

"High scientific standards", control, and Everett and Gibson's review of *Recursion Across Domains**

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In their review of the book *Recursion Across Domains* (Amaral, Maia, Nevins, and Roeper 2018), Everett and Gibson (2019) focus their attention exclusively on four chapters devoted to Pirahã, concluding: "unfortunately, the chapters investigating Pirahã do not meet high scientific standards." Their review is unusual in criticizing not only the argumentation and claims of these chapters, but also the very competence of the authors to conduct their research, as well as the competence of a local assistant thanked by the authors (mistakenly described as the "primary Pirahã consultant", as discussed below).

I co-authored two of the papers criticized in their review: chapter 6 "*Word order in control: evidence for self-embedding in Pirahã*", with Raiane Salles and Filomena Sândalo; and chapter 15 "*Self-embedding recursive postpositional phrases in Pirahã: a pilot study*" with Filomena Sândalo, Tom Roeper, Luiz Amaral, Marcus Maia and Glauber Romling da Silva. For space reasons, in this reply I will not address all the points raised by Everett and Gibson, but will focus on their criticism of the first of those papers. There is much to be said about the rest of their review, but I believe that the failings of their response to chapter 6 satisfactorily exemplify issues that pervade their review.

I begin by summarizing the evidence and argument that chapter 6 presents in favor of structural embedding. Everett and Gibson did not include such a summary in their review, but I believe it is necessary, in order to understand what is under dispute and how these issues might be resolved. I then consider Everett and Gibson's critique, and end with a brief response to their comments concerning our competence, the competence of our sources, and their criticism of our data.

1. Word order in control configurations: evidence for syntactic embedding in Pirahã

According to Everett's (1983, 1986, 1992) description of Pirahã, the canonical word order is SOV:

- (1) hi káixihí xoab-á- -há
he paca kill-REM-COMPLETE CERT
'He killed a paca'
(Everett, 1986: 201 (3))¹

However, in constructions that one might take to show a clause embedded as a

* I am grateful to David Pesetsky for valuable comments and suggestions. Naturally, I am responsible for the ideas and arguments presented here. Email for contact: crodrigues@puc-rio.br

¹ Throughout this reply, the numbers within parenthesis are the numbers of the example in the original data source.

complement of a higher verb, Pirahã places that clause after the verb, yielding a structure that one might analyze as SVO (2). Famously, however, Everett (2005) takes this order as evidence that such clauses are not syntactically embedded by the matrix predicate, but are paratactically conjoined with it.

- (2) ti gái - sai kó'óí hi kaháp -íí
 I say - nominalizer name he leave -intention
 'I said that Kó'óí intends to leave'
 (Everett, 2005: 629 (24))

To quote Everett (2005, 629), "The 'complement clause' [in (2)] is thus a juxtaposed clause interpreted as the content of what was said but not obviously involving embedding."

In chapter 6 of the collection reviewed by Everett and Gibson, Rodrigues and colleagues presented arguments against Everett's claim. We began by calling attention to the fact that Heavy NP Shift, a process attested in many unrelated languages, is found in Pirahã as well. As shown in (3), SVO is allowed when a heavy nominal expression occupies object position. This is not a new observation, but was first pointed out by Everett (1983, 1986, 1992):

- (3) tiobáhai koho-ái -hiab-a tomáti gihió -kasí píaii taí píaii
 child eat-ATEL -NEG -REM tomato bean -name also leaf also
 '(The) children do not eat tomatoes or beans or leaf(y vegetable)
 (Rodrigues et al., 2018: 115 (8), citing Everett, 1986: 226 (107); cf. discussion on p. 206)

Given the possibility instantiated by (3), Rodrigues and colleagues hypothesized that examples like (2) might instantiate clausal embedding after all, with SVO order due to the heaviness of the complement clause, rather than parataxis — a possibility already suggested by Nevins et al. (2009, 374).

To test this, they investigated control structures. In other languages, obligatory control configurations often involve structures in which an infinitival (or otherwise reduced) clause is embedded under a matrix verb, with the understood but silent subject argument of the embedded clause obligatorily c-commanded and bound by one of the arguments of the matrix verb (much like an anaphor). To the extent that obligatory control requires a particular sentence-internal structural relation to hold between the controlled null subject and its antecedent, observing obligatory control in a given language may constitute evidence that its grammar permits structural embedding.

Furthermore, as Rodrigues and colleagues observed, infinitival controlled clauses are treated cross-linguistically as light, often involving reduced phonological material (no overt subject, no overt complementizer). Consequently, one might not be surprised to learn that obligatory control in Pirahã, if it exists, may exhibit (though not necessarily require) SOV order.

As Rodrigues and colleagues noted, these predictions are born out. (4a) and (4b)

are both acceptable sentences in Pirahã:

- (4) a. [ti ogabagai [kapiiga kagakai]] (SVO)
I want paper study
 b. [ti [kapiiga kagakai] ogabagai] (SOV)
I paper study want
 ‘I want to study’
 (Rodrigues et al., 2018: 117 (13a & 14a))

Crucially, according to our consultant, Hiahoai Pirahã, the elided agent of the predicate *kapiiga kagakai* is obligatorily controlled by the subject *ti*, as we would expect if these are cases of obligatory control. These data thus provide two sorts of evidence for structural embedding in Pirahã: obligatory control and SOV.

Rodrigues et al. also observed the possibility of main-clause material following an embedded complement clause in structures like (4b). In particular, a temporal adverb placed at the end of a SVO obligatory control configuration may be understood to take scope within the main clause, as shown in (5). This endorses sentential embedding, with the temporal adverb adjoined to the matrix VP, as shown in (5a). If there were no structural embedding, but merely juxtaposition as diagrammed in (5b), this would not be possible.

- (5) ti sogabagai kapiiga kagakai maitai ahogio
I would-like paper study humaitá yesterday
 ‘Yesterday, I would have liked to study at Humaitá’
 (Rodrigues et al., 2018: 119 (17))

- a. [s ti [VP [V' sogabagai [kapiiga kagakai maitai]] ahogio]]
 b. *[s ti sogabagai] [s kapiiga kagakai maitai ahogio]

In fact, narrow scope for the final adverb is not possible, as indicated by the star in (5b). To account for this, Rodrigues et al. suggested that Pirahã controlled structures might be smaller than full clauses, lacking a tense layer, and thus precluding modification by a temporal adverb. This too might form part of the explanation for the possibility of SOV order: compared to full-blown sentential domains, the clausal complement is a light structure.

- (5) c. [s ti [VP sogabagai *[VP [V' kapiiga kagakai maitai] ahogio]]]

Data collected by Rodrigues and colleagues showed, however, that SOV clausal embedding SOV is not restricted to environments of control. As shown in (6), the desiderative verb *sogabagai* can also take as its complement a full sentence with an overt subject. However, in this case, SOV order is restricted. The full sentence is not allowed in the preverbal position. Only the embedded predicate can precede the desiderative verb, resulting in a subject-predicate split.

- (6) a. ti kapiiga kagakai sogabagai Kapoogo
I paper study would-like Kapoogo

'I would like Kapoogo to study'

- b. * ti Kapoogo kapiiga kagakai sogabagai.
I Kapoogo paper study would-like
(Rodrigues et al., 2018: 122 (28a&b))

This is consistent with the hypothesis that only light structures (e.g. bare VPs) can feed SOV. This is also taken as evidence for structural embedding: the subject-predicate split in (6a) can be explained under an embedding analysis, while it is unclear how it would be explained if syntax were juxtaposition.

2. Everett and Gibson's critique

According to Everett and Gibson, Rodrigues and colleagues "missed crucial issues with the material they used, which undermine their interpretation". They present (i) below as an alternative that we should have discussed, and (ii) as a related objection to our analysis:

- (i) "Pirahã zero-anaphora involve[s] [...] a form of discourse topic-tracking, along the lines of Givón (1983) and Everett (1983), which would be between two separate sentences."
- (ii) "Since the two sentences can both have overtly realized subjects control is not applicable."

Everett and Gibson do not actually explain how the alternative in (i) could explain the data discussed in our paper, summarized above, nor does the literature cited (Givón 1983 and Everett 1983) clarify what alternative they have in mind.

Everett (1983) contains a section on inter-sentential anaphora (13.2.4, pp. 109-111; translated as pp. 260-262 of Everett 1986). Neither this section nor any other section of this work discusses topic-tracking. Everett does note, however, against a background that assumes the existence of clausal embedding, that inter-sentential anaphora is less common in actual discourse than intra-sentential anaphora because it creates reference ambiguity — an observation pertinent to the present discussion that I return to shortly.

Givón (1983) is an edited collection of papers by different authors, concerned with "topic identification, topic maintenance and topic continuity in discourse". (The term "topic tracking" is not used anywhere in the collection.) Everett and Gibson offer no guidance concerning which contribution to the volume might suggest an alternative account of the data discussed above. Possibly Everett and Gibson have in mind, however, the idea, discussed in different chapters of the collection, that many languages use zero anaphora to recover an established topic within a narrative (e.g. written English, Japanese, Ute). Givón's introduction discusses grammatical strategies languages use to encode topic (dis)continuity, and suggests a scale according to which zero anaphora is the most common grammatical strategy to encode continuous/accessible topics.

Everett and Gibson might thus be hinting at a counter-proposal that posits that (4a) and (4b) each contain two independent sentences, with the second sentence containing a zero anaphor, as represented in (7).²

- (7) a. [s ti ogabagai] [s ø kapiiga kagakai] (= (4a))
 I want paper study
 b. [s ti kapiiga kagakai] [s ø ogabagai]] (= (4b))

This analysis fails to explain why the subject of the main clause *obligatorily* controls the null subject of the controlled clause. Control is not a general property of null subjects in Pirahã. In non-control configurations, these elements can be deictic. The null subject in (8), for instance, refers to the speaker, not the subject of the first sentence.

- (8) hi aba -háí -hiab -a xaoói xogi -hiab
 he stop -ingressive -negation - remote foreigner want - negation
 -a xihi ogíoi
 -remote cost big
 ‘He (the foreigner) does not stop (because) (I) don’t want the foreigner
 (because he is) expensive.’
 (Everett 1983: 118 (244))

Here Everett's (1983, 1986) observation that inter-sentential anaphors are highly ambiguous in reference is relevant. Suppose that (4) is pronounced in a context in which the topic of the conversation is *Ioá*, a Pirahã adult man. In this context, (7) wrongly predicts that the sentences in (4) can mean *I want Ioá to study*, with the zero anaphora recovering the topic of the conversation. As already noted, our informant categorically rejected all interpretations of (4) which did not involve obligatory control.

Furthermore, Rodrigues and colleagues' observations concerning adverbial modification in (5) and (6) above have no account on such a view, and go unmentioned in Everett and Gibson's critique.

Let us now turn to the related objection in (ii) above, which reflects (I believe) a misunderstanding of what control is. As emphasized above, obligatory control configurations are structural contexts in which a weak pronominal form in the subject position of a lower domain is obligatorily bound by a nominal within a higher domain. This binding process is intra-sentential. There is no obligatory control across sentences. Clearly, though, verbs that appear in control configurations (so-called "control verbs") are not necessarily restricted to these

² Pirahã licenses both null subjects and null objects:

- (i) poogahai xibá -bog-á xib -áo -b -í -i
 arrow hit-come-remote hit-thelic -perfective close certain
 ‘(I) hit (the snake) with an arrow’
 (Everett, 1992: 43-44 (61))

configurations. They can appear in other structures too. For example, in Brazilian Portuguese, the desiderative verb *querer* 'want' can appear in a control configuration, where the controlled clause displays infinitival morphology (9a), or in a non-control configuration, in which the embedded clause is marked with subjunctive mood (9b). While coreference between the higher and lower null subject is obligatory in (9a), it is barred in (9b).

- (9) a. Eu₁ quero [Ø₁ ir morar no Rio]
I want-1PSg go-Inf live-INF in.the Rio
 'I want to live in Rio'
- b. Eu₁ quero [que Ø*_{1/2} vá morrar no Rio]
I want-1PSg that go-SUBJ live-INF in.the Rio
 'I want for him to live in Rio'

In addition, the infinitival embedded clause can have an overt subject (Guimarães and Mendes, 2013), as illustrated in (10), where the embedded overt subject bears focus stress.

- (10) O João₁ quer ELE/O JOÃO ir morar em Rio
the João want-3PSg him/the John go-INF live-INF in Rio
 'John wants him/John/Maria to live in Rio'

It should be clear that the acceptability of (10) does not constitute evidence against (9a) as a case of obligatory control. When the embedded clause is infinitival and its subject is null, only the control interpretation is available, exactly as in Pirahã. Everett and Gibson's objection is thus misplaced at the outset.

In support of their objection, they present the following two examples (their examples (9) and (10)) as evidence that Pirahã permits overt subjects in what we would analyze as complement clauses embedded under control verbs:³

- (11) ti ʔóog -abagaí tii kapiiga kaga kaí.
1P want -frustrated initiation 1P paper mark do
absolute ergative
 'I want (something). (I) mark paper.'
- (12) Kóʔoí kapiiga ʔóog -abagaí Kóʔoí kapiiga kaga kaí
name paper want -frustrated initiation name paper mark do
 'Kóʔoí wants (something). Kóʔoí mark paper.'

Everett and Gibson cite Everett (1983) and (2016) as the source for these examples. However, these sentences are not cited in either source, so their origin is unknown. Even granting that these examples are actual fieldwork data, however, they do not contradict the hypothesis that (4a-b) are cases of control. Everett and Gibson suggest that (12) in particular cannot be analyzed as

³ I report all Pirahã sentences and glosses exactly as represented in the original source.

involving structural embedding, or else it would constitute a violation of Principle C. As we have seen, however, under specific circumstances such configurations are possible even in languages like Brazilian Portuguese, where the existence of control and clausal embedding is not in dispute. Consequently, the repetition of the name *Kóʔoí* in (12) does not tell us much about the presence or absence of structural embedding in Pirahã.

3. Meeting high scientific standards

As mentioned at the outset, Everett and Gibson characterize the chapters of *Recursion Across Domains* dedicated to Pirahã as failures to "meet high scientific standards". Unusually for a scholarly publication, they then proceed to speculate about why the authors' efforts were inadequate:

"[F]irst, no author of any paper on recursive structures in Pirahã is fluent in Pirahã. Second, the primary Pirahã consultant that these authors worked with is Jose Augusto Pirahã-Diarroi [...] Although his father was Pirahã, Verão is not a native Pirahã speaker and is not fluent in the language."

The first claim is true: we are not fluent speakers. I return to this issue below. The second claim is false. Our consultant for chapter 6 (our focus above) was Hiahoai Pirahã, an adult Pirahã man, a native speaker of Pirahã. For chapter 15, the main informant was Ioá Pirahã (although data on prepositional phrases was also collected from Hiahoai Pirahã). Ioá is a younger Pirahã man, and is also a native speaker of Pirahã.

José Augusto helped us in many ways. He accompanied Hiahoai and Ioá in their trips to Campinas/São Paulo and to Rio de Janeiro, where fieldwork was conducted.⁴ He also helped us during elicitations, intermediating, whenever necessary, our interactions with the native speakers. But none of the data reported on chapters 5 and 15 is from José Augusto.

Hiahoai and Ioá displayed some knowledge of Brazilian Portuguese, although I cannot judge how proficient they are. Jose Augusto is a native speaker of Portuguese and demonstrated good knowledge of Pirahã, although I am not in a position to judge his proficiency level. Notice, however, that he has been in contact with the Pirahãs for years. I was informed that he lives in the city of Humaitá, but he spends time in one of the villages.⁵ He is the creator of APIHAM (*Associação do Povo Indígena Pirahã do Amazonas* = The Association of the Pirahã Indigenous People of the Amazon).⁶

⁴ Hiahoai participated in the fieldwork conducted at University of Campinas (UNICAMP) and Ioá was our informant during fieldwork at the Federal University of Rio de Janeiro (UFRJ).

⁵ This information comes from students of mine who conducted research at Piquiá Village and at Augusto house in Humaitá, during a visit by Augusto's father (a native speaker of Pirahã).

⁶ This Association gives visibility to the Pirahã people and their needs. Recent news from Funai (Brazilian National Indigenous Foundation) indicates that APIHAM is now working with other local Indigenous associations. See

While it goes without saying that fluency in a language can only improve a linguist's investigation of that language, it is not and has never been a prerequisite for productive research. Everett, himself, for example, defended his MA thesis on Pirahã phonology in 1979 at University of Campinas, Brazil. On page 8 of that document, he reports that the basis for this report was two months of fieldwork. In 1983, he defended his doctoral dissertation at the same University, noting on page 3 of that document that his fieldwork was limited to January-March of 1979 and April-December of 1980, plus four months of work with Pirahã consultants outside the village on other occasions. Even if we grant that he may have achieved an impressive level of fluency during these years, we do not think it has been established that was more fluent in Pirahã than José Augusto Pirahã-Diarroi is now. Yet, Everett and Gibson see no problem citing Everett (1983) as a source of data that the reader can use to verify their empirical claims.

Of course we acknowledge that errors may have crept into our transcriptions. Indeed, that is certainly the case. Everett and Gibson claim that tones and glottal stops were not represented (with an implicature that we were unaware of their existence) and claim further that representations of vowel quality were inconsistent — describing our transcriptions as "a mixed set of symbols that seems to be drawn partially from Portuguese, partially from English and partially from Everett's (1979, 1983) phonemic representation of the language". In fact, the authors acknowledged that we did not represent tone in our transcription on footnote 14, page 117 of chapter 6 — and if we are guilty of missing some glottal stops and mistranscribing some vowels, we are happy to be corrected.

Pursuant to this criticism, however, Everett and Gibson proceeded to alter the Pirahã examples that they cited from *Recursion Across Domains*. Surprisingly, their silent alterations do not merely add tones and glottal stops and correct vowel quality. They also presumed to syntactically and lexically alter an example that matters to our argument, while claiming to be presenting our actual example.

"Rodrigues et al. also investigate examples purported to demonstrate "movement" in Pirahã. On p. 117 they claim that, "Crucially, for the present discussion, the SVO order in (14) [(4a) above] (our (11) [= (13) below]) can alternate with an SOV order." They provide the following example (we supply phonetic information, as above):"

- | | | |
|------|--|--|
| (13) | tíi kapiiga kaga kaí.
1 paper mark do
ergative | (ti) ʔóog -abagaí
(1) want -frustrated initiation
(absolute) |
|------|--|--|

'I mark paper. (I) almost begin to want (that, i.e. to mark paper.)'

Their example modifies our original example in a substantive way: a period was inserted after *kai* and an optional first person pronoun was placed after the period. We, however, reported the example exactly as produced by our consultant (Hiahoai Pirahã). Everett and Gibson changed the example without comment, falsely attributing their version to our chapter. Remarkably, Everett and Gibson did not justify or even flag this correction (or any other). No information is provided concerning whether these alterations were made based on Everett's knowledge of the language as an L2 speaker or if the reviewers consulted a native speaker. This strikes us as a rather significant violation of "scientific standards".

As noted above, we take responsibility for mistakes and omissions in our phonetic transcription. But since transcription errors are discussed in a manner intended to impugn our fundamental competence as researchers, it is worth dwelling for a moment on their rendition of the first person pronoun as *tíi* in (13) above, where our actual presentation of the example represented it as *ti*. In fact, Everett's previous work contains zero occurrences of *tíi* (with high tone and long vowel) until Everett (2013), which contains 8 occurrences of *ti*, and 2 occurrences of *tíi*. In Everett (1979), the form is given as *čí*; while in Everett (1983), (1986), (1992), (2005), (2007) and (2009) almost all occurrences of the pronoun are represented just as in our chapter (*ti*; 344 occurrences), with 5 occurrences of *tí* in Everett (2005). To the best of our knowledge, this variation is not commented on (and I have not found any generalization governing the variation). Thus, it looks like correction for correction's sake, raising the question of what other corrections have a similar character.

Uncertainty is a fundamental and positive aspect of science; it nourishes knowledge. Within linguistics, lesser-known languages, such as Pirahã, present many questions and uncertainties, which may sometimes feed hot debates and disputes. This is all acceptable and can help the field progress. For sure, there is lots to be discovered about Pirahã. Inattentive criticisms and personalized characterizations are bad practices, however, at best pointless and at worst destructive to scientific discourse.

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