

### Language universals and Universal Grammar: definitions

**Universals:** linguistic properties of all natural languages independent from historical transmission or language contact  
Types:

- 1) absolute universals: shared by all natural languages
- 2) implicational universals: feature A and feature B exist in a language
  - 2.1) unilateral universals: if feature A exists, feature B exists but not vice versa
  - 2.2) bilateral/equivalent universals:
- 3) statistic/frequency universals: a feature exists with a probability higher than chance

**Evidence:**

1. crosslinguistic investigation of properties of languages
2. evidence from language acquisition
3. general cognitive abilities



### Universal Grammar (UG): definitions

**Universal Grammar:** the study of the common grammatical properties shared by all natural languages and of the parameters of variation between the languages

**Evidence:**

Rapid and uniform acquisition of **all** children without instruction  
a.) IF a linguistic property of an individual speaker is a property in all known languages and  
b.) IF the property is not acquired as imitation of input data  
→ evidence that the property comes from specific feature of UG

Common linguistic properties:

Semantics: Thematic roles: e.g. AGENT, INSTRUMENT, found in nearly all languages

Syntax: word order patterns of functional categories S, V, O found in nearly all languages



### The biological foundations of language (Lenneberg)

**Lenneberg's biological premises:**

1. cognitive function is species-specific
  - cerebral functions mediate between sensory input and motor output and correspond with cognitive functions
2. specific properties of cognitive function are replicated in *every member* of the species (form/function invariance)
3. cognitive processes/capacities are differentiated spontaneously with *maturation*
4. at birth, humans are *immature*, certain cognitive aspects emerge during infancy, some require *extra-organismic stimuli*:
  - for development of visual perception it needs "properly illuminated objects"
5. social phenomena emerge via spontaneous adaptation of behavior

**Language is the manifestation of species-specific cognitive propensities (Lenneberg, 1996)**



### The biological foundations of language (Bickerton)

Bickerton (2001): Language faculty is an emergent property of
 

- biological predispositions
- learning and information processing

**Evidence for biological predispositions**

- UG and structural evidence from Generative theory
- first language acquisition and the "poverty of stimulus" argument
- animals and symbolic behavior (e.g. Chimpanzees, Grey parrots)
- studies on language deprivation (Creoles, sign languages, individual deprivation "Genie" etc., aphasia research)

**Evidence from learning and information processing**

Cognitive functioning (incl. language): reduced to neuronal functioning (Churchland, 1992)

- processes of
  - enzephalization
  - lateralization
  - neuronal maturation



### The neuronal approach

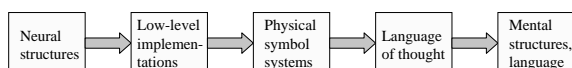
• reductionist approach that eliminates psychological explanations for language processing

Neville (1991): competition between inputs

• input deprivation leads to: reduction of responsive neurons therefore: **early experience** influences neuronal development

- a) neuron growth (size, number)
- b) dendritic branching increases
- c) synapse number increase

→ mature values are reached at around age 15



• in course of competition: important variable is the temporal patterning of the input: neurons that are active together tend to migrate + aggregate

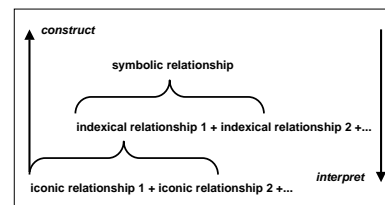


### The emergence of symbolic activity

**Iconic relationship:** signifier and signified have some similarity

**Indexical relationship:** signifier and signified have a certain spatiotemporal contiguity

**Symbolic relationship:** signifier and signified are linked by agreement, causality or convention

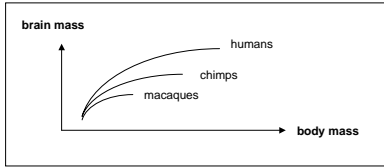


adapted from: Deacon, 1998



### Encephalization and lateralization

**Encephalization:** increase in brain size during an evolution of a species



**Lateralization:** language located in left hemisphere for 95% of right handers and 70% of all lefthanders (Corballis)

- left hemisphere: larger, has Broca/Wernicke areas but **language functions are distributed**
- left hemisphere: serial processing
- right hemisphere: holistic and spatial processing



### Poverty of stimulus and innateness

Chomsky: choice between parameters of a UG is determined by innate learning mechanisms

LAD: Language Acquisition Device, = a mental organ

Poverty of stimulus: **under-determination of theory by data**

- child perceives finite number of sentences, acquires comprehension for sentences drawn from infinite set of sentences
- 1. children acquire language rapidly and uniformly
- 2. children are only exposed to a finite amount of data
- 3. children appear to converge on a grammar capable of interpreting unfamiliar sentences

→ **conclusion:** some aspect of grammar must be innate

- dependence on parental correction of errors is ruled out

- plausible errors never occur, cf.

*The dog is barking* → *Is the dog barking?*

*The dog that is barking is black* → *\*Is the dog that is barking is black?*



### Universal principles in first language acquisition

- result of acquisition: sets of grammatical rules
  - rules must be productive for novel items
- washed/daed* → typical errors show progress in rule formation
- research: focuses on early utterances

#### phonological development:

- 1) to separate noises/non-speech from speech  
→ ability is present at birth, newborns respond to human sounds
- 2) articulatory movements start even before  
• articulatory skills emerge at around 6 months  
babbling: experimenting to gain control of articulatory organs  
• independent of particular languages, therefore **universal**
- 3) 12 months: babbling increases until children produce understandable words  
• babbling/real words overlap for weeks  
• babbling ends: lexicon of about 50 words



### Universal features of phonological acquisition 1

Across all languages:

- a) vowels are acquired before consonants
- b) stops before other consonants
- c) place of articulation: 1) labials 2) velars, alveolars, 3) palato-alveolars, 4) dentals
- d) phonemic contrasts emerge in word-initial position  
(*pat - bat* distinction before *cap - cab*)
- e) sounds in frequent words are acquired before peculiar sounds in infrequent words like ʒ

**age 2/ age 4 consonants:**

stops	fricatives	affricates	other
p b m	f v	tʃ dʒ	w j
t d n	s z		l r
k g ŋ	ʃ		

→ this inventory enlarges over time, cf. θ ð



### Universal features of phonological acquisition 2

Universal phonetic processes of replacement of more difficult sounds with easier sounds (in perception/production)

- systematic deletion to simplify syllabic structure: **reduction**

- 1) s deletion  

stop	→	/tɒp/	
small	→	/mɒ/	
desk	→	/dek/	
- 2) liquid deletion with stops  

try	→	/tɹi/	with fricatives		
crumb	→	/gɹʌm/	from	→	/fɹʌm/
bring	→	/brɪŋ/	sleep	→	/si:p/
- 3) nasal deletion  

bump	→	/bʌp/
tent	→	/det/

deletion of final consonants

dog	→	/dɒ/
bus	→	/bʌ/



### Universal features of phonological acquisition 3

- systematic replacement of sounds with alternative sounds

#### substitution:

- 1) stopping (fricative → stop)  

sing	→	/tɪŋ/
thing	→	/tɪŋ/
this	→	/dɪt/
- 2) fronting (forward shift of place of articulation)  

ship	→	/ʃɪp/
jump	→	/dzʌmp/
- 3) gliding (liquid → glide)  

lion	→	/lɪən/
look	→	/wʌk/
story	→	/stɔwɪ/
- 4) assimilation: modification of one segment under influence of neighboring sounds  
**forward voicing**  

tell	→	/del/
pig	→	/bɪg/
soup	→	/zʊ:p/



### Universal features of morphological acquisition 1

- initially: no internal morphological structure, no affixes
  - words: single root morphemes  
→ gradual basis for word formation
  - a) irregular plurals/past: initially on case by case  
*mouse* → *mice*      *run* → *ran*
  - b) overuse of rule (overgeneralization)  
*mouse* → *mouses*      *run* → *runned*
  - c) a) + b) *mices*      *ranned*
  - d) complete rule acquisition
- grammatical morpheme acquisition order:  
*-ing/plural -s/poss. -s/the, a/ -ed/ 3rd person -s/ aux be*
- frequency of occurrence in speech:  
*the, a / -ing/ plural -s/ aux be/ poss. -s/ 3rd person -s/ -ed*



### Universal features of morphological acquisition 2

- factors of order of acquisition
- a) utterance – final is more focal
- b) syllabicity (*-ing* can form own syllable, *-s* cannot)
- c) form meaning – relationship 1:1 is conducive  
whereas *-s* stands for 3 different grammatical phenomena
- d) number of exceptions (past/plural)
- e) allomorphic variance *cats dogs houses (-s/-z/-iz)*

test of productivity e.g. for plural: *wug* - test

- word formation
- a) productivity of derivational morphemes *-er*, compounds, adj – *y/adv-ly*, instrumental *-er* increases
- b) morphemes with restricted application like *-ly* (\*fast-ly) are acquired much later  
→ lack of exceptions is supportive cf. \*rats-eater vs. mice-eater
- c) multiword compounds: order errors like \*bird black



### Phonological Universals: evidence from language change

Different languages change in similar ways, determined by universal principles

Lenition vs. Fortition (Weakening vs. Strengthening)

1. Lenition hierarchy of strength

- |                      |             |                |
|----------------------|-------------|----------------|
| a) voiced            | higher than | voiceless      |
| b) stops             | higher than | continuants    |
| c) consonants        | higher than | semi-vowels    |
| d) orals             | higher than | glottals       |
| e) front/back vowels | higher than | central vowels |

• change: usually from strong to weak [k] → [ʔ]

Lenition examples: rhotacism [s]/[z] → rhotic between vowels  
[wɔz] (was) in plural: [wɔ:z] (were)  
probable root: [wase]/[wese]  
therefore: lenition [s] → [r]

Fortition examples: [naif] → [naip] (Tok Pisin)



### Extreme Lenition: loss of sound

*history* [hɪstri:], dropping schwa [ə]  
*long* → [lo] (Melanesian Pidgin)

Types of sound loss

- a) **aphaeresis/aphesis** C → Ø  
loss of initial consonant  
*knife* [kni:fe] → [naif]
- b) **apocope** \_V → Ø  
loss of final vowels  
*singe* (AE) → *sing*
- c) **syncope** \_CVC\_ → \_CC\_  
loss of V between C, creates consonant clusters  
*policeman* → [pli:smən], [hɪstri:]
- d) **cluster reduction** CC → C  
deletion of consonants, also in Pidgin *post* → *pos*  
*government* → [gʌvəmənt]



### Sound addition 1

Universal preference for CV-structure across languages  
• tendency of syllables to end in vowels, allowing no final consonants

Maori	English	Japanese
<i>kuki</i>	<i>cook</i>	
<i>mapi</i>	<i>map</i>	
	<i>table</i>	<i>taberu</i>

a) **excrescence** \_CC\_ → \_CCC\_  
consonant added between 2 consonants

*something* → [sʌmpθɪŋ]  
*æmtig* → [empti]  
*θymle* (*thimble*) → [θɪmbəl]

inserted stop: homorganic with preceding nasal  
(= same place of articulation)



### Sound addition (cont.) and metathesis

b) **epenthesis** \_CC\_ → \_CVC\_  
V added to break up consonant cluster  
produces CV syllables  
epenthetic schwa [ɪfɪm] → [ɪfɪmɪ]  
Tok Pisin: *black* → *bilak*  
*blue* → *bulu*

c) **prothesis**  
addition of sound at the beginning  
Spanish: *special* → *especial*  
*Spain* → *España*

### Metathesis

• change of order of sound, rare  
*bird*: [brɪd] → [bɜ:ɪd]



### Regressive assimilation of speech sounds: partial vs. full

• most universal sound change: influence of one sound upon another

	[n]	[p]
1	voiced	voiceless
2	alveolar	bilabial
3	nasal	stop

- a) A3 nasal → stop np → dp
- b) A2 alveolar → bilabial np → mp
- c) A2+3 np → bp
- d) A1+3 np → tp
- e) A1+2+3 np → pp

a)-d): partial assimilation  
 e): full assimilation produces geminates  
 → all: regressive (from p backward)  
 indivisible/ impossible



### Progressive assimilation, palatalization, devoicing

forward: progressive

- a) A1 np → nb
- b) A2 np → nt
- c) A3 np → nm
- d) A1+2+3 np → nn

#### palatalization

a non-palatal sound (dental, alveolar, velar...) becomes palatal  
 velar stops [k],[g] → [tʃ], [dʒ]

*kinn* → tʃin, *chin*  
*ke:si* → tʃi:z, *cheese*  
*geldan* → ji:d, *yield*

#### final devoicing, esp. German

ba:d → ba:t  
 ga:b → ga:p  
 hund → hunt



### Sound shift: Grimm's law

Sound shift: the systematic modification of series of phonemes

Greek	Latin	English
<i>patér</i>	<i>pater</i>	<i>father</i>
<i>treis</i>	<i>tres</i>	<i>three</i>
<i>hekatón</i>	<i>centum</i>	<i>hundred</i>

Grimm's law: consonant shift between Proto-Indo-European and Proto-Germanic

[p] > [f]      [t] > [θ]      [k] > [x]/[h]      *tenuis* > *thin*  
 [b] > [p]      [d] > [t]      [g] > [k]      *lubricus* > *slippery*  
 [bʰ] > [p] e.g. *bhrata* (Sanskrit) > *brother*

**Aspiration:** delay in the onset of the vibration of the cords after the release of a preceding voiceless consonant [pʰat] vs. [spat]  
**universal feature:** voiced aspirates always occur together with unvoiced aspirates in a phoneme inventory of a language



### Universal features of aspiration

English: aspirated stops occur in syllable-initial positions before V, typically in monosyllabic words preceding [s] deprives

bʰ p pʰ d dʰ t tʰ g gʰ k kʰ

violations: a language that has /p/ /b/ /bʰ/ as reconstructed is implausible

plausible: /p/ /b/ /pʰ/ or /p/ /b/ /pʰ/ /bʰ/

→ implausible is a system with voiced aspirates /bʰ/ but without unvoiced aspirates /pʰ/

-it violates the universal that voiced aspirates always go together with unvoiced aspirates (but not vice versa)



### Universal processes of Grammaticalization 1

**Grammaticalization** = process of forming of grammatical morphemes out of lexical items/sequences of lexical items

Tendency: grammatical morphemes develop out of lexical material

a.) by gradual generalization of meaning

b.) by gradual reduction of form

c.) by fusion with the head

Grammatical tense/aspect marking: 70-80% of all languages (Bybee/Dahl)

#### Future tense:

"desire"/movement + goal → intention/future

ex. *willan* (Old English) → *will* (future)  
*going to* <place> → *going-to* + inf. (future)

• other languages: desire verbs as future marker in Bulgarian, Bantu, Rumanian...

**Paths:** (Bybee 2001):

1) movement path: spatial movement > intention > future

2) volition path: desire > intention > future



### Universal processes of Grammaticalization 2

**Perfects:** in Germanic languages: formation usually with

a.) possessive + past participle (*has eaten/hat gegessen*)

b.) copula + past participle (*bin gelaufen*)

#### Progressive:

• universal tendency to be periphrastic rather than bound

Source: locatives, "to be located in an activity"

#### Gaelic Irish:

*"He is at shutting the door"*

#### German:

*She is smoking – Sie ist (gerade) beim rauchen.*

**English:** also locative meaning of English copula:

*I am here – I am working*

**Spanish:** *estar* from Latin *stare* = to stand – *Estoy fumando*

**Course of grammaticalization:** unidirectional

Processes: words/phrases become phonetically reduced via reduction, assimilation, deletion

• gr. is "automatized" from frequently occurring sequences



### Universal processes of Grammaticalization 3: Trends in English

**English determiners:** *the* from demonstrative *that*,  
*a/an* from numeral *one*

- other languages: German, French, Spanish, Greek, Moré, Hebrew...
- OE: no use of determiners

**English modal auxiliaries:** from lexical verbs  
*can* from *cunnan* (know how to)  
*may* from *magan* (be able to)

**English affixes:** from N, cf. *-ly* from *lic* (OE: body)  
*mann-lic* (having the body/appearance of a man) → *manly*

- conceptual origin of grammaticalized forms: culturally independent, universal experiences (Heine 1991)

concrete/lexical	>	abstract/grammatical
<i>head</i>		<i>top/on top of</i>
<i>back</i>		<i>back</i>
<i>towards</i>		<i>to, DAT</i>
stative, active verbs		<i>be/have, do</i>

