

## Cognitive Fire: Ideas on the Practice of Ethnogrammar

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## Wilhem von Humboldt On Language

- “We must look upon **language**, not as a dead **product**, but far more as a **producing...**” [emphasis in the original, DLE].”

Wilhelm von Humboldt, *On Language*, (1999 translation, Peter Heath, p46ff)

- “Language is, as it were, the outer appearance of the spirit of a people; the language is their spirit and the spirit their language; we can never think of them sufficiently as identical... [we] must seek the nature of this individuality in every case in its **structure**.”

- “... in the scattered chaos of words and rules that we are, indeed, accustomed to call a language, there is present only the **particular** brought forth by this speaking... this ... can only be perceived or divined in **connected discourse**; which is all the more proof that language proper lies in the act of its real production.” Humboldt (p49)

## Culture

- What is culture?
  - Living in a culture vs. living culturally
  - Culture vs. values
- A tree branch moving up and down can indicate the presence of mobile meat. (Etic vs. Emic)
- Rousseau was one step behind – language is the socio-cultural contract. (John Searle, “What is Language?”)

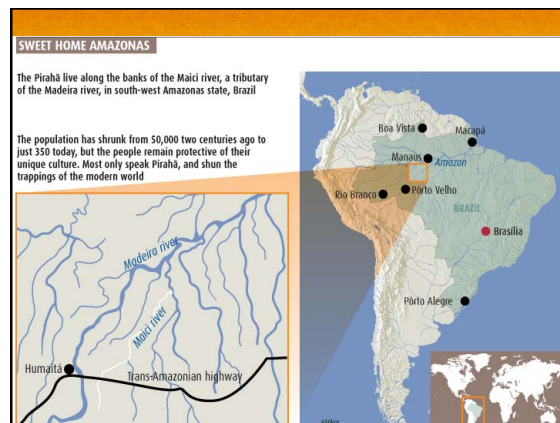
## Culture, Grammar, and Cognition

### COGNITION, GRAMMAR, CULTURE CONNECTIONS

Constraint Relationship	Representative Theory
1. cognition → grammar	Chomsky's Universal Grammar
2. grammar → cognition	Linguistic Relativity (Whorf)
3. cognition → culture	Brent Berlin and Paul Kay's work on color terms
4. grammar → culture	Greg Urban's work on discourse-centered culture
5. culture → cognition	Long term effects on thinking of cultural restrictions on certain behaviors
6. culture → grammar	Ethnogrammar; individual forms structured by culture

## The Hiaitíihí (Pirahã)

The 'straight ones'



## Grammar is shaped by culture

- 1. Pirahã Phonology
  - Segmental simplicity and free variation
  - Channels of discourse (different communicative tools)
- 2. Some cultural-cognitive-communicative tools that are not needed in all societies:
  - Number
  - Color
  - Quantifiers
  - Recursion

Other tools not needed by all societies:



## Phonology & Culture

## Prosodic complexity Stress

- Stress the rightmost token of the heaviest syllable in the last three syllables of the word.
  - Stress = amplitude
  - CVV > GVV > VV > CV > GV
  - (C = voiceless; G = voiced)
- (! = stress; ' = high tone)
- a. !tígi 'small parrot'; b. !pigi 'swift'; c. !sàbí 'mean, wild'; d. !xábi 'to stay'; e. tí!híí 'bamboo'; f. xí!ti 'forehead'; g. tí!xí 'honey bee'; h. tí!hí 'tobacco'

## Prosodic Complexity Tone

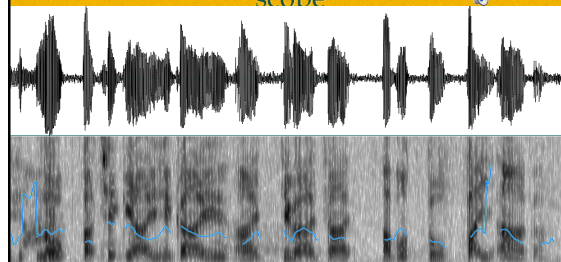
- |       |   |         |
|-------|---|---------|
| HH/LL | → | MM/*L*L |
| [CVV] |   | [CVV]   |

A H or L tone sequence associated with identical vowels in a monosyllabic word is lowered; H to M and L to \*L (extralow).
  - [HL... → [ML...
    - [LHL... → [LML

A H tone between two Ls or at the beginning of a word followed by a L tone is lowered to M.
  - [HLH → [HMH
    - [HL] → [HM]

A L tone between two H tones or following a H tone word finally is M.
- Rules 2 and 3 further show that the beginning of a word acts as a lowering environment and the end as a raising environment. Everett (1978) refers to this as word-level intonation.

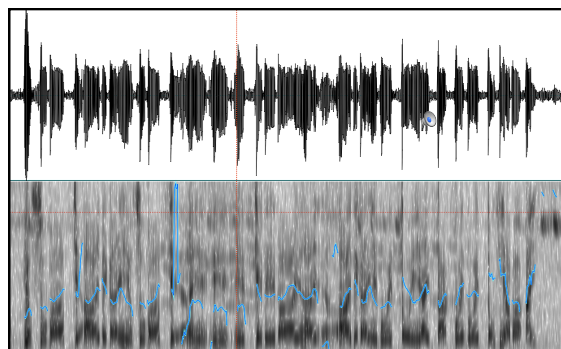
## Prosodic Complexity: Intonation Nonconfrontive, Nonrising, Single-sentence scope



Paóxai hí gáisai. Paóxai hí gáisai. Xabótoó. Góóó kai sígiáihix, gáihí. Xáí tí gáisai. Xabótopaii xáaga.  
Dan he spoke. Dan he spoke. Armpit. What is the name of that? I spoke. It is an armpit.

## Rising intonation: Multi-sentence scope

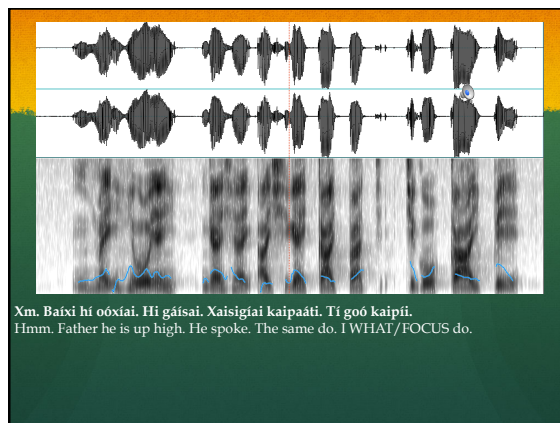
- Confrontive (or surprise; or generally emotional)



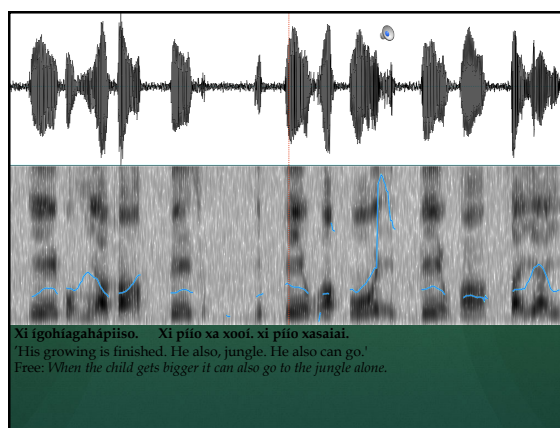
Hí xoósobaáti, Xaíbígai. Hí xoósobaáti. Hí tí xíbíibaiíhái.  
'Look at him (pay attention to him), Dan. Look at him. He ordered me.  
Xaíbígai. Hí boítóhooi. Hí xaítakói. Hí boító xabaxái.'  
'Dan. Hí (has a) boat. He really moves. He (in the) boat alone (moves).'



## “Relative Clause” Intonation



## Further intonational examples: Temporal Clauses



## Prosodic Channels of Discourse

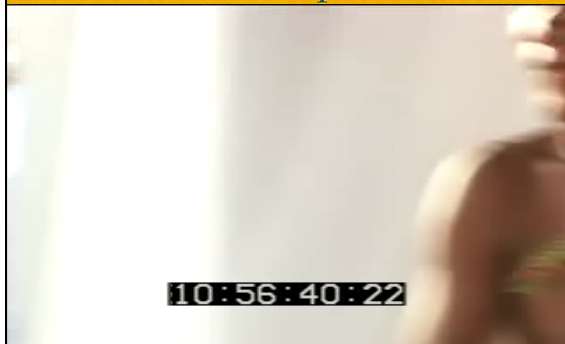
- a. **HUM SPEECH:** Disguise, Privacy, Intimacy, Talk when mouth is full, Child language acquisition
- b. **YELL SPEECH:** Long distance, Rainy days, Most frequent use – between huts & across river
- c. **MUSICAL SPEECH:** ('big jaw') New information, Spiritual communication, Dancing, flirtation
- d. **WHISTLE SPEECH:** (sour or 'pucker' mouth) Hunting, – same root as 'to kiss' or shape of mouth Men-only (as in ALL whistle after eating lemon)

## Hum Speech





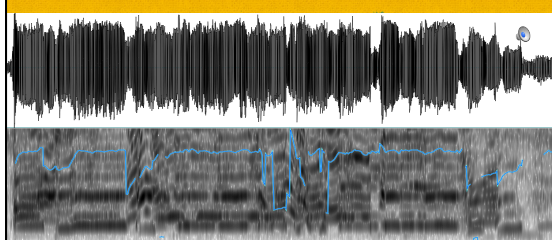
## Whistle Speech



## Bloodless talk



## Musical Speech (“singing”)



Xaagii xii ti xii xigioó. Ti xigioai xmm...  
Path wood (trees) I trees with. I with (them). Hmm...

The tones are normal word tones, though the tonal rises and falls are exaggerated.  
No special melody. No special theme. They can be repeated. Closest to formulaic.

## Phonology and Culture: Free Variation and Phonemic Inventory

### Segmental Inventory

- Male Phonemic Inventory: i, a, u; p, t, k, ʔ, s, h, b, g
- Female Phonemic Inventory: i, a, u; p, t, k, ʔ, (s), h, b, g

### Free Variation:

- tí píai ~ kí píai ~ kí kíai ~ pí píai ~ xí píai ~ xí xíai ~ tí píai, etc. (\*tí tiái, \*gí gíai, \*bí bíai) 'me too'
- xapapai ~ kapapai ~ papapai ~ xaxaxai ~ kakakai ~ (\*tapapai, \*tatatai, \*bababai, \*gagagai) 'head'
- xisiihoái ~ kisihoái ~ písihoái ~ píhihoái ~ kiihihoái 'fuel'

## Functionality implication - version one

- Constraint on functional load and necessary contrast (Everett (1985)):*

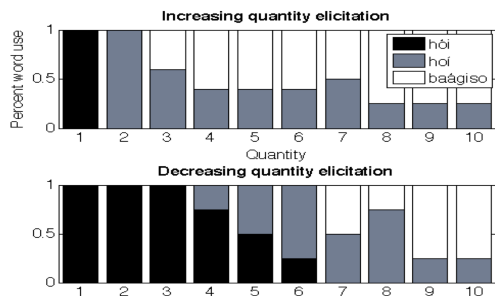
- a. Greater Dependence on the Channel → Greater Contrast Required**
- b. Lesser Dependence on the Channel → Less Contrast Required**

## Numbers as a cognitive tool: Frank, Everett, Fedorenko, & Gibson

Does speaking a language without number words change the way speakers of that language perceive exact quantities?

We show that the Pirahã have no linguistic method whatsoever for expressing exact quantity, not even “one.” These results suggest that language for exact number is an cultural invention rather than a linguistic universal, and that number words do not change our underlying representations of number but instead are a cognitive technology for keeping track of the cardinality of large sets across time, space, and changes in modality.

## What different counting directions illustrate.



## No Grammatical Number

*hiaitíhí hi kaoáibogí bai -aagá*

Pirahã people he evil spirit fear -be

"The Pirahã are afraid of evil spirits,"

"A Pirahã is afraid of an evil spirit,"

"The Pirahã are afraid of an evil spirit," or "A Pirahã is afraid of evil spirits."

## No Quantifiers

No lexical items, no binding, no truth conditions of quantifiers.

*Hiaitíhí hi xogixáagaó pió kaobí*

'A lot of the people went to swim/went swimming/are swimming/bathing, etc.'

*Ti xogixáagaó 'ítii'isi xogió xi kohoaibaaí. Koga hóí hi hi kóhoihaba*

'A lot of us ate a lot of of the fish. We didn't just eat a little (contrary to what you might expect).'

## No Quantifiers: 2

*Xigihí hi xogíáagaó xoga hápií. Xaikaíbaísi, Xahoáapati píó, Tíigi hi píó, 'ogíáagaó*

'The **bigness** of/a lot of men all went to the field, Xaikaíbaísi, Xahoáapati, Tíigi their **bigness** went.'

*Gátahai hóihii xabaxáígio 'aoaagá xagaoa koó*

'There were (a) few cans in the foreigner's canoe.' (literally: smallness of cans remaining associated was in the gut of the canoe')

## Color terms:

### Whorfianism isn't always right

- Karajá vs. Pirahã color terms: Karaja has words for colors and contradicts the predictions of Berlin and Kay. Piraha lacks these words yet conforms to the predictions of Berlin and Kay. *So the innate seems to be only able to be overridden in this case by language, whereas the absence of language leaves the innate unaffected.* (My reading of Terry Regier, Paul Kay, and Naveen Khetarpal, Color naming and the shape of color space. *Language* - Volume 85, Number 4, December 2009, pp. 884-892 and discussions with Kay)

## Color classification and Linguistic Determinism

<i>bii -opaí ai</i>	'Black'
blood -dirty/opaque be/ do	
"Blood is dirty."	
<i>k -obi ai</i> sees.	'White'
<i>bi ís ai</i>	
blood it is	'Red'
"bloodlike"	
<i>ahoas aagá</i>	'Green'
immature be:temporary	
"temporarily being immature"	

## Creation Myths, Kinship, Tense

- No perfect tenses (I had eaten when you arrived.)
- Simplest kinship system – only one generation from ego.
- No creation myths.

## Limited Time Words

**NO TIME LIKE THE PRESENT**  
The Pirahã tend to talk almost exclusively about the here and now. They do not celebrate birthdays or anniversaries. They do, however, recognise the passage of time through wet and dry seasons, and use the full moon as a simple calendar. The complete list of Pirahã words for time runs to just 12, as follows:

Pirahã word	Meaning	Literal translation
'ahoapiá	another day	other at fire
so'ád	already	time-wear
ahadi	night	be at fire
'ahookahoolio	early morning, before sunrise	at fire inside eat go
pi'i	now	
kahai'ali 'agitso	full moon	moon big temporal
piáiso	low water	water skinny temporal
hibigibagá'diso	sunset/sunrise	be touch comes be temporal
hiá	during the day	in sun
hióogiai	noon	in sun big be
hoá	day	fire
piibigaiso	high water	water thick temporal

## Cultural Factors

- **Societal Intimacy:** As in *Society of Intimates* vs *Society of Strangers*. The former share nearly 100% of knowledge and expectations of discourse content. (vs. Societies of Strangers in which few expectations on possible discourse content.)
- **Individual Cultural Values**
  - Information Rate; cultural conservatism
  - More narrow values: *Immediacy of Experience*.

## The Cultural Task:

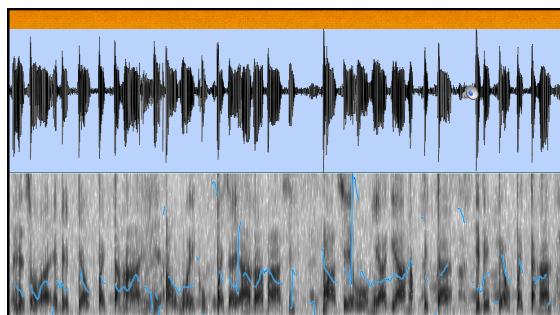
Keep Information Slow; Keep It Verifiable

Keep the information rate low – the value of cultural conservatism – carefully separate topics and comments

It must be witnessed (you saw it or someone who saw it told you)

## Xibipíio

Experiential liminality – a focus on the boundaries and immediacy of experience.



Hi soxóá hi xibipíio páitahaá. Hi xáohoi xigopáisaixaagahaá, báasi.  
He already just came back into sight. He manioc brought, sweet manioc.  
Báasií xoó hi xagíahápítá. Hi xibipíio páitahaá.  
Sweet manioc from the jungle he brought. Hi came back into sight.



## Immediacy of Experience

*'Declarative Pirahã utterances contain only assertions related directly to the moment of speech, either experienced by the speaker or as witnessed by someone alive during the lifetime of the speaker.'*

- 1) Explains time words; discourse content; lack of creation myths; contentment, perhaps.
- 2) Other characteristics of the language, e.g. lack of recursion, follow from being a society of intimates, by the **tool principle**.

## The tool principle

- a. **Greater Dependence on the Tool** → **More likely it will be used.**
- b. **Lesser Dependence on the Tool** → **Less likely it will be used.**

## Recursion as a Tool: Evidence for Cultural Design

- HC&F (1573): "In fact, we propose in this hypothesis that FLN comprises only the core computational mechanisms of recursion as they appear in narrow syntax and the mappings to the interfaces. If FLN is indeed this restricted, this hypothesis has the interesting effect of nullifying the argument from design, and thus rendering the status of FLN as an adaptation open to question."
- In fact, recursion supports the argument of design – cultural design (in a nonteleological sense).

## What is recursion?

- 1. "An operation that applies to its own output."
- 2. "Having the property that in principle a machine could determine in finite time, for any arbitrary finite string over the right alphabet, whether the string is in the language or not."
- I will assume we are interested in (1).

## Recursion: Everyone reasons with it

- *Killing the Panther*
- 1. *Xakí, xakí tí kagáíhiaí kagi abáípi koái.*
- *'Here the jaguar pounced upon my dog. It died'*
- 2. *Ti kagáíhiaí kagi abáípi koái.*
- 3. *Xaí tí aiaí xaíá.*
- *'There the jaguar pounced on my dog. It killed him. It happened with respect to me (summary – recursive).'*

Where recursion isn't needed, it isn't used – *it is neither necessary nor sufficient for sentential syntax.*

## Predictions if Pirahã Lacks Recursion

- (1) the lack of recursion predicts that factive and epistemic verbs will be absent (though there is a - crosslinguistically common - use of the verb 'to see' for 'to know').
- (2) Second, Piraha is predicted to lack a marker of subordination.
- (3) Piraha has no coordinating disjunctive particles (e.g. 'or').
- (4) Piraha has no coordinating conjunctive particle (e.g. 'and'). There is only a more general particle, **píaii**, which may appear preverbal or sentence final and which means 'is thus/simultaneous' (vague meaning), which never works like proper conjunction, but only supplies the information that these two things were simultaneous (it is related to pixai, now).

## Predictions (cont)

- (5) Piraha has no syntactic complement clauses.
- (6) Piraha does not allow recursive possession anywhere.
- (7) Piraha prohibits multiple modification in the same phrase.
- (8) Piraha semantics shows no scope from one clause into another: '*John does not believe you left*' (where 'not' can negate 'believe' or 'left', as in 'It is not the case that John believes that you left' vs. 'It is the case that John believes that you did not leave')

## Predictions (final)

- (9) *Piraha shows no long-distance dependencies except between independent sentences, i.e. discourse:*
  - (i) a. 'Who do you think John believes \_\_ (that Bill saw \_\_)?'
  - b. 'Ann, I think he told me he tried to like \_\_'
- (ii) **Soxógiái Paóxaísi hi xapaitísi xaabáítá.**
- **Hi hoísai píaii kosaagá. Hoagá xobáaxáípixái xíga.**
- '*Long ago Dan could not speak Piraha. His children could not either. Nevertheless, (he) speaks it well now.*'

## How to test a grammar for recursion or other features

- Was a structure generated by a recursive rule or not?
- Chomsky's simplicity principle: Tenenbaum and Perfors's Bayesian evaluation of alternative grammars
- Linguistic distributional arguments.
- Inconclusive:
  - Neuroscience: We cannot look inside the head.
  - Semantics: can't use meanings to argue for morphosyntactic form directly.
  - Intonation: no direct link to syntax.

## Language is a tool

- Tools require both biology and culture for use.

## Communication

- Turn-taking
- Objects and events
- Purpose and intentionality (monitoring the interlocutor)
- Serial ordering
- Desire/Need to cooperate and communicate

## What are the problems for language to solve?

- 1) Communication:
  - Information and Source → Transmitter → Receiver → Destination
- 2) Nonlinear thoughts to linear expression (this had to be solved by evolution – but as grammar or simply the ability to linearize?)
- 3) Refine, develop, and encode values
- 4) Share knowledge

## Things that are not essential for language(S)

Syntax? Any communication system, even DNA, must have this).

Recursion? No. It is a tool, but neither necessary nor sufficient.

Specific Physical Modality? (Gestures; Speech; Phonology) No. (Many species have meaningful sounds and gestures/movements.)

Phonetics – the fact that our meanings are instantiated? No. (All species have physical instantiations of meaning.)

Semantics? Not generally. (All species have meaning.)

Society? A prerequisite. (Although many species have social relations.)

## Essential to Language

- *Symbols – perhaps a sufficient condition for language.* (Saussure; Construction Grammar; Deacon)
- *Desire to communicate and to cooperate* (the principal universal of language, along with symbols – Tomasello; Hrdy).
- *Theory of Mind?* A prerequisite. (Only humans see others as have similar mental lives.)
- Language emerges/d from the interactions between these and the culture-specific tasks it has to solve (only once?)

## How specific is the genome for grammar?

To argue convincingly that grammar is innate, we must first show that it cannot be derived from independent factors. Is there any significant grammar 'left over' once we have explained what we can in terms of: *Logic; Mathematics/Statistics; Semantics; Phonetics; Sociolinguistics; Cognition; Culture; Diachrony; Functionality*. Aspects of syntax independently derivable from these other factors shouldn't be ascribed to the genome as well. The prognosis is dim.

## Genes and Culture

- We all know that human biology in some way underwrites human language. The debate is on the specificity of how this is accomplished.
- Humans have fewer genes than corn.
- Genes generally take millions of years, but they can be culturally influenced, perhaps even induced by culture (Boyd & Richardson).
- *The relationship of genes to phenotype in humans is non-linear.*
- *Neural microcircuitry is culturally shaped.*
- *There are no known language-specific genes or regions of the brain.*

## Humboldt, Sapir, and the Descriptivist Tradition

- Descriptive linguistics: understanding the 'genius' of each language, i.e. the way that each language fits its cultural niche. Not just lexically, but in morphosyntax, phonology, semantics, and so on.
- How much variation is possible in human languages?
- Universals of Language vs. Universal Grammar: If there are no universals, then the idea of a 'language faculty' or 'language organ' or UG refer only to a 'capacity'. But, in the absence of essential features (found in all languages), why should such a capacity be considered specifically linguistic? It would be less parsimonious to do so.



## Towards A Jamesian Linguistics: The Useful, The Particular, The Experiential

"The generalized conclusion is that therefore the parts of experience hold together from next to next by relations that are themselves parts of experience. The directly apprehended universe needs, in short, no extraneous trans-empirical connective support, but possesses in its own right a concatenated or continuous structure." William James: *Meaning of Truth*, p. 152

Taxonomies vs. Generalizations: Taxonomic Linguistics Revisited – Linguists study languages, not language. They speculate about that.

Studies of culture, subsistence, social structure, and language in other monolingual, hunter-gatherer societies.