

UNIVERSAL GRAMMAR AND WHERE TO FIND IT

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Who has language?



Human baby babbling

10 months

Who has language?



Talking Twin Babies (Sam and Ren), YouTube

Who has language?



Babbling in sign language

(9 months, ASL), YouTube



Bird talking

Funny Parrots Talking Like Humans, YouTube





Koko, the signing gorilla

A Conversation with Koko (ASL), YouTube



Back to our own species

1.5 years old

Who has language?



Interview with a One-Jear-Old (Jose Luis), YouTube

animal communication vs. human language



Some fundamental problems about language

- Wallace's problem: How did the human species acquire a mind that seems far more powerful than anything humans could have needed to survive?
- Humboldt's problem: How can children master complex language structures at such an early age with extreme rapidity?
- Plato's problem: How can children acquire their first languages to full competence with such limited experience?

(Bickerton 2014)

Language is a human instinct.

Universal Grammar



Language is a human instinct

Man has an instinctive tendency to speak, as we see in the babble of our young children; while no child has an instinctive tendency to brew, bake, or write. (Darwin 1871)

When we study human language, we are approaching what some might call the "human essence," the distinctive qualities of mind that are, so far as we know, unique to man. (Chomsky 1968)

Language is a human instinct

- The chimp's hands were moving constantly...I just wasn't seeing any signs...When [the chimps] want something, they reach. Sometimes [the trainers would] say, "Oh, amazing, look at that, it's exactly like the ASL sign for *give*!" It wasn't. (a deaf native signer on the teaching-ape-sign-language project, Pinker 1994)
- Animal signals do not express anything we could paraphrase with single words. If we try to translate them into Humanese, we find the nearest equivalents are whole (normally imperative) clauses: "Mate with me," "Keep off my territory." (Bickerton 2014)

What makes human language so special?



Vowel Continuum



My Fair Lady (1964)

"Grammar" in Linguistics

6.

English yes-no question: 1) John is a student. → 2) Is John a student?

Korean honorific ending:
1) annyeong haseyo. (to elders)
2) annyeong. (to friends) "Hello." English yes-no question rules:

- 1. Find the subject.
- 2. Find the auxiliary.
- 3. Move the auxiliary to the front of the subject.
- 4. If there's more than one auxiliary, move the first.
- 5. If there's no auxiliary, insert *do*.



The rules cannot be universal, but the capacity can.

WHY ONLY US LANGUAGE AND EVOLUTION



Robert C. Berwick • Noam Chomsky

A language is a finite computational system yielding an infinity of expressions, each of which has a definite interpretation in semantic-pragmatic and sensorimotor systems. (Berwick & Chomsky 2016)

"Grammar" in Linguistics







Meaning

[ˈlɪli iːts ˈkʊkiz]







There's such an event:

- its content is 1
- its agent is 😥
- its patient is
- its time is non-past
- it's in the real world

What may be universal?



Greenbergian Universals

Greenberg's grammatical universals

- Sample: 30 languages
 - Basque, Berber, Burmese, Burushaski, Chibcha, Finnish, Fulani, Greek, Guaraní, Hebrew, Hindi, Italian, Kannada, Japanese, Loritja, Malay, Maori, Masai, Maya, Norwegian, Nubian, Quechua, Serbian, Songhai, Swahili, Thai, Turkish, Welsh, Yoruba, Zapotec

(Greenberg 1963)

Greenberg's grammatical universals

- Universal #1
 - In declarative sentences with nominal subject and object, the dominant order is almost always one in which the subject precedes the object.
 - SOV, SVO, VSO, VOS, OVS, OSV



Subject Object

SOV: Japanese

John-ga tegami-o yon-da. John-SUBJ letter-OBJ read-PST "John read the letter."

SVO: Mandarin

Zhangsan shoudao-le yi-feng xin. Zhangsan receive-PFV one-CL letter. "Zhangsan received a letter."

VSO: Irish

Léann na sagairt na leabhair. read.PRES the.PL priests the.PL books "The priests are reading the books."

VOS: Nias

I-rino vakhe ina-gu. 3SG-cook ABS.rice mother-1SG.POSS "My mother cooked rice."

OVS: Hixkaryana

Toto y-ahosi-ye kamara. man 3:3-grab-DIST.PST jaguar "The jaguar grabbed the man."

OSV: Nadëb

Awad kalapéé hapúh. jaguar child see.IND "The child sees the jaguar."

(Mattausch 2015, cf. World Atlas of Language Structures, Dryer & Haspelmath 2011)

Based on WALS' sample (1,377 languages), Greenberg's Universal #1 holds true for about 97% of the world's languages.



Greenberg's grammatical universals

• Universal #20

- When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.
- 3 possible word orders:
 - Dem > Num > A > N, e.g. these three nice books (English)
 - N > A > Num > Dem, e.g. *books nice three these* (Thai)
 - N > Dem > Num > A, e.g. *books these three nice* (Kikuyu)

(Greenberg 1963, Piattelli-Palmarini et al. 2009)

Num>N>A>Dem: Welsh

y pum llyfr newydd hyn the five book new these "these five new books"

Dem>A>N>Num: Korean

ce ppalkan sakwa twu-kay that red apple two-CL "those two red apples"

N>A>Dem>Num: Akha

tshó-hà jɔ-mỳ xhø njì ɣà person good those two CL "those two good persons"

Num>A>N>Dem: Acehnese

duwa droe ureueng nyang-sakit nyoe two CL person REL-sick this "these two sick people"

Dem>A>Num>N: Dhivehi

mi raⁿgalu tin fot this good three book "these three good books"

N>Num>A>Dem: Medumba

bún kùà s≿ŋk≿d câ lì children black four these here "these four black children"

(Roberts 2017, Kouankem 2015, Joo 2013, Dryer 2009)

Greenberg's grammatical universals

- Data-driven, frequency-based
 - Mostly linearization patterns
 - Descriptive
 - Tendencies rather than universal



Linear

Lily eats cookies. (English) Lily cookies eats. (Japanese) Eats Lily cookies. (Irish) Eats cookies Lily. (Nias)

Chomskyan Universals

Knowledge of language is based upon a core set of principles embodied in all languages and in the minds of all human beings.

Universal Grammar is a theory of knowledge that is concerned with the internal structure of the human mind -- how the computational system links sounds to meaning. (Cook & Newson 2007)



Universal Grammar must meet the condition of evolvability, and the more complex its assumed character, the greater the burden on some future account of how it might have evolved.

The optimal situation would be that Universal Grammar reduces to the simplest computational principles, which operate in accord with conditions of computational efficiency.

(Berwick & Chomsky 2016)

Minimally:

- The capacity to construct and store meaningful atoms.
- An operation to build up hierarchical structures.

[ˈlɪli] - 😥 [i:t] - 👖 [ˈkʊki] - 🍪 [s/z] - PRES.3SG; PL



The rest can be reduced to experience and computational efficiency.

Example: the locality principle

- Dependency in sentence structure is limited to a short hierarchical distance.
- "Locality is a pervasive property in natural-language syntax." (Rizzi 1990)

Compare:

- 1. The girl is eating <u>cookies</u>. \rightarrow <u>What</u> is the girl eating?
- John likes the girl that is eating <u>cookies</u>. →
 <u>XWhat</u> does John like the girl that is eating?



Example: the locality principle

Compare:

1. Jack reckons that John likes himself. ("himself" = ?)

2. Jack reckons that John likes him. ("him" = ?)



Example: the distinctness principle

Adjacent elements on a hierarchical structure cannot be identical in category.

English

- Every guy admired every girl, except [D Jack] [D Lily].
- the singing [_{GEN} of songs] [_{GEN} of the children] X

French

- Jean a fait manger [_D la tarte] [_D Paul]. X
 "Jean made Paul eat the cake."
- [_D le] [_D le] plus beau paysage X
 "the most beautiful landscape"

(Richards 2010, Neeleman & van der Koot 2006)

Locality

Distinctness

- 1. Don't move things out of complex nominal phrases.
- 2. Don't move things out of subjects.

- 1. Except phrases don't allow ellipsis.
- 2. Don't use two of phrases for
- 3. Principles like locality and distinctness are inherent
 properties of the computational system and do not
- 4. need to be learned.
- 5. Personal pronouns get reference from context.

4. When two dennite articles
are adjacent, delete one.
5. ...

6. ..

- Theory-driven
- Explanatory
- Minimalist
- Acquisition-friendly
- Evolution-friendly

Many problems remain to be solved...

"By all accounts the origin of mind-dependent word-like elements remains a big mystery—for everyone, us included." (Berwick & Chomsky 2016)

"Mind-dependent word-like elements"

- cat, dog, fish, duck...
- eat, drink, walk, sleep...
- nice, pretty, good, yummy...
- at, on, in, above...

→Noun
→Verb
→Adjective
→Preposition

Words are CONCEPTs in linguistic "dresses", i.e. syntactic categories. Categories bridge the two components of UG.



The theory of syntactic categories is still being advanced...

My project: flexibility of syntactic categories

- Subcategories
 - Ie soleil "the sun", Ia mer "the sea" (noun gender)
 - the window broke, John broke the window (verb type)
- Fuzzy categories
 - look up, give in (verbal particle)
 - Hao hao chi ya! "It's so yummy!" (sentence final particle)
- Reused categories
 - a dog, the problem dogs him (conversion)
 - I have a pen, I have eaten (grammaticalization)

How much freedom does UG leave to individual categories and categorization?

Summary

- 1. Language is a human instinct (Humanese)
- 2. "Grammar" refers to our tacit linguistic knowledge
- 3. Typological vs. theoretical universals
- 4. Universal Grammar lies in the computational system
- 5. Syntactic categories play a pivotal role in UG

Beyond Humanese

Human languages vary a lot in form, but are highly consistent in meaning (hence the translatability)

causation (cause>effect)

"Universal Grammar" = grammatical universals on Earth

If there were other intelligent species, they might have different UGs...









