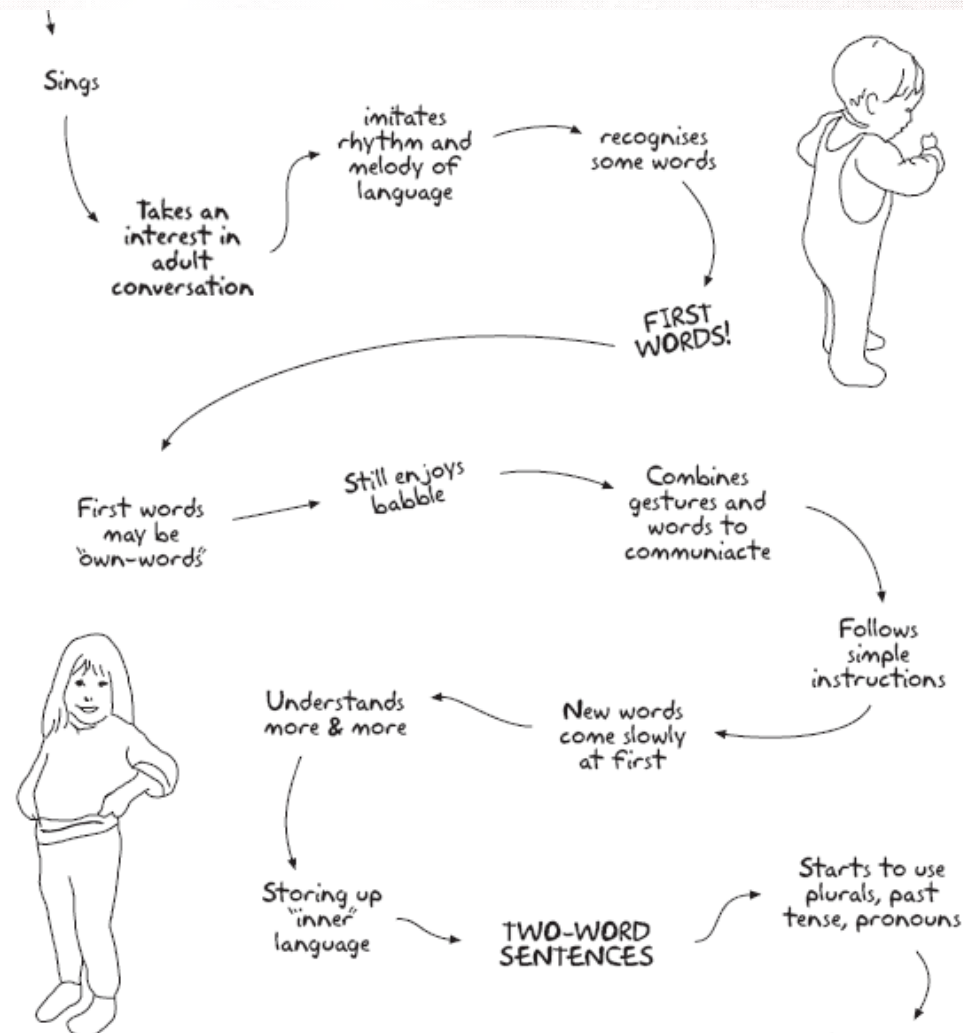
Stages	Typical Age
1. The Pre-linguistic Period	Birth - 10 months
2. The Holophrastic Period	12 months - 18 months
3. The Telegraphic Period	2 years - 3 years
4. The Complex Period	3 years - 5 years

Stages in Language Acquisition

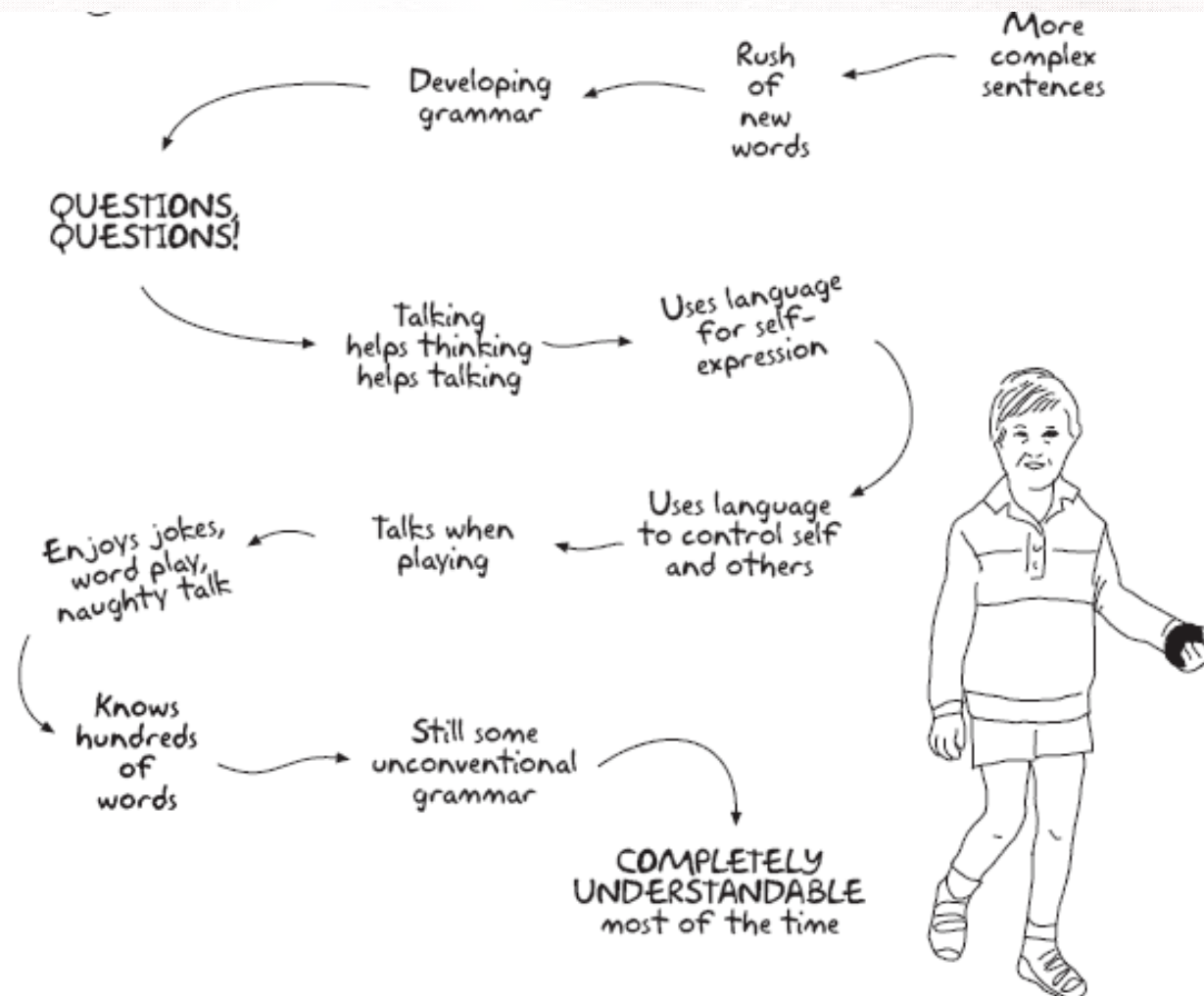
The GROWTH of LANGUAGE



Stages in Language Acquisition

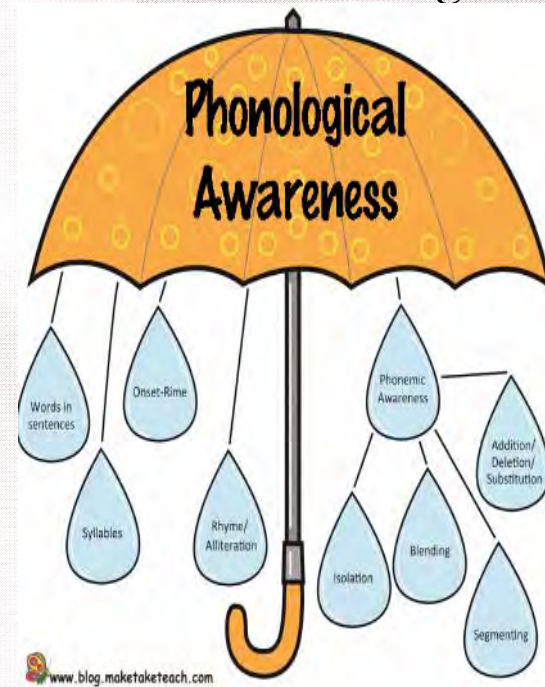


Stages in Language Acquisition



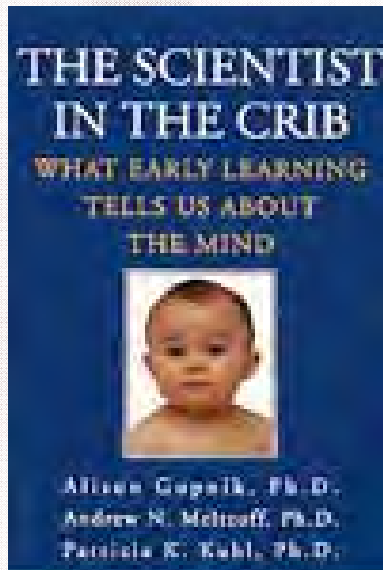
The Perception and Production of Speech Sounds

- Infants display an ability to discriminate and recognize speech sounds
 - They will even respond to linguistic contrasts when those contrasts are not present in the language(s) spoken around them
 - They can perceive differences in voicing, place of articulation, manner of articulation
 - But they do not react to nonlinguistic aspects of speech (loudness, gender-based pitch differences, etc.)

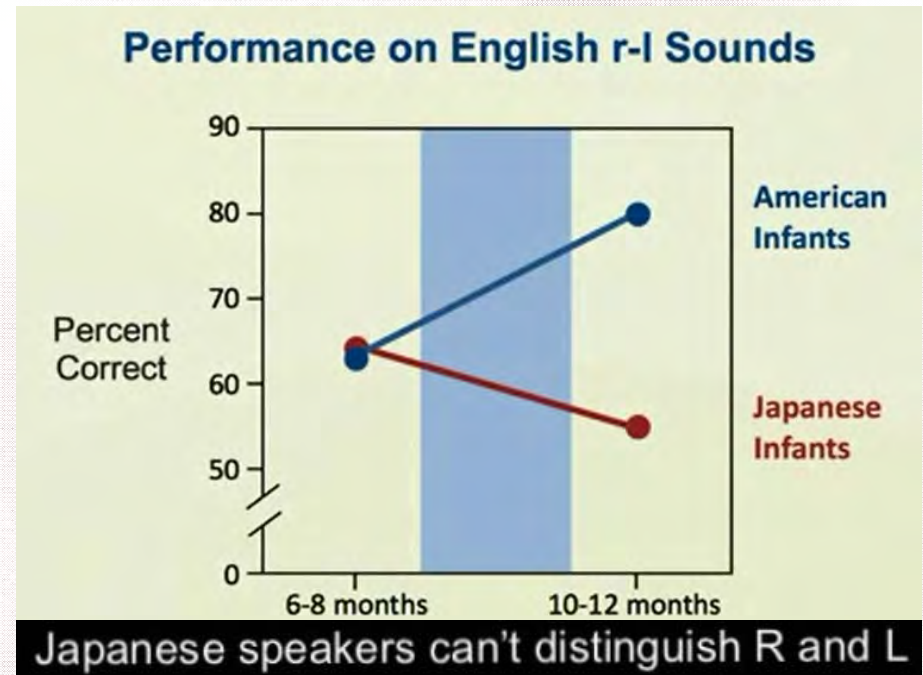


The Perception and Production of Speech Sounds

- Infants appear to be born with the ability to perceive and focus on the sounds that are important for language, so they can learn any human language



But by 6 months babies begin to lose to ability to discriminate between sounds that are not phonemic in the language(s) they are acquiring



"When babies listen, what they're doing is taking statistics on the language that they hear." Patricia Kuhl



Babbling

- Babbling begins at about 6 months and is considered the earliest stage of language acquisition
 - Babies may babble phonemes that do not occur in the language(s) they are acquiring
 - 95% of babble is composed of the 12 most common consonants around the world
 - Early babbles mostly consist of CV sequences but become more varied later on
 - By 1 year babbles are composed only of the phonemes used in the language(s) they hear
 - Deaf babies babble with their hands like hearing babies babble using sounds



Talking Twin Babies.mp4

First Words

- After the age of one, children figure out that sounds are related to meanings and start to produce their first words
- Usually children go through a **holophrastic** stage, where their one-word utterances may convey more meaning
 - *up* used to indicate something in the sky or to mean “pick me up”
- This suggests that children know more language than they can express



Segmenting the Speech Stream

- A major obstacle that babies must overcome is to be able to identify where word boundaries are
- English-speaking children may be able to use stress as a cue for word boundaries (*prosodic bootstrapping*)
 - Every content word in English has stress
 - If a word has two syllables, the stress either falls on the first syllable (**trochaic stress**) or the second syllable (**iambic stress**), but the vast majority of English words have trochaic stress
 - Experiments have shown that children do use stress as a cue for word boundaries since most English words have stress on the first syllable
- But how do children know the stress pattern of the language they are acquiring?



golabupabikututibubabupugol abubabupu

- Babies may use statistical frequency of syllable sequences to determine word boundaries
- Evidence for this comes from a study by J. R. Saffran, R. N. Aslin, and E. L. Newport. They presented 8-month-olds with a continuous spoken sequence of multisyllabic words from a nonsense language, i.e.:

golabupabikututibubabupugolabubabupu







- The only cues that could be used to segment the words and detect word boundaries were the statistical properties of the syllables in the sequence. The 8-month-olds were found to be able to discriminate words such as *golabu* and *pabiku* from sequences that crossed word boundaries, such as *bupabi*. Thus, 8-month-olds were observed to detect boundaries of spoken words without obvious acoustic cues.
- Similarly, with regard to syntax, J. R. Saffran argues that predictive dependencies (e.g., that *the* or *a* is usually followed by a noun) allow language learners to acquire abstract structure.

The Acquisition of Phonology

- Children tend to acquire the sounds common to all languages first, followed by the less common sounds of their own language

- Vowels tend to be acquired first, and consonants are ordered:
 - Manner of articulation: nasals, glides, stops, liquids, fricatives, affricates
 - Place of articulation: labials, velars, alveolars, palatals

- Uncommon but high frequency sounds may be acquired earlier than expected

<u>Age</u>			<u>File</u>
3 months	03.wav	06.wav	03.wav
6 months			06.wav
9 months			09.wav
12 months	09.wav	12.wav	12.wav
18 months			18.wav
24 months			24.wav
36 months	18.wav	24.wav	36.wav

- Children can perceive more sound contrasts than they can make in early stages

- Thus they know more about phonology than we can tell by listening to them speak



36.wav

- When they cannot yet produce a sound, they may substitute an easier sound
 - These substitutions are rule-governed
 - Children tend to reduce consonant clusters ([pun] for *spoon*), reduplicate syllables ([wawa] for *water*), and drop final consonants ([ke] for *cake*)

The Acquisition of Word Meaning

- When children learn the meanings of words they must learn the relevant features of the class of things that are referred to by that word
 - They must learn that *dog* refers to pugs and Great Danes, but not cats
- When learning words, children often **overextend** a word's meaning
 - For example, using the word *dog* to refer to any furry, four-legged animal (overextensions tend to be based on shape, size, or texture, but never color)
- They may also **underextend** a word's meaning
 - For example, using the word *dog* to refer only to the family pet, as if *dog* were a proper noun
- The whole object principle: when a child learns a new word, (s)he is likely to interpret the word to refer to a whole object rather than one of its parts



Apple Overextension.mp4

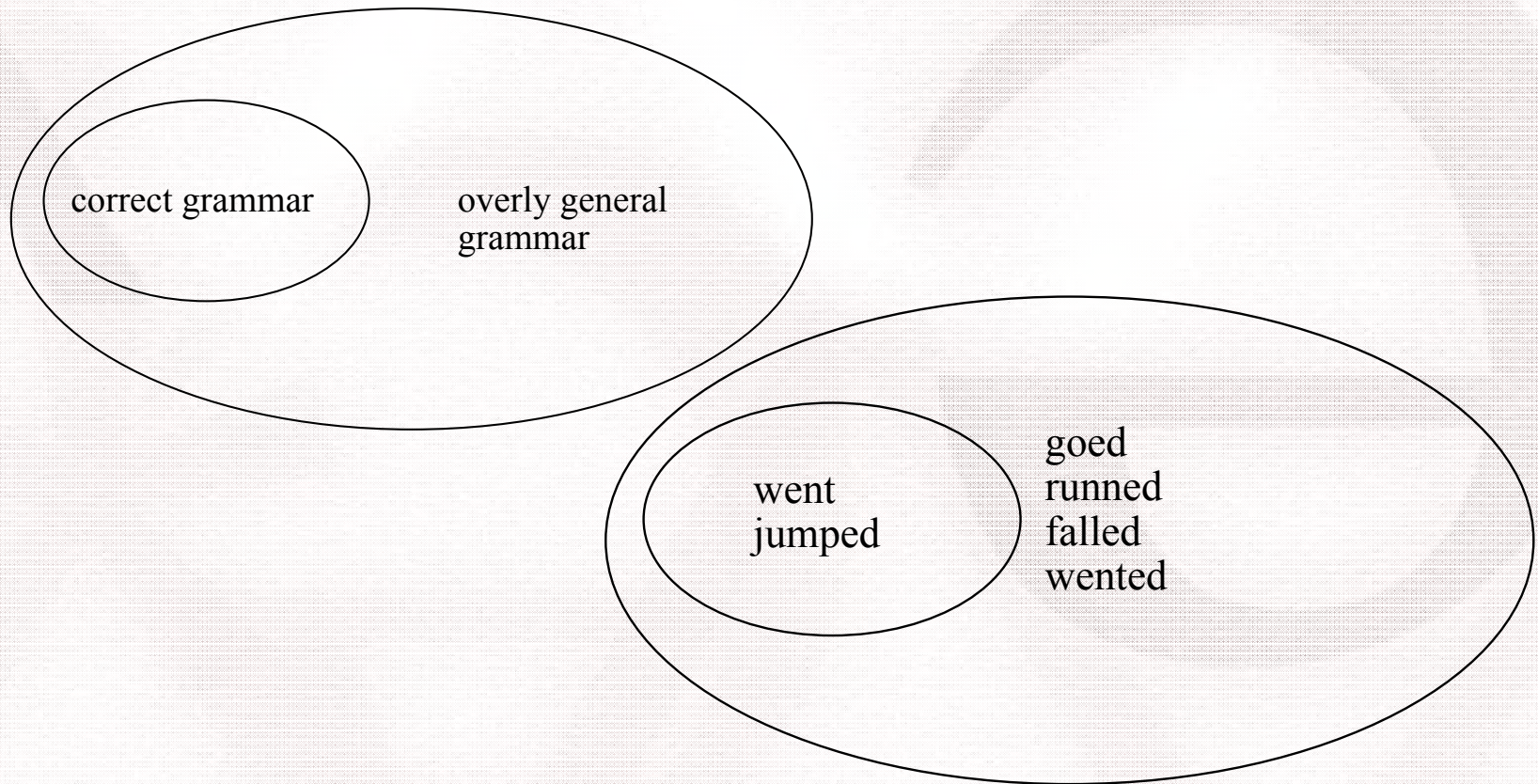
The Acquisition of Morphology

- The acquisition of morphology clearly demonstrates the rule-governed nature of language acquisition
 - Children typically learn a morphological rule and then **overgeneralize**
 - Children go through three stages in the acquisition of an irregular form:
 - In phase 1 they use the standard irregular past tense forms because they have learned these irregulars as separate lexical items (*broke, brought*)
 - In phase 2 the child has learned the rule for past tense and therefore attaches the regular past tense morpheme to the irregular verb (*breaked, bringed*)
 - In phase 3 the child realizes that there are exceptions to the morphological rule and bring the standard irregular forms back into their vocabulary (*broke, brought*)



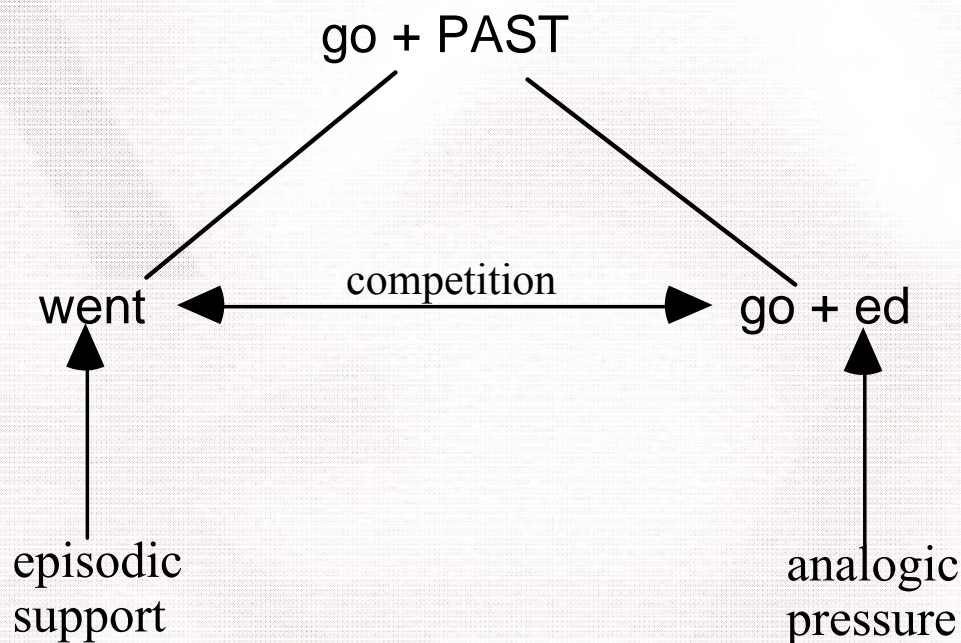
An overly general grammar

- Children typically learn a morphological rule and then **overgeneralize**



An overly general grammar

- Children typically learn a morphological rule and then **overgeneralize**



Children's overgeneralizations in language acquisition.mp4

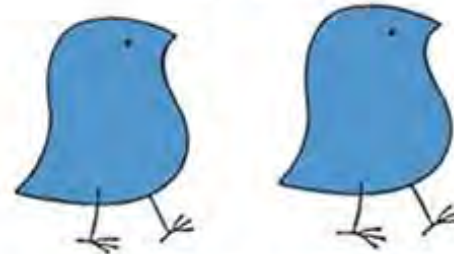
Jean Berko's (1958) *Wug Test*

- The “wug test” demonstrates that children apply the correct plural allomorph to nouns they have never heard before
 - Which shows they have an understanding of natural classes of phonemes and are not just imitating words they have heard before
- Children also demonstrate their knowledge of derivational rules and can create new words
 - E.g. *broomed* (“swept”)

The Wug Test



This is a wug.



Now there is another one.
There are two of them.
There are two —.



Steven Pinker's *Language Instinct*

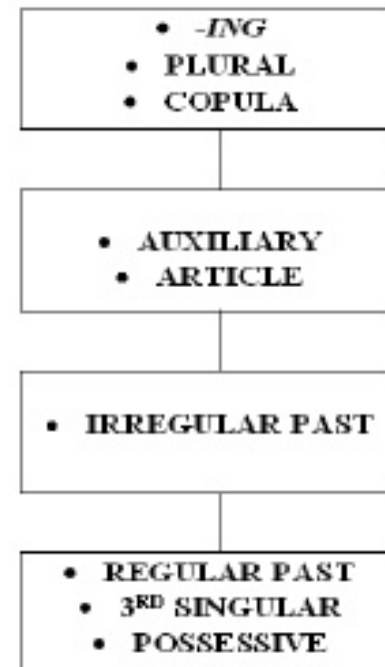


Developmental Sequences in Learner Language

- The **order of acquisition** is a concept in language acquisition that all learners of a given language will learn the grammatical features of that language in roughly the same order. This phenomenon has been confirmed for people learning their first language, and also, to some extent, for people learning a second language.

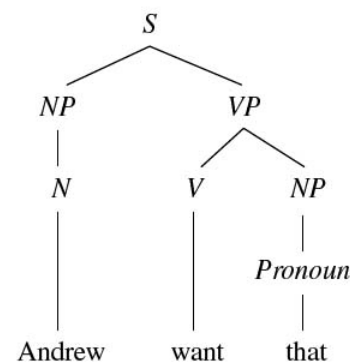
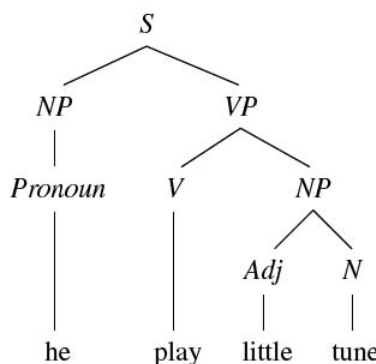
Data 3a: Developmental sequences of morphemes in L1 and L2 English (Krashen 1977)

1. present progressive verb (with or without auxiliary): *play-ing*
2. prepositions: *in, on*
3. regular noun plural: *shoe-s*
4. irregular past tense verbs: *came, fell, saw* etc.
5. possessive noun: *Daddy's shoe*
6. copula *is, am, are*
7. articles *a, the*
8. regular past tense verb: *play-ed*
9. regular third person singular: *play-s*
10. irregular third person singular: *has*



The Acquisition of Syntax

- At about two years of age, children start to put words together to form two-word utterances
 - The intonation contour extends over the two words as a unit, and the two-word utterances can convey a range of meanings:
 - *mommy sock* = subject + object or possessive
- The **telegraphic stage** describes a phase when children tend to omit function morphemes such as articles, subject pronouns, auxiliaries, and verbal inflection
 - For example: *He play little tune*
 - or *Andrew want that*
- After 3'6 children can produce *wh*-questions, and relative pronouns
- Sometime after 4 children have acquired most of the adult syntactic competence



The Acquisition of Pragmatics

- *Deixis*: Children often have problems with the shifting reference of pronouns
 - Children may refer to themselves as 'you' or in 3rd Person, e.g., Jack
- Problems with the context-dependent nature of deictic words
 - A class of words which presents grave difficulty to children are those whose meaning differs according to the situation, so that the child hears them now applied to one thing and now to another. That was the case with words like 'father,' and ['mother.' Another such word is 'enemy.' When Frans (4.5) played a war-game with Eggert, he could not get it into his head that he was Eggert's enemy: no, it was only Eggert who was the enemy. A stronger case still is 'home.' When a child was asked if his grandmother had been at home, and answered: "No, grandmother was at grandfather's," it is clear that for him 'at home' meant merely 'at my home.' Such words may be called shifters.



Otto Jespersen "Shifters" (1922)

Childhood Bilingualism

- **Bilingual language acquisition**, or **simultaneous bilingualism** refers to the acquisition of two languages simultaneously from infancy
 - About half the people in the world are bi- or multilingual
 - In many parts of the world, bilingualism (or multilingualism) is the norm
 - Bilingual children tend to have better **metalinguistic awareness** than monolingual speakers, meaning they have more conscious knowledge about language



'Gina is by lingual . . . that means she can say the same thing twice, but you can only understand it once.'

Second Language Acquisition



- “English for Coming Americans” 1918

Second Language Acquisition

- Most adult language learners never become fully proficient in their second language
 - They make errors unlike children's errors and these errors may become **fossilized**
- **Fundamental difference hypothesis:** learning a second language is a different process than learning a first language
 - Different principles are drawn upon in L2 learning than L1 acquisition
 - However, L2 learners do demonstrate rule-governed **interlanguage grammars**
- One obvious difference between L1 and L2 acquisition is that in L2 acquisition a speaker already knows a language
 - Learners often **transfer** phonological, syntactic, and morphological rules from their first language to their second language
 - French speakers learning English may substitute [z] for [☆]
 - Spanish speakers learning English may insert a schwa to break up word-initial consonant clusters

Second Language Acquisition

- But, not everything transfers from the L1 to the L2, and many errors made by learners are not found in their L1
- Speakers with different L1s go through similar stages when learning their L2s
 - Which points to some possibly universal developmental principles like those in L1 acquisition
- **Heritage language learners** constitute a unique type of adult language learner
 - Someone who was raised with a strong cultural connection to a language and who then chooses to study that language more formally
 - May have no prior linguistic knowledge of the language
 - May be bilingual

Sources

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- Otto Jespersen “Shifters” (1922)
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- David Crystal “Child Language Acquisition” (1994)
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- Jean Berko Gleason “The Child’s Learning of English Morphology” (1958)
- Lev Vygotsky “Interaction Between Learning and Development” (1934)
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- Steven Pinker “The Language Instinct” (1994)
- Patsy Lightbown & Nina Spada “How Languages Are Learned” (2006)

And many internet sources

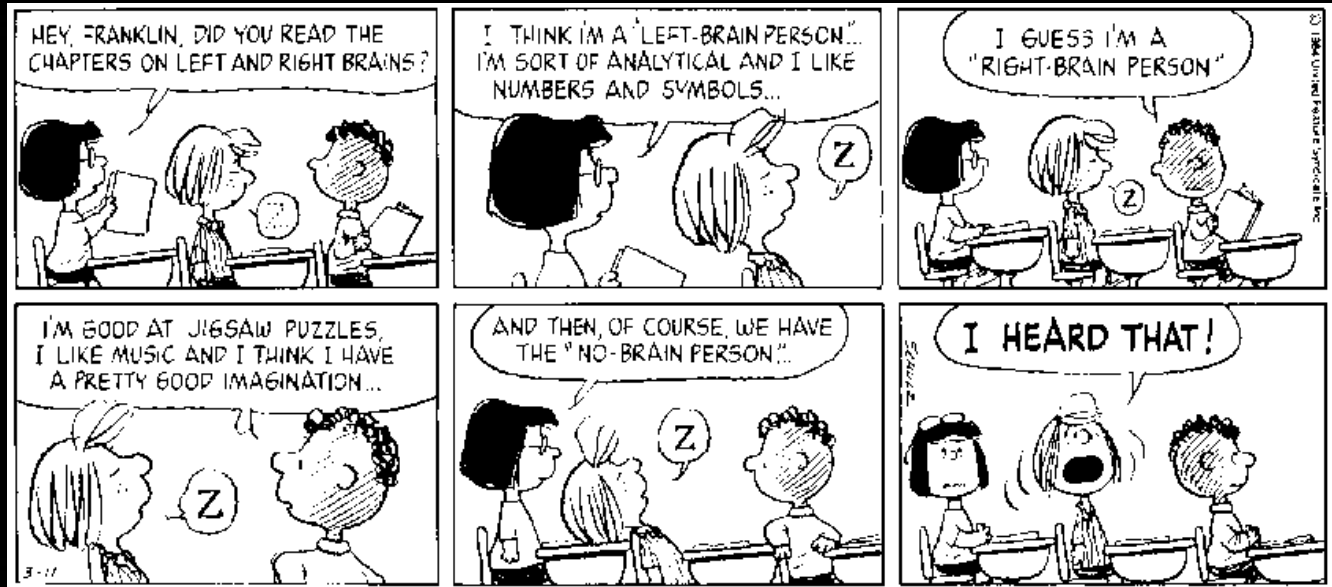
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Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 10



Language and the Human Brain

The Human Mind at Work

- The study of the brain-mind-language relationship*

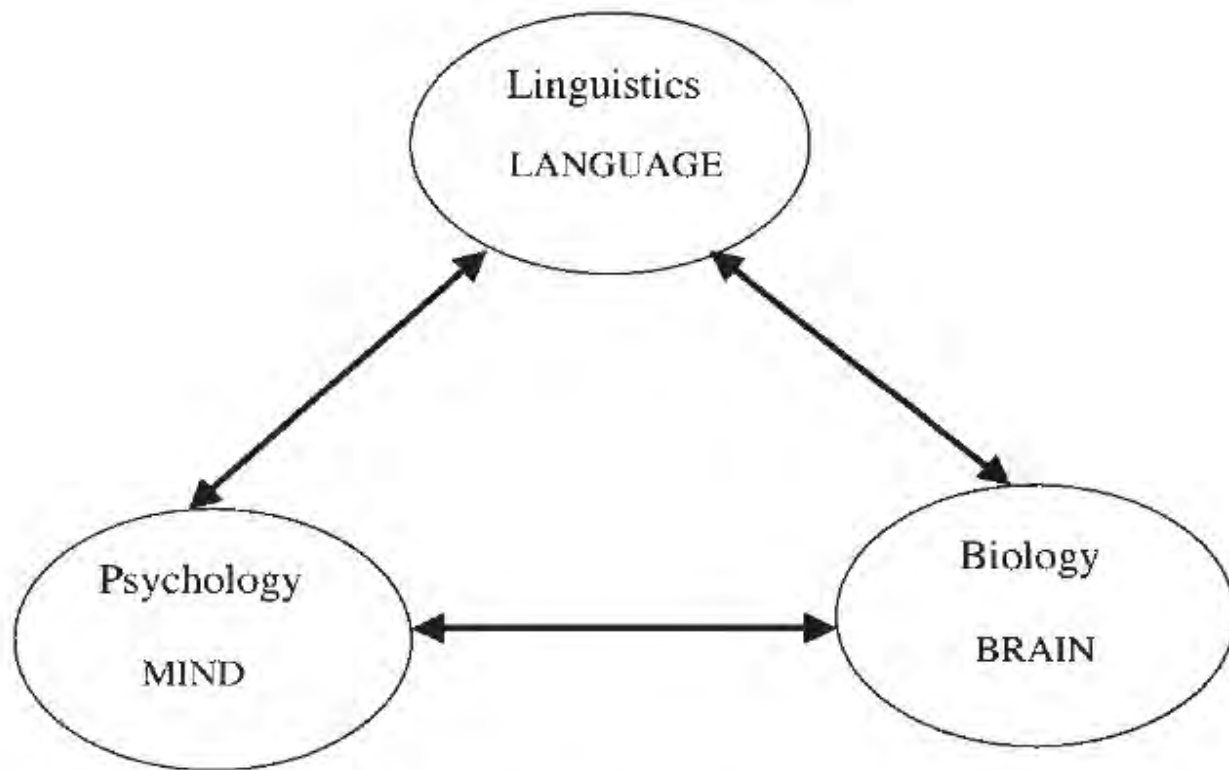


Figure 1.1. Triangle of functional interdependency of language-specifying disciplines.

Source: Helmut Schnelle “Language in the Brain” (2010)

The Human Mind at Work

The study of the brain-mind-language relationship

- The brain is an organ of soft nervous tissue contained in the skull.
- Its specialized cortices supply the biological and neural foundations of human language and cognition.
- **Neurolinguistics** is concerned with brain mechanisms and the neurobiology of language.
- **Psycholinguistics**: the study of linguistic performance in speech production and comprehension
 - Linking psychological mechanisms to grammar to understand language production and comprehension



The Mystery of the Human Mind, ▲ engraving,
Robert Fludd, *Utriusque Cosmici Majoris*, 1617–1621

A Brief History of Neuroscience

1891: Santiago Ramon y Cajal discovers **the neuron**, the elementary unit of processing in the brain

1911: Edward Thorndike's **connectionism**: the mind is a network of connections and learning occurs when elements are connected

1921: Otto Loewi discovers the first neurotransmitter

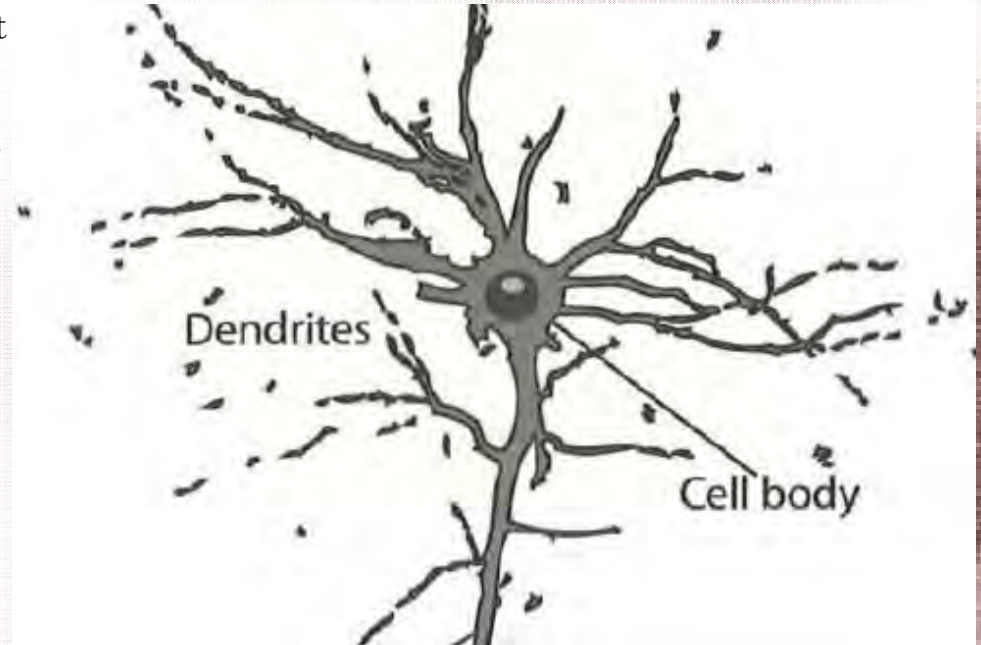
1940: Willian Van Wagenen performs “split brain” surgery to control epileptic seizures

1949: Donald Hebb's cell assemblies: the brain organizes itself into regions of self-reinforcing neurons - **the strength of a connection depends on how often it is used**

1953: Roger Sperry “split-brain” experiment on cats

A Brief Tour of Your Brain

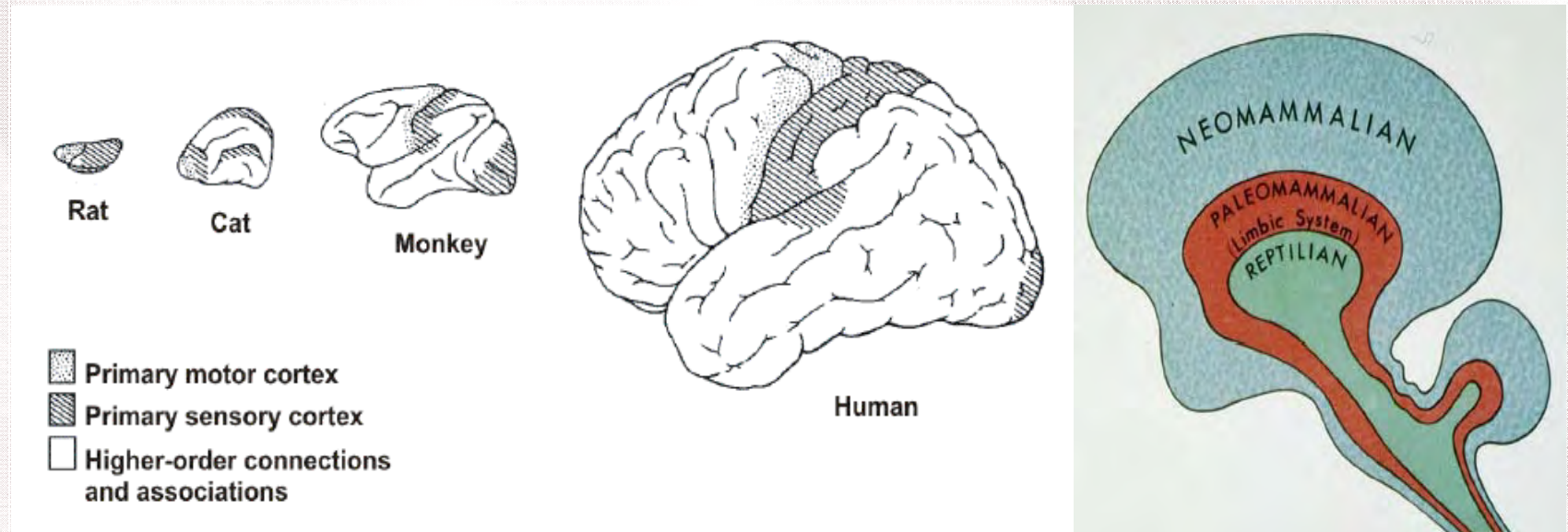
- The human brain is made up of about 100 billion nerve cells, or neurons. **Neurons "talk" to each other** through threadlike fibers that alternately resemble dense, twiggy thickets (**dendrites**) and long, sinuous transmission cables (**axons**). **Each neuron makes from one thousand to ten thousand contacts with other neurons.** These points of contact, called synapses, are where information gets shared between neurons. Each synapse can be excitatory or inhibitory, and at any given moment can be on or off. With all these permutations the number of possible brain states is staggeringly vast; in fact, it easily exceeds the number of elementary particles in the known universe.



Drawing of a neuron showing the cell body, dendrites, and axon. The axon transmits information (in the form of nerve impulses) to the next neuron or set of neurons in the chain.

The Human Mind at Work

- **Association Areas in the Cortex**

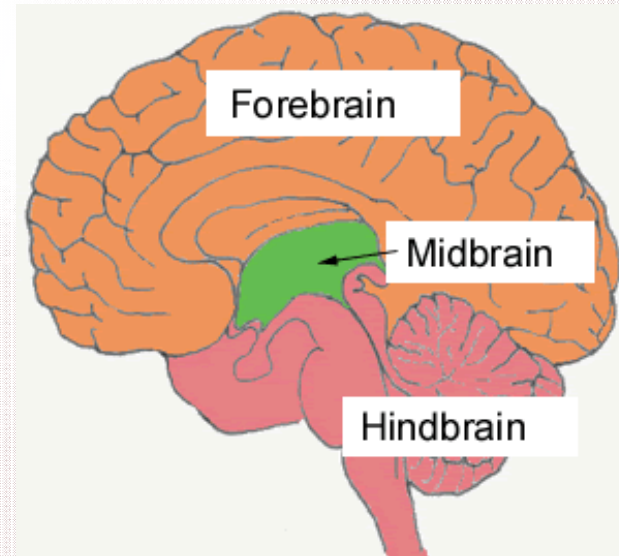
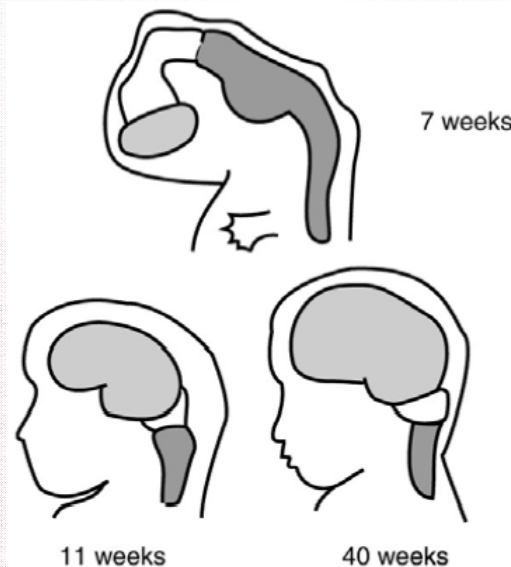


- The shaded areas are the primary projection areas for sensory and motor neurons. Association areas are in white.
- The relative size of the association areas and the complexity of the interconnections are strongly correlated with intelligence.

Diagram adapted from Lamb (2011)

The Human Mind at Work

- CNS (Central Nervous System) Development in the Embryo

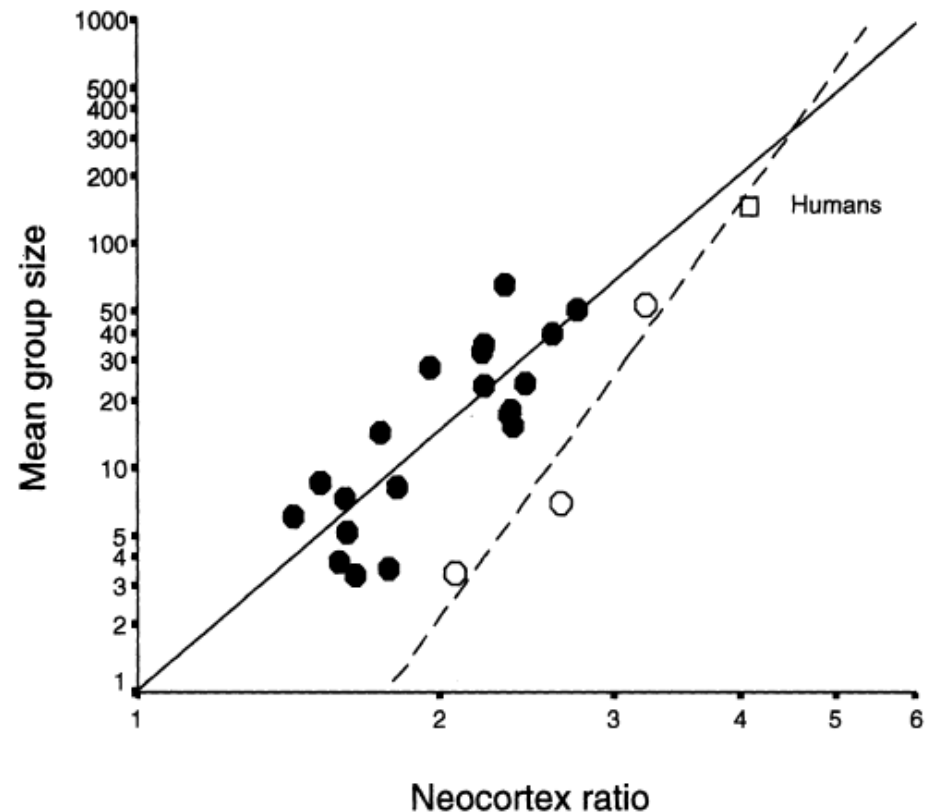


- The human nervous system starts as a tube of cells in the developing embryo. Over the first few weeks of development, the front part of the tube thickens. Already the three basic divisions of the central nervous system are visible: the *forebrain*, *midbrain*, and *hindbrain*.
- Late in embryological development the convolutions begin to form, giving the human brain its distinctive wrinkled appearance. The convolutions continue to form and deepen for years after a baby is born.

Source: Russ Dewey "Human Nervous System" (2004)

The Social Brain Hypothesis

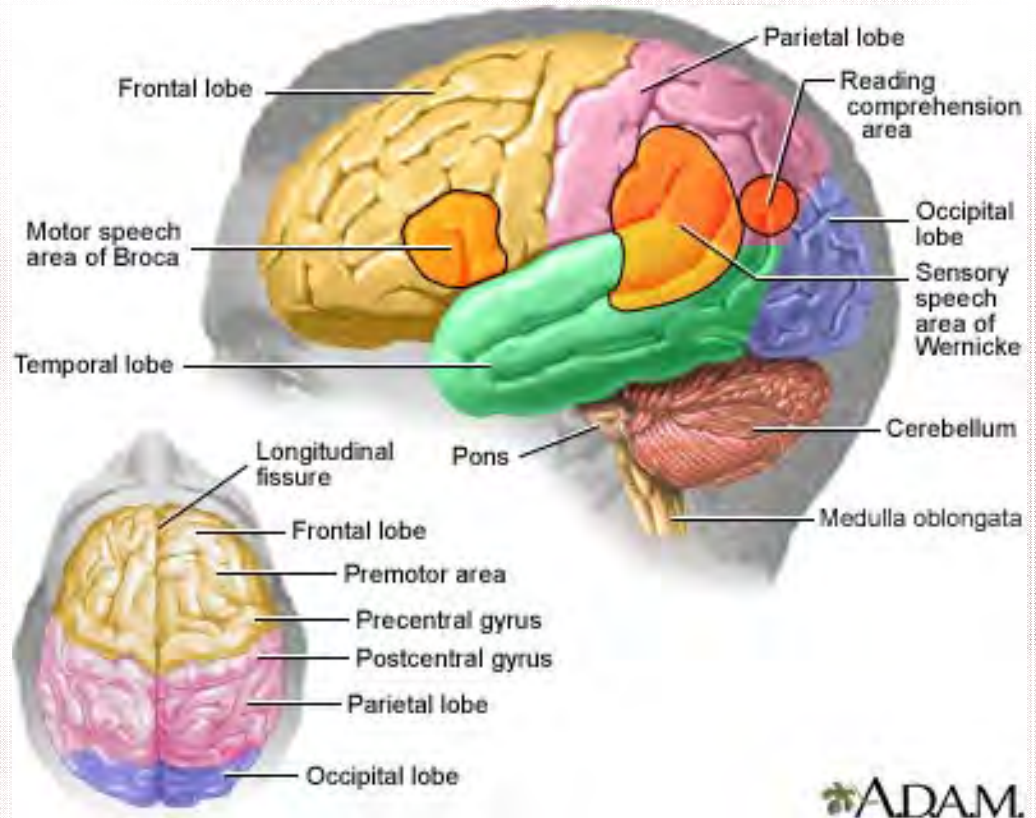
- Why some primates have larger neocortices than others?
- The social brain hypothesis was proposed to explain primates' unusually large brains: It argues that the cognitive demands of living in complexly bonded social groups selected for increases in executive brain (principally neocortex).
- Although there remain difficulties of interpretation, the bulk of the evidence comes down in favor of the social brain hypothesis.



Source: R. I. M. Dunbar "The Social Brain: Mind, Language, and Society in Evolutionary Perspective" (2003)

The Human Brain

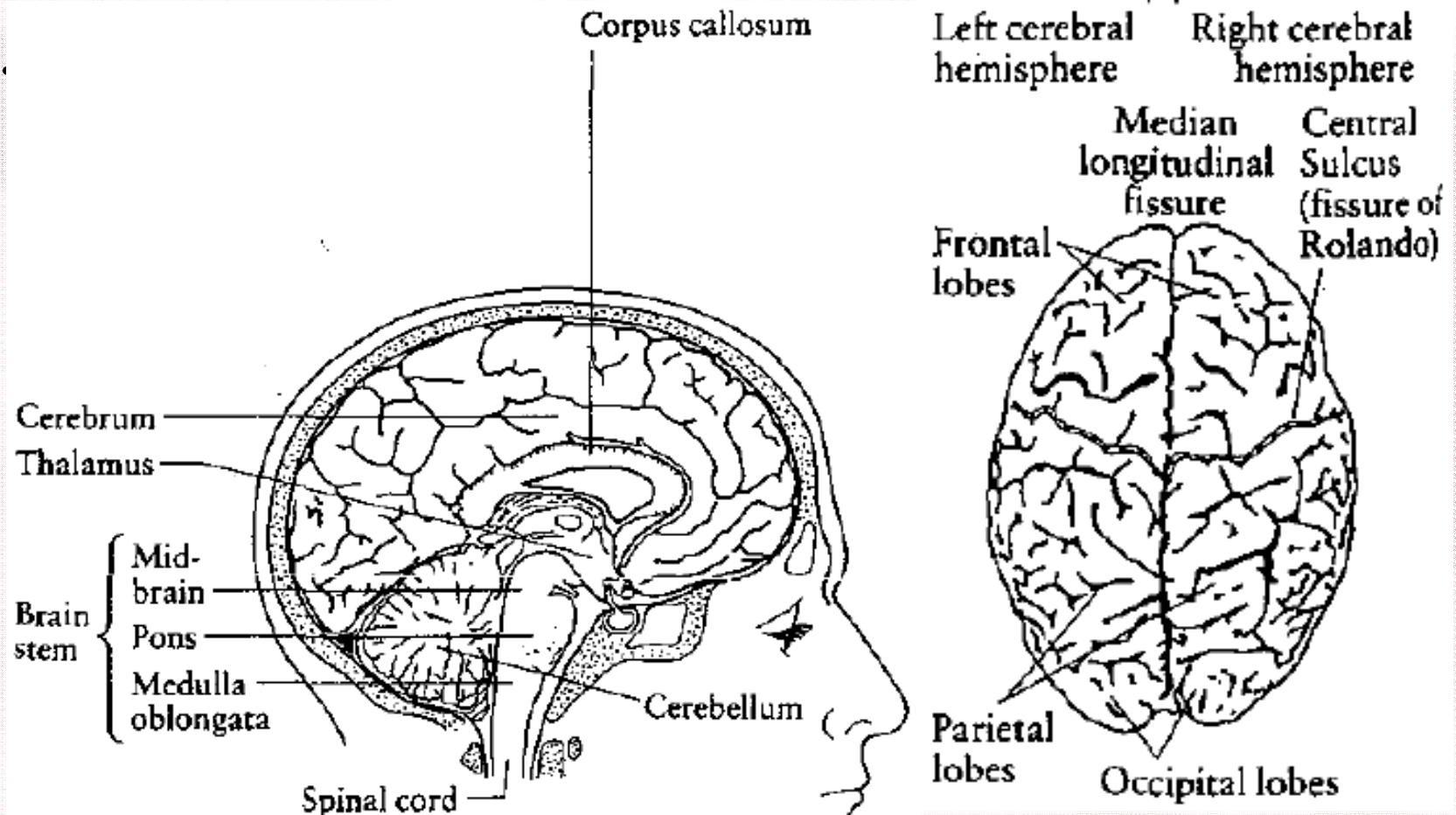
- The brain is the most complex organ of the body, composed of 100 billion nerve cells
- **Cortex:** the surface of the brain which receives messages from the sensory organs, initiates actions, and stores our memories and our knowledge of grammar
- **Cerebral hemispheres:** the left and right hemispheres of the brain function *contralaterally*
 - e.g., a stroke involving the right side of the brain may cause contralateral paralysis of the left leg.
- **Corpus callosum:** a network of 200 million fibers that join the two hemispheres and allow the left and right hemispheres to communicate with each other



*The Four Lobes
in Lateral and Superior Views*



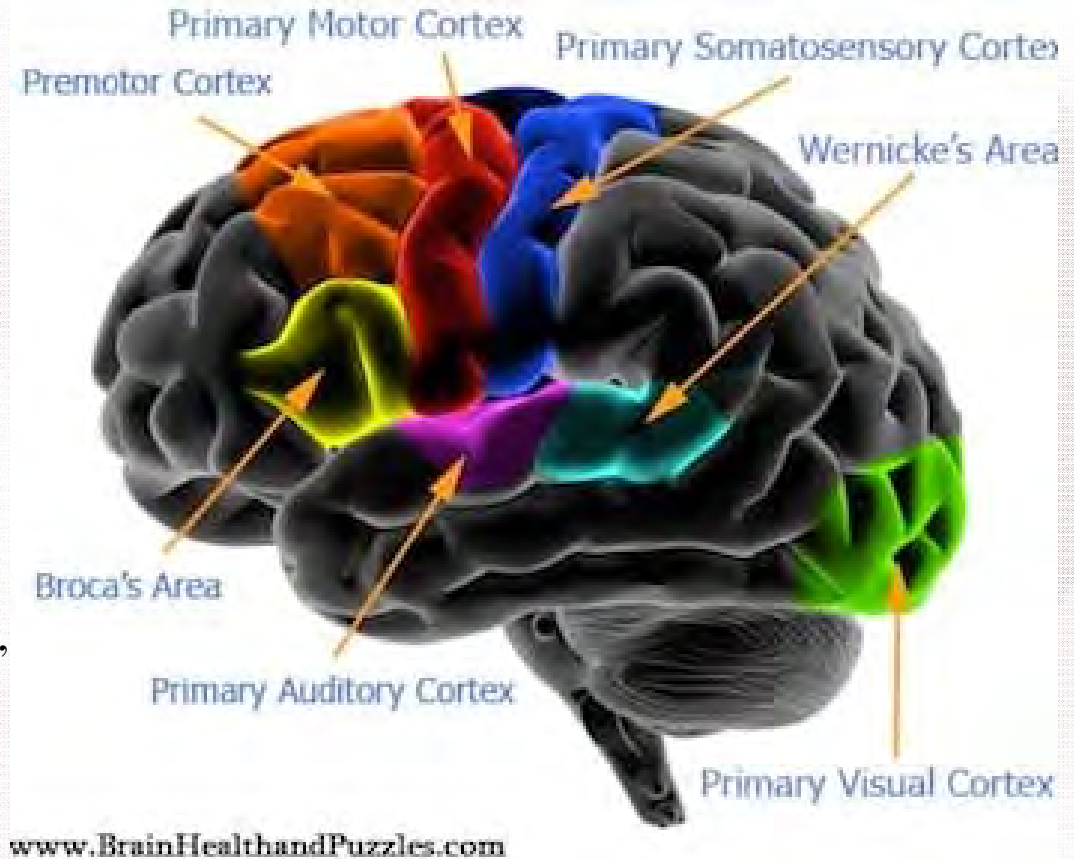
The Human Brain



Source: David Crystal "Language and the Brain" (1997)

The Cerebral Cortex

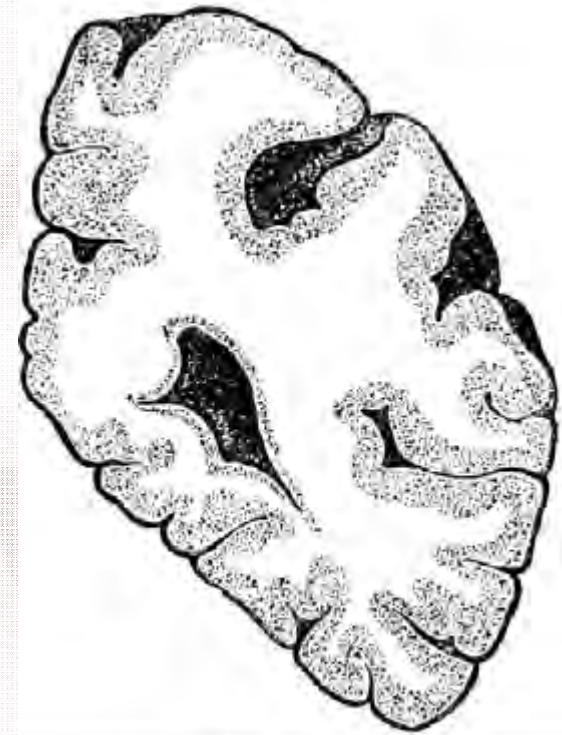
- 10 billions of nerve cells, or **neurons**, are concentrated in the outer layer of the forebrain, or cerebrum.
- The cell bodies form the **(cerebral) cortex**, the “gray matter,” which is about $\frac{1}{4}$ inch thick and composed of at least 6 layers.
- Neurons project into billions of long, slender fibers, or axons, that form the “white matter” beneath the cortex and interconnect to transmit electrical impulses



Cortical Areas and Functions

The Cerebral Cortex

- The word *cortex* means *rind* or *shell* in Latin and refers to a dense outer layer of neurons on brain structures.
- When a brain is preserved, *cortical* areas appear *gray* because they contain dense concentrations of cell bodies. This is called ***gray matter***. Other brain tissue is called ***white matter***. It consists of communication lines: neural fibers called axons which run from the cells in the cortical layers to other parts of the brain. The axons appear white because in this area of the brain they are coated with a fatty substance, myelin.
- A slice of brain tissue is shown above. ▲ You can see how the gray matter extends down into the fissures. This is significant because it creates a large *surface area* on the brain for nerve cell bodies. *The cerebral cortex, if unfolded, would have about the same surface area as a small umbrella.*

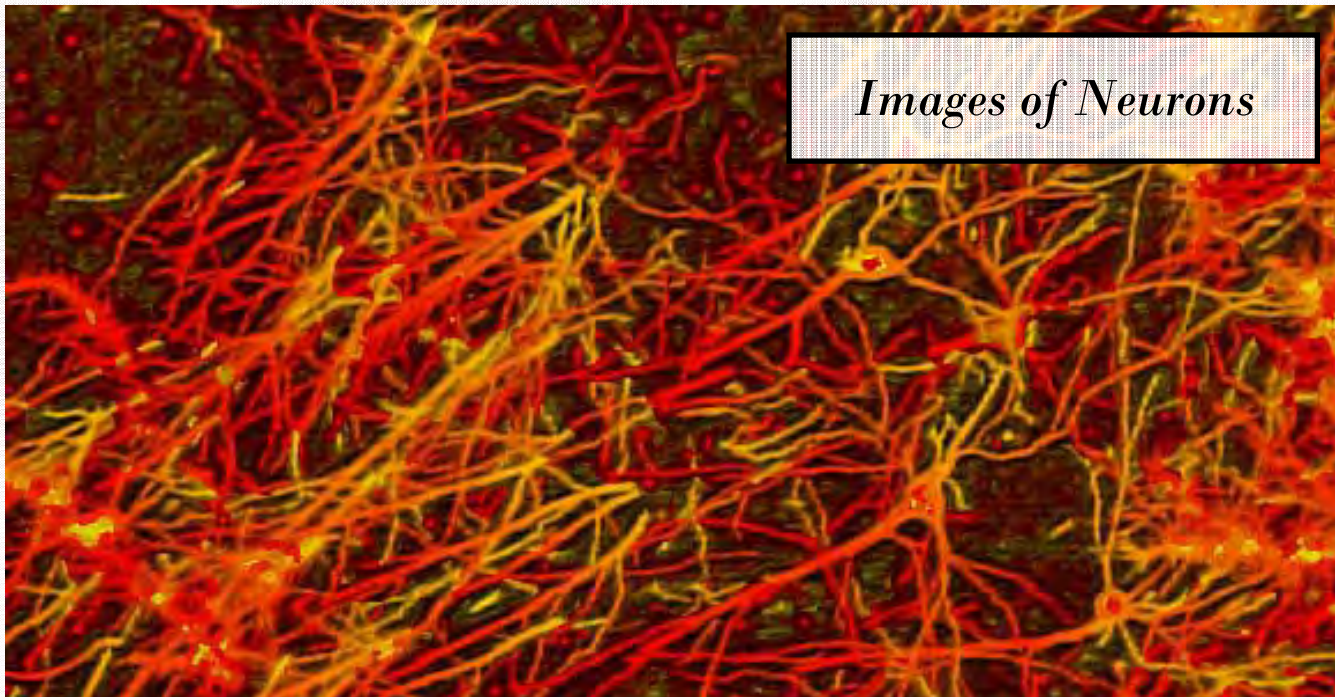


Gray and White Matter

Source: Russ Dewey "Human Nervous System" (2004)

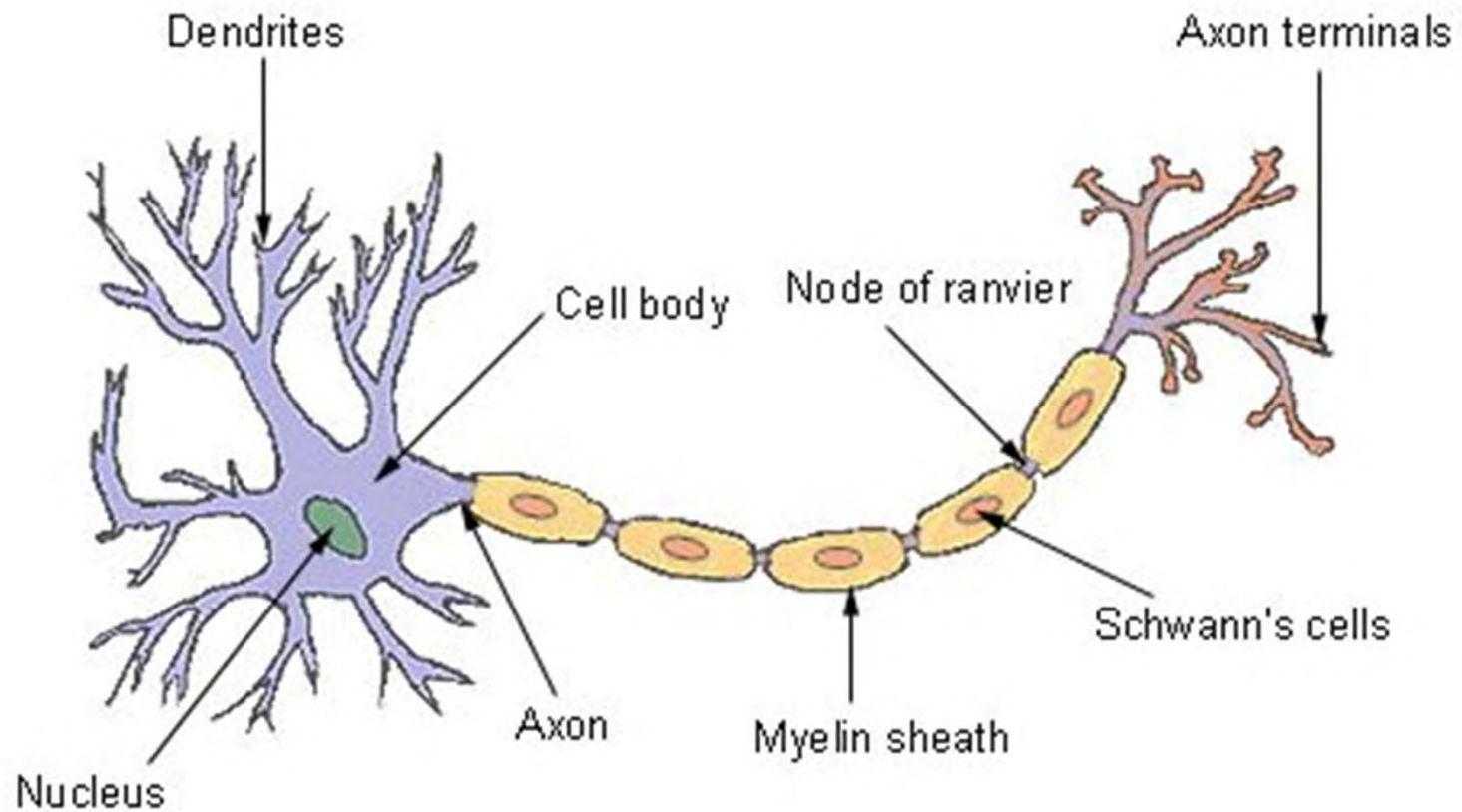
Functions of Neurons

- Neurons in the cortex integrate messages that they receive from sensory organs, and coordinate and initiate voluntary actions.
- Neuronal impulses “fire” at the speed of ca. 20 per second.
- Cortical areas are **localized** for the storage of memories, motor or sensory commands, visual information, grammar, etc.

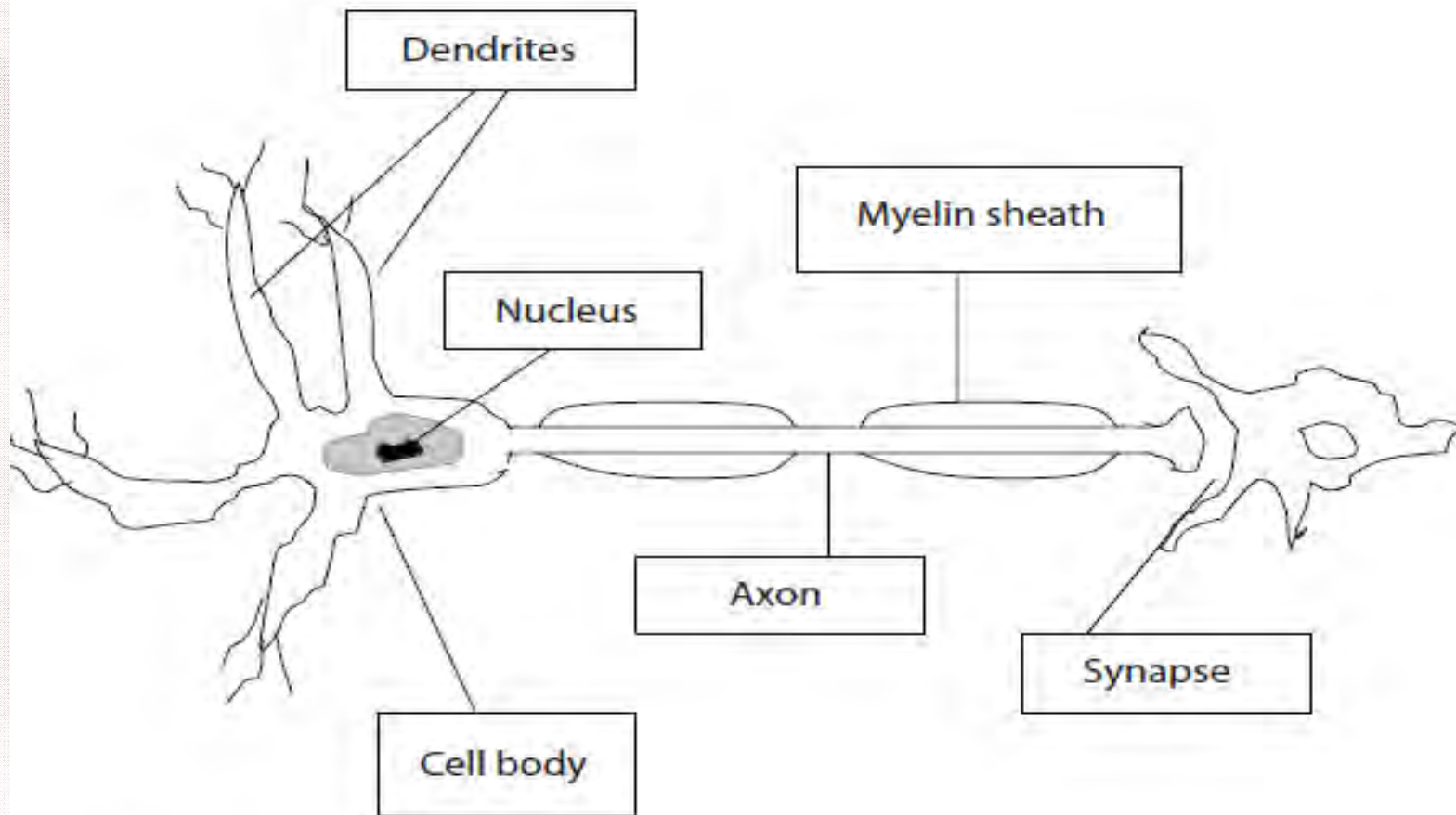


Source: <http://www.idsia.ch/NNcourse/brain.html>

Structure of A Neuron



Structure of A Neuron

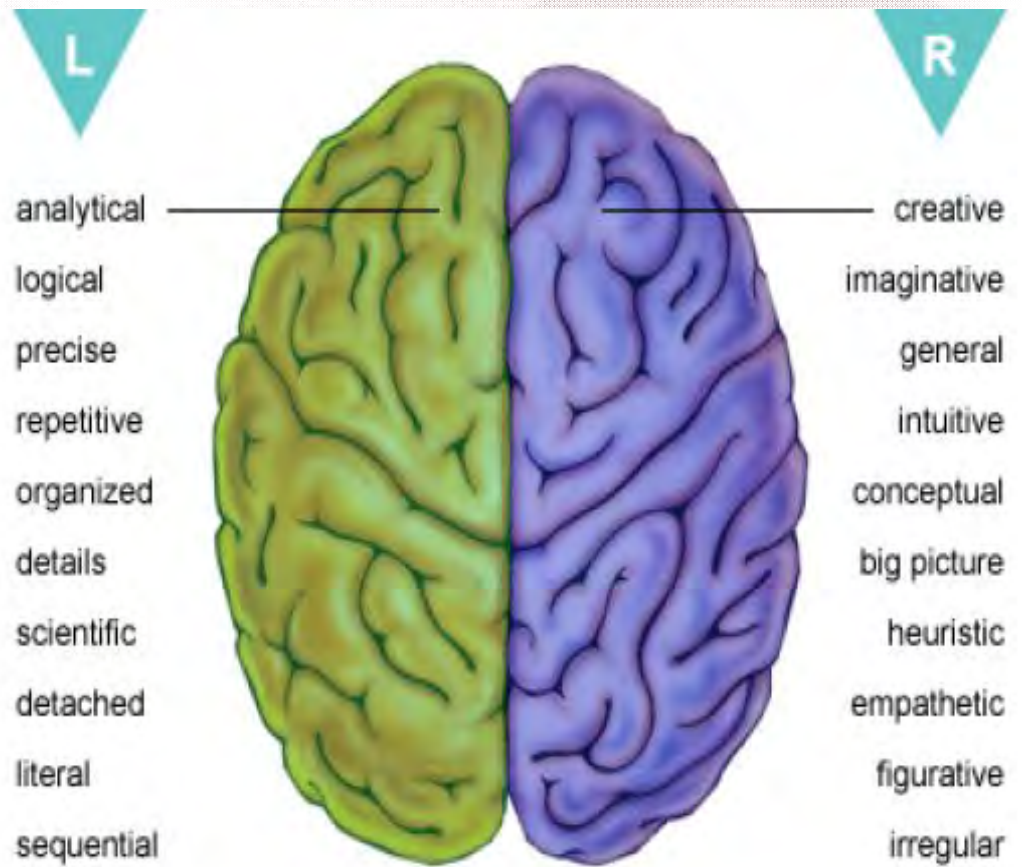


Neuron

Source: Elisabeth Ahls "Introduction to Neurolinguistics" (2006)

Hemispheres of the Brain

- Left and right hemispheres are similar in their outer appearance, composed of folded ridges or convolutions called **gyri**, and furrows, clefts, or fissures called **sulci**
- They however show anatomical and functional asymmetries.
- The two cerebral hemispheres are joined by a longitudinal (transverse) bundle of 2 billion nerve fibers called the **corpus callosum**.



Brain Asymmetries & Hemispheric Specialization

- Functions of the right brain:
 - Holistic processing
 - Emotional
 - Spatial Relations
 - Music
- Functions of the left brain:
 - Analytic processing
 - Intellectual
 - Temporal relations
 - Mathematical
- Right brain more superior in:
 - Pattern-matching tasks
 - Facial recognition
 - Spatial orientation
- Left brain more superior in:
 - Language perception and production
 - Rhythmic perception
 - Temporal-order judgments
 - Mathematical thinking

Hemispheric Specialization

- Brain lateralization in humans:
- Left hemisphere: abstraction, reading, writing, speaking, arithmetic, and understanding (the "major" hemisphere)
- Right brain: creative, communication, social skills but *mostly a mystery*

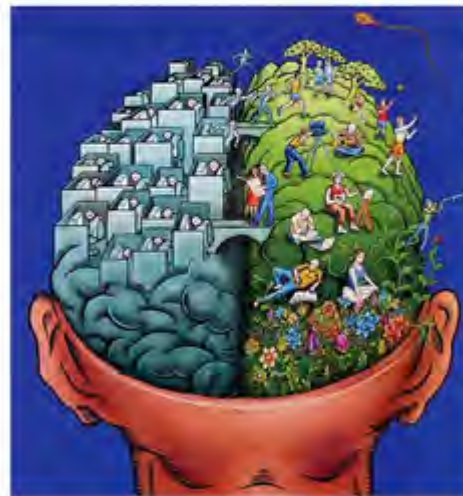
“The great pleasure and feeling in my right brain is more than my left brain can find the words to tell you.” - Roger Sperry

- CHECK YOUR IQ: Why do we know so much about the left hemisphere and so little about the right one?



Brain-Body Communication

- Brain-body communication is primarily *contralateral*
- Brain cells control actions of the opposite side of the body through the groove of the callosal fissure.
- Contralateral stimuli outweigh ipsilateral ones in intensity and speed.



Hemispheres

- Divided into a left and right hemisphere.
 - Contralateral controlled- left controls right side of body and vice versa.
 - Brain Lateralization.
 - Lefties are better at spatial and creative tasks.
 - Righties are better at logic.
- Split-brain patients can only verbalize stimuli presented to their left hemisphere. “[E]ither orally or in writing... the right hemisphere is mute.” (Akamajian *et. al.*, 2001: 534)

Split Brain Patients

- Sometimes patients have their corpus callosum severed

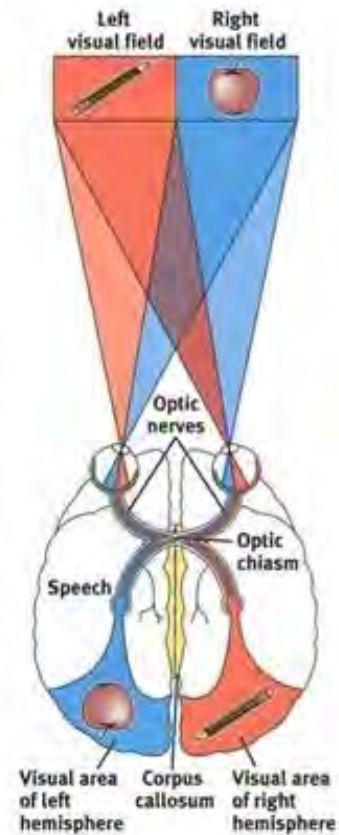


Split brain behavioral experiments .mp4

- Linguistic experiments with split brain patients provide further evidence for the localization of language in the left hemisphere
 - If a patient sees an image with her right eye, it can be named, but if she sees an image with her left eye, she cannot name the object in the picture

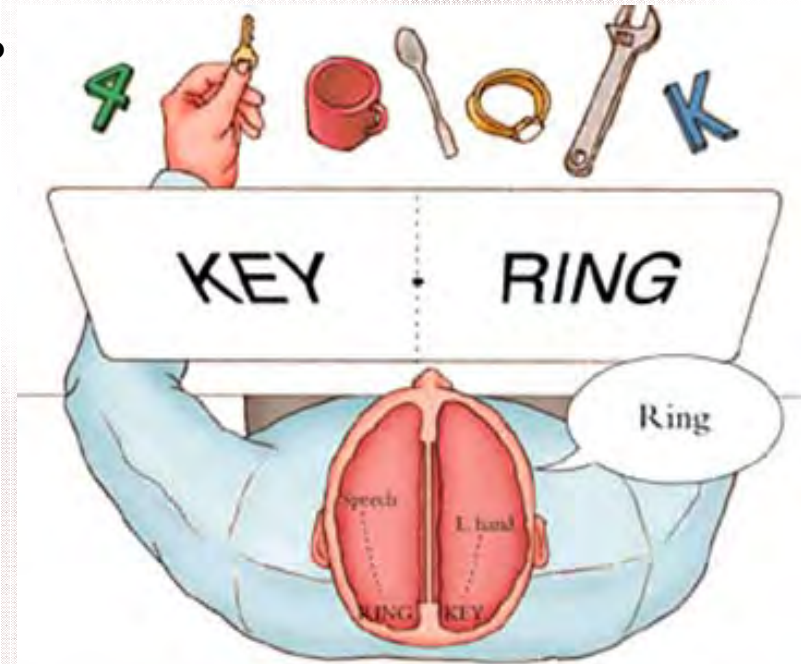
Split Brain Patients

With the corpus callosum severed, objects (apple) presented in the right visual field can be named. Objects (pencil) in the left visual field cannot.



Split Brain Patients

- Split brain is a term used to refer to someone who has had the corpus callosum (a white fiber tract connecting the two sides of the brain) severed. Therefore, the two sides of the brain cannot communicate with each other. The reason that this would be done is usually in very severe cases of epilepsy.
- Split brain patients act entirely normally during normal life. It is only when doing tasks, such as those that only use one side's visual field, that you can notice abnormal behavior. The left side of the brain contains all of the language centers. Therefore, whatever is in the left visual field (above: "RING") can be spoken aloud. The right side of the brain is more abstract-relating to more "artistic" things- like spatial reasoning. Therefore, whatever can be seen in the right visual field (above: "KEY") can be drawn or picked out, but it cannot be verbalized.



NeuroLoveBlog:
What Split-Brain Patients See
and Say

<http://neurolove.tumblr.com/post/999115421/split-brain-is-a-term-used-to-refer-to-someone-who>

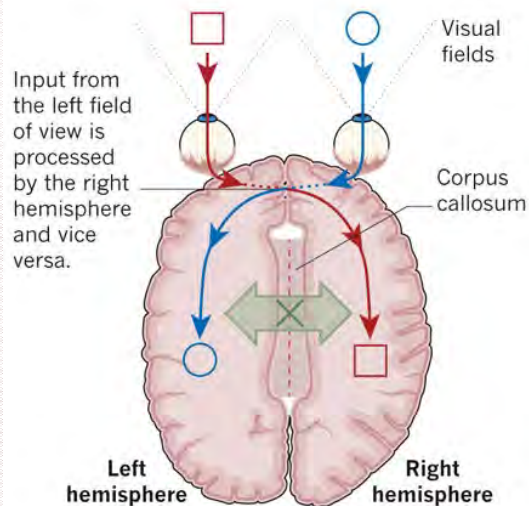
Split Brain Patients

- A Tale of Two Halves

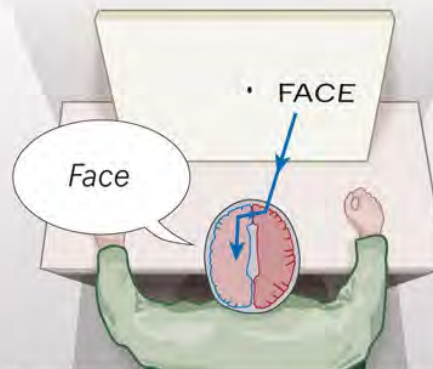
OF TWO MINDS

Experiments with split-brain patients have helped to illuminate the lateralized nature of brain function.

Split-brain patients have undergone surgery to cut the corpus callosum, the main bundle of neuronal fibres connecting the two sides of the brain.



A word is flashed briefly to the right field of view, and the patient is asked what he saw.



Because the left hemisphere is dominant for verbal processing, the patient's answer matches the word.

Now a word is flashed to the left field of view, and the patient is asked what he saw.

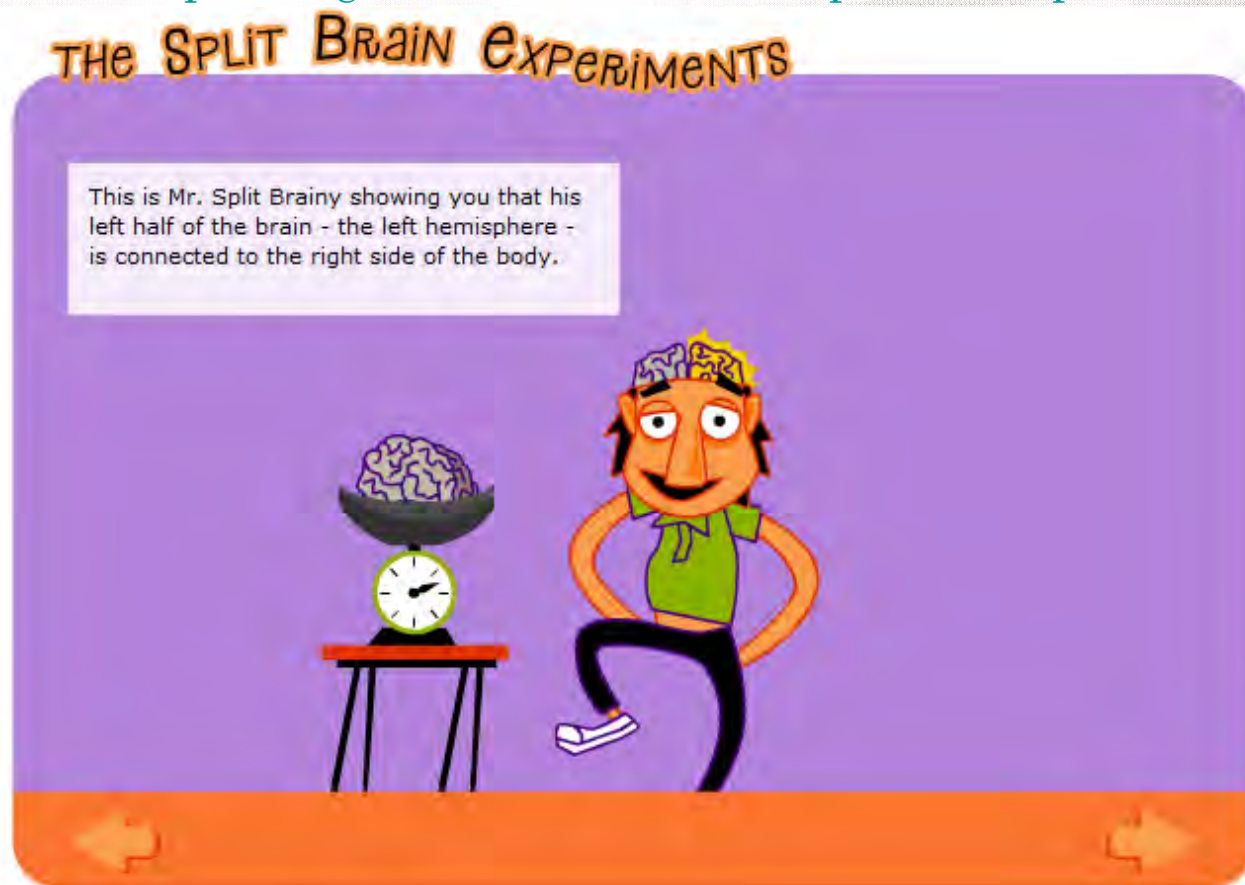


The right hemisphere cannot share information with the left, so the patient is unable to say what he saw, but he can draw it.

Source: David Wolman "The Split Brain: A Tale of Two Halves" (2012)

Split Brain Patients

- For more information about The Split-Brain Experiments, play the game at
- <http://www.nobelprize.org/educational/medicine/split-brain/splitbrainexp.html>

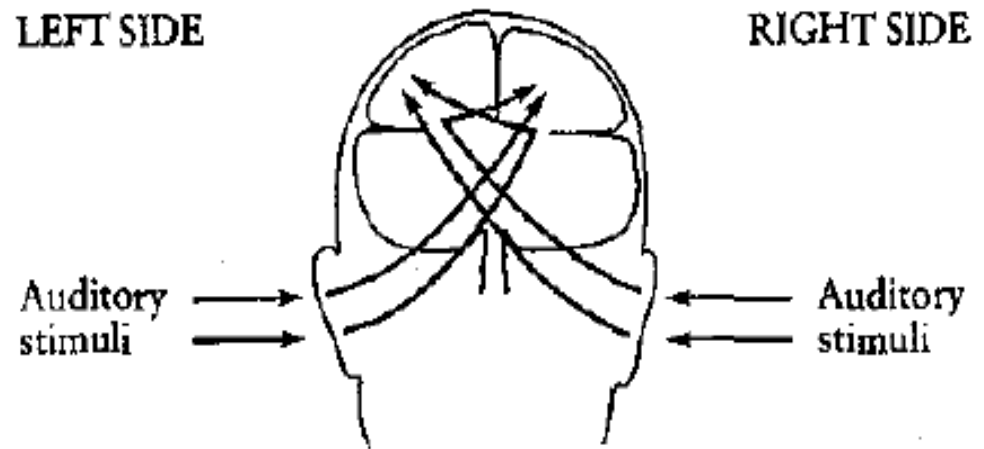


Dichotic Listening Test

- **Dichotic listening**

- Subjects hear two different sounds or words simultaneously, one in each ear
- Subjects more often accurately report hearing linguistic sounds coming into the right ear (left hemisphere) and nonverbal sounds coming into the left ear (right hemisphere)

- **Right ear advantage (REA)** can be observed on speech sounds (even linguistically meaningless utterances) but not on nonverbal signals such as laughing or coughing. This distinction in aural perception attests to the lateralized speech function of the left brain.



———— Non-linguistic stimuli (e.g. coughs)

- - - - - Linguistic stimuli (e.g. words)

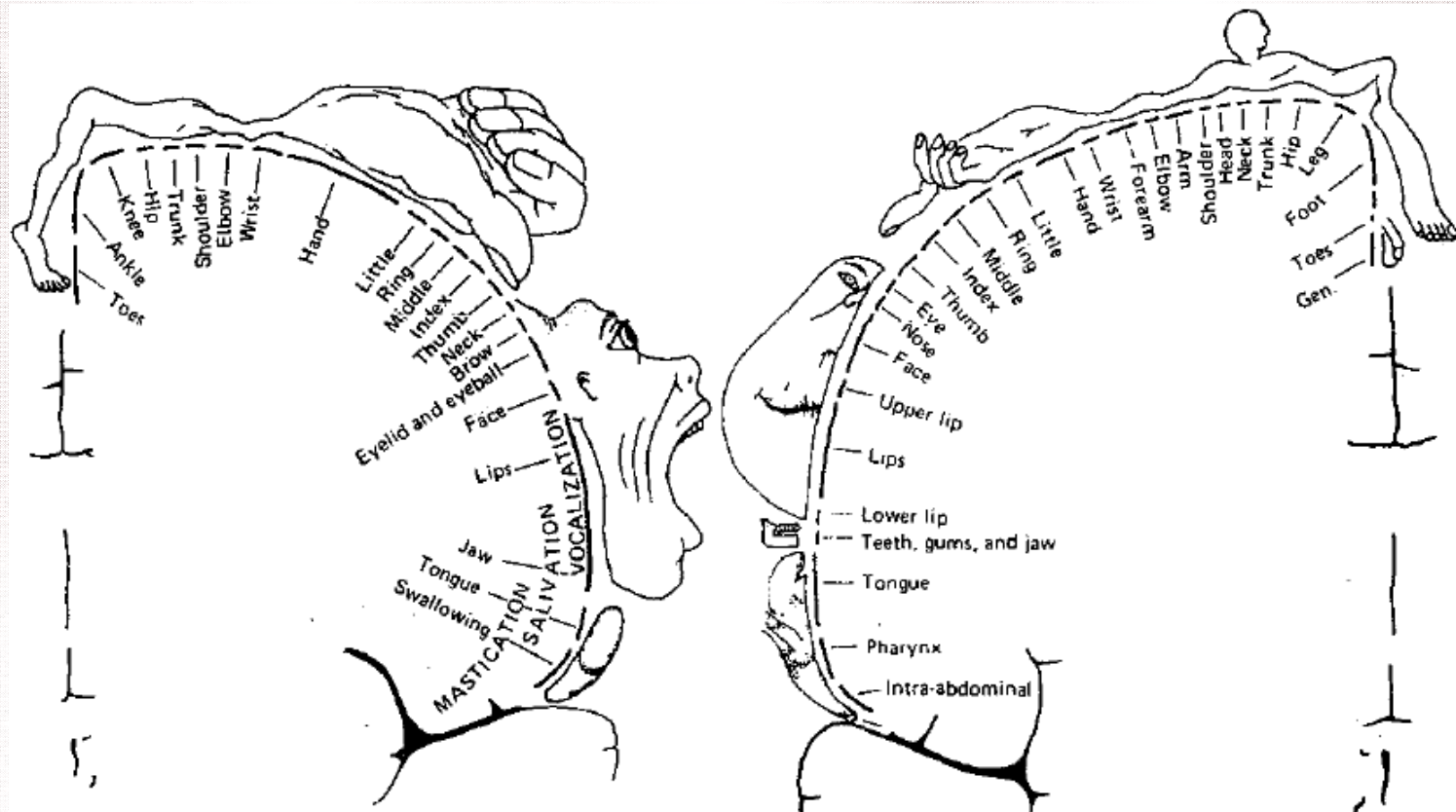
The routes between ears and hemispheres, as shown by dichotic listening tasks

Source: David Crystal "Language and the Brain" (1997)

- **Event-related potentials (ERPs)** are the electrical signals emitted from the brain in response to different stimuli. Researchers can investigate the brain's ERP responses by taping electrodes to different areas of the skull and measuring the responses to different kinds of perceptual and cognitive information.
 - Studies show that even nonsensical sentences cause more electrical signals in the left hemisphere

Cortical homunculus

- **Cortical homunculus:** many of the results of brain-body communication were summarized in the shape of two 'homunculi' - a human form, drawn against the shape of the outer surface of the brain, in which the size of the parts of the body is made proportional to the extent of the brain area involved in their control.

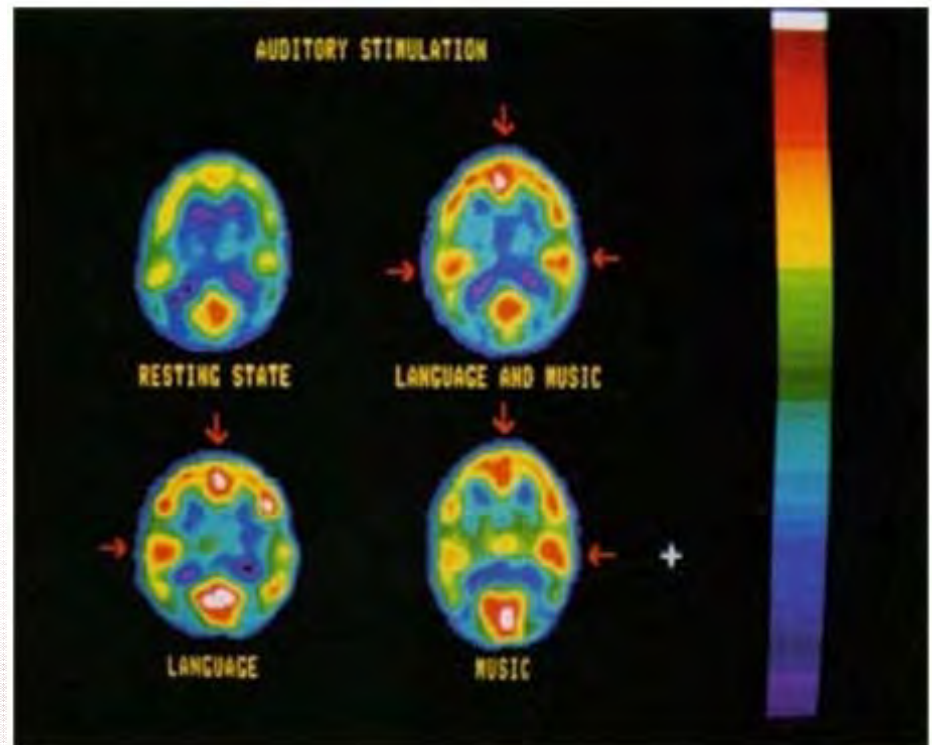


Source: David Crystal "Language and the Brain" (1997)

Brain Imaging Technology


- MRI and CT scans can reveal lesions in the brain soon after the damage occurs
- fMRI, PET, and SPECT scans can show brain activity
 - These scans let researchers see the different areas of the brain that are used to accomplish various linguistic tasks, such as naming people, animals, and tools
- Computed Axial Tomography (CAT Scan)
 - X electromagnetic radiation
- Magnetic Resonance Imaging (MRI)
 - Radio electromagnetic radiation
- Positron-Emission Tomography (PET)
 - Position-electron annihilation
- Event-Related Brain Potentials (ERPs)
 - Electrodes
- Combination of these techniques

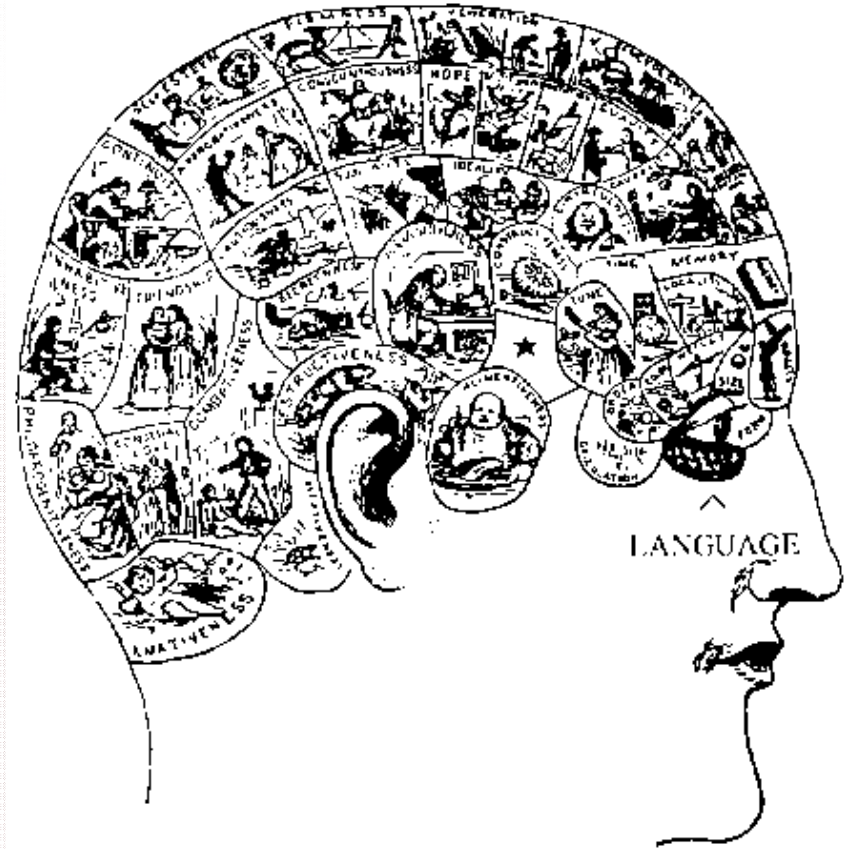
<http://www.humanillnesses.com/Behavioral-Health-A-Br/The-Brain-and-Nervous-System.html> ►



Brain Concentration Level Reflected
through PET Scans

The Localization of Language in the Brain

- In the early 19th century, Franz Joseph Gall proposed the idea of **localization**, which is the idea that different cognitive abilities are localized in specific parts of the brain
 - He also proposed the theory of **phrenology**, which is the practice of examining the “bumps” on the skull in order to determine personality traits and intellectual capacity
 - Phrenology is no longer followed as a scientific theory, but the idea of localization remains
 - A ***pseudoscience***
 - Other examples: physiognomy, astrology
- 



Brain's Language Areas

Language areas

The areas which have been proposed for the processing of speaking, listening, reading, writing, and signing are mainly located at or around the Sylvian and Rolandic fissures (p. 258). Several specific areas have been identified.

- The front part of the parietal lobe, along the fissure of Rolando, is primarily involved in the processing of sensation, and may be connected with the speech and auditory areas at a deeper level.

- The area in front of the fissure of Rolando is mainly involved in motor functioning, and is thus relevant to the study of speaking and writing.

- An area in the upper back part of the temporal lobe, extending upwards into the parietal lobe, plays a major part in the comprehension of speech. This is 'Wernicke's area'.

- In the upper part of the temporal lobe is the main area involved in auditory reception, known as 'Heschl's gyri', after the Austrian pathologist R. L. Heschl (1824–81).

- The lower back part of the frontal lobe is primarily involved in the encoding of speech. This is 'Broca's area'.

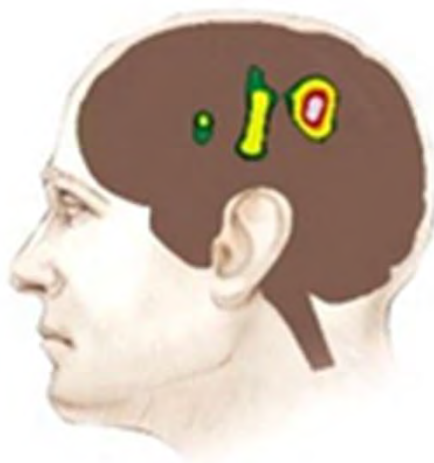
- Another area towards the back of the frontal lobe may be involved in the motor control of writing. It is known as 'Exner's centre', after the German neurologist Sigmund Exner (1846–1926).

- Part of the left parietal region, close to Wernicke's area, is involved with the control of manual signing.

- The area at the back of the occipital lobe is used mainly for the processing of visual input.

Brain's Language Areas

Brain Activity when Hearing, Seeing,
and Speaking Words



(a)
Hearing



(b)
Seeing



(c)
Speaking

Neural Evidence of Grammatical Phenomena

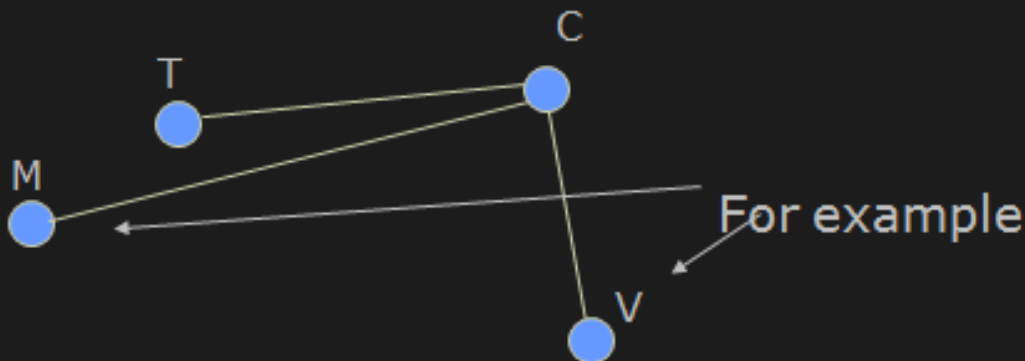
- The fundamental unit of cerebral function is the neural network (Buonomano and Merzenich 1998).
- A neural network is comprised of a large number of relatively simple units, each of which is heavily connected with many if not all the other units in the network, hence the term connectionist model.
- The knowledge in a network (long-term memory) consists of the pattern of connection strengths between units, corresponding to synaptic strengths between neurons (an idea that likely originated with Hebb 1949).
- Learning consists of altering connection strengths.
- Specific components of language (and grammatic) function are localized to the neural domains that, by virtue of their connectivity and neural network properties, can uniquely support them. Thus, a lesion almost anywhere can potentially disrupt language function, but in a specific way that reflects the unique contribution of that neural tissue to language processes.

Source: Stephen E. Nadeau "The Neural Architecture of Grammar "(2012)

Neurocognitive Network for the Word 'fork'

Building a model of a functional web:
First steps

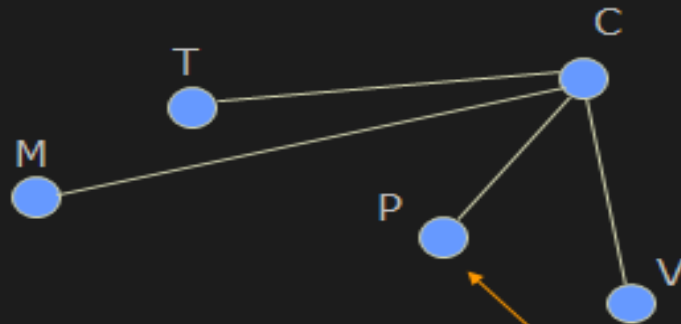
Each node in this diagram
represents the cardinal node of a
subweb of properties



Source: Sydney Lamb "Words in the Brain: The Mental Lexicon" (2010)

Neurocognitive Network for the Word 'fork'

Add phonological recognition



For example, FORK

Labels for Properties:

C – Conceptual

M – Motor

P – Phonological image

T – Tactile

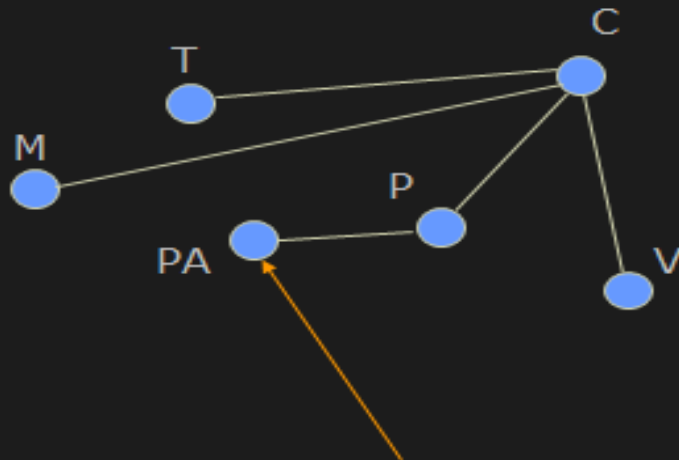
V – Visual

These are all
cardinal nodes –
each is supported
by a subweb

The phonological image
of the spoken form [fork]
(in Wernicke's area)

Neurocognitive Network for the Word 'fork'

Add node in primary auditory area



For example, FORK

Labels for Properties:

C – Conceptual

M – Motor

P – Phonological image

PA – Primary Auditory

T – Tactile

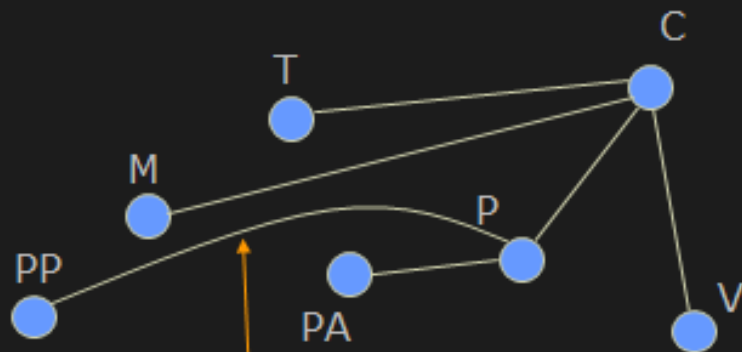
V – Visual

Primary Auditory: the cortical structures in the primary auditory cortex that are activated when the ears receive the vibrations of the spoken form [fork]

Neurocognitive Network for the Word 'fork'

Add node for phonological production

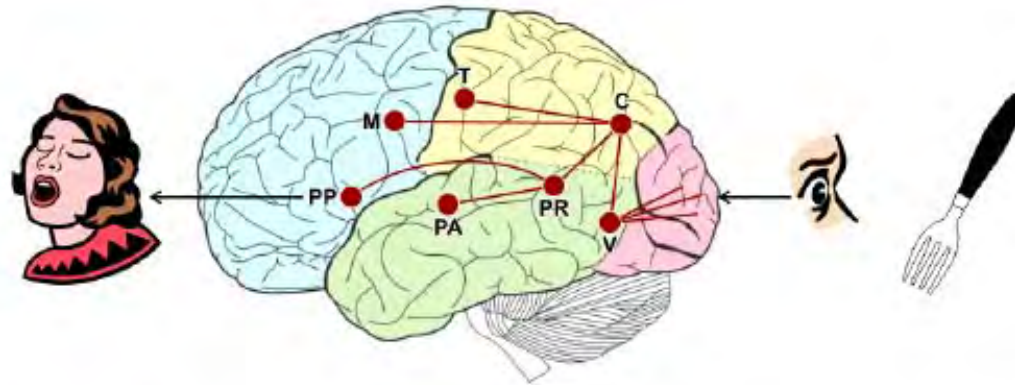
For example, FORK



Labels for Properties:

C – Conceptual
M – Motor
P – Phonological image
PA – Primary Auditory
PP – Phonological Production
T – Tactile
V – Visual

Neurocognitive Network for the Word 'fork'



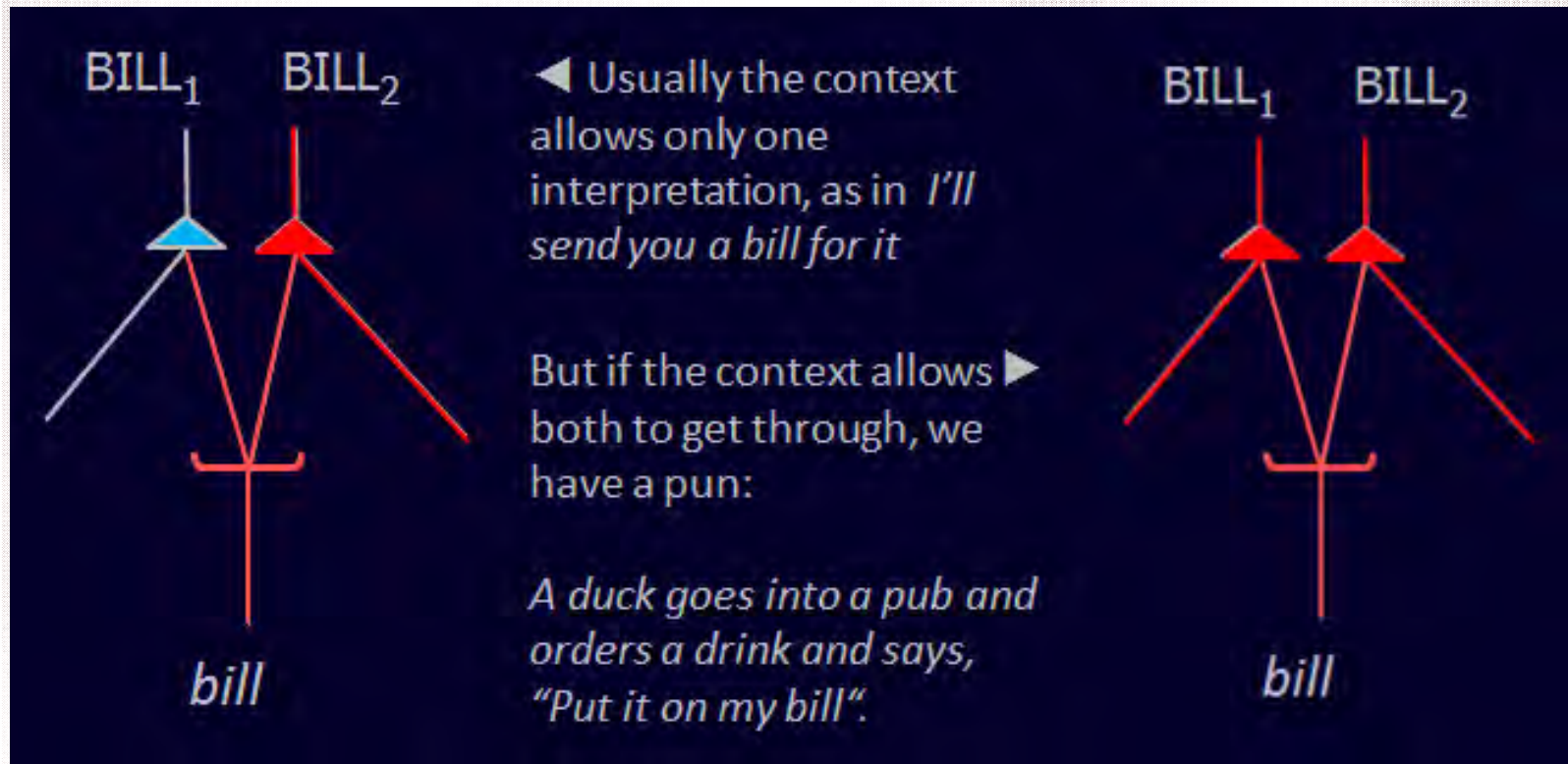
Network of locations in the LH, adapted from Lamb (2011):

- **C:** Concept of a fork in the parietal lobe links to all other areas.
- **V:** Visual recognition in the temporal lobe links to the visual cortex.
- **T:** Tactile feel of a fork in the somatosensory cortex.
- **M:** Motor schemata for manipulating a fork in the motor area.
- **PR:** Phonology for recognizing the word 'fork' in Wernicke's area.
- **PA:** Phonology for the sound /fork/ in the primary auditory cortex.
- **PP:** Phonology for producing the articulation of /fork/ in Broca's area.

Source: John F. Sowa "The Goal of Language Understanding" (2015)

Relational networks & activation

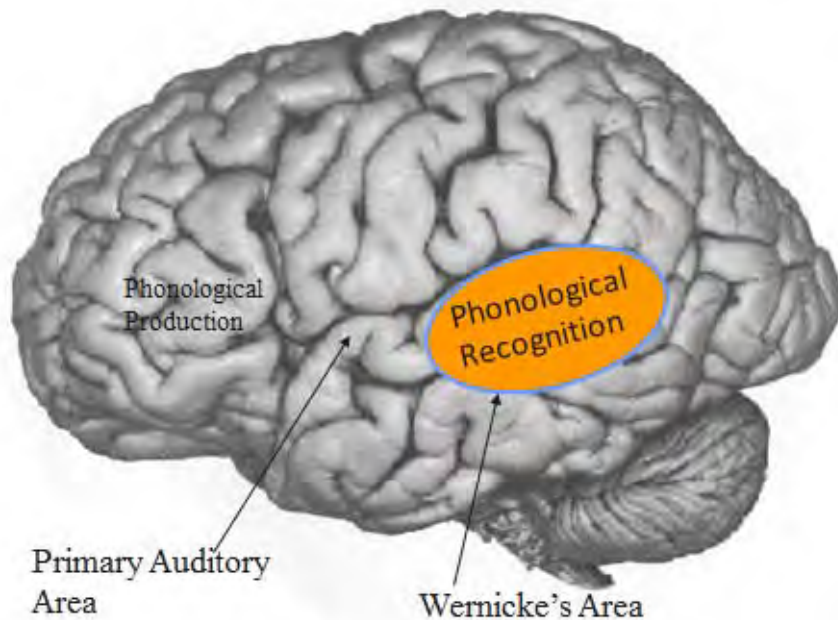
- Neurologically, using language is activation of lines and nodes in the brain
- The nodes can be defined on the basis of how they treat incoming activation



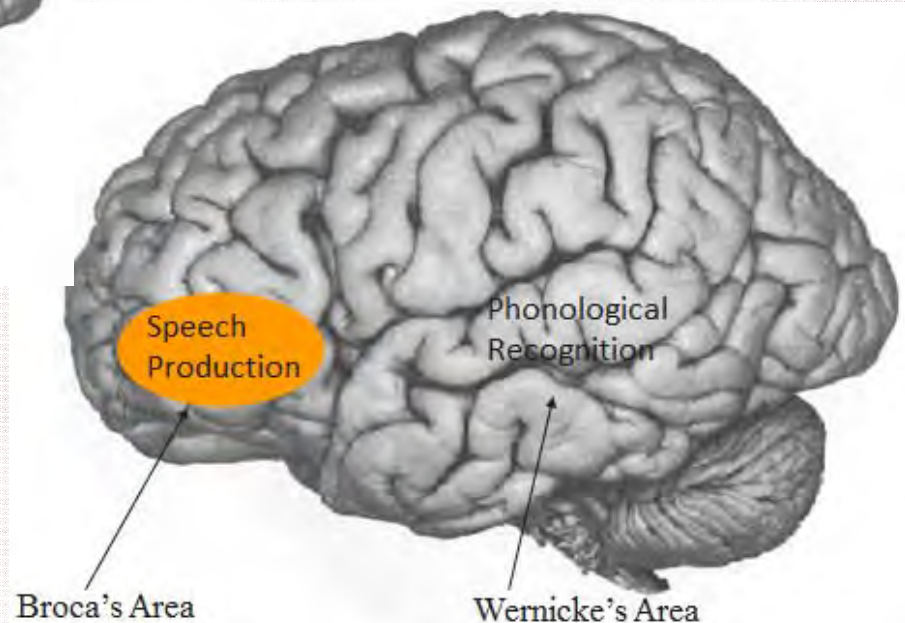
A Pun Travels the Pathways of Your Brain

- 1. You hear from a jocular friend:
*"This duck walks into the bar, orders a drink, and says:
Put it on my bill! Har har har."*
- 2. Your phonological system interprets sounds to activate the lexical nection *bill*.
- 3. This nection (a logonection) is connected to two separate conceptual subnetworks via two different conceptual nections (ideonections), one for the bill you would pay at a bar, the other for the mouth of a duck.
- 4. Normally, other contextual cues would help your linguistic system choose one alternative, by activating one and not the other. If you were talking about bars, or if you were in a bar, connections to the bar concept and its subnetwork would be receiving activated. The threshold of the BAR-BILL ideonection would therefore be easily satisfied by the activation from the lexical nection *bill*. No thought of ducks would reach your conscious awareness. However, if you were talking about ducks, or were in the presence of ducks, the DUCK-BILL ideonection would be activated.
- 5. But the wording of this joke has caused activation surrounding both duck-related concepts and bar-related concepts. Therefore activation on the lexical nection *bill* proceeds to both conceptual areas. You thus get both interpretations, resulting from two different integrations of the spoken input to your system.

Speech Recognition & Production in the Left Hemisphere

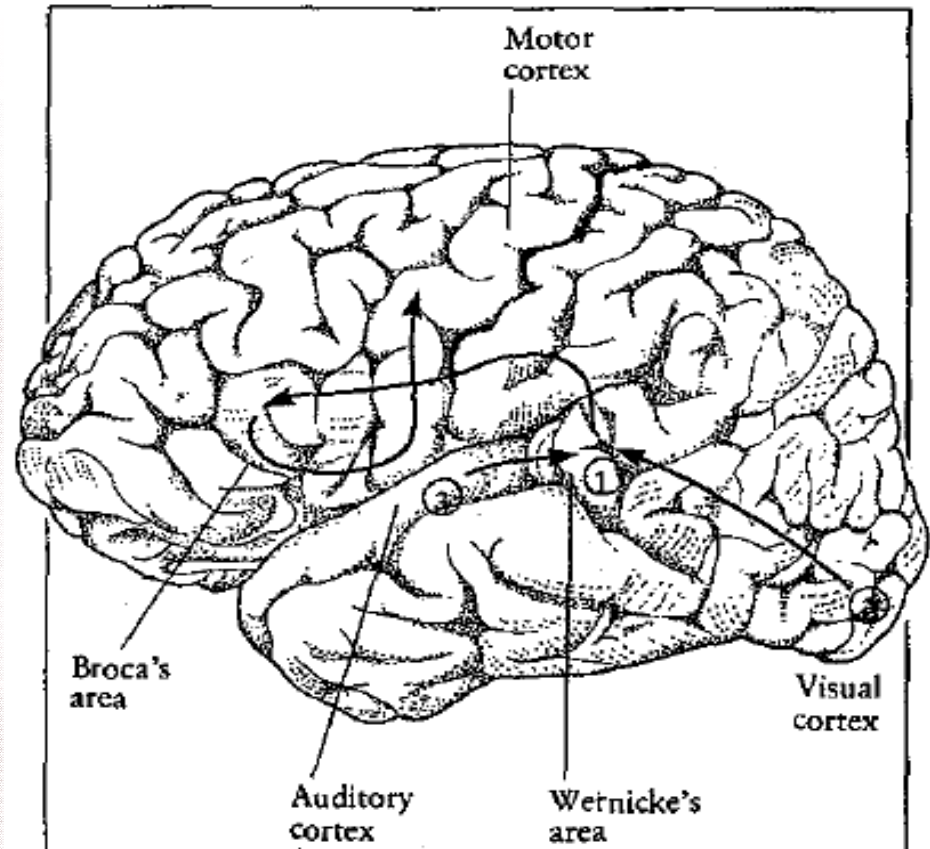


Source: Sydney Lamb "Words in the Brain: The Mental Lexicon" (2010)



Aphasia

- **Aphasia:** any language disorder that results from brain damage caused by disease or trauma
- Studies of aphasia have been very important for identifying the areas in the brain used specifically for language



- Broca's area and Wernicke's area are both language centers found in the left hemisphere

Broca's vs. Wernicke's areas

Source: Language and Your Brain
[INFOGRAPHIC] - Voxy Blog



Broca's area:

fig. 1

Associated with motor planning and speech production, Broca's area is believed to be responsible for lexical and phonological processing. Patients who suffer damage to this part of the brain — a disorder known as Broca's aphasia — have difficulty speaking but can still understand language.



Wernicke's area:

fig. 3

Considered the area of the brain critical for language comprehension, Wernicke's area is responsible for processing speech sounds. Patients with lesions to this part of the brain suffer speech comprehension problems and, although capable of producing sounds and word sequences at a normal rhythm, are unable to produce meaningful speech.



Motor Cortex:

fig. 2

The vocalization region of the motor cortex controls the mouth and lips, involved in the physical production of speech.



Auditory Cortex:

fig. 4

Receives signals from the auditory nerves in the inner ear, and transmits temporal and spatial frames of reference for the data it receives.



Broca's (Expressive) Aphasia

- **Broca's area** – the lower back part of the frontal lobe; it is primarily involved in *the encoding of speech*.
- Damage to Broca's area of the brain may result in *Expressive Aphasia*
- Labored speech. Individuals with **Expressive aphasia** frequently speak short, meaningful phrases that are produced with great effort. Expressive aphasia is thus characterized as a nonfluent aphasia. Affected people often omit small words such as "is", "and", and "the" (= the *agrammatism* syndrome).
 - **Agrammatism**: lacking articles, prepositions, pronouns, and auxiliary verbs as well as grammatical word endings such as past tense marker – *ed*

Broca's (Expressive) Aphasia

- Example of Broca's aphasia:

DOCTOR: Could you tell me what you have been doing in the hospital?

PATIENT: Yes, sure. Me go, er, uh, P.T. [physical therapy] none o'cot, speech ... two times ... read ... r ... ripe ... rike ... uh write ... practice ... get ... ting ... better.

DOCTOR: And have you been going home on weekends?

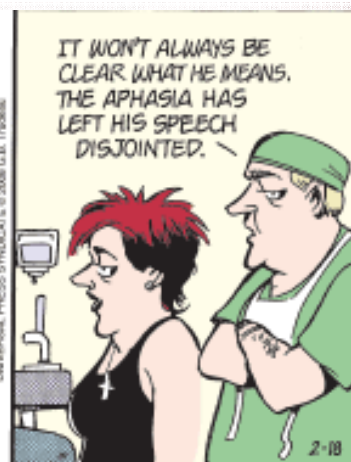
PATIENT: Why, yes ... Thursday uh ... uh ... uh ... no ... Friday ... Bar ... ba ... ra ... wife ... and oh car ... drive ... purpikie ... you know ... rest ... and TV.



Broca's Aphasia (1).mp4



Broca's Aphasia (2).mp4



Wernicke's (Receptive) Aphasia

- **Wernicke's area** – an area in the upper back part of the temporal lobe, extending upwards into the parietal lobe; it plays a major part in *the comprehension of speech*.
- Damage to Wernicke's area of the brain may result in *Receptive aphasia*
- Fluent but semantically incoherent speech. Individuals with **Receptive aphasia** may speak in long sentences that have no meaning, add unnecessary words, and even create new "words" (neologisms). For example, someone with Receptive aphasia may say, "You know that smoodle pinkered and that I want to get him round and take care of him like you want before", meaning "The dog needs to go out so I will take him for a walk" (= the *paragrammatism* syndrome). They have poor auditory and reading comprehension, and fluent, but nonsensical, oral and written expression.

Wernicke's (Receptive) Aphasia

- Examples of Wernicke's aphasia:

- Clinician: "Tell me where you live."
- Patient: "Well, it's a meender place and it has two ... two of them. For dreaming and pinding after supper. And up and down. Four of down and three of up ..." (Brookshire 2003:155)
- Clinician: "What's the weather like today?"
- Patient: "Fully under the jimjam and on the altigrabber." (Brookshire 2003:155)

APHASIA is
when your brain holds
your words hostage.



aphasia
NATIONAL
APHASIA
ASSOCIATION

I felt worse because I can no longer keep in mind from the mind of the minds to keep me from mind and up to the ear which can be to find among ourselves.

The only thing that I can say again is madder or modder fish sudden fishing sewed into the accident to miss in the purdles.



Wernicke's Aphasia.mpg

A Picture for Diagnosing Aphasia

- This is a diagnostic test picture shown to patients with aphasia.
- The patients' descriptions of the scene help diagnose the effects of lesions caused by wound, stroke, tumor, or infection.

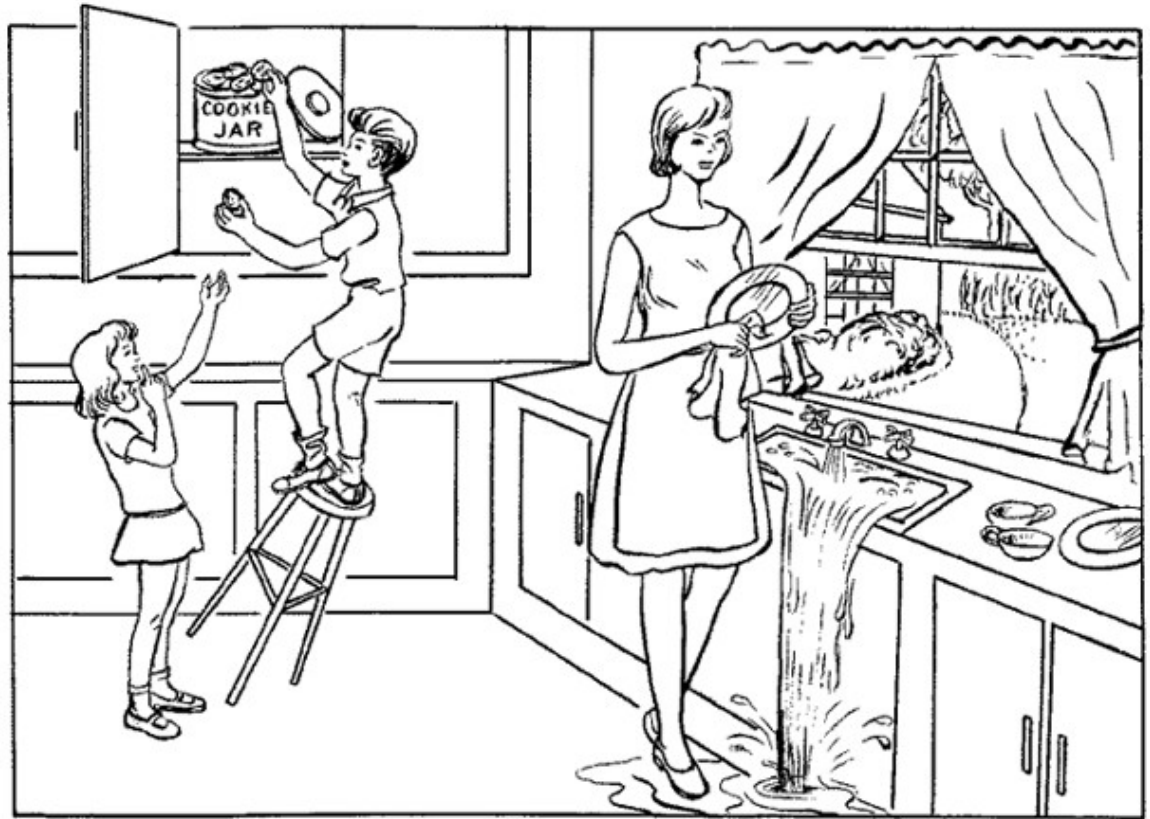


Diagram adapted from Goodglass & Kaplan (1972)

A Picture for Diagnosing Aphasia

Lesions in Broca's Area

- Patients can understand language, they can respond correctly to questions and requests, but their speech has no syntax.
- The patient B.L. is unable to describe the picture, but he can correctly express nouns in short answers to questions:

B.L.: Wife is dry dishes. Water down! Oh boy! Okay Awright. Okay ...
Cookie is down... fall, and girl, okay, girl... boy... um...

Examiner: What is the boy doing?

B.L.: Cookie is... um... catch

Examiner: Who is getting the cookies?

B.L.: Girl, girl

Examiner: Who is about to fall down?

B.L.: Boy... fall down!



A Picture for Diagnosing Aphasia

Lesions in Wernicke's Area

- Patients have difficulty understanding language, their speech is wrong, irrelevant, or nonsensical, but it has syntactic structure. Note almost no nouns, but many verbs and pronouns.
- The patient H.W. is trying to describe the same picture as B.L.:

H.W.: First of all this is falling down, just about, and is gonna fall down and they're both getting something to eat... but the trouble is this is gonna let go and they're both gonna fall down... but already then... I can't see well enough but I believe that either she or will have some food that's not good for you and she's to get some for her too...

Examiner: That's not real clear. What do you think she's doing?

H.W.: But, oh, I know. She's waiting for this!

Examiner: No, I meant right here with her hand, right where you can't figure out what she's doing with that hand.

H.W.: Oh, I think she's saying I want two or three, I want one, I think, I think so, and so, so she's gonna get this one for sure it's gonna fall down there or whatever, she's gonna get that one and, and there...

A Picture for Diagnosing Aphasia

Broca's Aphasia

Cookie jar...fall over...
chair...water....



Wernicke's Aphasia

Well this is...mother is away
here working her work out
o' here to get her better, but
when she's looking, the two
boys look in the other part.
One their small file into her
time here. She's working
another time because she's
getting to. So two boys work
together and one is sneakin'
around here, making his work
an' his further funnas his time
he had.

Aphasia

- The symptoms of Wernicke's and Broca's aphasia provide evidence for a **modular** organization of language in the brain

SYMPTOMS	BROCA'S	WERNICKE'S
Fluency	Impaired	Hyper-normal
Comprehension	Near-normal	Impaired
Naming	Impaired	Impaired
Expressive Grammar	Omission (agrammatism)	Substitution (paragrammatism)
Receptive Grammar	Impaired	Impaired
Lexical Profile	Omit > Substitute	Substitute > Omit
Word Types	Nouns > Verbs Content > Function Irregular > Regular	Verbs > Nouns Function > Content Regular > Irregular

- Grammar consists of distinct components or modules with different functions
- For example, aphasia patients frequently may substitute words with similar sounds or meanings
 - *pool* may be substituted for *tool*
 - *table* may be substituted for *chair*
- This tells us that neural connections exist between words that sound alike and words with similar meanings

Source: Elizabeth Bates "Cross-Linguistic Studies of Aphasia" (2002)

Aphasia

- Reading in English:

- An agrammatic aphasic could not read function words, even though he could read content words that sound the same
- *witch* is OK, *which* is not
- *hour* is OK, *our* is not
- *eye* is OK, *I* is not
- *wood* is OK, *would* is not

- Reading in Japanese:

- People with damage in their left hemisphere cannot read *kana*, a writing system based on the sound system of the language
- People with damage to their right hemisphere cannot read *kanji*, an ideographic writing system

Aphasia

BROCA'S APHASIA				WERNICKE'S APHASIA	
MEANING	KANA		KANJI		
	PATIENT'S	CORRECT	PATIENT'S	CORRECT	
INK	インス (KINSU)	インキ (INKI)	墨 (SUMI)	墨	参 参 微 久 (LONG TIME) 失 (SOLDIER) 失
UNIVERSITY	タイ (TAI)	ダイガク (DAIGAKU)	大学 (GREAT LEARNING)	大学	
TOKYO	トウ (TOU)	トウキョウ (TOKYO)	東京 (EAST CAPITAL)	東京	

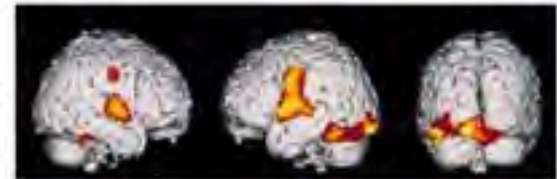
- Japanese aphasics display some characteristics rarely found in Western patients because of the unique writing system used in Japan. There are two separate forms of such writing. One is Kana, which is syllabic. The other is Kanji, which is ideographic. Kana words are articulated syllable by syllable and are not easily identified at a glance, whereas each Kanji character simultaneously represents both a sound and a meaning. A patient with Broca's aphasia, studied by Tsuneo Imura and his colleagues at the Nihon University College of Medicine, Was able to write a dictated word correctly in Kanji but not in Kana (top left). When the patient Was asked to write the word "ink," even though there is no Kanji character for the word, his first effort was the Kanji character "sumi," which means India ink. When required to write in Kana, the symbols he produced were correct but the word was wrong. Another patient who had Wernicke's aphasia wrote Kanji quickly and without hesitation. He was completely unaware that he was producing meaningless ideograms, as are patients who exhibit paraphasia in speech. Only two of the characters had meaning (top right).

Source: Norman Geschwind "Language and the Brain" (1972)

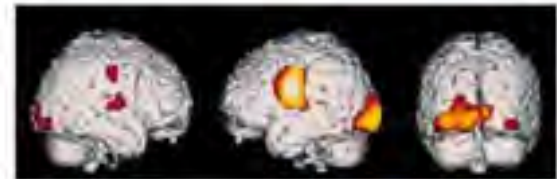
Japanese Reading Tests

- The right brain is activated more when reading Japanese *kanji* (ideographic) compared to the left brain when reading *kana* (syllabic).

Kanji



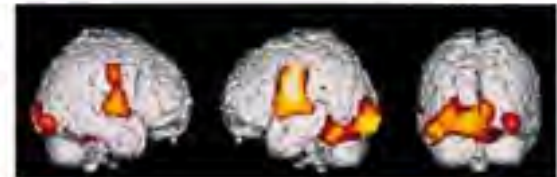
Kana



Kana
nonwd



Kanji &
Kana

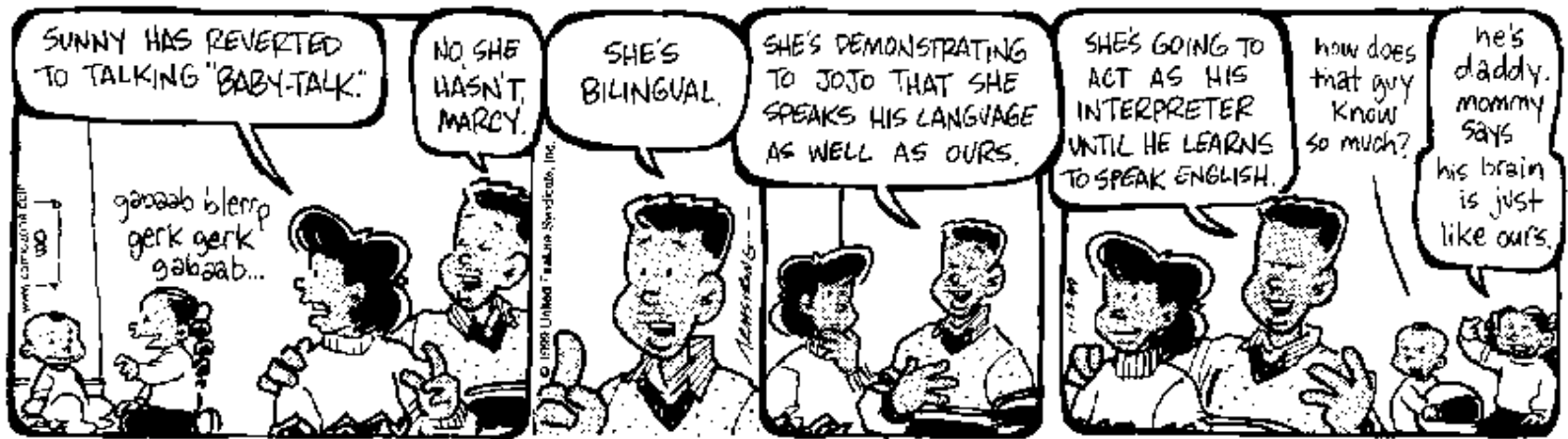


Word &
Nonwd



Young Children and Brain Plasticity

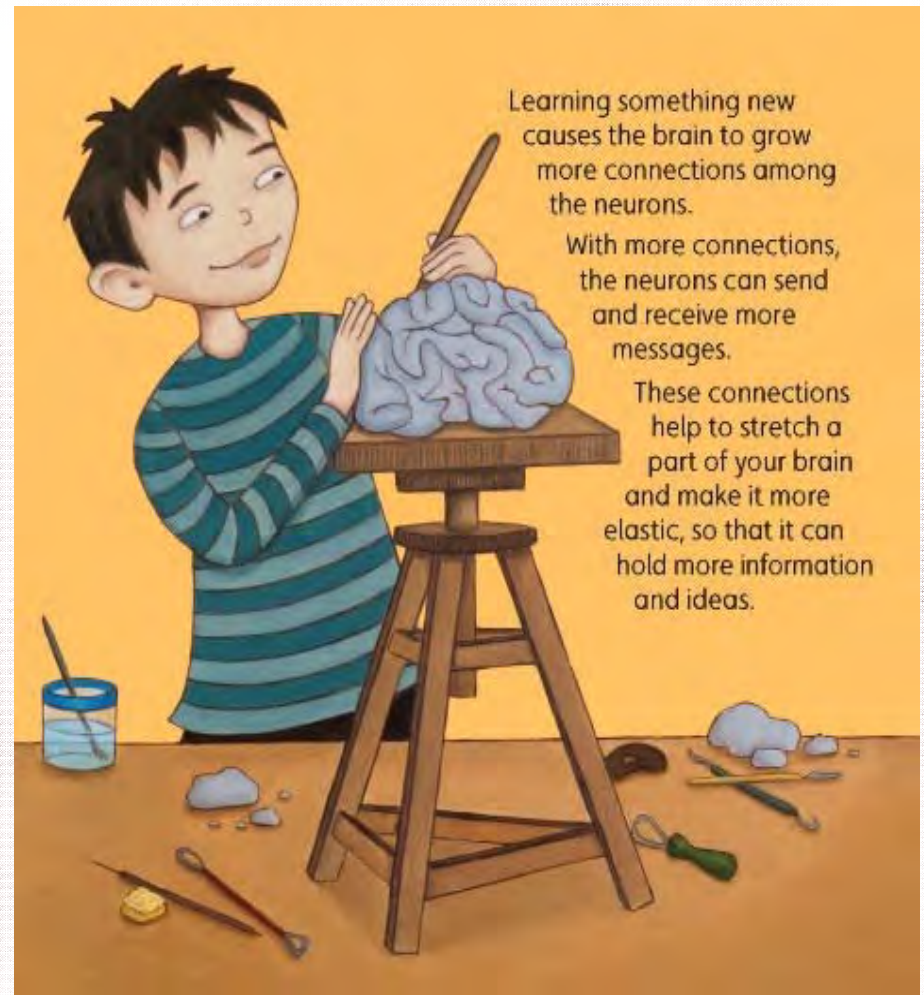
- Lateralization begins very early
 - Language appears more dominant in the left hemisphere even in infants



- However, while language is predisposed to be localized in the left hemisphere, children's brains display a remarkable amount of **plasticity**
 - If the left hemisphere of a child's brain is removed (in a **hemispherectomy**), the right hemisphere may take over the language duties

Brain Plasticity

- Plasticity of the brain decreases with age
- Adults undergoing surgery to remove the left hemisphere then suffer from severe language impairment
- The right hemisphere is also important for first language acquisition
 - Children with damage to the right hemisphere may experience problems with vocabulary
 - If the right hemisphere is removed before the age of two, language may never develop



The Critical Period

- The **critical-age hypothesis** assumes that the ability to learn a native language develops between birth and middle childhood (the **critical period**)
 - After this critical period, the acquisition of grammar is difficult, and is never fully achieved for most people
- The critical period for species-specific, biologically based behaviors seems to be present in other species as well
 - For example, during the period of 9 to 21 hours after hatching, ducklings will follow the first moving object they see
 - Some birdsongs must be acquired within a set period of time



The Critical Period: *Genie*

- There are several instances of children being deprived of linguistic exposure during the critical period for various reasons
 - Victor, Genie, Chelsea
- These children did not know any language when they were reintroduced to society
- They were able to learn words but were unable to fully acquire grammar

- Genie



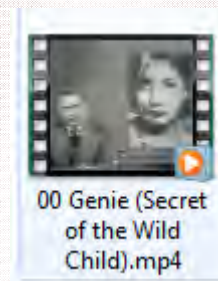
Secret of the Wild Child part 1.mp4



Secret of the Wild Child part 2.mp4



Secret of the Wild Child part 3.mp4



The Critical Period: *Genie*

Genie, a modern-day Wild Child

- 13 years old
- November 4, 1970 - Temple City, Los Angeles, California
- **Acute social deprivation**
- Clark Wiley and his wife Irene – 4 kids
- potty chair - "stopit" and "nomore."
- could not focus her eyes beyond 12 feet. She weighed 59 pounds and was 54 inches tall.
- Children's Hospital in Los Angeles, California
- "Did Genie have a normal learning capacity? Could a nurturing, enriched environment make up for Genie's horrible past? Would it be possible for Genie to recover completely?"
- attached to some of the scientists
- She was brilliant at nonverbal communication. -grab a pencil and paper
- remained unable to master the basics of language.
- no left brain activity!

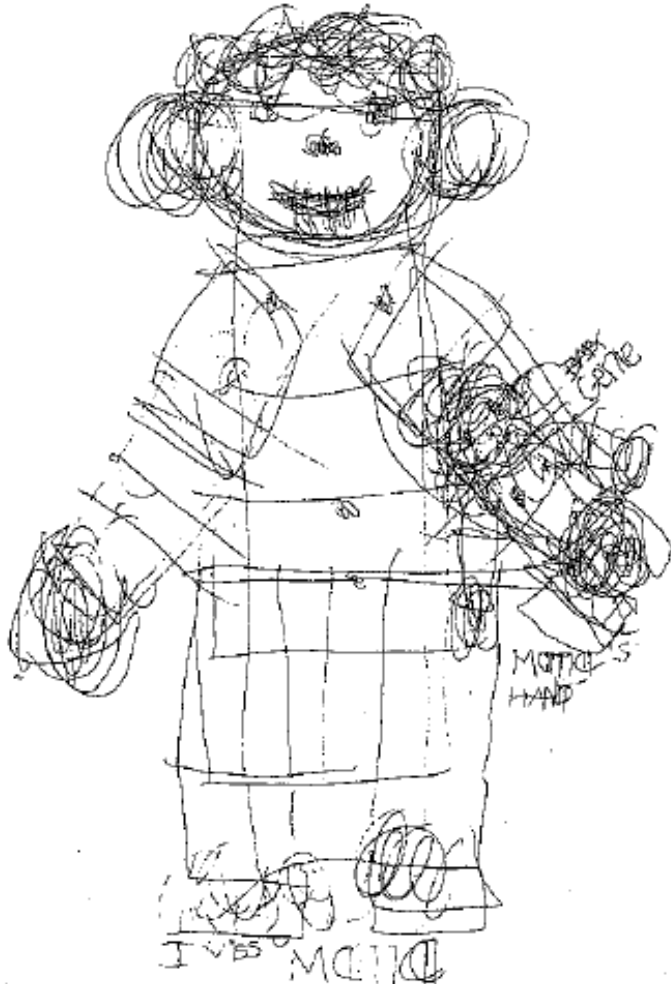


The Critical Period: *Genie*

- Genie was deprived of all but minimal human contact until she was 14 years old
- Genie was able to learn a large vocabulary
 - And was a very skilled nonverbal communicator
 - But, she lacked grammatical skills
 - She never acquired articles, auxiliary verbs, inflectional suffixes, question words, and was unable to create complex sentences and questions
- Dichotic listening and ERP experiments showed that Genie's language was lateralized to the *right* hemisphere
- It is hypothesized that the language centers in Genie's brain atrophied since she received no linguistic input during the critical period



The Critical Period: *Genie*



- This drawing is testimony to the importance and strength of the mother-child relationship for all human beings, and to Genie's need for a sense of her own history. Early in 1977, filled with loneliness and longing, Genie drew this picture. At first she drew only the picture of her mother and then labeled it "I miss Mama." She then suddenly began to draw more. The moment she finished she took my hand, placed it next to what she had just drawn, motioning me to write, and said "Baby Genie." Then she pointed under her drawing and said, "Mama hand." I dictated all the letters. Satisfied, she sat back and stared at the picture. There she was, a baby in her mother's arms. She had created her own reality.

The Critical Period

- Chelsea was born deaf but was wrongly diagnosed as intellectually disabled
- At age 31 she was finally diagnosed as deaf, was fitted with hearing aids, and began years of intense language training and therapy
- She also has acquired a large vocabulary
 - But, like Genie, she has not acquired grammar
 - And, like Genie, Chelsea's brain activity shows unusual lateralization of language; Chelsea's language ability is equally located in both hemispheres

Language and Brain Development

- Deaf children born to hearing parents also provide information about the critical-age hypothesis
 - Hearing parents often don't know sign language, and so their deaf babies may be exposed to language later on
 - Babies who are exposed to American Sign Language (ASL) up to age 6 are significantly more fluent than those not exposed until after age 12
- The cases of Genie and Chelsea and studies of late learners of ASL show that people cannot fully acquire a language unless they are exposed to it during the critical period

Linguistic Savants

- **Savants** are intellectually disabled people who have remarkable talents in certain areas
 - **Laura:** could produce complex sentences and could detect grammatical errors
 - **Christopher:** could not only produce language as complex as any other native speaker but could also translate fifteen to twenty languages into English
- The cases of Laura and Christopher provide strong evidence that linguistic ability is separate from general intelligence

The Human Mind at Work

- *Linguistics as a Window to Understanding the Brain (Steven Pinker)*



Source: https://www.youtube.com/watch?v=Q-B_ONJIEcE

Connecticut College

Spring 2015



LIN 110: Language & Mind
Prof. Petko Ivanov

Chapter 12

Frank and Ernest

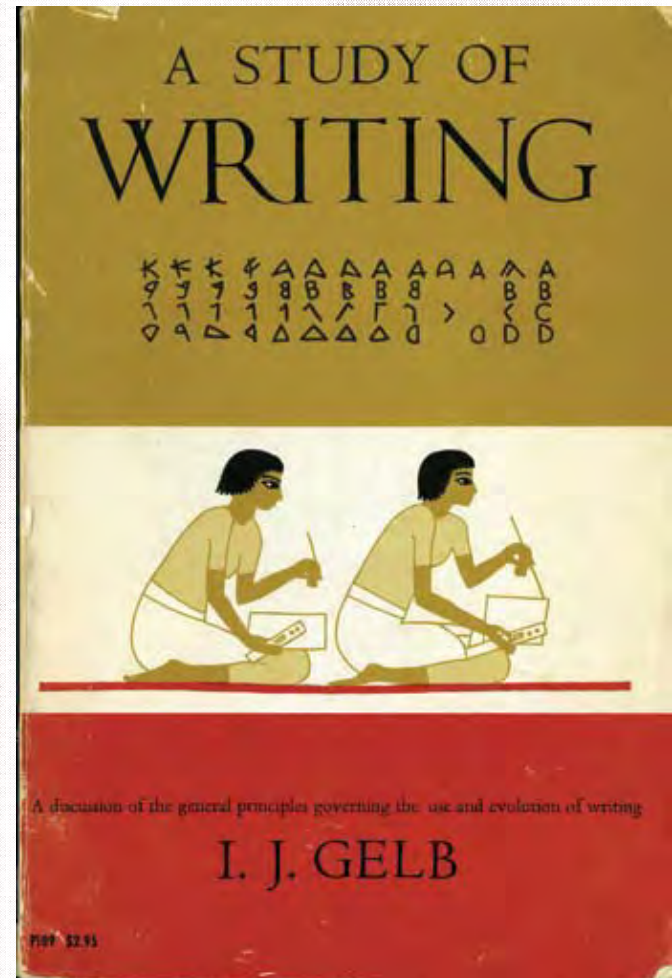


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Writing: The ABCs of Language

Writing: Making Language Visible

- **Writing is not a “natural” skill:** children acquire spoken or signed language without instruction, but literacy requires conscious effort and instruction
- Writing overcomes short-lived human memory and allows communication *across space and through time*
- **Oral lore vs. Written records:** Before the invention of writing, useful knowledge had to be memorized. Messengers carried information in their heads. Crucial lore passed from the older to the newer generation through speaking.
- **Legends vs. History:** Writing permits a society to permanently record its literature, its history and science, and its technology.



Writing: The First True Information Technology

- Writing is one of the most important inventions ever made by humans. By **putting spoken language into visible, material form**, people could for the first time **store information and transmit it across time and across space**. It meant that a person's words could be recorded and read by others — decades, or even centuries later. It meant that people could send letters, instructions, or treaties to other people thousands of kilometers away.
- Writing was the world's ***first true information technology***, and it was revolutionary. The very ubiquity of writing in our civilization has made it seem like a natural, unquestioned part of our cultural landscape. Yet it was not always this way. Although anatomically modern humans have existed for about one hundred thousand years, ***writing is a relatively recent invention*** — just over five thousand years old. How and why did writing first appear?

"The invention of writing and of a convenient system of records on paper has had a greater influence in uplifting the human race than any other intellectual achievement in the career of man. It was more important than all the battles ever fought and all the constitutions ever devised."

— J. H. Breasted,
The Conquest of Civilization (1926)

Source: Gil J. Stein's *Foreword* to "Visible Language: Inventions of Writing in the Ancient Middle East and Beyond," ed. Christopher Woods (2010)

Map of Important Places in the History of Writing

- One of the most important aspects of writing is the fact that it was *invented independently at least four times in different places* in the Old World and Americas — in Mesopotamia, Egypt, China, and Mesoamerica.



Source: Gil J. Stein's *Foreword* to "Visible Language: Inventions of Writing in the Ancient Middle East and Beyond," ed. Christopher Woods (2010)

Writing & Institutional Memory

- The specifics of writing varied from place to place, just as did the apparent *motivation to invent writing*.
 - It is clear that in Mesopotamia, and perhaps to a lesser degree in Egypt, **writing only came into existence with the emergence of *state societies*** or civilizations.
 - The earliest written texts from Mesopotamia, from the site of Uruk, are **economic records**, indicating that the early state needed to keep records of the people who worked for it, the food rations it disbursed, and the taxes it collected.
- *Writing allowed the bureaucracy to have an institutional memory* that extended beyond the lifetime of any single priest or scribe. Writing continues to fill those exact same needs of the state, five thousand years later.

Source: Gil J. Stein's *Foreword* to "Visible Language: Inventions of Writing in the Ancient Middle East and Beyond," ed. Christopher Woods (2010)

Writing as Inventory

- *How many sheep .. ?*
- The earliest writing seems to have been to keep a record of property - how many animals you had, how much land or how many measures of grain your neighbours owed you.
- 'Counting tokens' made of clay were used for this purpose to trade around 6,000 years ago.
- For example, a token with a shape of a coin and with a cross carved on it indicated a sheep; a coneshaped token meant a measure of corn, an eggshaped indicated a flask of oil, etc. For 20 sheep, people needed to use 20 sheep tokens.



- Later, these tokens became smaller, more like today's coins, and they had a symbol on them to show which animal or item they represented. Number systems developed so that a single coin could represent 10 or 20 of that object.

Writing, Literacy, Religion

- Once it was thought that writing, regardless of where it was invented, was **related to the bureaucratic needs of the newly emerged complex states**. The most current scholarship presents a more nuanced view.
 - For example, the earliest writing in Egypt, although related to state concerns, seems to be more about **ceremonial display**, while writing in China is first attested in divination rituals, and the hieroglyphic writing of Mesoamerica was motivated by **religious beliefs**.
- In much of today's world, ***literacy*** — the ability to use the marvelous invention of writing — is largely taken for granted. Yet in the earliest states, we estimate that **literacy was limited to less than 1 percent of the population** so that it was rare for even kings to know how to read and write. In this context, it is hardly surprising that the earliest writing and the written word itself would have seemed mysterious, powerful, and even inspired by the gods.

Source: Gil J. Stein's *Foreword* to "Visible Language: Inventions of Writing in the Ancient Middle East and Beyond," ed. Christopher Woods (2010)

The “Finger of God”: Religions of the Scripture

- The “**finger of God**” is a biblical phrase, mostly used for the means by which words were said to have been written onto stone tablets that later were brought down the Biblical Mount Sinai by Moses, commonly referred to as the Ten Commandments.
- **Abrahamic religions** are impossible without writing = sacred scriptures, expressed in sacred scripts
- The largest Abrahamic religions in chronological order of founding are Judaism (1st millennium BCE), Christianity (1st century CE), and Islam (7th century CE)
- As of the early 21st century, it was estimated that 54% of the world's population (3.8 billion people) considered themselves adherents of the Abrahamic religions, about 30% of

other religions, and 16% of no organized religion.



The religious “contract” ▲

Source: Wikipedia

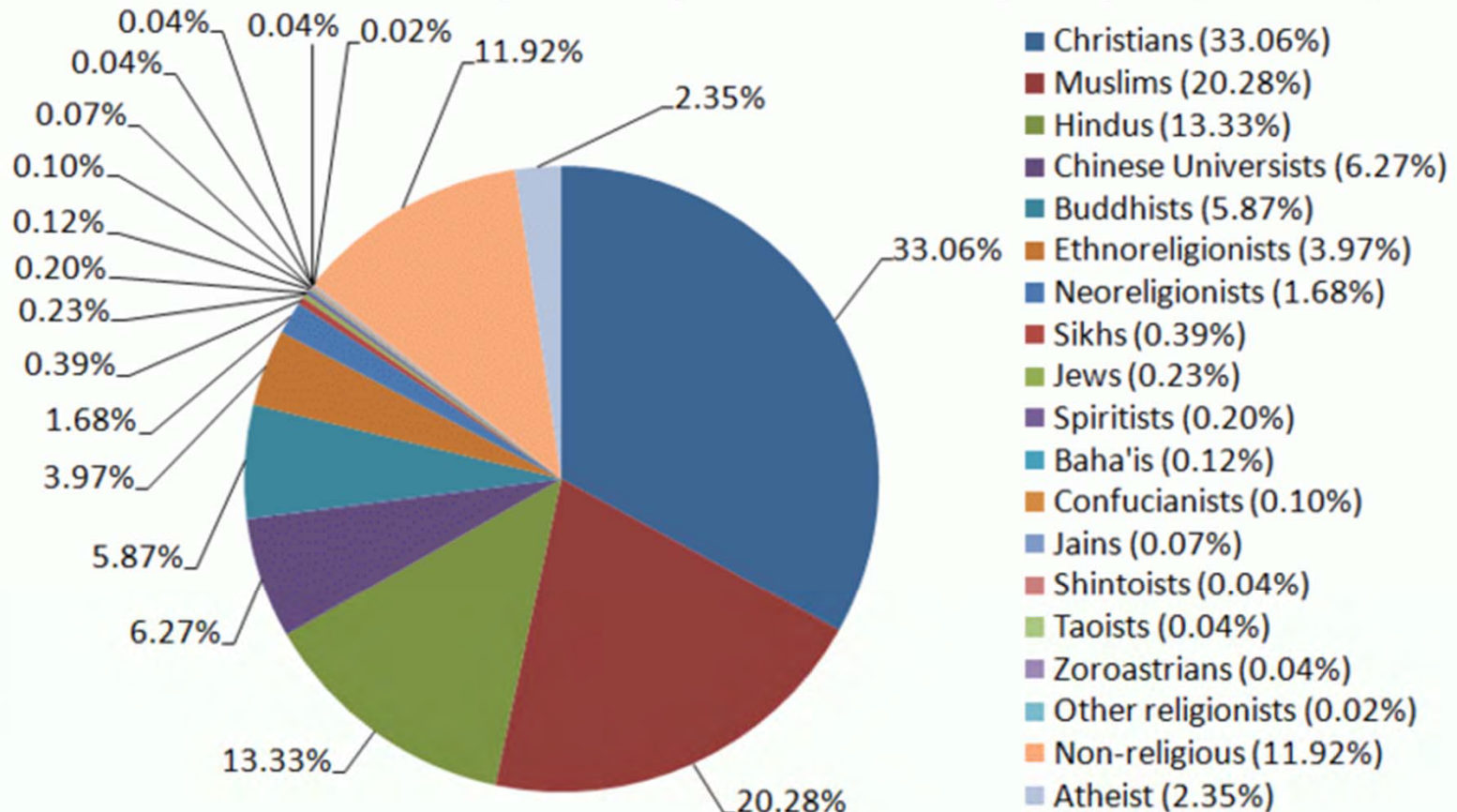
The “Finger of God“: Religions of the Scripture



Top to bottom: Jewish Star of David, Christian cross, and Islamic star and crescent

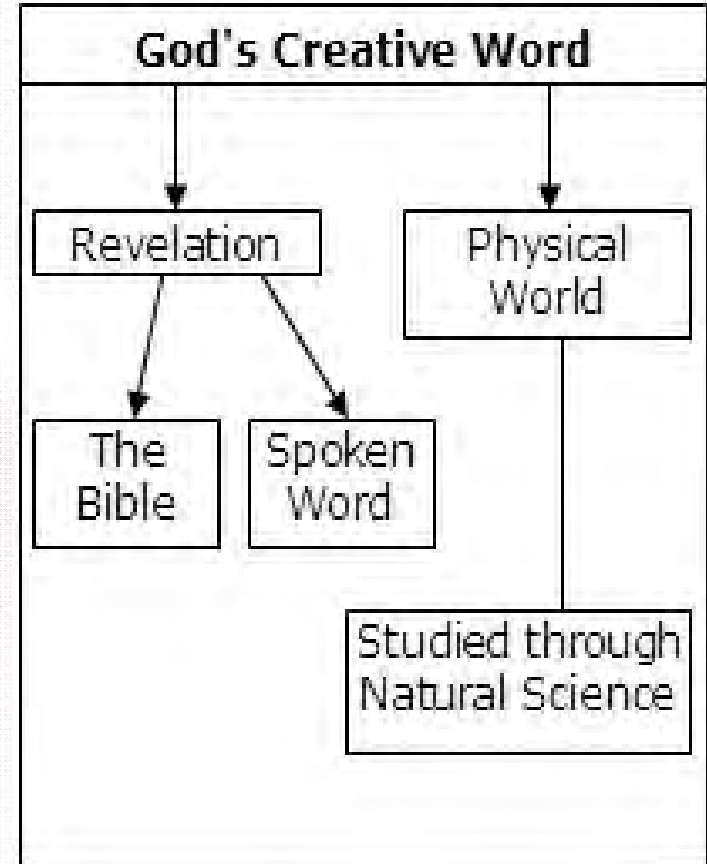
Religions of the Scripture

Worldwide percentage of Adherents by Religion (mid 2005)



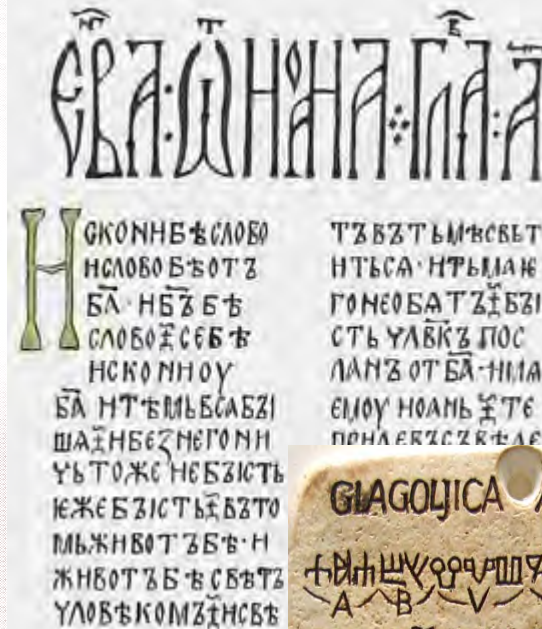
Sacred Languages / Scripts

- Once a language becomes associated with religious worship, its believers may ascribe virtues to the language of worship that they would not give to their native tongues. In the case of sacred texts, there is a fear of losing authenticity and accuracy by a translation or re-translation, and difficulties in achieving acceptance for a new version of a text. A sacred language is typically vested with a solemnity and dignity that the vernacular lacks. Consequently, the training of clergy in the use of a sacred language becomes an important cultural investment, and their use of the tongue is perceived to give them access to a body of knowledge that untrained lay people cannot (or should not) access. In medieval Europe, the (real or putative) ability to read (see also benefit of clergy) scripture—which was in Latin—was considered a prerogative of the priesthood, and a benchmark of literacy; until near the end of the period almost all who could read and write could do so in Latin. Because sacred languages are ascribed with virtues that the vernacular is not perceived to have, the sacred languages typically preserve characteristics that would have been lost in the course of language development. In some cases, the sacred language is a dead language.



Sacred Languages / Scripts

- In other cases, the sacred language may simply reflect archaic forms of a living language. For instance, 17th-century elements of the English language remain current in Protestant Christian worship through the use of the *King James Bible* or older versions of the Anglican *Book of Common Prayer*. In more extreme cases, the language has changed so much from the language of the sacred texts that the liturgy is no longer comprehensible without special training. In some instances, the sacred language may not even be (or have been) native to a local population, that is, missionaries or pilgrims may carry the sacred language to peoples who never spoke it, and to whom it is an altogether alien language.
- Old Church Slavonic:
Glagolitic ► & Cyrillic ▲



Writing = History

- It is an often-quoted sentiment that **speech is to being human, what writing is to civilization**, or, in the words of the anthropologist Jack Goody, “Cognitively as well as sociologically, writing underpins ‘civilization,’ the culture of cities.” While many of us would quibble with the grandness of this claim and its implications for non-literate societies, it would be difficult to dismiss the contention that *writing — the boundary between history and prehistory* — transformed civilization more than any other invention. Books, letters, records, computers — all the ways in which we record ideas, facts, opinions, and sentiments — are inconceivable without writing.
- **Speech is temporally fleeting and spatially anchored.** Writing frees speech of these constraints, giving it permanence and allowing it to be transmitted over space far beyond the place of discourse. Writing also enhances capacity, enabling the recording of information well beyond the capabilities of human memory.

Source: Christopher Woods “Visible Language: Inventions of Writing in the Ancient Middle East and Beyond” (2010)

Invention of Writing: Legends

- *Mesopotamian accounts of the invention of writing*
- The oldest and most explicit Mesopotamian account of the origins of writing comes from the Sumerian story Enmerkar and the Lord of Aratta, one of a cycle of narrative poems that involve the rivalry between the southern Mesopotamian city-state of Uruk and the faraway, fabled city of Aratta, considered to lie across seven mountain ranges on the Iranian plateau. The story is known primarily from early Old Babylonian sources (ca. 2000–1750 BC), but it was likely first compiled in the preceding Third Dynasty of Ur (conventionally referred to as the Ur III period, ca. 2100–2000 BC), based on older oral traditions.

“(Enmerkar’s) speech was very grand; its meaning very profound. But the messenger’s mouth was too heavy, and he could not repeat the message. Because the messenger’s mouth was too heavy, and he could not repeat it, the Lord of Kulab (that is, Enmerkar) patted some clay and put the words on it as on a tablet. Before that day, words put on clay had never existed. But now, when the sun rose on that very day – so it was! The Lord of Kulab had put words as on a tablet – so it was!”

Enmerkar and the Lord of Aratta, lines 500–06
(after Vanstiphout 2003, p. 85)

Source: Christopher Woods “The Earliest Mesopotamian Writing” (2010)

What Is Writing?

- **What is writing?** It is a question that is more difficult than first appearances suggest.
- Broadly defined, **writing represents speech**. One must be able to recover the spoken word, unambiguously, from a system of visible marks in order for those marks to be considered writing. As defined in a recent survey of the world's writing systems, writing is “a system of more or less permanent marks used to represent an utterance in such a way that it can be recovered more or less exactly without the intervention of the utterer” (Daniels 1996). **The bond to the spoken word is prerequisite to any definition of writing.**
- Those systems that meet this criterion, and so represent true writing, are labeled *glottographic*, while systems of communication that represent ideas only, without that essential bond to speech and so do not meet our definition of writing — for example, musical and mathematical notation, international road signs and the like — are labeled *semasiographic* (Sampson 1985).

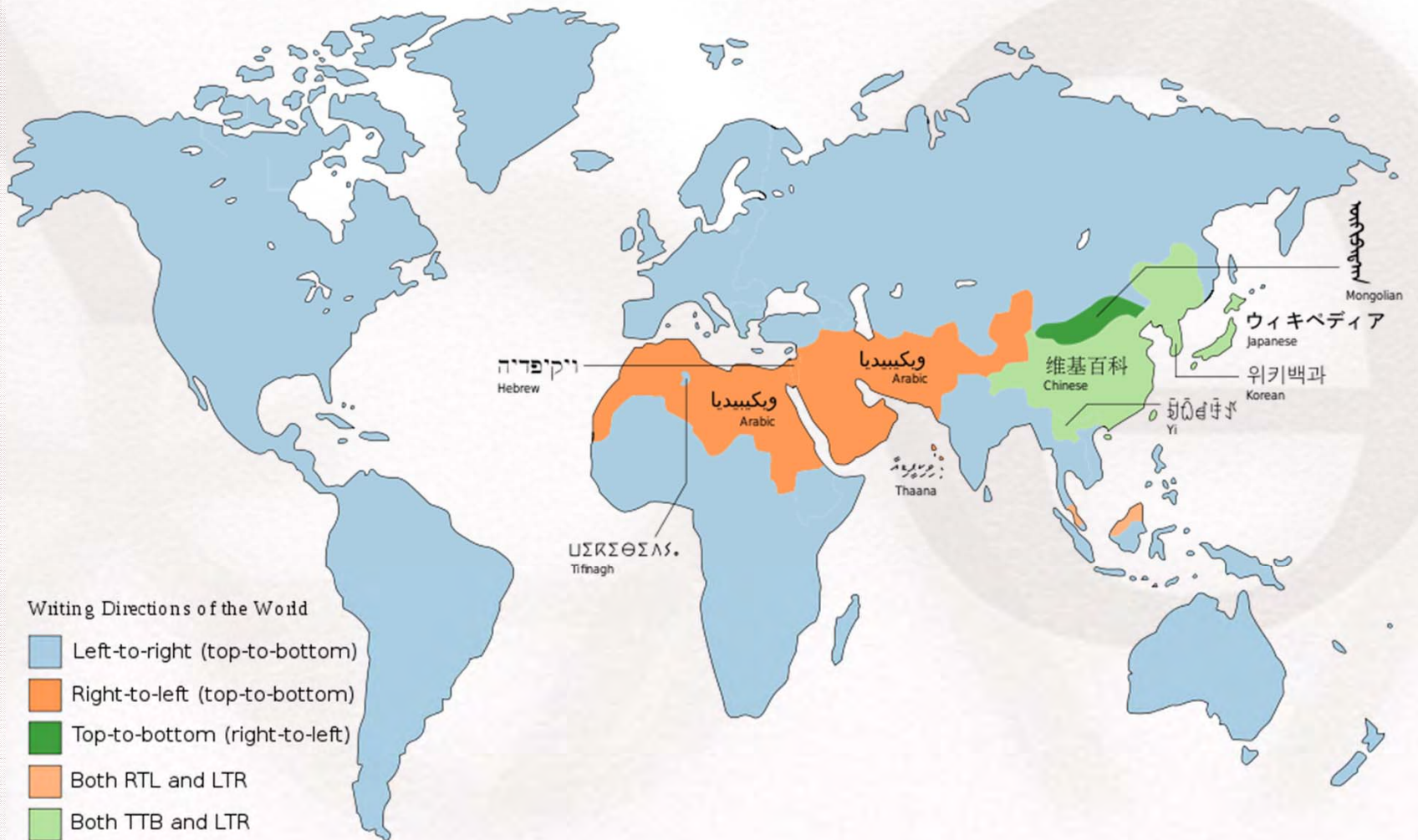
Source: Christopher Woods “Visible Language: Inventions of Writing in the Ancient Middle East and Beyond” (2010)

Writing as a System of Signs

- *Arrangement of symbols*
- All writing has an underlying **linear organization**: that is, symbols follow each other in some sort of predictable order. English is written in horizontal lines of symbols from left to right with the lines ordered from top to bottom. We are so accustomed to this arrangement that we may think that it is universal. There are several other arrangements, though. Hebrew and Arabic are written in horizontal lines from right to left. Chinese was traditionally written vertically in columns starting at the upper right. Mongolian is written vertically in columns starting at the upper left.

Source: Henry Rogers "Writing Systems: A Linguistic Approach" (2005)

Writing Directions



Linear Sequence of Signs

- Even though all writing systems have an overall linear organization, we often encounter **non-linear elements** in writing. In Arabic, for example, writing is written in horizontal lines from right to left; however, this description applies only to consonants and long vowels. Short vowels are normally not written in Arabic; if they are written, they are written as symbols above or below the phonologically preceding consonant.

Table 2.1 Non-linear elements of Arabic writing; the example is /malik/ 'king'. Consonant division is shown on the left. On the right, the short vowels are written as diacritics: <a> above, and <i> below the consonants

<mlk>	م ل ك	<malik>	م ل ك
	k l m		k l m
			a
			i

In the Arabic example in table 2.1, the writing on the left shows the word /malik/ 'king' written without vowels. Vertical lines are used here to divide the consonants from each other. The writing is right-to-left. In the example on the right, the short vowels are indicated: <a> by an angled line above the <m>, and <i> by an angled line below the <l>.

Source: Henry Rogers “Writing Systems: A Linguistic Approach” (2005)

Graphemes and Allographs

- We define **grapheme** as a **contrastive unit in a writing system**, parallel to phoneme or morpheme. For example, there is a grapheme in English which contrasts with other graphemes such as <p t a l r x>. The collection of graphemes for segmental units in English, i.e., for consonants and vowels, is traditionally known as the English alphabet. Non-segmental graphemes for punctuation, numbers, wordspace, etc. are not usually considered part of an alphabet. Linguists have emphasized that the crucial nature of a phoneme lies in the fact that it is different from the other phonemes. In the same way, each grapheme in a language is different from the others; each grapheme contrasts with the other graphemes. For example, the graphemic unit in Chinese is the character; each Chinese character contrasts with the other characters just as the letters of an alphabet contrast with each other.

Source: Henry Rogers “Writing Systems: A Linguistic Approach” (2005)

Graphemes and Allographs

- Phonemes are classes of allophones, which are non-contrastive variants occurring in complementary distribution or in free variation. In much the same fashion, graphemes are classes of allographs.



Allographic variation in Roman handwriting

- A grapheme often has a good deal of allographic variation related to style of handwriting or printing. We can often speak of classes of allographs. For example, we can distinguish cursive and printed letters as classes of allographs. We also distinguish upper-case and lower-case letters. In printed English, we distinguish different typefaces, such as Palatino, Times, Helvetica, etc., as well as certain style variations such as roman, italic, and bold.

Source: Henry Rogers "Writing Systems: A Linguistic Approach" (2005)

Graphemes and Allographs

- Allographic variation in Roman handwriting



Varieties of Written Signs

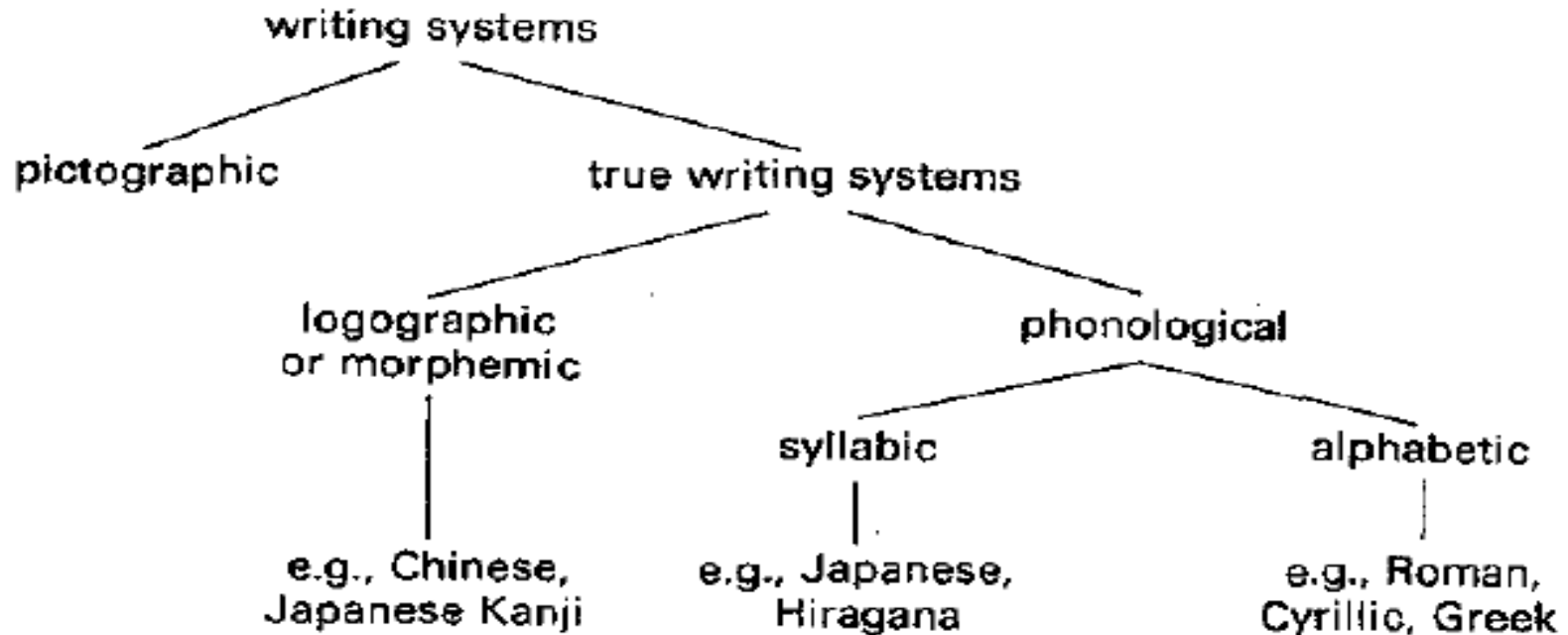
	<i>Written Sign</i>	<i>System of Signs</i>
Single Sound (phoneme)	Letter or Alphabetic Sign	Alphabet or Alphabetic Writing.
Syllable	Syllabogram or Syllabic Sign	Syllabary or Syllabic Writing.
Word	Logogram or Word Sign	Logography or Word Writing.
[Phrase	Phraseogram or Phrase Sign	Phraseography or Phrase Writing]
[Prosodic Feature	Prosodic Sign or Mark	Prosodic Writing]

FIG. 2. WAYS OF WRITING LINGUISTIC ELEMENTS

Source: I.J. Gelb "A Study of Writing" (2nd ed., 1963)

Writing Systems: An Overview

The main possibilities for writing systems are therefore:



Source: Michael Stubbs “Language and Literacy: The Sociolinguistics of Reading and Writing” (1980)

Writing Systems: Stages

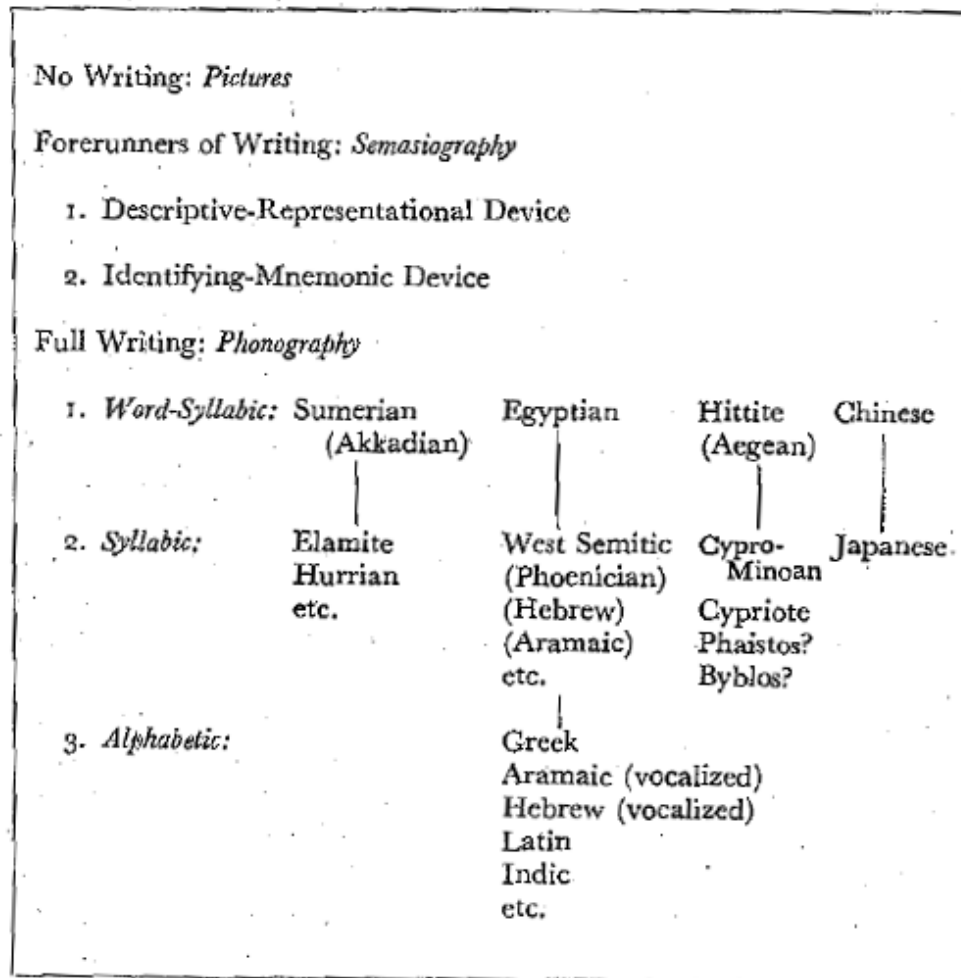
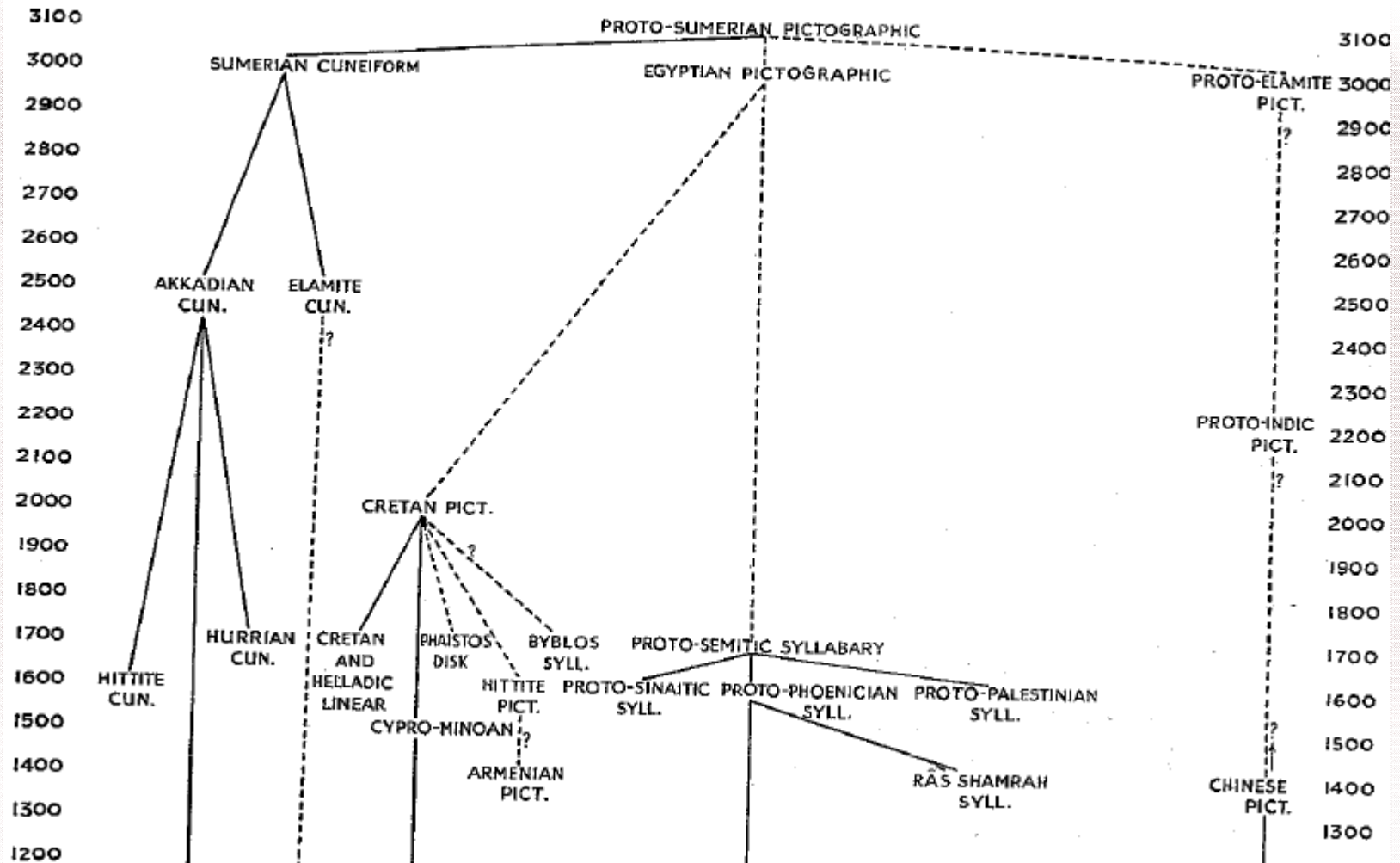


FIG. 95.—STAGES OF THE DEVELOPMENT OF WRITING

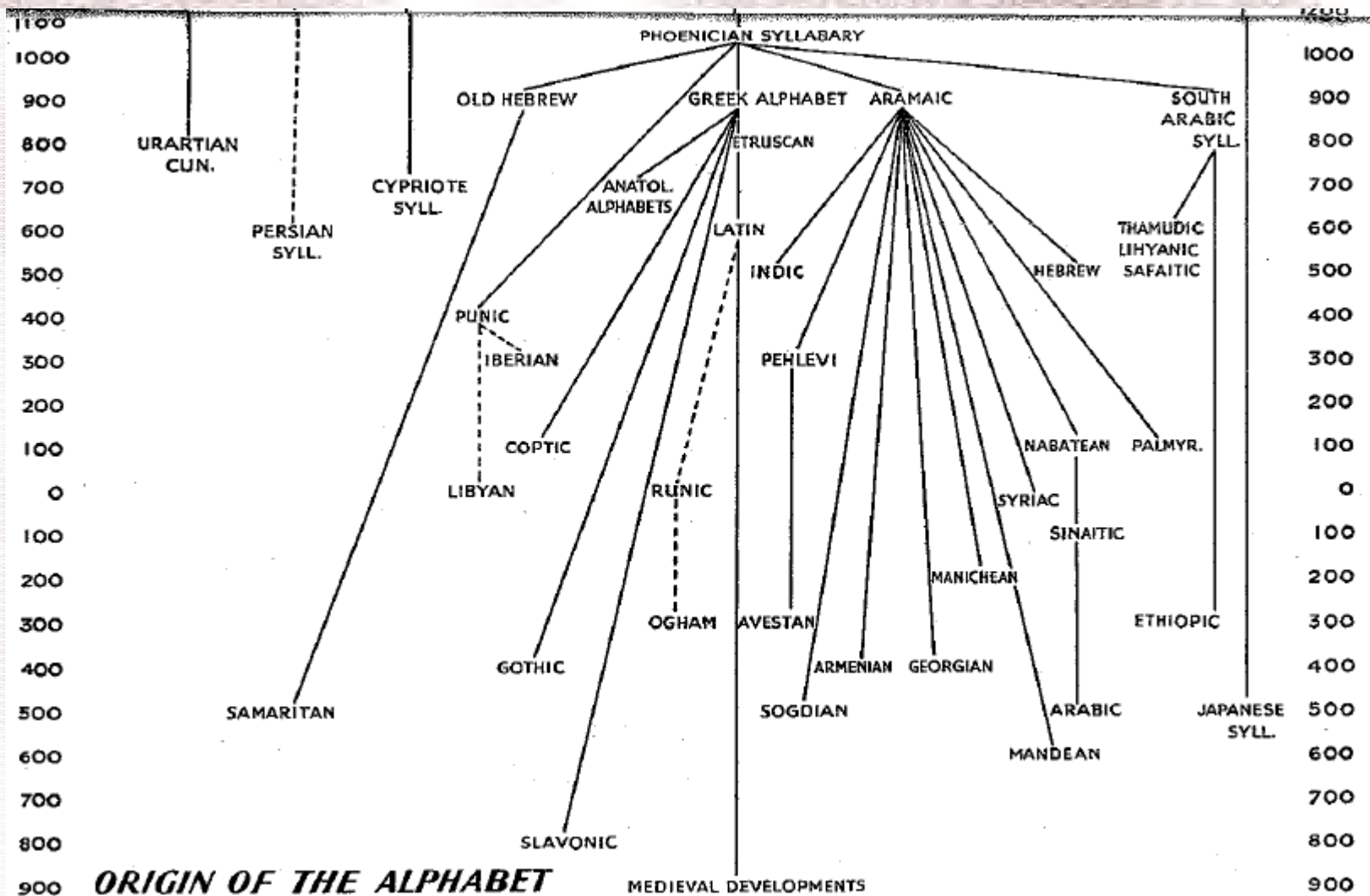
In a true writing system, the symbols represent linguistic units: these may be words or morphemes, or they may be phonological units, such as syllables or phonemes. The writing system relates these symbols to units of language, not to concepts or ideas. A pictographic system is not therefore a true writing system in this definition, since here the symbols do relate to ideas, and then only imprecisely. Therefore, given a sequence of pictograms, there are various ways to interpret them. But given a series of symbols in a true writing system, and in a particular language, there is only one possible reading. For example, given the orthographic sequence, *The man hit the woman* (1), it would not be a correct reading to say, 'The chap bashed the lady' (2), since there is a strict determinism between the sets of orthographic symbols and some level of units in the language, in this case words.

Source: I.J. Gelb "A Study of Writing" (2nd ed., 1963)

Writing Systems: Historical Chronology



Writing Systems: Historical Chronology



Forerunners of Writing:

Semasiography

- An often-cited example of *semasiography* is the so-called Cheyenne letter. This 19th century pictographic letter was posted by a Cheyenne father named Turtle-Following-His-Wife to his son, Little-Man, both of whom are represented by icons above the drawings of the respective figures. The letter contains a request from the father for his son to return home. The essence of this message — “Come to me” — is indicated by the “speech lines” emanating from the father’s mouth and by two lines drawn from the small figure at the right shoulder of Little Man in the direction of his father. The fifty-three small circles between the two figures represent fifty-three dollars, which the father is sending Little-Man to cover expenses in connection with the trip.

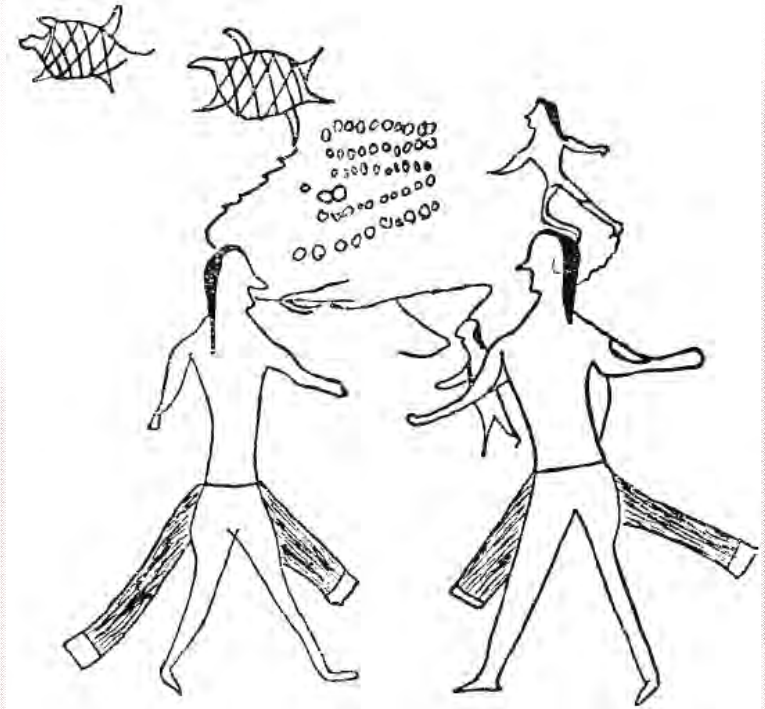


FIGURE 2. A Cheyenne semasiographic letter

- The message is quite detailed and specific, but, since it represents ideas rather than speech directly, it is not writing — the message could be rendered in speech in various ways without affecting its essential meaning. In order for the letter to be intelligible, the father and the son presumably would have had a prior understanding of the symbols and their arrangement.

Source: Christopher Woods “Visible Language: Inventions of Writing in the Ancient Middle East and Beyond” (2010)

Forerunners of Writing:

Semasiography

- Another example of this kind is the proclamation issued by the governor of Van Diemen's Land (Tasmania) to the natives illustrating 'retributive justice for the edification of parrots, 'possums, and Black fellows.' The first register shows the state of peace in which both white and native men should live. The second confirms the peace concluded between the official parties. The third register states that if a native kills a white man, the former will be punished by hanging; finally, the fourth sets the same punishment for a white man who kills a native.

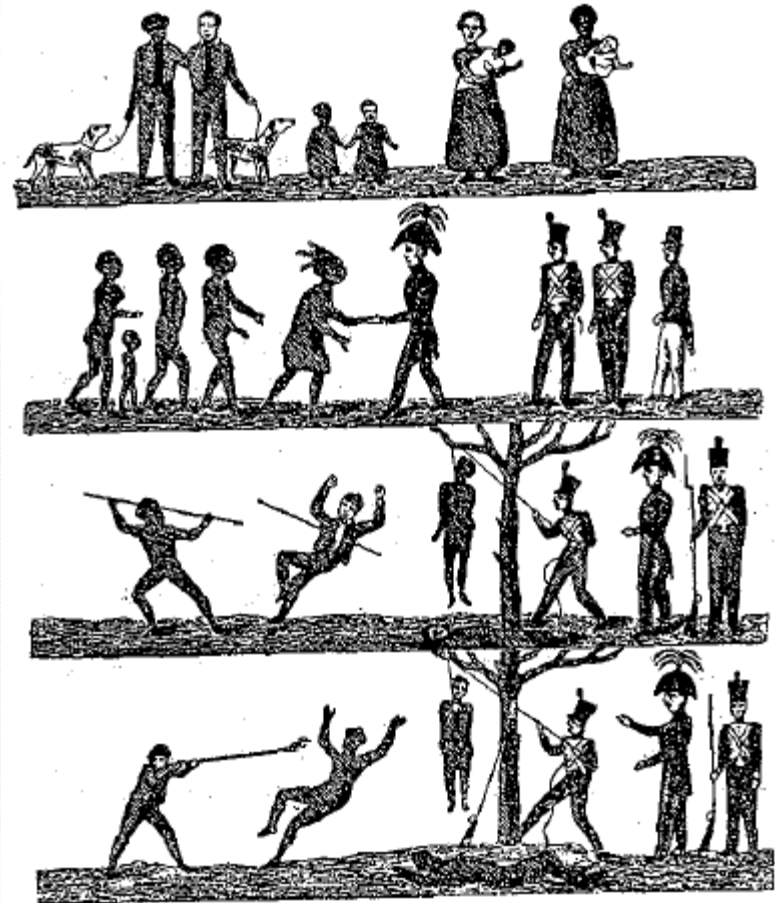
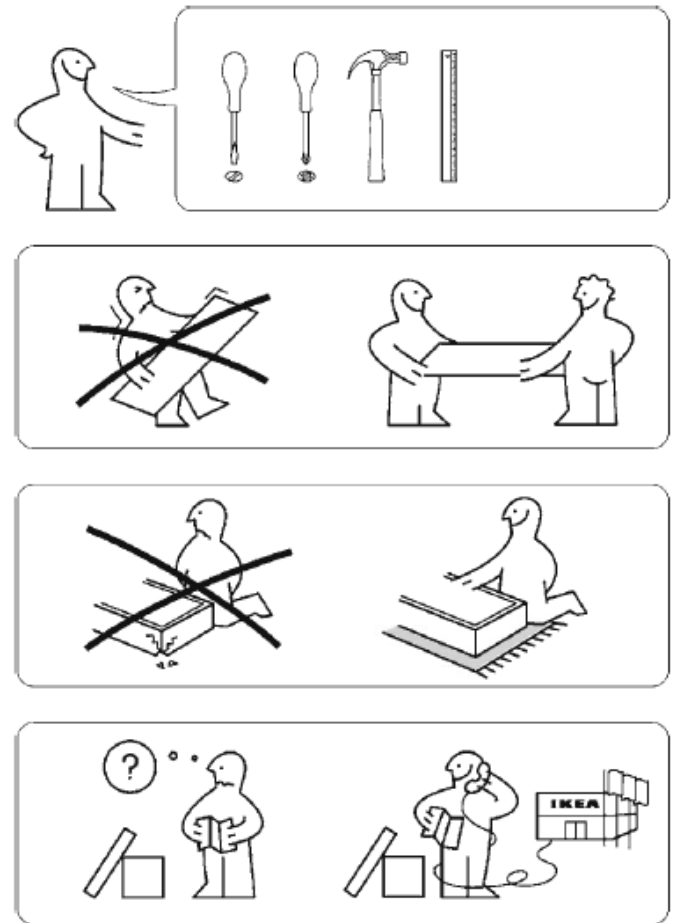


FIG. 12.—PROCLAMATION FROM VAN DIEMEN'S LAND
(TASMANIA)

Source: I.J. Gelb "A Study of Writing" (1963)

IKEA Semasiography

- Far from representing an outdated, primitive form of communication, **semasiography** is being increasingly used in this era of globalization and mass media, in which it is necessary to communicate with speakers of various languages (Sampson 1985, pp. 31–32). Typically, these messages appear in limited and well-established contexts, but nevertheless may be quite sophisticated: A well-known example is unpacking and assembly Instructions of the type given in figure 3 — with the Exception of the word “Ikea” in the fourth case, the entirety of this relatively complex message is communicated pictographically (however, the question mark, while not representing speech, is more accurately described as an ideogram — representing the “idea” of a question).



Source: Christopher Woods “Visible Language: Inventions of Writing in the Ancient Middle East and Beyond” (2010)

The History of Writing: Pictograms

- **Petroglyphs:** cave art that may be aesthetic expressions rather than pictorial communications
- **Pictograms:** “picture writings” used for communication that are direct images of the objects represented
 - The relationship between the picture and the message is not arbitrary, so pictograms are used today for international signs

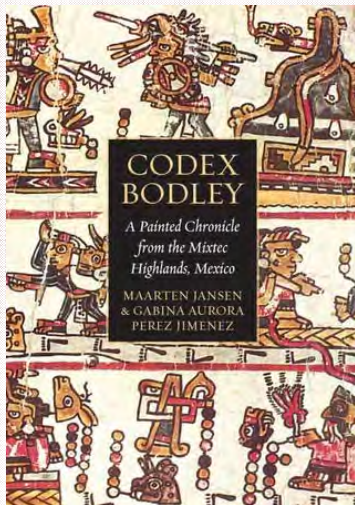


FIGURE 12.1 | Six of seventy-seven symbols developed by the National Park Service for use as signs indicating activities and facilities in parks and recreation areas. These symbols denote, from left to right: ‘environmental study area,’ ‘grocery store,’ ‘men’s restroom,’ ‘women’s restroom,’ ‘fishing,’ and ‘amphitheater.’ Certain symbols are available with a prohibiting slash—a diagonal red bar across the symbol that means that the activity is forbidden.

National Park Service, U.S. Department of the Interior

Mixtec Pictogram

**Codex Bodley:
A Painted
Chronicle from
the Mixtec
Highlands,
Mexico**



The History of Writing: Ideograms

- **Ideograms:** pictograms whose meanings have been extended to represent attributes of the object represented, or concepts associated with it
 - For example, a picture of a sun could begin to represent warmth, heat, light, daytime, etc.


Modern Ideograms



The History of Writing: Ideograms

u	‘eye’	pictogram
>	‘see, vision’	formed by semantic extension
>	‘I’	formed by phonetic extension

‘see’  differentiated by the arrow, indicating a verb

‘I’  compounded with a drawing of a person

The original pictogram for ‘eye’ is extended semantically and phonetically to serve as the symbol for other words. The last two symbols show how new symbols could be formed so as to reduce ambiguity.

Source: Kirsten Malmkjær, ed. “The Routledge Linguistics Encyclopedia” (2010)

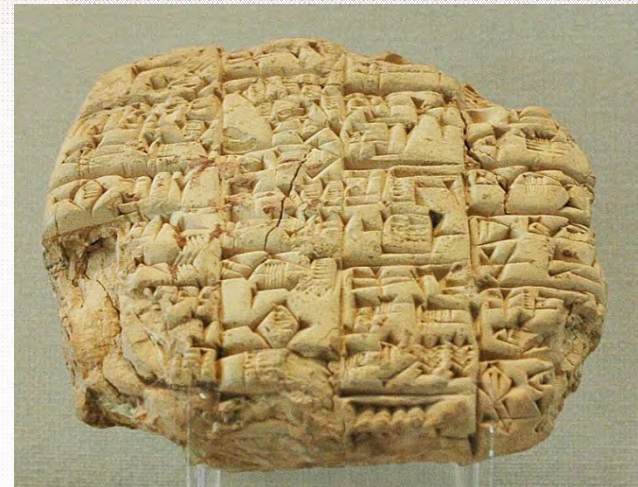
The History of Writing: Cuneiform Writing

Archaic cuneiform

- In the mid-3rd millennium B.C.E. a new wedge-tipped stylus was used which was pushed into the clay, producing wedge-shaped ("cuneiform") signs; these two developments made writing quicker and easier. By adjusting the relative position of the tablet to the stylus, the writer could use a single tool to make a variety of impressions.
- Cuneiform tablets could be fired in kilns to provide a permanent record, or they could be recycled if

permanence was not needed. Many of the clay tablets found by archaeologists were preserved because they were fired when attacking armies burned the building in which they were kept.

Letter sent by the high-priest Lu'enna to the king of Lagash (maybe Urukagina), informing him of his son's death in combat, c. 2400 B.C.E., found in Telloh (ancient Girsu).



The History of Writing: Cuneiform Writing

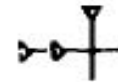
- **Cuneiform** writing was done by pressing a wedge-shaped stylus into clay tablets
- The **Sumerians** developed the oldest known writing system, which began as a complex system of pictograms and became conventionalized over time:



became



became



star



became



hand



became



fish

The History of Writing:

Cuneiform Writing

- As cuneiform evolved, users began to think of the symbols more in terms of the name of the things represented rather than the things themselves
 - This system is called **logographic** or **word writing**
 - **Logograms**, the symbols of a word-writing system, are ideograms that represent a concept *and* the word or morpheme for that concept



- As the cuneiform writing system spread, the borrowers of the system often used the symbols to represent the sounds of syllables in their own languages
 - This is known as a syllabic writing system
- In a syllabic writing system, each syllable in the language is represented by its own symbol and words are written syllable by syllable


The History of Writing: From Hieroglyphics to the Alphabet

- Around 4000 B.C.E., while Sumerian pictography was flourishing, Egyptians were using a similar system of pictography (the Greeks later called them *hieroglyphics*)
 - The hieroglyphics became a logographic system, and then through *the rebus principle* became a syllabic writing system
- The Phoenicians were aware of hieroglyphics and the offshoots of Sumerian writing, and by 1500 B.C.E. they had developed a writing system with 22 characters called the West Semitic Syllabary
 - The characters stood for consonants alone and the readers would provide the vowels as they read
 - Thus the West Semitic Syllabary was both a **syllabary** and a **consonantal alphabet** (also called **abjad**)



"It's a prescription from my doctor
but I can't understand his terrible handwriting."

The Rebus Principle

- What systems of communication that eventually develop into full-fledged writing do have, as opposed to their semasiographic counterparts and progenitors, is the germ of phoneticism — **the rebus principle** is integrated into these systems. That is, the existence of **homonyms** in the language is exploited in that the sound of one word, most often one with a referent that can be easily drawn, is used to write another word that is pronounced identically or similarly, just as we alphabet users might draw the picture of an eye, , to write the first personal pronoun “I” in a game of Pictionary.
- **The rebus principle is integral to writing**, as it allows the writing of those elements of language that do not lend themselves easily to graphic representation, such as pronouns, grammatical markers, and, of particular importance for early writing, personal names and foreign words. There is an element of economy here as well. By assigning homonyms to a common sign, the system can make do with fewer signs, thus facilitating the learning of the script.

Source: Christopher Woods “Visible Language: Inventions of Writing in the Ancient Middle East and Beyond” (2010)

The Rebus Principle

- When a graphic sign no longer has a visual relationship to the word it represents, it becomes a **phonographic symbol** and represents the sounds of words
 - A single sign can then be used to represent all the words with the same sounds (the **rebus principle**)
 - A **rebus** is a representation of words by pictures or objects whose names sound like the word

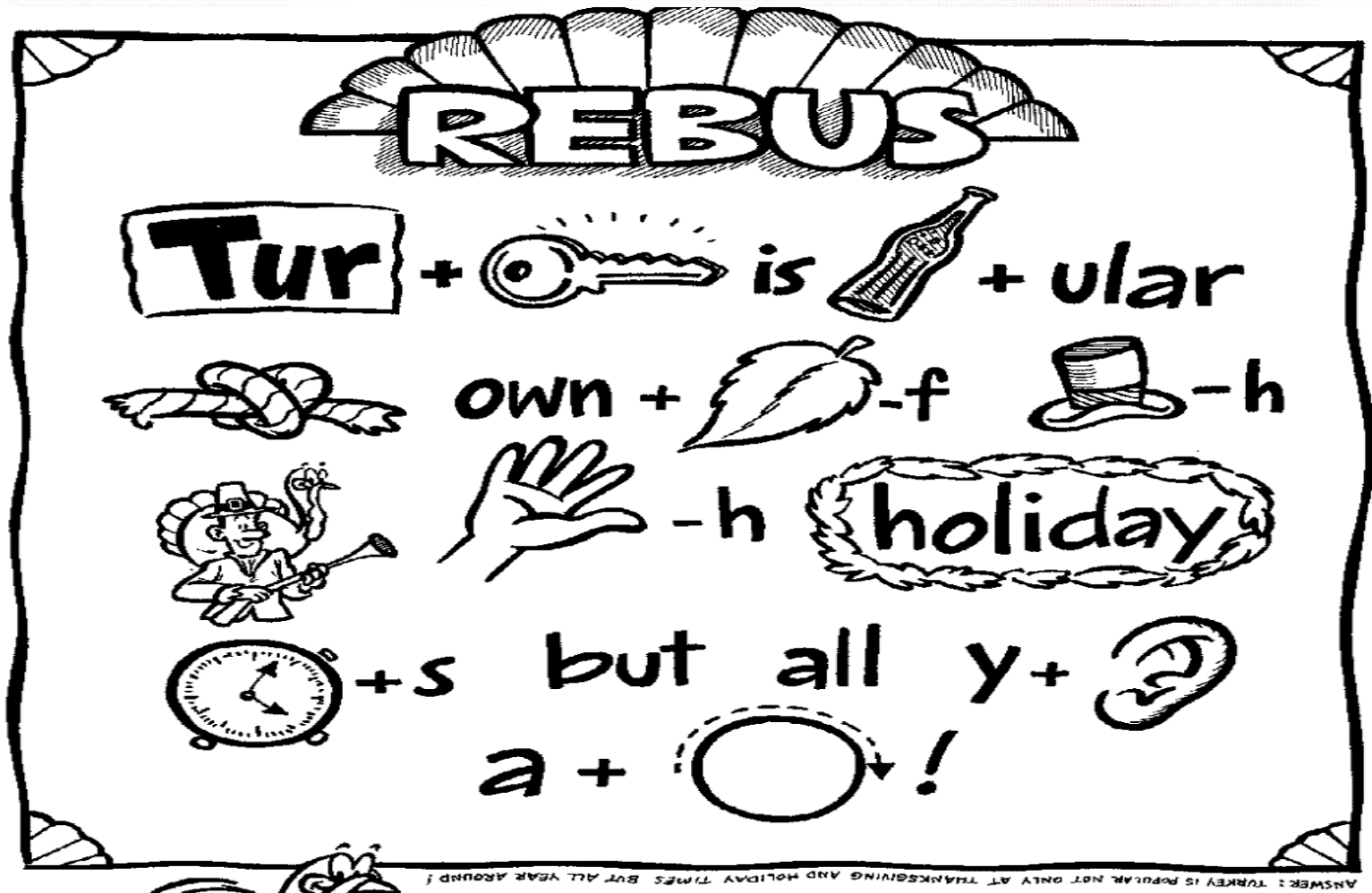


belief
(bee + leaf)



believes
(bee + leaves)

The Rebus Principle



The History of Writing: The Alphabet



"I'm not sure where I'm going with this but so far I have 'A is for Anthropoid.'"

The History of Writing: The Alphabet

- The ancient Greeks tried to borrow the Phoenician writing system, but it didn't work well because Greek syllable structure is unsuited for a syllabary
 - So, the Greeks borrowed the symbols and used some of the symbols to represent vowels
 - The result was alphabetic writing, a system in which both consonants and vowels are symbolized
- Most alphabetic systems today derive from the Greek system



Early Greek alphabet on pottery in the National Archaeological Museum of Athens



Modern Writing Systems:

Word Writing

- In a logographic writing system, a written character represents both the meaning and pronunciation of each word or morpheme
- The Chinese writing system is a logographic system that is 3,500 years old
 - For the most part, each character represents an individual word or morpheme
 - Longer words are made by combining two words or morphemes, similar to English compounding
- The Chinese languages are well-suited to logographic writing because they have very little inflection
 - A language like English would not work well with a logographic system because of the pervasiveness of inflection
 - English would need multiple characters for each word to represent all the inflections (*cat* + *cats* + *cat's* + *cats'*)
- The Chinese government has also adopted a spelling system using the Roman alphabet that is called **Pinyin** which is now in use alongside the traditional logographic system

Modern Writing Systems:

Syllabic Writing

- English and other European languages are unsuitable for a syllabic writing system because they allow a large number of possible syllable structures
 - Possible English syllable structures:

I	/aɪ/	V	ant	/ænt/	VCC
key	/ki/	CV	pant	/pænt/	CVCC
ski	/ski/	CCV	stump	/stʌmp/	CCVCC
spree	/spri/	CCCV	striped	/straɪpt/	CCCVCC
an	/æn/	VC	ants	/ænts/	VCCC
seek	/sik/	CVC	pants	/pænts/	CVCCC
speak	/spik/	CCVC	sports	/spɔrts/	CCVCCC
scram	/skræm/	CCCVC	splints	/splɪnts/	CCCVCCC

Modern Writing Systems:

Syllabic Writing

- Japanese is very well-suited for a syllabic writing system because it only has about 100 syllables
- Japanese uses a combination of three different writing systems:
 - Katakana: a syllabary used for representing loan words and special effects similar to italics in English
 - Hiragana: a syllabary used for native words
 - Kanji: ideographic characters borrowed from Chinese used to represent roots
- For example, *ikimashita* is the word that means “went” in Japanese
 - The initial [i] is represented by the borrowed Chinese character:
 - The [kimashita] is represented by hiragana symbols:

行きました

行

きました

Modern Writing Systems: Consonantal Alphabetic Writing

- Semitic languages such as Hebrew and Arabic are written with alphabets that consist only of consonants
 - This writing system works well for these languages because consonants form the roots of most words
 - For example, the consonants *ktb* form the root for words associated with writing
 - *katab* means “to write,” *kitab* means “book”
- Semitic alphabets also include diacritics to indicate vowels in order to preserve historic pronunciations of religious writings and also to facilitate literacy






Represents the consonant [l]

- The consonant [l] and the vowel [e] is represented as



Alphabetic Writing: *Hangul*

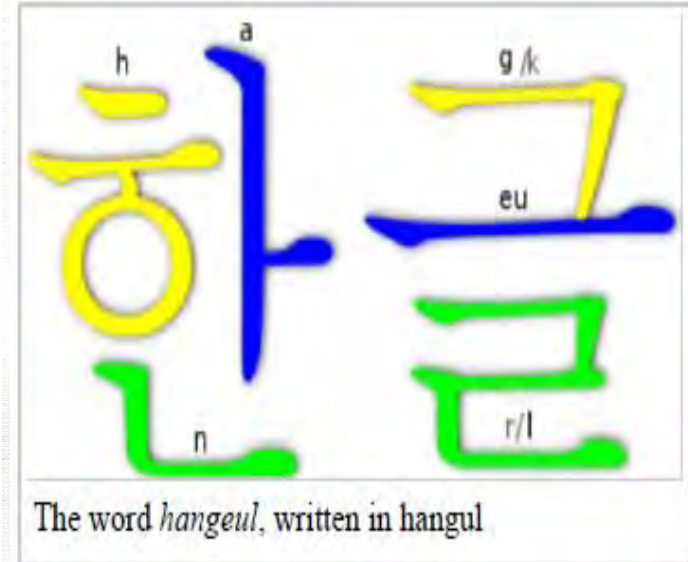
- The **Korean alphabet**, known as **Hangul** in South Korea and as **Chosŏn'gŭl** in North Korea and China, is the alphabet that has been used to write the Korean language since the 15th century. It was created during the Joseon Dynasty in 1443, and is now the official script of both South Korea and North Korea.
- The modern name *Hangul* was coined by Ju Sigyeong in 1912. *Han* (한) meant "great" in archaic Korean, while *geul* (글) is the native Korean word for "script."
- Hangul is phonemic so it does not have separate symbols to differentiate between allophones [r] and [l], [s] and [ʃ], and [ts] and [tʃ]
 - It is also designed so as to depict the place and manner of articulation of sounds
 - For example, the sound /g/ is represented as:  to represent the back of the tongue raising to the velum
 - The phoneme /m/ is represented as:  to represent the closing of the lips

Source: Wikipedia

Alphabetic Writing: *Hangul*

- In its classical and modern forms, the alphabet has 24 consonant and vowel letters. However, instead of being written sequentially like the letters of the Latin alphabet, Hangul letters are grouped into blocks, such as *한* *han*, each of which transcribes a syllable. That is, although the syllable *한* *han* may look like a single character, it is actually composed of three letters: *ㅎ* *h*, *ㅏ* *a*, and *ㄴ* *n*. Each syllabic block consists of two to six letters, including at least one consonant and one vowel. These blocks are then arranged horizontally from left to right or vertically from top to bottom. Each Korean word consists of one or more syllables, hence one or more blocks. The number of mathematically possible distinct blocks is 11,172.
- Hangul Day [October 9th] is a holiday to celebrate the Korean writing system.

Source: Wikipedia

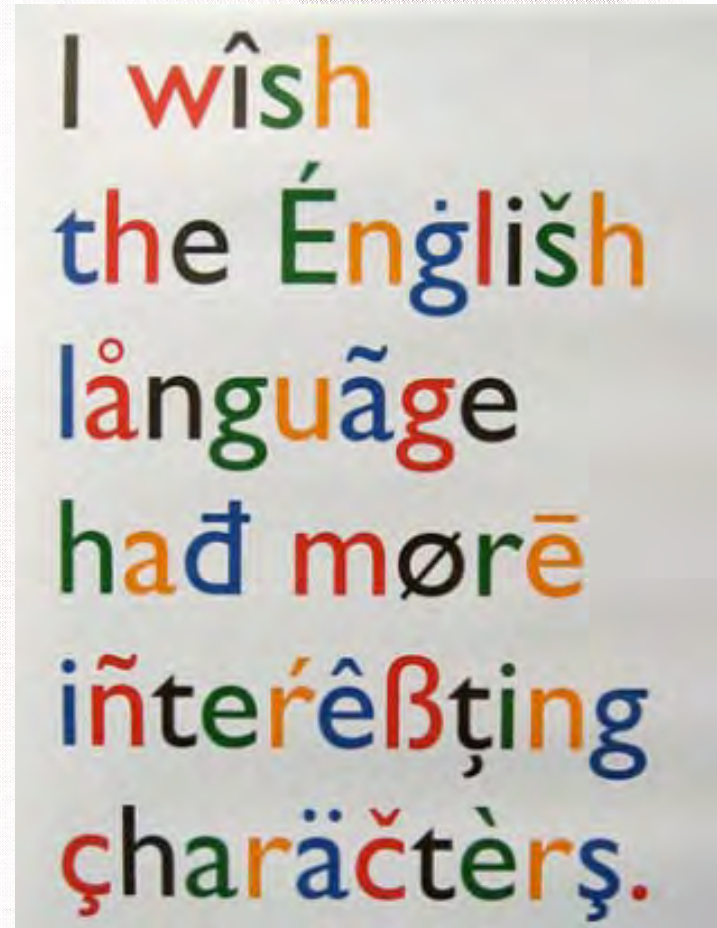


James McCawley's Interview About Hangul.mp4

Diacritic Marks:



- Most European alphabets use Latin (Roman) letters and add diacritic marks to represent individual characteristics of a particular language
 - Spanish uses *ñ* to represent a palatal nasal
 - German uses an umlaut for certain vowels not used in Latin
- Some languages use **digraphs**, which are two letters used together to represent a single sound
 - English: *sh* /ʃ/, *ch* /tʃ/, *ng* /ŋ /



Cherokee Syllabary



Cherokee Syllabary

- The **Cherokee syllabary** is a phonetic writing system invented by Sequoyah, a Cherokee from North Carolina, for his Iroquian tribe in 1821. In a very short time, most Cherokees had a high degree of literacy.
- Sequoyah's creation of the syllabary is particularly noteworthy in that he could not previously read any script. He first experimented with logograms, but his system later developed into a syllabary.

Source: Wikipedia



Cherokee Syllabary



SNOW
gu ti ha



DAY / NIGHT
i ga / u sv i



DRY
u ka hy o da



MOUNTAIN
o da lv i



CHILD
a yoh li

CHEROKEE ALPHABET

D ^a Ꭰ ga Ꭱ ka	R ^e Ꭲ ge Ꭳ he	T ⁱ Ꭴ gi Ꭶ hi	A ^o Ꭶ go Ꭶ ho	O ^u Ꭶ gu Ꭶ hu	I ^v Ꭶ gv Ꭶ hv
W ^{la} Ꭶ la Ꭶ ma	P ^{le} Ꭶ le Ꭶ me	L ^{li} Ꭶ li Ꭶ mi	G ^{lo} Ꭶ lo Ꭶ mo	M ^{lu} Ꭶ lu Ꭶ mu	E ^{lv} Ꭶ lv Ꭶ nv
Ꭶ hna	Ꭶ nab	Ꭶ qwi	Ꭶ qwo	Ꭶ qwu	Ꭶ qwv
Ꭶ quwa	Ꭶ qwe	Ꭶ si	Ꭶ so	Ꭶ su	Ꭶ sv
Ꭶ da	Ꭶ de	Ꭶ di	Ꭶ do	Ꭶ du	Ꭶ dv
Ꭶ ta	Ꭶ te	Ꭶ ti	Ꭶ to	Ꭶ tu	Ꭶ tv
Ꭶ tla	Ꭶ tle	Ꭶ tli	Ꭶ tlo	Ꭶ tlu	Ꭶ tlv
Ꭶ tsa	Ꭶ tse	Ꭶ tsi	Ꭶ tso	Ꭶ tsu	Ꭶ tsv
Ꭶ wa	Ꭶ we	Ꭶ wi	Ꭶ wo	Ꭶ wu	Ꭶ wv
Ꭶ ya	Ꭶ ye	Ꭶ yi	Ꭶ yo	Ꭶ yu	Ꭶ yv

"v" sound is "u" as in "but"



HORSE
so gwi li



BIRD
jis gwa



FISH
a ja di



RAIN
a ga sga



CHIEF
u gv wi yu hi



RIVER
u we yv i



TOWN
ga du hv i



WISDOM
ak to v his di

Cherokee Syllabary

- In Sequoya's system, each symbol represents a syllable rather than a single phoneme; the 85 (originally 86) characters in the Cherokee syllabary provide a suitable method to write Cherokee.
- So using the English alphabet, the Cherokee word *ama* ("water") is written with three letters: **a**, **m**, and **a**. Using the Cherokee syllabary, the same word is written with only two characters, **D** and **Ꭰ** (pronounced "a" and "ma.")

Source: Wikipedia

Stop Sign in Cherokee ►



Paleo-Ethnography of Writing

- Writing seems to have become more widespread with the invention of **papyrus** in Egypt. That this material was in use in Egypt from a very early period is evidenced by still existing papyrus of the earliest Theban dynasties.
- **Parchment**, using sheepskins left after the wool was removed for cloth, was sometimes cheaper than papyrus, which had to be imported outside Egypt.
- With the invention of **wood-pulp paper**, the cost of writing material began a steady decline.



"I can hardly wait for someone to invent paper."

Paleo-Ethnography of Writing

- A **palimpsest** is a manuscript page, either from a scroll or a book, from which the text has been either scraped or washed off so that the page can be reused, for another document. Parchment and other materials for writing or engraving upon were expensive to produce, and in the interest of economy were re-used wherever possible.
- A number of ancient works have survived only as palimpsests. The Sana'a palimpsest is one of the oldest Qur'anic manuscripts in existence. Carbon dating indicates that the undertext (the scriptio inferior) was written probably within 15 years of the death of the Islamic prophet Muhammad. The undertext differs from the standard Qur'anic text and is therefore the most important documentary evidence for the existence of variant Qur'anic readings.

An Abridged History of Writing Instruments



FINGER
(IN SAND
OR CLAY)



QUILL



PENCIL



BALL POINT
PEN



FINGER
(ON TOUCHSCREEN)

The Invention of the Book

- **THE PRINTING PRESS**
- A complete copy comprises 1282 pages.
- The **Gutenberg Bible** was printed by Johann Gutenberg, in Germany.
- The print **run** started on February 23, 1455. Its production marked the beginning of the mass production of books in the West.

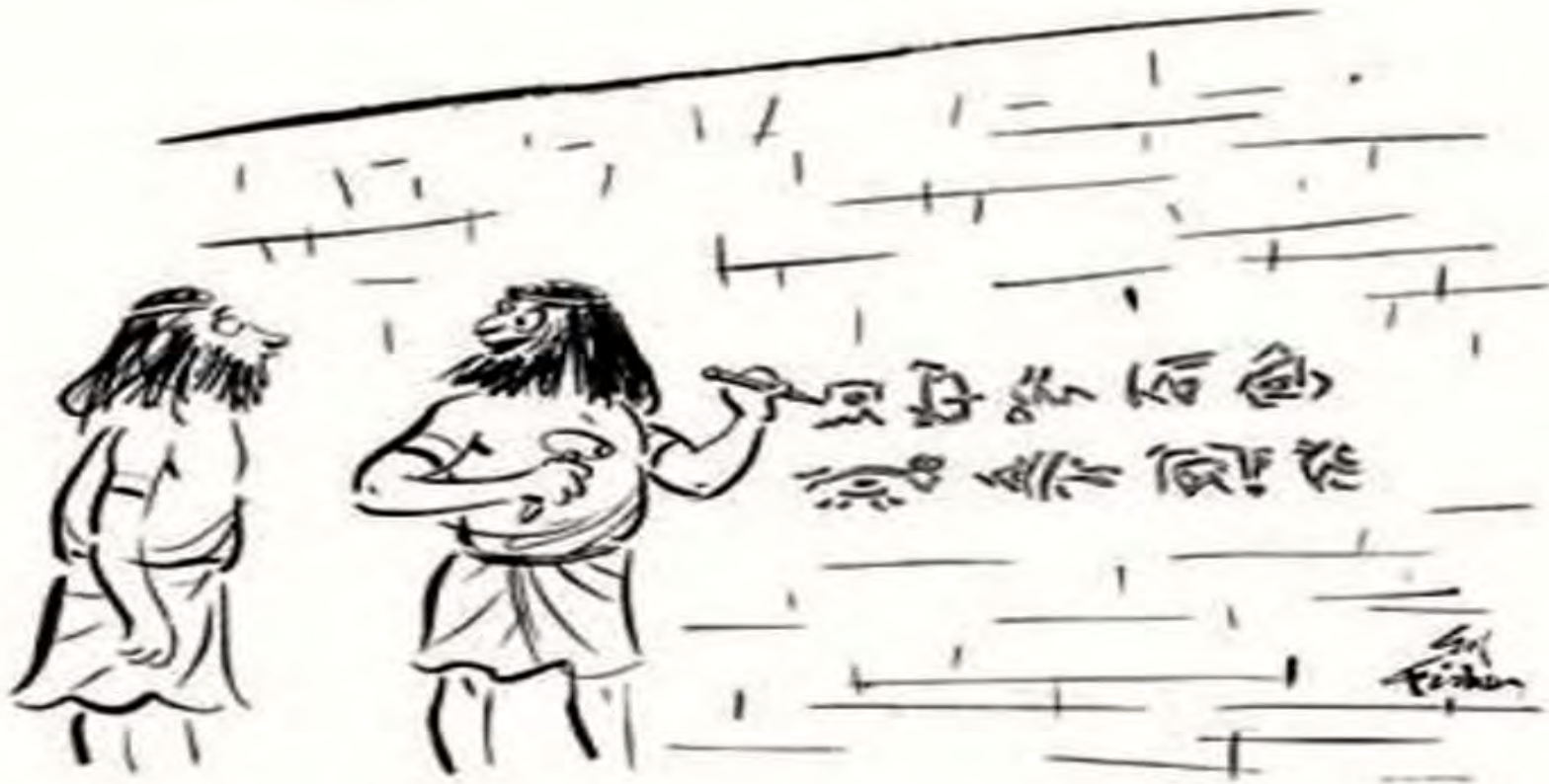


"Nice, but as long as there are readers there will be scrolls."



Introducing the book (repost).mp4

The Decipherers



"It doesn't mean a thing, but boy, will it drive them crazy a thousand years from now!"

The Decipherers: Champollion

- Jean-François Champollion's decipherment of the letters in the name Ptolemy ►
- **The Rosetta Stone** was carved around 290 BCE and was discovered in 1799; it contains 3 scripts: hieroglyphic, demotic Egyptian, and Greek ▼



3			<i>multiple</i>	K
6			KE. KEN	S
7			MA	M
8			OLE	L
9	*		P	P



"SAY, ROSETTA, WHAT'S THAT STONE YOU'RE WORKING ON?"

Spelling: *Romans Go Home!*



Life of Brian - Romans Go Home.wmv

English Spelling

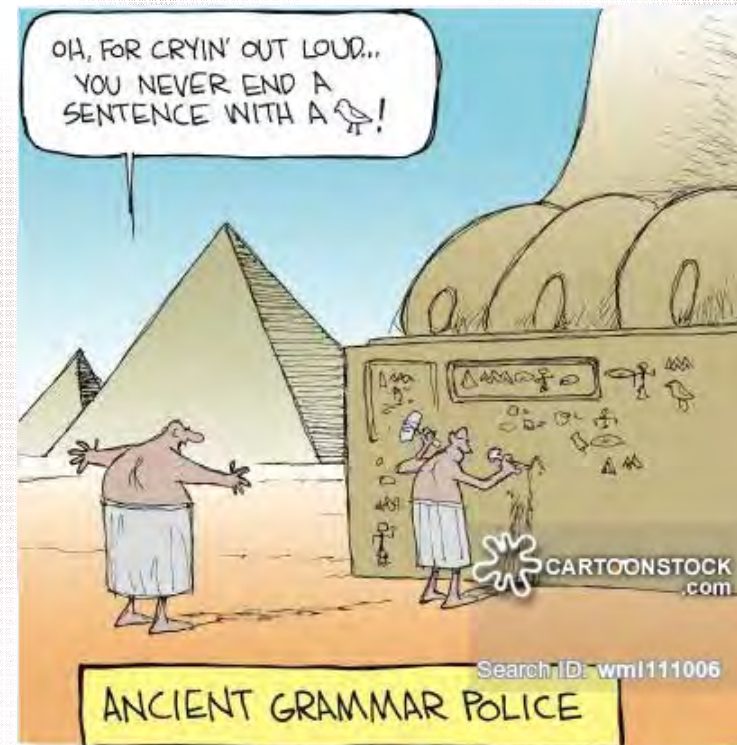
- As we know, the English spelling system does not accurately reflect the pronunciation of many words
- The spelling of most English words today is based on the pronunciations of English in the 14th, 15th, and 16th centuries
- After the invention of the printing press, spelling inconsistencies became even more widely spread than before
- Spelling reformers saw the need for a consistent spelling that correctly reflected the pronunciation of words
 - But, scholarly reverence of Classical Greek and Latin caused English spelling to change in order to match their etymological roots rather than their pronunciation:

Middle English Spelling

indite →
dette →
receit →
oure →

Reformed Spelling

indict
debt
receipt
hour



Text Messaging, i.e., Txtng

- Text messaging is having a growing effect on spelling
 - The need is to be understood in as few characters as possible
 - The rebus principle is present in text messaging
 - Phonetic spelling and acronyms are common
 - *Text messaging is not ruining the language but is just another example of linguistic creativity and makes use of written features used throughout the history of writing*



Braille Writing:



- Braille “writing” is a *tactile* system for the visually impaired.

<h1>Braille Alphabet</h1>		<table><tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td><td>j</td></tr><tr><td>⠁</td><td>⠃</td><td>⠉</td><td>⠙</td><td>⠑</td><td>⠋</td><td>⠗</td><td>⠓</td><td>⠏</td><td>⠗</td></tr><tr><td>k</td><td>l</td><td>m</td><td>n</td><td>o</td><td>p</td><td>q</td><td>r</td><td>s</td><td>t</td></tr><tr><td>⠅</td><td>⠇</td><td>⠍</td><td>⠝</td><td>⠕</td><td>⠎</td><td>⠖</td><td>⠚</td><td>⠞</td><td>⠟</td></tr><tr><td>u</td><td>v</td><td>w</td><td>x</td><td>y</td><td>z</td><td colspan="4"></td></tr><tr><td>⠥</td><td>⠦</td><td>⠪</td><td>⠭</td><td>⠽</td><td>⠿</td><td colspan="4"></td></tr></table>										a	b	c	d	e	f	g	h	i	j	⠁	⠃	⠉	⠙	⠑	⠋	⠗	⠓	⠏	⠗	k	l	m	n	o	p	q	r	s	t	⠅	⠇	⠍	⠝	⠕	⠎	⠖	⠚	⠞	⠟	u	v	w	x	y	z					⠥	⠦	⠪	⠭	⠽	⠿				
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<p>The six dots of the braille cell are arranged and numbered:</p>	<table><tr><td>1</td><td>⠠</td><td>4</td></tr><tr><td>2</td><td>⠠</td><td>5</td></tr><tr><td>3</td><td>⠠</td><td>6</td></tr></table>	1	⠠	4	2	⠠	5	3	⠠	6																																																													
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3	⠠	6																																																																					
<p>The capital sign, dot 6, placed before a letter makes a capital letter.</p>	<table><tr><td>1</td><td></td><td>4</td></tr><tr><td>2</td><td></td><td>5</td></tr><tr><td>3</td><td>⠠</td><td>6</td></tr></table>	1		4	2		5	3	⠠	6																																																													
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<p>The number sign, dots 3, 4, 5, 6 placed before the characters a through j, makes the numbers 1 through 0. For example a preceded by the number sign is 1, b is 2, etc.</p>	<table><tr><td>1</td><td>⠠</td><td>4</td></tr><tr><td>2</td><td>⠠</td><td>5</td></tr><tr><td>3</td><td>⠠</td><td>6</td></tr></table>	1	⠠	4	2	⠠	5	3	⠠	6																																																													
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Pseudo-Writing

- **Pseudo-writing** systems are based on artificially constructed alphabets to look real
 - For artistic purposes, such as alien languages in comic strips
- Usually **asemic** (meaningless)
- E.g., the *Codex Seraphinianus* by Luigi Serafini ►



Scripts and Identity /Politics/

- *Vukovar, Croatia, Feb. 2013: “Ne Ćirilici! = “No to Cyrillic!”*



**NE
ĆIRILICI**

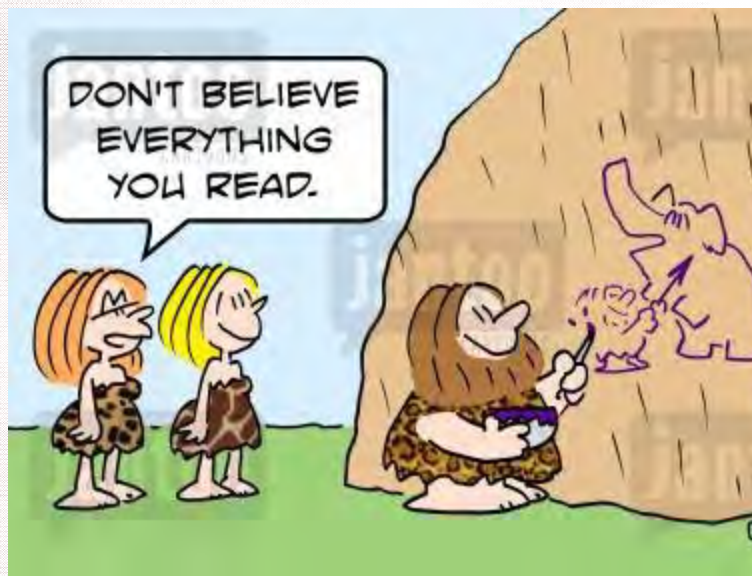


BRANILI
SMO
VUKOVAR
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BYKOBAP



Final Words of Caution

- Don't believe everything you read!



- No writer's block on the exam!