

Presentation 16: Universals of language

Herbert H. Clark
Stanford University

Four pressures on language

1. Learnability
language has to be learnable by children
2. Processability
language has to be able to be produced and understood (by people of all capacities)
3. Social utility
language needs to be used for practical purposes
4. Commonality of experience
language should reflect people's common experiences

Processability: The case of classifiers

Step 1: Words that refer to the same thing are easier to process as parts of the same grouping, or constituent.
the large flea
die schöne Sonne (the beautiful sun)

What aspects of language are universal?

1. Languages *evolve slowly*
2. Languages have evolved the simplest forms (*with caveats*) based on ...
 - a) the uses to which language is put
 - b) our capacities to use language
3. Universals should, therefore, reflect *optimal uses* of language

Learnability: The case of regular paradigms

Step 1: Word paradigms are easier for children to learn when they are regular (Slobin)

Regular work/worked, reach/reached

Irregular go/went, break/broke, bring/brought, ring/rang

Children's errors:

plural mans, sheeps

past breaked, goed, breaked, bringed, ringed

pres sing gots

possessive mines



Processability: The case of classifiers

Step 2: Languages have strong preferences in grouping of C, Q, N:

two head of cattle = (two head) of cattle

classifier C (**head**)

quantifier Q (**two**)

noun N (**cattle**)

Languages treat Q as modifier of C *not* of N:

Languages treat Q + C as a constituent

Languages **never** treat Q + N, or C + N constituents



Why study universals?

Simplest answer

1. To discover universal ways in which people think and use language
2. To discover constraints on people's ability to process language

Complications

1. There may be no complete universals
2. So, try to discover universal pressures on language and language use

Learnability: The case of regular paradigms

Step 2: Language change (Bybee):

analogical extension: extend regular endings

analogical leveling: get rid of alternative endings

Examples of historical change:

wrought work

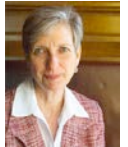
dreamt dreamed

spelt spelled

shone shined

thriven thrived

wove weaved



Processability: The case of affixes

Step 1: Two preferences in word processing

(Hawkins & Cutler)

People process initial segments of word first

Example: **br**anch

People process stem and affixes separately

singer = sing + er

Evidence: slips of the tongue: "Singing sewer machine"

Processability: The case of affixes

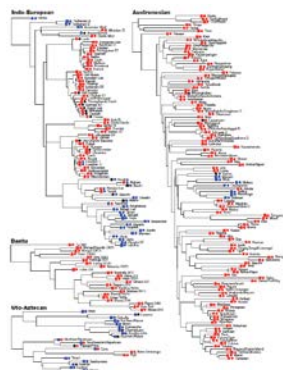
Step 2: Suffixes are preferred to prefixes in world's languages

| | Exclusively prefixing | Exclusively suffixing |
|--------------------|--------------------------|--------------------------|
| Verb + Object (VO) | 10% | 17% |
| Preposition + NP | 7% | 21% |
| Object + Verb (OV) | 0% | 62% |
| NP + Postposition | 0.7% | 65% |

Processability: Greenberg's harmony

Step 2: Patterns in the world's languages (VO vs. OV)

| VO (like English) | OV (like Japanese) |
|---|---|
| Verb + object (<i>hit ball</i>) | Object + verb (<i>ball hit</i>) |
| Preposition + noun (<i>on ball</i>) | Noun + post-position (<i>ball on</i>) |
| Verb + subject (<i>hit he</i>) | Subject + verb (<i>he hit</i>) |
| Noun + relative (<i>ball that rolled</i>) | Relative + noun (<i>that-rolled ball</i>) |
| Weak: Noun + adj (<i>red ball</i>) | Adj + noun (<i>ball red</i>) |



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Processability: The case of word order

Six possible orders of Subject, Verb, Object

- But only some are common (e.g., SVO, SOV)
- Most languages are SO. Why?
Perhaps we attend to S before O, or S is generally given and O new.
- Most languages are SV. Why?
Perhaps we need to know who or what is taking the action in order to interpret the action.

Contrary evidence (Nature, 2011)

Evolved structure of language shows lineage-specific trends in word-order universals

Michael Dunn
Simon J. Greenhill
Stephen C. Levinson
Russell D. Gray

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Processability: Greenberg's harmony

Step 1: It should be easier to process two elements in one phrase if they have the same ordering as two elements in another phrase with analogous functions.

the good dog
the two apples

One claim

"Contrary to the Greenbergian generalizations, we show that most observed functional dependencies between traits are lineage-specific rather than universal tendencies.

These findings support the view that—at least with respect to word order—

- cultural evolution is the primary factor that determines linguistic structure,
- with the current state of a linguistic system shaping and constraining future states."

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Relations studied

| Relation | English example |
|-----------------------------|--------------------------|
| Nominal <i>noun</i> | one shoe |
| Genitive <i>noun</i> | Mary's shoe |
| Adjective <i>noun</i> | large shoe |
| Demonstrative <i>noun</i> | that shoe |
| Adposition <i>noun</i> | at home VO vs. OV |
| Verb <i>object</i> | hit ball |
| Relative clause <i>noun</i> | to-be-caught ball |
| Subject verb | Mary left |

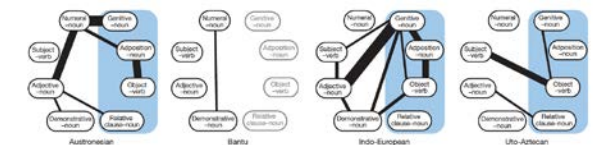


Figure 2 | Summary of evolutionary dependencies in word order for four language families. All pairs of characters where the phylogenetic analyses detect a strong dependency (defined as BF ≥ 5) are shown with line width proportional to BF values (indicating a range from 5.01 to 21.25, see Supplementary Information section 5). In the case of the Bantu language family, four invariant features (indicated in grey) were excluded from the analyses. Following Dryer's reformulation of Greenberg's word-order universals, we expected dependencies between all the features in the blue shaded area. However, only two dependencies (object-verb order and adposition-noun order; and object-verb order and genitive-noun order) are found in more than one language family, and no dependencies were found involving relative clause order and any of the other three features. Of the other thirteen strongly supported dependencies, nine were unexpected (no prediction was made about feature pairs outside the blue area). Most of these 19 dependencies occur in only one language family (three occur in two families, and one in three families).

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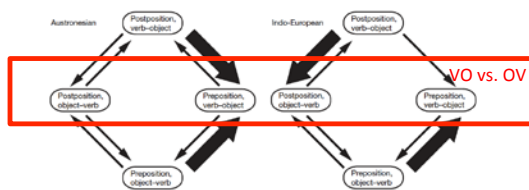


Figure 3 | The transition probabilities between states leading to object-verb and adposition-noun alignments in Austronesian and Indo-European. Data were taken from the model most frequently selected in the analysis; probability is indicated by line weight. The state pairs across the midline of each figure (postposition, object-verb, and preposition, verb-object) are Greenberg's "harmonic" or stable word orders. Nevertheless, each language family shows tendencies for specific directions and probabilities of state transitions.

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Question

What does all this mean?
Greenberg's "harmonic" relations don't seem to be universal
So what is universal?

Social utility: The case of politeness

Step 1: There is a universal social pressure to maintain face (Goffman):

1. *autonomy*: to maintain freedom of action, freedom from imposition
2. *self-regard*: to maintain their desirability to other people



Social utility: The case of politeness

Step 2: Universality of forms of requests (Brown & Levinson):

- requests threaten people's face
- request restricts the addressee's freedom
- request imposes on addressee
- hence: need for mitigation techniques

English examples:

- "Can you open the door?" better than "Open the door?"
- "Do you have the time?" better than "Tell me the time"



Universality of nouns, verbs, adjectives

| Uses | Reference | Modification | Predication |
|-------------------|--------------|------------------------------------|----------------|
| Objects | child | childlike, childish, child's | be a child |
| Properties | whiteness | white | be white |
| Actions | destruction | destroying, destroyed, destructive | destroy |

Prototypical N, V, A are **simple words**
child, white, destroy

Non-prototypical N, V, A are **derived words**
childlike, childish, child's, be a child
whiteness, be white

William Croft



Standard inflectional categories: Nouns

| | Category | Example |
|--------------|---------------------------------|----------------------------|
| Nouns | number (countability) | dog- s |
| | case, gender | actr- ess |
| | size (augmentative, diminutive) | dogg- ie |
| | shape (classifiers) | sheet, wad of paper |
| | definiteness | the dog |
| | alienability | the (my) head |

William Croft

Standard inflectional categories: Adjectives

| | Category | Example |
|-------------------|------------------------------------|---|
| Adjectives | comparative, superlative, equative | old- er , old- est , as old |
| | intensive | very good |
| | approximative | child- ish |
| | agreement with head | die schön- e Sonne |

William Croft

Standard inflectional categories: Verbs

| | Category | Examples |
|--------------|---------------------------------|---|
| Verbs | tense, aspects, mood, modality | work- ed , work- ing , can work, would work |
| | agreement with subject, objects | he work- s |
| | transitivity | be -moan |

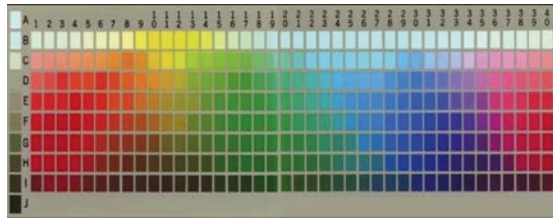
William Croft

Universal color terms

It all began with Berlin & Kay (1969) at UC Berkeley

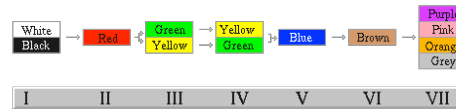


Munsell color chips



Universals of basic color terms

| Stages: I | II | III-V | VI | VII |
|-----------|-----|--------|-------|--------|
| black | red | yellow | brown | purple |
| white | | green | | pink |
| | | blue | | orange |
| | | | | gray |



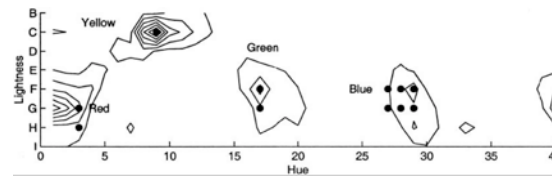
Some comparisons



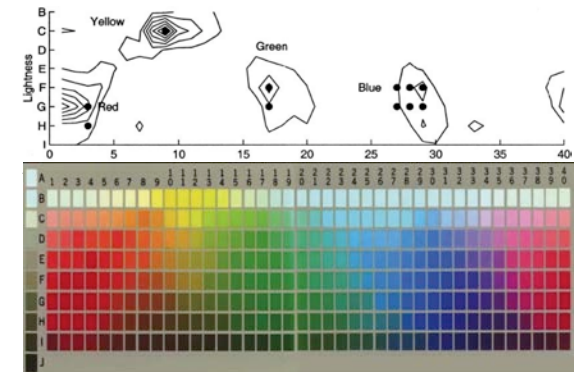
Physiological account (Kay and McDaniel)

1. Certain colors highly perceptible
2. Hering color theory: three contrasts
 - a) luminosity: black-white,
 - b) red-green
 - c) yellow-blue
3. These reflect *cone connections* in retina
4. Focal colors correspond to break points in color discrimination curves
 - a) *primary hues*: red, green, yellow, blue
 - b) *secondary hues*: brown, grey, orange, pink, purple

Focal colors of 110 WCS languages cluster



Contour plot of WCS (World Color Sample) best-example choices compared with best examples of English color terms. Berlin and Kay reported more than one best-example choice for several of the English color terms; all best-example choices are displayed here.



Optimal color distributions

Colors should be distributed to maximize *well-formedness*:

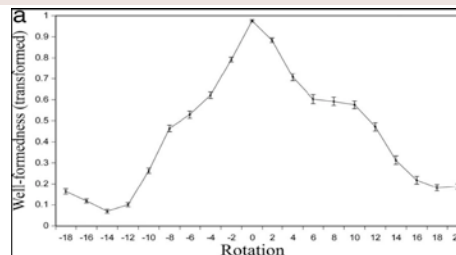
1. Maximize perceptual similarity *within* categories
2. Minimize perceptual similarity *across* categories

Test case: four basic color terms for Lele

1. Rotate the color space by moving it right or left
2. Then recompute well-formedness measure



Color spaces optimize well-formedness



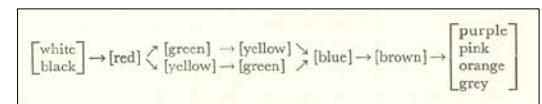
Rotation analysis of WCS data. Well-formedness averaged across all 110 WCS languages as a function of rotation. For each rotation, the dot shows the average transformed well-formedness value across languages.

Color universals?

Basic color terms have a *universal character*

From 2 to 11 or 12 basic color terms

More terms with industrialization, use of dyes



Universals have a perceptual basis

Ewald Hering color theory (reflected in **retina**)

1. **black-white** luminosity

2. **red-green** Δ 2 cones

3. **blue-yellow** Δ 2 cones

4. **other** combinations



Universals have a perceptual basis

1. Ewald Hering color theory (reflected in **retinal connections**)
2. **Focal colors** of all languages cluster on perceptual basis
3. Color systems partition the color space in **optimal** ways **based on perceptual similarity**

Universals of botanical life form terms

| Stages | I | II | III | IV-VI |
|--------|---------|------|-------|-------|
| | no term | tree | grerb | bush |
| | | | | vine |
| | | | | grass |

grerb = grass + herb

Cecil Brown

Universals of zoological life form terms

| Stages | I-III | IV | V |
|--------|-------|-----|--------|
| | fish | wug | mammal |
| | bird | | |
| | snake | | |

wug = worm + bug

Cecil Brown

Universals of base states

Adjectives that allow *un-*, *in-*, etc., are primarily:
positive in evaluation (good, desirable)
not negative in evaluation (bad, undesirable)

Examples

You find: *unhappy*, *unintelligent*

You don't find: *unsad*, *unstupid*

Strong evidence from:

English, German, Russian, French, other languages

von Jhering, 1883; Wundt, 1886; Jespersen, 1942; Zimmer, 1964.

What makes some states *base states*?

| Base states are ... | primary | secondary |
|----------------------------|------------------|----------------------|
| 1. standard | <i>healthy</i> | <i>unhealthy</i> |
| 2. expected | <i>student</i> | <i>non-student</i> |
| 3. good | <i>good</i> | <i>bad</i> |
| 4. specifiable | <i>Christian</i> | <i>non-Christian</i> |
| 5. extendable | <i>long</i> | <i>short</i> |
| 6. majority | <i>many</i> | <i>a few</i> |

Cultural norms, common points of reference

Universals of human experience: Space

Step 1: We all experience roughly the same spatial dimensions in the world around us.

Shared experience

| | |
|---------------------|------------------------------------|
| gravity | defines vertical |
| canonical position | people stand upright |
| canonical encounter | people meet face-to-face |
| tandem positions | people follow each other on paths |
| extent | measure of extent in any direction |

Universals of human experience: Space

Step 2: Use of these canonical notions in language

1. canonical position

extend up-down to person's body
 "up the arm" (regardless of how positioned)

2. canonical encounter

"front/back" of rock, tree, objects without features

3. tandem positions

"front/back" in some African languages (HIII)



Universals of human experience: Space

Step 2: Use of these canonical notions in language

1. *distance*

- *far-near*: how far is it
- *deep-shallow*: how deep is it
- *high-low*: how high is it

2. *extension*

- *tall-short, long-short*
- *wide-narrow, broad-narrow*
- *deep-shallow*

Universals of human experience: Deixis

Step 1: Communication must be anchored to a “deictic frame” (see presentations 1, 11, 12).

- local space
- current time
- current participants

Step 2: Anchoring is done with *deictic terms*

“those linguistic elements whose interpretation in simple sentences makes essential reference to properties of the extralinguistic context in which they occur” (Anderson & Keenan)

Universals of human experience: Deixis

Person deixis: All languages have *pronouns*

| | |
|---------------|---|
| Person | <i>I, you, he</i> |
| Number | <i>I, we</i> |
| Gender | <i>he, she</i> (mainly in third person) |
| Social status | <i>tu/vous, du/Sie</i> (of speaker, addressee, third persons) |

Universals of human experience: Deixis

Spatial deixis: All languages have *spatial contrasts*

| | |
|-----------------------|--------------------------------------|
| center of perspective | <i>come/go</i> |
| distance | <i>this/that</i> (at least two ways) |
| visibility | visible/invisible |

Temporal deixis:

| | |
|---------------------|------------------------------|
| earlier, later: | <i>ahead/behind, up/down</i> |
| present, past tense | <i>go/went</i> |
| near/far in time: | <i>now/then</i> |

Conclusion

Universals of language reflect universal pressures of ...

1. learnability
2. processibility
3. social utility
4. common experience