

**Cultural Constraints on Grammar and Cognition in Pirahã:
Another Look at the *Design Features* of Human Language**

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December 01, 2006

- (1) *Pirahã cultural constraint on grammar and living:*
- a. Grammar and other ways of living are restricted to concrete, immediate experience (where an experience is immediate in Pirahã if it has been seen or recounted as seen by a person alive at the time of telling).
 - b. Immediacy of experience is reflected in immediacy of information encoding – one event per utterance.
- (2)
- a. Pirahã is the only language known without number, numerals, or a concept of counting.
 - b. Pirahã is the only language known without color terms.
 - c. Pirahã is the only language known without embedding (that is, putting one phrase inside another of the same type or lower level, e.g. noun phrases in noun phrases, sentences in sentences, etc.).
 - d. Pirahã has the simplest pronoun inventory known and evidence suggests that Pirahã's entire pronominal inventory may have been borrowed (see Appendix Two).
 - e. Pirahã has no perfect tense.
 - f. Pirahã has perhaps the simplest kinship system ever documented.
 - g. Pirahã has no creation myths – its texts are almost always descriptions of immediate experience or interpretations of experience; it has some stories about the past, but only of one or two generations back.
 - h. The Pirahã in general have no individual or collective memory of more than two generations past.
 - i. Pirahã people do not draw, except for extremely crude stick figures representing the spirit world that they (claim to) have directly experienced.
 - j. Pirahã has no terms for quantification, e.g. 'all', 'each', 'every', 'most', 'some', etc.
- (3)
- a. The phonemic inventory of Pirahã women is the smallest in the world, with only seven consonants and three vowels, while the men's inventory is tied with Rotokas and Hawaiian for the next smallest inventory, with only eight consonants and three vowels (Everett 1979).
 - b. The Pirahã people communicate almost as much by singing, whistling, and humming as they do using consonants and vowels (Everett 1985; Everett 2004).
 - c. Pirahã prosody is very rich, with a well-documented five-way weight distinction between syllable types (Everett, 1979; Everett 1988; Everett and Everett 1984).
- (4) The Pirahã continue to be monolingual in Pirahã after more than two hundred years of regular contact with Brazilians and other non-Pirahã.

PIRAHÃ NUMBER, NUMERALS, AND COUNTING

- (5) **hiaitíihí hi kaoáibogi bai -aagá**
Pirahã people he evil spirit fear -be
'The Pirahã are afraid of evil spirits.' OR 'A Pirahã is afraid of an evil spirit.' OR 'The Pirahã are afraid of an evil spirit.' OR 'A Pirahã is afraid of evil spirits.'
- (6) **kó'oi, kóhoibíihai, hi píai, 'aáibígaí, hi**
name name he also, name 3

píai, hi koabáipí
also, he die
'Kó'oi, Kóhoibíihai, and 'aáibígaí died.'

- (7) **kó'oi hi koabáipí**
 name he die
'Kó'oi died.'
- (8) **báigipóhoaá 'i 'óooí kobai -baaí**
 name:f she tarantula watch -intensely
'Báigipóhoaá watched the tarantula(s) closely.' (this can refer to one woman named 'Báigipóhoaá or several)

NO NUMERALS

- (9) a. **hói** 'small size or amount'
 b. **hoí** 'somewhat larger size or amount'
 c. **bá a gi so** 'lit: cause to come together (loosely 'many')
 touch -causative associa nominalizer
 -tive
- (10) a. **tí 'ítíi'isi hói hii 'aba'áigio 'oogabagai**
 I fish small pred. only want
'I only want {one/a couple/a small} fish.' (NB: This could not be used to express a desire for one fish that was very large, except as a joke.)
 b. **tiobáhai hói hii** 'small child/child is small/one child'
- (11) a. **tí 'ítíi'isi hoí hii 'oogabagai**
 I fish larger pred. want
'I want {a few/larger/several} fish.'
 b. **tí 'ítíi'isi báagiso 'oogabagai**
 I fish many/group want
'I want {a group of/many} fish.'
 c. **tí 'ítíi'isi 'ogii 'oogabagai**
 I fish big want
'I want {a big/big pile of /many} fish.'
- (12) a. **'aoói 'aaíbaí 'ao'aagá'oi kapió'io**
 foreigner many exist jungle other
'There are many foreigners in another jungle.'
 b. ***'aoói'apagí 'ao'aagá'oi kapió'io**
 foreigner much exist jungle other
 ? *'There are much foreigners in another jungle.'*
- (13) a. **'ágaísi 'apagí 'ao'aagá'oi kapió'io**
 manioc meal much exist jungle other
'There is a lot of manioc meal in another jungle.'
 b. ***'ágaísi 'aaíbaí 'ao'aagá'oi kapió'io**
 manioc meal many exist jungle other
 **'There is many manioc meal in another jungle.'*
- (14) **ti 'apaí kaóbii 'ahaigí hi tíohió'io/gaaba kaóbii**
 I head fall same generation he towards me/there stay fall
'I was born first then my sibling was born.' (lit: *'I head fall sibling to me/there at fall.'*)

ALL

- (15) **hiaitíhi hi 'ogi -'áaga - ó pi -ó**
 Pirahã people he big -be (permanence) -direction water
-ó kaóbii

-direction entered
'All the people went to swim/went swimming/are swimming/bathing, etc.'

MOST

- (16) **ti** **'ogi** **-'áaga** **-ó** **'ítii'isi** **'ogi** **-ó**
 I big -be(perm) -direction fish big -direction
- 'i** **kohoai** **-baaí,**
 she eat -inten.
- koga** **hói** **hi** **hi** **-i** **kohoi** **-hiaba**
 nevertheless small amount intens. intens. -be eat -not
'We ate most of the fish.' (lit: 'My bigness ate (at) a bigness of fish, nevertheless there was a smallness we did not eat.'

EACH

- (17) **'igihí** **hi** **'ogiáagaó** **'oga** **hápii;** **'aikáibaísi,** **'ahoáápati** **pío,**
 man he bigness field went name, name also,
tíigi **hi** **pío,** **'ogiáagaó**
 name he also bigness
'The men all went to the field, 'aikáibaísi, 'ahoáápati, tíigi all went.'

FEW

- (18) **gáta** **-hai** **hói** **hi** **-i**
 can -foreign object small intens. -be
'aba **-'á** **-ígi** **-o** **'ao** **-aagá**
 remain -temp -associative location possession -be (temporary)
- 'agaoa** **ko** **-ó**
 canoe gut -direction
'There were (a) few cans in the foreigner's canoe.' (lit: smallness of cans remaining associated was in the gut of the canoe')

- (19) a. **tíobáhaihi** **bá** **-a** **-i** **-so**
 child he touch -causative -connective -nominalizer
 'whole'
- kohoai** **-sóog** **-ab** **-agaí**
 eat -desiderative -stay -thus
'The child wanted/s to eat the whole thing.' (lit: 'Child muchness/fullness eat is desiring.')

- b. **tíobáhaihi** **gíi** **-ái** **kohoai** **-sóog**
 child he that -there eat -desiderative
 'part' (in the appropriate context)
- ab** **-agaí**
 -stay -thus
'The child wanted/s to eat a piece of the thing.' (lit: 'Child that there eat is desiring.')

- (20) a. **tíobáhaihi** **poogaíhiaí** **báaiso** **kohoai**
 child he banana whole eat
- sóog** **-ab** **-agaí**
 -desiderative -stay -thus
'The child wanted/s to eat the whole banana.' (lit: 'Child banana muchness/fullness eat is desiring.')

- b. **tíobáhaihi** **poogáihiaí** **gúái** **kohoi** **-sóog**
 child he banana piece eat -desiderative
-ab **-agaí**
 -stay -thus
'The child wanted/s to eat part of the banana.' (lit: 'Child banana piece eat is desiring.')
- (21) a. **'áoí** **hi** **paóhoa'ai** **'isoí** **báaiso**
 foreigner he anaconda skin 'whole'
'oaboi **-haí**
 buy -relative certainty
'The foreigner will likely buy the entire anaconda skin.'
- b. **'aió** **hi** **báaiso** **'oaob** **-áhá;** **hi** **'ogió**
 affirmative he whole buy -complete certainty 3 bigness
'oaob **-áhá**
 buy complete certainty
'Yes, he bought the whole thing.'
- (22) a. STATEMENT: He will likely buy the whole anaconda skin.
 b. OCCURRENCE: Piece is removed (in full view of interlocutors).
 c. STATEMENT: %He bought the whole anaconda skin.
- (23) ***Ti** **'ísi** **báaiso** **'ogabagai,** **gúái** **'ogi** **-hiaba.**
 1 animal 'whole' want, piece want -negative
'I prefer whole animals to portions of animals.' (lit: 'I desire (a) whole animal(s), not piece(s).')
- (24) **tí** **'iíbisi** **hi** **baiai** **-hiaba**
 1 blood-one he fear -negative
'I am not afraid of beings with blood.'
- (25) **kaoáibogi** **hi** **sabí** **'ágahá**
 evil spirit he mean is (permanent)
'Evil spirits are mean.'

(26) Quantification: quantification entails abstract generalizations that range in principle beyond immediate experience.

(27) Qualification: qualification entails judgments about immediate experience.

COLOR TERMS

The proposed color terms of Sheldon are given in Table 1:

Symbol	Term	Gloss	Users	BCT
#	<i>bio³pai²ai³</i>	black (extended)	25	+
-	<i>ko³biai³</i>	white (extended)	25	+
+	<i>bi³i¹sai³</i>	red/yellow	25	+
o	<i>a³hoa³saa³ga¹</i>	green/blue (green-focused)	25	+

Table 1: Word Color Survey Chart of Pirahã Color Terms

- (28) a. *bio³pai²ai³* 'blood is dirty'
 b. *biü -o³pai² ai³*
 blood -dirty/opaque be/do
- (29) a. *ko³biai³* 'it sees'
 b. *k -o³bi ai³*
 object -see be/do
- (30) a. *bi³i¹sai³* 'blood-like'
 b. *bi³i¹ -sai³*
 blood -nominalizer
- (31) a. *a³hoa³saa³ga¹* 'temporarily being immature' (ahoa –s –aag –a)
 b. *a³hoa³saa³ga¹*
 immature be:temporary

(32) CONCLUSION: There are no color terms in Pirahã.

PRONOUNS

LACK OF RECURSION IN PIRAHÃ

- (33) I said that [_S John will be here].
 (34) I want for [_S you to come].
 (35) I think [_S it's important].

- (36) **ti gáí -sai kó'oi hi kaháp -íí**
 I say -nom. name he leave -intention
'I said that kó'oi intends to leave.' (literally 'My saying **kó'oi** intend-leaves')

- (37) a. **hi ob -áa'ái kahái kai -sai**
 he see -attractive arrow make -nom.
'He knows how to make arrows well.' (lit: 'He sees attractively arrow-making')

b. **kahái kai -sai hi ob -áa'ái**
 arrow make -nom. he see -attractive

c. ***hi kahái kai -sai ob -áa'ái**
 he arrow make -nom. see -attractive

- (38) **hi gó 'igi -ai kai -sai hi 'ob**
 he WH associate -do/be make -nom. he see

-áa'ái

-attractive

'What (thing/kind of) making (does he) know well?' (lit: 'He what associated making sees well?')

- (39) ***hi gó 'igi -ai 'ob -áa'ái kai -sai**
'What thing (does he) know well to make?' (lit: 'What associated thing he knows well to make/making?')

- (40) **ti** **kobai** **-baí** **'áoói,** **hi** **'íkao** **-ap** **-áp**
 I see -intensive foreigner he mouth -pull -up
-iig **-á**
 -continuative -declarative
'I really watch(ed) the foreigner fishing (with line and hook).' (lit: 'I watch the foreigner intensively. He was pulling (fish) out by (their) mouths.')
- (41) ***hi** **gó** **'igí** **-ai** **hi** **'íkaoapápiigá**
 he WH associate -do/be he fish
hi **kobai** **-baí** **'áoói**
 he see -intensive foreigner
'What did he pull out by the mouth you watched intently?'
- (42) **hi** **gó** **'igí** **-ai** **hi** **kobai** **-baí** **'áoói,**
 he WH associate -do/be he see -intensive foreigner
'What did he see the foreigner do/why did he watch the foreigner'
- (43) **kohoai** **-kabáob-áo,** **ti** **gí** **'ahoai** **-soog**
 eat -finish -temporal I you speak -desiderative
-abagaí
 -frustrated initiation
'When (I) finish eating, I want to speak to you.' (lit: 'When eating finishes, I speak-almost want')
- (44) **píi** **-boi** **-sai** **ti** **kahapi** **-hiab**
 water vertically move -nominalizer I go -negative
-a
 -declarative
'If it rains, I will not go.' (lit: 'Raining I go not.')
- (45) **ti** **baósa** **-ápisí** **'ogabagaí.** **Chico** **hi** **goó** **bag** **-áoba.**
 I cloth -arm want. name he what sell -completive
'I want the hammock. Chico what sold.'
- (46) **'ipóihii** **'i** **gí** **kobai** **-soog** **-abagaí**
 woman she you see -want -frustrated initiation
'The woman wants to see you.'
- (47) ***kó'oi** **hoagí** **kai** **gáihii** **'íga**
 name son daughterthat true
'That is kó'oi's son's daughter'.
- (48) ***kaóoi** **'igíai** **hoagi** **kai** **gáihii** **'íga**
 who
'Whose son's daughter is that?'
- (49) **'isaabi** **kai** **gáihii** **'íga.** **kó'oi** **hoagí** **'aisigí** **-ai**
 name daughter that true. name son the same-be
'That is 'isaabi's daughter. kó'oi's son, being the same.'
- (50) **gahiío** **'ogii** **biísai** **hoí** **-hio** **'ao** **-aagá**
 airplane big red two there possess -be
'There are two big red airplanes.'
- (51) Old men and women.

- (52) **'ogi -áag -aó toío -'aagá 'igihí, 'ipóihii píaii**
 big -be -thus old -be man, woman also
'Everyone (lit: 'people bigness') is old. Men and women too.'
- (53) **'ogíáagaó toío'aagá 'igihí toío'aagá, 'ipóihii toío'aagá**
 big old man old, woman old
 also
píaii
'Everyone (lit: 'people bigness') is old. Men and women too.'

TENSE

- (54) **'ahoapió** 'another day' (lit: 'other at fire')
 (55) **pi'í** 'now'
 (56) **so'óá** 'already' (lit: 'time-wear')
 (57) **hoa** 'day' (lit: 'fire')
 (58) **ahoái** 'night' (lit: 'be at fire')
 (59) **piiáiso** 'low water' (lit: 'water skinny temporal')
 (60) **piibigaíso** 'high water' (lit: 'water thick temporal')
 (61) **kahai'aíi 'ogíiso** 'full moon' (lit: 'moon big temporal')
 (62) **hisó** 'during the day' (lit: 'in sun')
 (63) **hisóogiái** 'noon' (lit: 'in sun big be')
 (64) **hibigibagá'áiso** 'sunset/sunrise' (lit: 'he touch comes be temporal')
 (65) **'ahoakohoihió** 'early morning, before sunrise' (lit: 'at fire inside eat go')
- (66) a. S,R,E 'present tense'
 b. S__R,E'future tense'
 c. E, R__S 'past tense'
 d. E__R__S 'past perfect'
 e. S__E__R 'future perfect'
 f. E__S,R'present perfect'

THE CONCEPT OF 'BOUNDARY OF EXPERIENCE' IN PIRAHĀ KINSHIP TERMS

- (67) a. **'ahaigí** 'ego's generation'
 b. **tiobáhai** 'any generation below ego'
 c. **baí'i** 'any generation above ego/someone with power over ego'
 c'. **'ogíi** 'any generation above ego/someone with power over ego'
 (lit: 'big')
 d. **'ibígaí** 'usually two generations above ego or more, but overlaps
 with c. and c.')(lit: 'to be thick')
 f. **hoagí** 'biological son' (lit: 'come next to')
 g. **hoísai** 'biological son' (lit: 'going one')
 h. **kaai** 'biological daughter' (a house is a **kaaiíi** 'daughter thing')
 i. **piihí** 'child of at least one dead parent/favorite child'
- (68) a. **'áoóí** 'foreigner'
 b. **'áoóí-gíi** 'Brazilian' (lit: 'real foreigner' – the ones they knew first)
- (69) a. **'ahaigí** 'same generation'
 b. **'ahaigí-gíi** 'biological sibling' (lit: 'real sibling')

ABSENCE OF CREATION MYTHS AND FICTION

"In fact, virtually all linguists today would agree that there is no hope of correlating a language's gross grammatical properties with sociocultural facts about its speakers."
(Newmeyer (2002, 361))

(71) HOCKETT'S DESIGN FEATURES OF HUMAN LANGUAGE

1. Vocal-Auditory Channel
2. Broadcast Transmission and Directional Reception
3. Rapid Fading
4. Interchangeability
5. Total Feedback
6. Specialization
7. Semanticity
8. Arbitrariness
9. Discreteness
10. Displacement
11. Productivity
12. Duality of Patterning
13. Traditional Transmission

(72) (a) if culture is causally implicated in grammatical forms, then one must learn one's culture to learn one's grammar. But then a grammar is not simply 'grown', contra Chomsky (2002);

(b) linguistic fieldwork should be carried out in a cultural community of speakers because only by studying the culture and the grammar together can the linguist (or ethnologist) understand either;

(c) smorgasbord studies, that is, studies which merely look for constructions to interact with a particular thesis by looking in a non-statistically sophisticated way at data from a variety of grammars, are fundamentally untrustworthy because they are too far removed from the original situation. This is bad because grammars, especially grammars of little-studied languages, need an understanding of the cultural matrix from which they emerged to be properly evaluated or used in theoretical research;

(d) particulars can be as important as universals. This follows because each culture-grammar pair could in principle produce unique tensions and interactions found nowhere else, each case extending the parameters of our understanding and of the interaction of culture and grammar.

(4) The Pirahã continue to be monolingual in Pirahã after more than two hundred years of regular contact with Brazilians and other non-Pirahã.