

Pirahã Exceptionality: a Reassessment*

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Abstract: Everett (2005) has claimed that the grammar of Pirahã is exceptional in displaying "inexplicable gaps", that these gaps follow from an alleged cultural principle restricting communication to "immediate experience", and that this principle has "severe" consequences for work on Universal Grammar. We argue against each of these claims. Relying on the available documentation and descriptions of the language (especially the rich material in Everett (1986; 1987b)), we argue that many of the exceptional grammatical "gaps" supposedly characteristic of Pirahã are misanalyzed by Everett (2005) and are neither gaps nor exceptional among the world's languages. We find no evidence, for example, that Pirahã lacks embedded clauses, and in fact find strong syntactic and semantic evidence in favor of their existence in Pirahã. Likewise, we find no evidence that Pirahã lacks quantifiers, as claimed by Everett (2005). Furthermore, most of the actual properties of the Pirahã constructions discussed by Everett (for example, the ban on prenominal possessor recursion and the behavior of *wh*-constructions) are familiar from languages whose speakers lack the cultural restrictions attributed to the Pirahã. Finally, following mostly Gonçalves (1993; 2000; 2001), we also question some of the empirical claims about Pirahã culture advanced by Everett in primary support of the "immediate experience" restriction. We are left with no evidence of a causal relation between culture and grammatical structure. Pirahã grammar contributes to ongoing research into the nature of Universal Grammar, but presents no unusual challenge, much less a "severe" one. [241 words]

1. How surprising is Pirahã grammar?

In a recent article in *Current Anthropology*, Everett (2005; henceforth CA) presents a series of general conclusions about human language, reached as a consequence of his investigations into the grammar of the language Pirahã. The focus of Everett's discussion is the syntax and lexicon of Pirahã and a "cultural constraint" to which the syntax and lexicon are said to be subject.

Pirahã is a language spoken by a small community of speakers¹ living by the Maici River in Amazonas, Brazil. It appears to be the last surviving member of the Mura language family (Nimuendajú (1948) and Everett (1986)). Most of the information available about the syntax and lexicon of Pirahã comes from Everett's own earlier work, in particular his dissertation from the Universidade Estadual de Campinas (published in Portuguese as Everett (1987b), henceforth DISS) and a lightly revised English translation of the dissertation's descriptive sections included in the *Handbook of Amazonian Languages* (Everett (1986), henceforth HAL). A small number of other articles, most notably Everett (1987a), offer some further information, as do on-line sources currently archived on the Web (Everett (1998a)), which include some glossed and translated texts. For Pirahã culture, a principal source is the work (in Portuguese) of the Brazilian anthropologist Marco Antonio Gonçalves (1993; 2001), which we touch on below. A non-technical presentation available on the Web of some of this material (in English and Portuguese), along with related material on Pirahã culture and language, is Gonçalves (2000).

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¹ Currently approximately 250, according to Cahill (2004), a three-fold increase over the population reported in the 1970s. But see also Gonçalves (2000), who cites a 2000 figure of 360. Ulisses de Sousa Lima cites 380 over eight villages (<http://www.uniaonet.com/ulisses.htm>).

Everett (CA 621) takes as his starting point a number of alleged properties of Pirahã grammar that are described as "very surprising". These properties of Pirahã grammar are claimed to have a common explanation rooted in certain equally "surprising" properties of Pirahã culture. Everett claims to advance a common explanation for both the grammatical and the cultural properties. He suggests that "Pirahã culture severely constrains Pirahã grammar in several ways, producing an array of otherwise inexplicable 'gaps' in Pirahã morphosyntax." In addition, he presents this cultural explanation for morphosyntactic gaps as a challenge to foundational ideas in linguistics:

"These constraints lead to the startling conclusion that Hockett's (1960) design features of human language, even more widely accepted among linguists than Chomsky's proposed universal grammar, must be revised. With respect to Chomsky's proposal, the conclusion is severe — some of the components of so-called core grammar are subject to cultural constraints, something that is predicted not to occur by the universal-grammar model." (CA 622)

In this paper, we disagree with Everett on every one of these points. Indeed, the simplest summary of the present article can be obtained by placing a negation in front of each claim summarized above. Some of Pirahã's supposed "inexplicable gaps" (both linguistic and cultural) will be argued to be illusory or non-existent. The remaining linguistic "gaps" will turn out to be (in all likelihood) real, but shared with languages as diverse as German, Chinese, Hebrew, Wappo and Adyghe. Since these are languages spoken within cultures that do not share the key properties of Pirahã culture as described by Everett, no arguments for Everett's "startling" or "severe" conclusions will remain.

The alleged grammatical gaps and cultural properties that Everett considers important are the following:²

Syntax

1. "the absence of embedding;

Lexicon/Semantics

2. "the absence of numbers or any kind or a concept of counting and of any terms for quantification;
3. "the absence of color terms;
4. "the simplest pronoun inventory known;
5. "the absence of 'relative tenses';

Culture

6. "the absence of creation myths and fiction;³
7. "the absence of drawing or other art;
8. "the fact that the Pirahã are monolingual after more than 200 years of regular contact with Brazilians;
9. "the absence of any individual or collective memory of more than two generations past;
10. "the simplest kinship system yet documented;
11. "one of the simplest material cultures documented;

² We have taken the liberty of reordering the claims and numbering them, but otherwise the quotation is direct.

³ In Everett (2006, 144), this claim is generalized to "absence of myths and fiction" — i.e. not merely absence of *creation* myths. We return to this point in section 5 below.

All these alleged properties of Pirahã language and culture are claimed to follow from a single "cultural constraint", the *Immediacy of Experience Principle*:

(1) **Immediacy of Experience Principle (IEP)**

Communication is restricted to the immediate experience of the interlocutors. [CA 622]

Our first major point of disagreement with CA concerns Everett's presentation and analysis of the facts of Pirahã grammar. We have examined Everett's data and conclusions in CA in light of what we can learn of the language from both CA and from the previous literature — including available examples and connected texts. Much of our report concerns the supposed absence of embedding (point 1), since this is the point claimed to most directly challenge "Chomsky's proposed universal grammar". We believe that many of the allegedly exotic and inexplicable phenomena that supposedly bear on the question of embedding are incorrectly described in CA. When described and analyzed more carefully, the relevant properties of Pirahã actually argue strongly in favor of the existence of embedding in Pirahã. The constructions discussed by Everett turn out to be neither exotic nor inexplicable, but have properties that are known (and in some cases very well-known) from other languages of the world.

We have also looked into point 2 (in particular the claims about quantification), but have examined in less detail the other lexical gaps claimed for Pirahã.⁴ In these domains, we are not even clear about the relevance of Everett's empirical claims to the IEP and the broader issues that IEP is claimed to engage. In addition, the properties summarized in 2-5, to the extent that they are true of Pirahã, are attested in other languages as well (just like property 1, the alleged lack of embedding). This claim is of most direct relevance to our next point.

Our second point of disagreement with CA concerns the claimed link between Pirahã culture and grammar. If we are correct in our first point of disagreement, then the phenomena of Pirahã that are crucial to Everett's claims are found in other languages as well. To the extent that speakers of these other languages participate in cultures that do not share the supposedly "surprising" features of Pirahã culture, we are left with no argument that there are any grammatical peculiarities of Pirahã that require a cultural explanation.

We also have some strong reasons for skepticism about Everett's assertions concerning Pirahã culture itself, though we deal with these only briefly. We will base our presentation mostly on Gonçalves' work, cited above, and will focus our attention on mythical narratives recounted by the Pirahã, including creation legends, with a few remarks about Pirahã art and the Pirahã's alleged inability to learn other languages. If our skepticism in this domain is warranted, then the IEP as stated in (1) is not just irrelevant to grammar; it also fails as an observation relevant to Pirahã culture.

Our final point of disagreement with CA concerns the claim that Pirahã motivates any "startling" or "severe" conclusions whatsoever concerning either "design features of human language" or "Universal Grammar"⁵. Just as our second point rests on our first point of disagreement, this point rests

⁴ CA appeared with brief commentaries by a number of researchers, and a reply by Everett. Many of the points in 2-5 are discussed at length in the commentaries, but 1 is not, hence our choice of emphasis. In addition, though we will briefly discuss the supposed general absence of quantification in Pirahã, we will not devote any special attention to the alleged absence of numerals. This is the property of Pirahã that has attracted the most attention in the scientific and journalistic literature (most notably Gordon (2004)), and is therefore in least need of elucidation here.

⁵ We will not discuss Hockett's design principles in this paper. As far as we can tell, however, the facts of Pirahã discussed by Everett do not bear on the evaluation of Hockett's principles any more than they bear on the evaluation of "Chomsky's proposed universal grammar".

in part on the first two. If there is no link between Pirahã culture and grammar, and if the facts have been mischaracterized and misanalyzed, Everett's claims about Pirahã culture and grammar are irrelevant to discussions of design features for language or Universal Grammar.

Everett's assertions are also irrelevant for stronger reasons. "Universal Grammar" is nothing more than a name for the human capacity for language, an aspect of our genetic endowment. The very existence of linguistic diversity teaches us that a given individual's personal linguistic abilities and behaviors reflect not only UG but also that individual's linguistic experience (in ways that UG itself circumscribes). Imagine we learn that aspects of some individual's linguistic experience were shaped by the culture of the community in which the individual grew up (surely a truism). In such a case, we may have learned something interesting about linguistic experience or about culture, but we have not necessarily learned anything about UG (much less about design features for language).

A salient observation about human languages (by now a commonplace) is that for all their diversity, they are made to a great extent of familiar pieces, like the wide variety of objects that can be assembled from a limited array of Lego blocks. This general characterization of linguistic variation, of course, leaves virtually every detail open — in particular, the precise nature of the building blocks and how freely they may be combined in particular languages. Nonetheless, it characterizes well the practical experience of linguists who encounter the data of an unfamiliar language (or newly discovered facts about a well-described language). It is this context that makes it meaningful to describe languages by ticking off their properties, and allows us to use well-known names for these properties, even when describing unfamiliar languages. Thus, a linguist in conversation with a colleague might describe a language as "SOV, nominative-accusative, aspect but no tense, and no overt determiners" and then get asked "Is it also *wh*-in-situ?" just to confirm a point of interest. The two linguists understand each other precisely because the investigation of different languages so often involves discovering that what looks strange at first is actually familiar — a novel recombination of properties already discovered and investigated in other languages.

The Principles-and-Parameters research tradition in linguistics (Chomsky (1981; 1995, ch. 1; Baker (2001); Anderson and Lightfoot (2002), among many others) explains this common experience as a consequence of particular limitations on linguistic variation provided by UG.⁶ UG is thought to characterize the human language faculty in a manner that leaves a number of choices open, with linguistic experience fixing these choice-points in any given child's internal grammar. (See Yang (2002) for one recent proposal as to the nature of the process, and discussion of alternatives.) This explanation for the practical experience of linguists discussed above is thought to dovetail with the results of research into the actual language acquisition process, in ways familiar from the literature.

As a practical matter, a linguist investigating grammar in the manner described above generally embarks upon the task with a "theoretical framework" in mind — a set of beliefs about aspects of grammar that are almost "non-negotiable" and believed not to vary from language to language, coupled with a set of expectations about ways in which languages do vary. (This is not a fact unique to linguistics, but is true, in one way or another, of any person investigating any topic.) As a *logical* matter, of course, it is possible that beliefs considered "non-negotiable" will turn out to be false, and it is never good to be so rigid about one's expectations that it becomes impossible for a new discovery to offer the element of *surprise*.

⁶ There is thus no such thing as "Chomsky's Universal Grammar" (Everett's phrase), though there are particular proposals advanced by Chomsky and many others about the exact *nature* of Universal Grammar, for example the proposals discussed in the literature just cited.

One might discard IEP and disagree with Everett's more far-reaching conclusions about Universal Grammar, and still be willing to agree that Pirahã grammar presents us with just such a "surprise" (in which case, one might wish to rethink aspects of syntactic theory in light of the new results). We will argue nonetheless that the properties of Pirahã highlighted by Everett (CA) present no such surprise. Since one might view this conclusion as somewhat mundane, we wish to give three reasons why we have undertaken this investigation and written the present paper.

The first reason is worldly. The claims reported in CA have captured the attention of journalists and have figured prominently in the popular press all over the world. The *New Scientist* (March 18, 2006), for example, reported:

"Everett also argues that the Pirahã language is the final nail in the coffin for Noam Chomsky's hugely influential theory of universal grammar. Although this has been modified considerably since its origins in the 1960s, most linguists still hold to its central idea, which is that the human mind has evolved an innate capacity for language and that all languages share certain universal forms that are constrained by the way that we think."

Likewise, the British newspaper *The Independent* reported (May 6, 2006) that:

"At [UG's] core is the concept of "recursion", defined as the ability to build complex ideas by using some thoughts as subparts of others, resulting in subordinate clauses. The Pirahã language has none of these features; every sentence stands alone and refers to a single event. [...] Professor Everett insists the example of the Pirahã, because of the impact their peculiar culture has had upon their language and way of thinking, strikes a devastating blow to Chomskian theory. 'Hypotheses such as universal grammar are inadequate to account for the Pirahã facts because they assume that language evolution has ceased to be shaped by the social life of the species.' The Pirahã's grammar, he argues, comes from their culture, not from any pre-existing mental template."

The German *Der Spiegel* (English on-line edition May 3, 2006; German original April 24, 2006) likewise noted:

"Everett sensed his findings would be controversial. Indeed they were: What he found was enough to topple even the most-respected theories about the Pirahãs' faculty of speech. [...] The small hunting and gathering tribe, with a population of only 310 to 350, has become the center of a raging debate between linguists, anthropologists and cognitive researchers. Even Noam Chomsky of the Massachusetts Institute of Technology and Steven Pinker of Harvard University, two of the most influential theorists on the subject, are still arguing over what it means for the study of human language that the Pirahãs don't use subordinate clauses. [...] Eventually Everett came up with a surprising explanation for the peculiarities of the Pirahã idiom. "The language is created by the culture," says the linguist. He explains the core of Pirahã culture with a simple formula: 'Live here and now.'"

Since it is exceedingly uncommon for claims about subordinate clauses and Universal Grammar to figure in public discourse, it is of course of considerable importance to us as linguists to follow the discussion, and to participate, where possible and appropriate.

The second reason is the considerable excitement we find even in a "business as usual" result. We find claims that lie at the opposite pole from Everett's to be every bit as interesting as Everett's own.

If we find, as we think we do, a total *lack* of evident connection between grammatical structure and culture — if, for example, the properties of Pirahã identified by Everett are actually properties found in equal measure in such languages as German, Adyghe, Quechua and Korean — this discovery suggests to us robust *support* for the idea of a species-invariant "mental template" for language, not a "nail in the coffin" of the theory of Universal Grammar. If we find that one acquires the same types of languages whether one grows up in a German city, in a village in the Caucasus or along the Maici River in Amazonas, Brazil — this too is a result of extraordinary interest.

The third reason is our desire to stimulate further investigation of Pirahã itself. As we noted earlier, the most comprehensive source of information concerning Pirahã syntax and morpho-syntax is the dissertation in Portuguese and its English rendering by Everett himself (HAL, DISS). On the one hand, since we have not yet done independent fieldwork on Pirahã, we cannot independently verify the descriptions offered in this earlier work of Everett's. Nonetheless, we are impressed with its comprehensiveness, perspicacity and consistency. These properties suggest that this earlier work is a reliable guide to basic properties of Pirahã, as well as to those complex properties of the language that it discusses in depth. As we also noted above, in the two decades between the publication of DISS and HAL and the appearance of CA, Everett (1987a) appears to be the only significant additional contribution to the study of Pirahã syntax besides the on-line texts cited above.

An additional motivation for the present study is a set of concerns that we share with some other commentators on CA about the broader consequences of the way in which the Pirahã people and culture are being represented in CA (and in media reports that build on CA). We return to this issue at the end of the paper.

Before turning to the substance of our criticism, we should offer a few words about our sources and reasons for relying on them. After all, our principal sources for information about Pirahã grammar are reports by the same researcher responsible for CA. As we hope to show, the presentation of Pirahã syntax in DISS and HAL does provide the best available basis for evaluating the claims in CA. We are reassured, for example, by the fact that the actual Pirahã examples that appear in CA look very much like examples familiar from DISS and HAL. We are not dealing in CA with striking new empirical discoveries about Pirahã. A few of the analytical claims in CA are also familiar from DISS and HAL (most notably the claims about prenominal possessor recursion discussed in the next section). On the other hand, CA contains various statements about the facts of Pirahã (as well as analyses that predict new facts) that directly contradict the facts and analyses of DISS and HAL. These new claims are in almost every case presented without discussion or even acknowledgment of these contradictions. We have also found no papers intervening between the older work and CA that bridge the gap by explaining or acknowledging these contradictions. DISS and HAL, when combined with fairly standard views of syntax, provide an adequate framework for understanding almost all of the actual data in CA, and there is no indication in CA of data or puzzles that motivate the new view of Pirahã offered there. This fact too receives no comment.

We find troubling this unacknowledged and unexplained disparity between the assertions in CA and the arguments presented in the earlier work. If our paper merely serves to call attention to the disparity and thereby stimulates fresh work on Pirahã, it will have achieved one of its most important goals. In our judgment, however, CA itself does not offer new results that give us any reason to put aside Everett's own previously established view of the language.

And what does this earlier work teach us about Pirahã and its place among the languages of the world? In general, the Pirahã that emerges from DISS and HAL is a fascinating language, but at the same

time it is "just a language". (We mean "just a language" in the same spirit in which one might say that a cat, human or honeybee is "just an animal". That observation does not make cats, humans or honeybees any less fascinating.) The Pirahã language described in DISS and HAL, even when coupled with the Pirahã *data* offered in CA, gives us no cause to suspect that Pirahã displays, as Everett now claims, "gaps that are very surprising from just about any grammarian's perspective". It certainly does not offer any "nail in the coffin" of Universal Grammar, much less a "final nail". Consequently, much of our discussion will be devoted to showing that the Pirahã constructions discussed by Everett in CA, when properly analyzed in the spirit of DISS and HAL, reveal properties of the language that are attested elsewhere among the world's languages.

A few notes about the presentation of data in our paper. Everett in DISS and HAL presents Pirahã examples in the standard manner familiar in linguistics, with dashes and spaces separating morphemes judged to be independent, and with glosses and translations offering a fair approximation of the meaning of Pirahã rendered into Portuguese (DISS) and English (HAL). Similar data as presented in CA has a rather different character. Morpheme division is more extreme, and many glosses appear to reflect etymology rather than current meaning. For example, CA offers the gloss 'cloth arm' where HAL has 'hammock', and insists that the Pirahã rendering of 'all' actually means 'big'. As Wierzbicka (2005) notes in her commentary on CA, "in using such glosses, Everett exoticizes the language rather than identifying its genuinely distinctive features. To say that *ti 'ogi* means, literally, 'my bigness' (rather than 'we') is like saying that in English *to understand* means, literally, 'to stand under.' To deny that *hi 'ogi* means 'all' is to make a similar mistake."

This is in fact a point that Everett himself stressed in his earlier work, with specific reference to the linguistic intuitions of the Pirahã themselves. In setting the stage for a discussion of "compound words", Everett in HAL offered the following observations:

"The criterion used to classify the examples to follow as compound words rather than merely phrasal constructions is semantic. For example, [...] the syntagmeme *xabagi soixaoxoisai* may be understood as 'toucan beak' or 'saw', according to the context. However, the majority of speakers who, for example, ask me for a saw (or other instrument with a compound name) find it very amusing and surprising when I make some sort of remark relating 'saws' and 'toucan beaks'. In my opinion, they are not even aware of the relationship unless they stop to reflect for a moment." [HAL 322]

The paragraph from HAL just quoted is followed by a presentation of Pirahã N-N compounds with similar properties: 'foot handle' (= 'ladder'); 'bow vine' (= 'bowstring'); and 'foot leather' (= 'shoe'); as well as N-A compounds glossed 'thorn crooked' (= 'scissors') and 'mouth big' (= 'type of bass (fish)'). In CA, Everett overlooks these lessons from HAL, without comment. Neither in CA nor in any other papers known to us does Everett offer any defense of the etymologizing (and exoticizing) glosses offered in CA.

CA also makes some terminological choices that may be uncorrected typographical errors; but if not, are entirely puzzling. Particularly confusing to the unwary is CA's gloss for the nominalizing suffix *-sai*, which is "NMLZR" in HAL (*nominalizador* in DISS), but "Nominative" in CA.

Despite these qualms and objections, we will in general quote examples as we find them in Everett's work, except where we note otherwise. This means that glosses and translations from CA will look somewhat different from their counterparts taken from DISS and HAL. It should also be noted that

the glottal stop is rendered with an apostrophe in CA, but with the letter *x* in older work. We have retained this disparity as well.

2. IEP and Embedding

What follows from IEP

The IEP in (1) is proposed as an explanation of both linguistic and cultural properties of the Pirahã. It should be possible, therefore, to see a clear logical connection between what the IEP asserts and what it is said to predict. In fact, CA is mostly inexplicit about the logic by which IEP makes predictions in either the linguistic or the cultural domains — for example, how exactly it predicts the properties listed in 1-11 in the previous section. The point is moot of course, for properties in 1-11 that not only fail to follow from IEP, but also fail to hold of Pirahã in the first place. Nonetheless, we should begin with some attempt to clarify IEP and its possible predictions.

Everett elucidates IEP as follows:

"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), and immediacy of experience is reflected in immediacy of information encoding—one event per utterance." (CA 622)

"The notion of "event" used in this paper—a single logical predicate—comes from the standard literature on lexical semantics. Such predicates can be modified but are represented as solitary events (see Van Valin and LaPolla (1997) for one model). This is not to say that a single event cannot be expressed by more than one utterance but merely that multiple events are not expressed in a single utterance/sentence." (CA 622, fn 3)

The cultural side of this description is claimed to be reflected in properties 6-11. Thus the supposed absence of creation myths presumably arises because no individual would claim to have been "present at the creation". (Everett is, however, not completely clear on this point.) Thus if the Pirahã were to tell such a narrative, IEP would be violated, since they could neither claim to have witnessed the creation nor to have heard the myth from someone else who could make such a claim. We do not understand how the other alleged properties of Pirahã culture follow logically from IEP.

In addition, as we discuss in section 5, there are issues of fact at stake in Everett's (CA) characterization of Pirahã culture. For example, as Gonçalves (1993; 2001) documents, Pirahã actually have knowledge of many myths. These include descriptions of mythical events from long ago such as the (re)creation of the world after a cataclysm by the demiurge *Igagai*. These stories are supported by an elaborate theory of a multi-level universe, in which creatures at our level (*ibiisi*) who suffer harm or injury generate distorted counterparts of themselves at other levels (*abaisi*). This is a world-view that the Pirahã were willing to illustrate for Gonçalves with clear and seemingly careful drawings. These observations will call into question not only the logical links between IEP and culture (and therefore the validity of IEP in the first place) but also such alleged facts of the matter as "the absence of creation myths and fiction" and "the absence of drawing or other art".

We will delay further discussion of the alleged cultural "gaps" of the Pirahã until the final section of this paper. In the following subsections and sections, we turn instead to the alleged linguistic

"gaps" of Pirahã, the primary focus of this article. Here too, we will see both logical problems and issues of fact.

Embedding

One of the more striking alleged syntactic consequences of IEP for Pirahã is "absence of embedding". Everett claims that Pirahã "is the only language known without embedding" (CA 622), a fact he calls "perhaps the strangest of all" (CA 628) in the list of strange facts that we have quoted above. Everett describes what he means by "embedding" as follows:

"putting one phrase inside another of the same type or lower level, e.g., noun phrases in noun phrases, sentences in sentences, etc." (CA 622)

What Everett has in mind is made clear by the kind of evidence that he offers and the interpretation he provides for this evidence.⁷ In the section of CA devoted to embedding, he discusses both cases in which a language like English is said to show a given phrase-type immediately dominated by the same phrase-type (possessive constructions) and cases in which the recursion is not immediate — cases in which English would show a clause embedded in a VP that itself forms a subconstituent of a larger clause.

More generally, Everett appears to be suggesting that Pirahã lacks a property often taken to be absolutely central to human language, the formal property of "discrete infinity". As Hauser, Chomsky and Fitch (2002, 1571) describe this property:

"The core property of discrete infinity is intuitively familiar to every language user. Sentences are built up of discrete units: There are 6-word sentences and 7-word sentences, but no 6.5-word sentences. There is no longest sentence (any candidate sentence can be trumped by, for example, embedding it in "Mary thinks that . . ."), and there is no non-arbitrary upper bound to sentence length. In these respects, language is directly analogous to the natural numbers... At a minimum, then, [the Faculty of Language - Narrow Sense] includes the capacity of recursion."

The fact that there is "no longest sentence" follows simultaneously from a way in which human language is claimed to be "smart" and from a way in which it is "dumb". Human language is "smart" in exploiting the combinatory possibilities of the basic rule of combination. In the recent research tradition discussed by Hauser, Chomsky and Fitch, this rule is called "Merge" (Chomsky (1995)).

⁷ On one reading of Everett's description of embedding, only cases of immediate self-embedding are excluded in Pirahã. Thus, we would expect possessors inside possessors to be excluded, as discussed below, if they would involve a nominal immediately dominated by a nominal, as in standard analyses; but we would not expect clausal embedding within a VP to be excluded, since although this is an instance of recursion (in which a clause contains a constituent which itself contains a clause), it is not immediate self-embedding. In his reply to Bambini, Gentili and Pietrini (2006), Everett (2006) claims that he "was referring primarily" to immediate self-embedding, and that clausal complement embedding is excluded by IEP because in work in progress, he will demonstrate the Pirahã lacks a VP. (Consequently, complements of V are daughters of the clause itself, and clausal complementation is an instance of self-embedding.) We are, of course, unable to evaluate Everett's as yet unavailable work on the existence of VP in Pirahã, but we also do not understand why the issue is even relevant. If the prohibition on embedding follows from the cultural principle IEP, how does this principle make any distinction between self-embedding and more indirect recursion? Surely the existence or non-existence of VP in Pirahã should be irrelevant to the question of whether a putative embedded clause makes reference to events distinct from those given by the main clause.

Merge takes two⁸ of the "discrete units" offered by human language and combines them to form a new unit (a phrase), which may now serve as input to other applications of Merge. Because Merge iterates, the rule yields the familiar structures of syntax, including such syntactic relations as complementation (when a lexical item merges directly with a phrase formed by previous applications of Merge) and modification (when more complex structures merge, with a particular consequence for the semantics).

Though the iteration property of Merge makes human language "smart" in some ways, it is also "dumb" — in that there is no mechanism internal to language that prevents Merge from iterating "too much". That is the point of Hauser, Chomsky and Fitch's example. Once we know (1) that a verb (*thinks*) may undergo Merge with a sentence (forming *thinks that...*) and (2) that a chain of one or more subsequent applications of Merge can yield a larger sentence (*Mary thinks that...*), we also know (3) that the larger sentence can itself be merged with *thinks* — and the procedure may repeat as many times as desired. The result is structures that show indefinite amounts of *embedding* — structures that offer a straightforward demonstration of the property of *recursion* within human language. In such structures, we may find — in principle — the same types of units at the lowest levels as we do at higher levels.

As Everett (CA 642) makes clear, he believes that this situation is never found in Pirahã. In the following sections, we argue against this claim. At the same time, even if it were true, the logic by which it follows from IEP remains obscure. Everett explains his reasoning as follows:

"If indeed there is no embedding in Pirahã, how might this lack be related to cultural constraint? Embedding increases information flow beyond the threshold of the principle of immediacy of information encoding. Although Pirahã most certainly has the communicative resources to express clauses that in other languages are embedded, there is no convincing evidence that Pirahã in fact has embedding [...]. This would follow from the principle of immediacy of information encoding, which I take to be the iconic principle constraining the grammar's conformity to cultural constraint."

[CA 631]

Imagine that IEP is a cultural fact among the Pirahã and that they consequently are limited to one event per utterance. One might imagine such a constraint blocking the production of certain types of embedded clauses.⁹ As a consequence, children acquiring Pirahã might never hear certain types of lexical items (e.g. finite complementizers) that in other languages typically introduce embedded clauses that communicate distinct events. Why other kinds of recursive structures should be blocked as well — for example structures that do not evoke events should be blocked more generally — is unclear to us. We return to this point shortly, but otherwise suspend our disbelief in order to challenge some of Everett's more basic empirical claims about Pirahã.

⁸ On some views, more than two units may be combined at one time by Merge. This issue is not of direct relevance here. Also, though Merge presents a "bottom up" view of syntax, also familiar from work in other grammatical traditions (Categorial Grammar, for example), the points made in the text can easily be recast from "top down" perspectives like those familiar from much generative syntax through the 1980s, or in grammatical frameworks that leave open the question of directionality (such as so-called Constraint-Based Frameworks). That is because for a half-century it has been clear that any overall approach to syntax that does not capture the familiar insight discussed by Hauser, Chomsky and Fitch disregards a key property of language.

⁹ Though why embedded clauses should be blocked in general remains obscure. For example, consider the sentence "The apple that I am now looking at is rotten" (suggested to us by Noam Chomsky, personal communication). This utterance describes a single situation, using the device of sentence embedding. As far as we can tell, the IEP should not block the construction.

Constraints on embedding: possessives in German and Pirahã

We commented above that the iteration property of Merge allows us to "find — in principle — the same types of units at the lowest levels as we do at higher levels.". Our qualification "in principle" was important.

Merge in human languages may be "dumb", but it is not lawless. Not every imaginable combination of words or phrases is acceptable in a given language. Consequently, cheap and easy demonstrations of recursion may or may not be available within individual languages. A variety of properties of human-language syntax put limits on complementation, modification, and other relations — and thus limit actual instances of Merge. The study of these restrictions, and how they pattern from language to language, is the bread and butter of research in syntax: the relation between the cognitive capacity for discrete infinity and the behavioral reality of *discreet* infinity.

Thus, an instance of Merge in a particular language that might in principle have served as a classroom demonstration of recursion may actually lead to a bad output, because it violates some additional law operative within the language. Consider a simple example from English. A verb may merge with a sentence, as in Hauser et al.'s example of *Mary thinks that...*. Likewise, a verb may merge with a noun or noun phrase, as in an example like *Mary translated poems*. Nouns, on the other hand, are different. Although a noun can merge with a sentence, as it does in *(the) claim that the world is round*, a noun may not merge directly with another noun or noun phrase, as in the unacceptable noun phrase **translation poems* (cf. *translation of poems*). Adjectives behave similarly. We may say *Storms destroy houses* but we may not describe such a storm as *destructive houses* (with the meaning expressed by the phrase *destructive to houses*). Many languages share these particular restrictions, but many others do not. Those languages that differ from English may, however, impose other requirements on nouns and noun phrases that have been merged with other nouns or with adjectives — special case morphology, for example, which may differ from the morphology found in verbal contexts. Thus, merge (and the repertoire of embedded structures that a language allows) are often constrained by "selectional" requirements.

Furthermore, certain instances of Merge in the languages of the world do block other instances of Merge from occurring. In English, for example, once an adjective has taken a direct object, the resultant phrase may not merge as a modifier to the left of a noun: *the destructive (*to houses) storm*. Once again, other languages, even closely related languages of the Germanic family such as German, lack this restriction:

- (2) der das Haus zerstörende Sturm (German)
- the the house destroying storm

On the other hand, it is not a pervasive property of English that it displays less recursion than other Germanic languages. To pick an example of particular relevance to Pirahã, we can note that English allows prenominal possessive noun phrases to embed other possessives — but German does not (Krause (2000a, 2000b)); Roeper and Snyder (2005)). As Roeper and Snyder put it: "the English possessive is potentially recursive [(3a)], while the Saxon genitive [its counterpart in German] is not [(3b)]" (compare (4a-b)):

- (3) a. John's car (English)
- b. Hans-ens Auto (German)

- (4) a. [John's car's] motor (English)
 b. *[Hans-ens Auto]-s Motor (German)

Since a German speaker can do the "*Mary thinks that...* trick" as well as an English speaker can, no one could rationally imagine (even if so inclined) that the unacceptability of recursion in prenominal possessors is due to some global absence of recursion in German. Likewise, we imagine that that it is beyond dispute that the culture of the German-speaking regions of Europe allows for creation myths, artwork, counting and discourse not bound to the "here and now". It thus seems unlikely that one would attribute the absence of recursive prenominal possessors to any pattern of cultural gaps like that claimed by Everett for the Pirahã. Instead, there must be some provision available to human languages (usually called a "parameter") that "turns off" the possibility of recursion within possessive phrases. The switch itself might be fairly abstract in nature. Krause (2000b, 2000a), discussing German and some other languages, argues that the relevant factor concerns the mechanisms that license case morphology, and shows that the kind of effect seen in (4b) is found in other environments that require genitive case, such as the direct objects of particular verbs and prepositions.

As it happens, Pirahã looks strikingly similar to German in this domain. A prenominal possessor (which is not marked with any special case morphology) is possible, but recursion in this position is not:

- (5) a. **non-recursive prenominal possessor**
xipoógi hoáoíi hi xaagá
 Xipoógi shotgun 3 be
 'That is Xipoógi's shotgun.' (HAL 205 (22))
- b. **recursion in prenominal possessor**
 *kó'oi hoagí kai gáihíi 'íga
 name son daughter that true
 "That is Kó'oi's son's daughter." (CA 630 (35))

How should we explain these facts in Pirahã?¹⁰ Everett makes the following proposal:

"A cultural observation here is, I believe, important for understanding this restriction. Every Pirahã knows every other Pirahã, and they add the knowledge of newborns very quickly. Therefore one level of possessor is all that is ever needed."

The fact that German appears to show the very same phenomenon, however, suggests to us a more obvious and parsimonious proposal: that whatever syntactic switch turns off prenominal possessor recursion in German is also at work in Pirahã. The contrast between German and English already teaches us that possessor recursion is a dimension along which languages may vary. Furthermore, the culture shared by most German speakers is surely more similar to that of most English speakers than either English or German is to the culture of the Pirahã (at least with respect to the broad-brush

¹⁰Everett's (CA) empirical claims here go somewhat beyond his own earlier work. In HAL (p. 272), he notes only: "I have no examples of expanded nominal expressions in pre-head position in a possessive phrase", and then describes what the syntax of a recursive prenominal possessor would look like. In the more recent paper, (CA) he offers the example in (5b) with the indication of ungrammaticality, and states categorically that "no more than one possessor per noun phrase is ever allowed. Removing one of the possessors in [(5b)] makes it grammatical". Our text assumes that the stronger claims in the more recent paper are correct, or else Pirahã becomes more like English than like German, and there is no issue at all to discuss.

properties discussed by Everett).¹¹ The fact that in this domain, German and Pirahã appear to share a linguistic property that English does not is just the kind of dissociation that renders an explanation in non-linguistic cultural terms for (5a-b) profoundly unlikely.

It is possible, of course, that further research will show that the Pirahã and German restrictions on prenominal possessors have distinct sources, that the two phenomena are *faux amis*. Much work remains to be done on the syntax of even well-studied languages like German, much less Pirahã.

Even so, this will not leave us with Everett's explanation as a contender. In our view, Everett's explanation makes little sense even on its own terms. As Everett notes (CA 630), the Pirahã (like the Germans, in fact) do have alternate ways of expressing possessors of possessors, so it cannot be the case that what is culturally unnecessary is ineffable.¹² In addition, it is hard to see how reference to a "father's brother's wife", for example, invokes multiple *events*. We are thus at a loss to connect the constraint on such structures to IEP. Additionally, Guimarães (2007) (who discusses the logic of IEP) also notes that such utterances as *Carol's hand's skin is smooth* or *John's canoe's walls are made of pitch* do not rely for determination of truth-value on contingent facts of acquaintance or relatedness — yet are presumably equally excluded in Pirahã. Thus, Everett's explanation for the unacceptability of the cases discussed above does not generalize to the apparent facts of the matter.

It is thus hard to see what work is being done by the cultural hypothesis, nor how one might put it to the test — except if we are correct that the English vs. German/Pirahã contrast presents us with the beginnings of a relevant double-dissociation. In the very worst case, the syntactic hypothesis gives the researcher a place to stand and a path of investigations to follow.

We have just considered an argument for the "absence of embedding" in Pirahã for which a syntactic explanation looks plausible, but the alleged cultural account is not. Everett offers a range of other examples intended to make the same point, where Everett's syntactic claims seem to us at best dubious, and at worst to contradict his own earlier work (without acknowledgment of the issue). We now turn to these cases.

Embedding of clauses

Much of the discussion of recursive syntax in Everett (CA) is devoted to the claim that there is no clausal embedding in Pirahã. The Pirahã have, of course, ways of communicating the same message

¹¹ It is also worth noting that earlier stages of German apparently lacked the recursion restriction. The Bible translation by Martin Luther, for example, contains such passages as the following, with a possessor embedded within a possessor.

Wenn jemand bei seines Vaters Bruders Weibe schläft, ...
'If someone sleeps with his father's brother's wife,...' (Leviticus 20.20, *trans. Luther*)

We will not discuss the possibility that the German speakers of Martin Luther's day had a capacity for recursion that their modern counterparts have lost.

¹² The example offered by Everett (CA 630, (37)) is:

'isaabi kai gáihíí '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.'

Everett notes that "the juxtaposition makes it clear that 'isaabi is Kó'oi's son."

as that communicated by English sentences like “I told you that the child is hungry” or “I’m asking you to help me build a canoe”. Everett claims, however, that the Pirahã way of expressing such concepts never involves embedded sentences. Everett goes on to suggest that embedding is missing from Pirahã because Pirahã speakers lack the *Mary thinks that...* capacity that Hauser, Chomsky and Fitch discussed in the passage with which we began this section.

In this, Everett (CA) disagrees strongly with Everett (HAL), though this fact is not directly acknowledged in CA. As we will argue, there is good reason to suspect that Everett was correct in his earlier work, and incorrect in his current claims. Pirahã *does* have embedded sentences (like every other human language known to us). We focus our attention in this section on embedded sentences that function as *complements*, and consider other types of embedded clauses later.

In fact, the constituents that we (in agreement with HAL) would identify as complement clauses in Pirahã look quite *ordinary* from a cross-linguistic perspective. The verb of a complement clause in Pirahã bears special morphology and looks more "nominal" than the verbs of main clauses. The morpheme typically found on the verb in Pirahã embedded complement clauses is *-sai*, glossed as "NOMLZR" (nominalizer) by Everett (HAL). It looks more nominal than other verbs in lacking the ability to show tense and aspect distinctions (HAL 279). In this sense, one can also call it nonfinite. Some examples are given in (6)-(9). (We discuss examples with the verb 'say' below.) We have added brackets around what we would identify as embedded clauses and have boldfaced the suffix *-sai*, for convenience:

- (6) hi ob¹³- áaxái [kahaí kai- **sai**]
 3 see/know-INTNS arrow make-NOMLZR
 'He really knows how to make arrows.' [HAL 263 (232)]
- (7) xoogíái hi xob-áaxái [xapaitíisi xohoi- **sai**] hiaitíihi xigiábi-koí
 Xoogíái 3 see-well Pirahã language speak- NOMLZR Pirahã people like- EMPH
 'Xoogíái really knows how to speak Pirahã, like the Pirahã.' [HAL 222, (94)]
- (8) kóxoí soxóá xibíib-i- haí [tiobáhai bífo kai-**sai**]¹⁴
 Kóxoí already order-PROX-RELATIVE CERT child grass do-NOMLZR
 'Kóxoí already ordered the child to cut the grass.' [HAL 263 (231)]
- (9) ko xoogíái góí tiobáhai xibíib-a- áti [xabo-óp-i- **sai**]
 VOC Xoogíái 2IMP child order-REMOTE- UNCERT turn- go-EP-NOMLZR
 'Hey, Xoogíái! Make your child return!' [HAL 220 (83)]

The special morphological properties of the embedded verb in such examples are not unusual cross-linguistically. As is well-known, it is quite common across languages for embedded clauses to look more "nominal" than their main-clause counterparts, due to a partial or complete suppression of tense, aspect or agreement distinctions found in the verbs of main clauses. Koptjevskaja-Tamm (1993) adopts from Stassen (1985) the term *deranked* (vs. *balanced*) for reduced embedded clauses of this sort:

¹³ On *xob* vs. *ob*: "Word initial glottal stop is frequently deleted in adjectives and verbs when preceded by nouns, pronouns, postpositions, or modifiers (in verbs)." (HAL 317).

¹⁴ An interesting question about this example is whether *tiobáhai* 'child' is syntactically part of the embedded clause, as we have bracketed it, or is a postposed object of the matrix clause. The former possibility is consistent with the SOV aspect of the language and might suggest that *xibíib-* should have been glossed as 'make', which is another of its meanings, according to HAL. See below for further discussion of post-verbal objects in Pirahã.

"In **balanced constructions**, both predicates remain structurally of the same rank, whereas in **deranked constructions**, one of the predicates is deranked, that is, the form of the predicate itself signals the subordination of that clause, which however, does not preclude the use of other markers of subordination." (Kotjevskaja-Tamm (1993, 24))

Kotjevskaja-Tamm offers many examples of languages that (either exclusively or quite commonly) use deranked constructions with nominal properties for complement clause embedding. A random sampling of languages with this property would include Quechua¹⁵ (Lefebvre and Muysken (1987), Hermon (1985)); Turkish (George and Kornfilt (1981), Kornfilt (2001), Kelepir (2001)); Inuktitut (Johns (1992)) and Adyge¹⁶ (Polinsky (2007)). Classical Latin (Lakoff (1968)) and Ancient Greek (Smyth and Messing (1956)) also show deranked embedded clauses (almost exclusively, in the case of Classical Latin complement clauses).

Everett (CA) does briefly consider the possibility that the bracketed constituents in examples like these might be deranked embedded clauses (his own earlier view), but claims to reject that proposal in favor of an alternative that involves no embedding. His discussion focuses on the example we have quoted as (6) above:

"There are two plausible analyses for this construction. The first is that there is embedding, with the clause/verb phrase "arrow make" nominalized and inserted in direct-object position of the "matrix" verb "to see/know well." The second is that this construction is the paratactic conjoining of the noun phrase "arrow-making" and the clause "he sees well." The latter analysis seems to fit the general grammar of Pirahã better. This is because as an object the phrase "arrow-making" should appear before the verb, whereas here it follows it. And, whereas normally there is optional clitic agreement available with any direct object, there is never any clitic agreement with such "object complement clauses" in Pirahã ([Everett (1987a)]¹⁷). Further, although the order of "complement" and "matrix" clauses can be reversed, the 'embedded' clause can never appear in direct-object position." [CA 629]

As we will show, Everett has not in fact offered any coherent alternative to the obvious analysis in terms of embedding. Furthermore, the considerations that he invokes as arguments against embedding are nothing of the sort. The word order argument, to the extent that it is supported by the facts, is too weak in a Pirahã context to argue against the more obvious analysis in terms of embedding, and the argument from clitic agreement is at best inconclusive.

We begin with Everett's claimed alternative to embedding: "paratactic conjoining". Though this term is familiar to us, we cannot see how it describes examples like (6)-(9). In his earlier work, Everett (HAL 223-224) employs the term in a reasonable fashion to describe the conjunctions in Pirahã that

¹⁵ Nominalized clauses in Quechua are not tenseless, but show a reduced set of tense distinctions (Lefebvre and Muysken (1987, 18).

¹⁶ Adyge nominalized embedded clauses do show tense distinctions, but like nominals, take a determiner and case marking. Polinsky (2007) argues that they actually show relative clause syntax, which would distinguish them from (obvious analyses of) Pirahã.

¹⁷ The original refers the reader to Everett (1988), which appears to be an error.

convey comparison. In these constructions, two normal clauses are juxtaposed, and certain elements may be omitted from the non-initial clauses of the sequence.¹⁸

- (10) **Paratactic conjoining** [HAL 223, (95)-(96)]
- a. xisaitoógií hi kapiigakagakai-baí xoogiái hi kóhi xabaxáigio
 Xisaitoógií 3 study- INTNSF Xoogiái 3 little only
 'Xisaitoógi studied a lot. Xoogiái (studies) very little.'
- b. batío paga póoko xoogiái hi mais paga bíi¹⁹
 Martinho pay little Xoogiái 3 more pay well
 [lit. 'Martinho pays little. Xoogiái pays better. - *authors*]
 'Xoogiái pays better than Martinho.'

The clauses in such constructions appear to be on an equal footing, and are equally finite. Neither of the two clauses in each of these examples shows the suffix *-sai*, and neither can fairly be analyzed as an argument of a predicate inside the other. As Noonan (1985) notes, parataxis may indeed be used in some languages to express what other languages would express with clausal embedding of the sort found in English. In such circumstances, the second clause is "interpreted as a separate assertion; [is] syntactically not a subordinate clause; [and] can't take a complementizer" (Noonan (1985, 65)). Lango (East Sudanic, Nilo-Saharan; Uganda), discussed at length by Noonan, has both parataxis, seen in (11a), and non-paratactic complementation, seen in (11b), which also shows "deranking" in the form of an infinitival verb. (The language also allows finite complementation, as Noonan discusses.)

- (11) **Paratactic and non-paratactic infinitival complementation (Lango)**
- a. Án àpóyò àcégò dógólá *paratactic*
 I remembered-1sg closed-1sg.subj door
 'I remembered it; I closed the door'
 (I remembered to close the door)
- b. Án àpóyò cèggò dógólá *non-paratactic (infinitive)*
 I remembered-1sg close-Inf door
 'I remembered to close the door' (Noonan (1985, 78, (149)-(150)))

As Noonan notes: "In [(11a)], the second predicate *àcégò* is fully inflected for person and tense-aspect. In [(11b)], the second predicate *cèggò* 'to close' is an infinitive, inflected neither for person nor tense-aspect".

As should be obvious, Pirahã examples like (6)-(9) resemble (11b) much more than they resemble (11a). On a paratactic analysis of Pirahã *-sai* clauses, we have no explanation for the absence

¹⁸ In fact, it is not impossible that (10a) shows gapping, rather than "paratactic conjoining", much like English *Mary studied a lot, and John just a little*. Johnson (2003, 2006) argues at length that gapping involves coordination below the sentence level (and "across-the-board" movement) — and thus cannot be parataxis.

¹⁹ The lexical items in this example, with the exception of the proper names and the clitic *hi*, are all Portuguese. In discussing this example, Everett (HAL 223) notes "Although a few Pirahã have learned the word *mais* 'more' of Portuguese, their 'Portuguese constructions' conform to the pattern in Pirahã. [...] Even when speaking Portuguese, the Pirahã express comparison by the paratactic conjunction of two clauses. The Portuguese clausal comparative *melhor* 'better' is not used by the Pirahã." In fact, the suppletive form *melhor* is used interchangeably with its analytic counterpart *mais bem* 'more good' (*mais...bíi* in (10b)) in non-standard dialects of Portuguese (arguably the dialects to which the Pirahã have the most exposure). Thus it is relevant to ask not only about *melhor*, but also about *mais bem* whether it is ever used with a clausal complement to the comparative.

of tense and aspect morphology on the second verb, nor for the presence of *-sai*. An analysis in terms of embedding, where the embedded verb is obligatorily "deranked", makes immediate sense of the Pirahã constructions as an instance of a phenomenon found in many languages. Furthermore, as far as we can tell from the data available to us, a *-sai* clause *always* fulfills the selectional requirements of some nearby predicate — just as we expect from a nominalization or embedding marker in a normal language. The morpheme appears to have no main-clause use.

In light of these considerations, we think there is already little reason to pursue an analysis of (6)-(9) as instances of "paratactic conjoining". Nonetheless, Everett (CA) asserts that such an analysis "fit[s] the general grammar of Pirahã better". Let us now consider his reasoning.

Everett's principal argument for parataxis concerns word order. When the direct object is a non-clausal nominal, Pirahã typically shows OV order. By contrast, examples like (6)-(9) must be taken to show VO order, if the *-sai* clauses are true objects of the finite verb. It might look at first glance, therefore, as though we have a simplicity argument in favor of the thesis that Pirahã lacks clausal embedding. We think this is not the case, however.

As documented cross-linguistically by Dryer (1980), it is quite common to find clausal complements following a main verb in languages that are otherwise generally or uniformly OV.²⁰ This is the case in Hindi, German, and Wappo for example:

(12) **Hindi**

a. **OV (nominal object)**

Raam becca dekhtaa hai
Raam child see AUX
'Raam sees the child'

b. **VO (clausal object)**

Raam kehtaa hai [ki vo becca dekhtaa thaa]
Raam say AUX that he child see had
'Raam says that he had seen the child'

(13) **German**

a. **OV (nominal object)**

Hans hat die Kinder gesehen.
Hans has the children seen.

b. **VO (clausal object)**

Hans sagte, [dass er die Kinder gesehen hat].
Hans said that he the children seen has

²⁰ Dryer (1980, 128) offers the following generalization (his "final-over-internal-position hypothesis"): "Whenever sentential NP's of the same grammatical relation differ in their relative tendencies to occur in clause-final position as opposed to clause-internal position, the difference will be that sentential NP's will exhibit a greater tendency than simple NP's to occur in clause-final position rather than clause-internal position".

(14) **Wappo (Yukian, California)**²¹

a. **OV (nominal object)**

?ah ce k'ew haʔis-khi? .
I DEM man know-STAT
'I know that man.'

b. ***VO (nominal object)**

*?ah haʔis-khi? ce k'ew.
I know-STAT DEM man
[Dryer (1980, 130), quoting Li, Thompson and Sawyer (1977);
and Thompson, Park and Li (2006, 5-6)]

c. **VO (clausal object)**

ah haʔis-khi? [te taka? mani-ya].
1sg:nom know-STAT 3sg basket carry-DUR:DEP
'I know s/he is taking the basket'
[Thompson et al. (2006, 144 ex. (135))]

The bracketed elements in (12)-(14) are clearly not main clauses. They show elements such as complementizers (in Hindi and German), characteristic embedded-clause word order (in German) and "dependent form" morphology (Wappo; Thompson et al. (2006, 140)) that are not found in main clauses.

Once again, it should be clear that Pirahã is not in any obvious way unusual. We certainly have no puzzles before us at this point that require special explanation in terms of an "Immediate Experience Principle". In displaying VO word order where the object is a clause, Pirahã makes a very ordinary choice from the menu of possibilities available to the languages of the world — the choice of a postverbal clausal complement in an otherwise OV language. This is a choice made by languages associated with diverse cultures and by languages with a varied range of other linguistic properties.

That said, it would of course be a matter of great interest to link the property seen in (6)-(9) and (12)-(14) to other properties of human language — that is, to offer some kind of explanation for the pattern. There are a number of proposals that might be entertained. Stowell (1981), for example, linked the behavior of embedded clauses in SOV languages like German to their behavior in SVO languages like English, where in complex Verb Phrases that contain an embedded clause and other material, it is the clause (all things being equal) that comes last:

- (15) a. Mary complained [about me] [that my music was always too loud].
b. *Mary complained [that my music was always too loud] [about me].

For Stowell, the relevant factor was a particular morphological property of clauses and verbs (connected to his theory of how case interacts with syntax). Work inspired by Kayne's (1994) *Antisymmetry* theory of linearization, on the other hand (for example Zwart (1993, 1997), argues that

²¹ The acceptable SOV variant is inferred from our sources. We make the morpheme divisions and use the transcription from Thompson et al. (2006). They note (p. 5) that "[t]he verb-medial order seen in [(14b)] was never offered or accepted in simple clauses," but "with complement clauses, particularly with first person subjects, the word order becomes considerably freer". OSV and SOV are also offered as possible alternative orders in such cases. We chose a different (c) example from Dryer to show the dependent verb form.

the SVO order seen with clausal complements in languages like German or Hindi (or Pirahã) is actually the neutral, unmarked order, and that SOV is derived by other processes, in response to particular syntactic requirements imposed on nominal objects (and some other objects as well). Hawkins (1990, 1994), however, suggests that sentence processing considerations motivate positioning of structurally complex phrases such as clauses. A hypothesis of this sort leads us to expect, in contrast to the purely syntactic proposals, that VO might be a general option in languages like Pirahã, dispreferred but chosen when the object exceeds some threshold of heaviness or complexity.

Pirahã might in fact provide some evidence for the last of these possibilities. Although SOV is the dominant order in Pirahã, Everett's earlier work offers a number of examples of SVO order in which the object is not a clause, but is an heavy NP, as well as other examples where it is at least conceivable that the post-verbal object is focused or made heavy in some other way. Some of these examples involve heavy objects with appositive modifiers (e.g. (16a-b) below):

(16) **SVO in Pirahã (objects underlined)**

a. ti xoba-i- sog- abagaí hiaitíihí ti xahaigí
1 see- EP-DESID-FRUST.INIT Pirahã 1 brother
'I want to see the Pirahã, who are my brothers.' [HAL 212 (55)]

b. tiobáhai koho-ái- hiab-a tomáti gihió- kasí piáii taí piáii
child eat- ATELIC-NEG-REMOTE tomato bean- name also leaf also
'(The) children do not eat tomatoes or beans or leaf(y vegetables).' [HAL 226 (107)]

c. ti soxóá kap- í- hí baai
1 already shoot-PROX-COMPLETE CERT wild pig
'I already shot a wild pig.' [HAL 295 (361)]

It is therefore not even clear that a *nominal* object "should appear before the verb" — a key premise of Everett's argument for parataxis rather than embedding in Pirahã. Consequently it is not clear that the normal position of a clausal -*sai*-complement poses any special puzzle. Postverbal position (SVO order) appears to be an option rather generally in Pirahã. For oblique objects, at least, Everett notes:

"when these objects are larger than five or six syllables they tend to undergo movement to postverbal position. This is apparently a stylistic mechanism to avoid overcrowding of the space between S and V, reminiscent of 'Heavy Shift'" (HAL 206)

Though examples like (16a-c) show non-oblique postverbal objects, it is possible that clausal complements pattern more generally with oblique objects. For example, clausal complements also may pattern with obliques in failing to undergo doubling by a pronominal clitic (Everett (1987a, 248 n. 6); CA 629), the only other fact besides word order (and general goodness of "fit") mentioned as support for a non-embedding analysis of what look like complement clauses in Pirahã.²²

²² This distribution of clitic doubling may reflect another property that obliques and clausal arguments have been argued to share. Neither needs to be licensed by abstract case, as first suggested by Vergnaud (2006; orig. 1976), and developed in much succeeding work. It is this fact that allows both obliques and clauses to function as complements to non-case assigners such as adjectives and passivized verbs. On the other hand, clitic doubling of CPs is not unattested. Tsakali (2004), for example, shows that Greek contrasts with many other languages in allowing clitic doubling of CPs, and argues that this reflects peculiarities of case assignment in Greek.

Furthermore, and crucially, Pirahã may also allow SOV to some degree when the object is a clause — a fact that supports our suspicion that an SOV~SVO alternation is an option possibly governed by factors like heaviness. Example (17) shows the clause *ti xap-i-sai* 'me to go' sandwiched between the third-person (possibly clitic) subject of 'want' and the verb 'want' itself:

(17) **SOV with clausal direct object in Pirahã**

hi ti xap-i- sai	xog- i- hiab- a	
3 1 go- EP-NOMLZR	want-EP-NEG-REMOTE	
'He doesn't want me to go.'		[HAL 278, ex. (290)]

An example like (17) could not involve "paratactic conjunction" of 'he want' and 'my going' unless paratactic conjunction were to allow the wrapping of the first conjunct around the second, in defiance of Everett's own argument from word order in favor of his conjunction proposal. Whatever paratactic conjunction may be, it does not include a discontinuous subject and verb with another clause in the middle. (It is presumably examples like (17) whose existence Everett denies with the remark, quoted above, that the "embedded" clause can never appear in direct-object position".) Example (17) is, however, unique in the corpus of examples available to us, so we cannot say what factors permit this ordering, and what accounts for its seeming rarity.

There are, of course, other ways besides word order and verbal morphology to verify whether a given clause is embedded or not. One way is to examine the *semantics* that correspond to the syntactic structures under discussion. We cannot, for example, imagine any interpretation of (17) that involves distinct sentences ("Him! My going! He doesn't want!") or conjoined sentences ("Him and my going and he doesn't want") — precisely because SOV word order does not even raise the question of an analysis in which S-V and the putative O constitute distinct sentences in a discourse.

Furthermore, the scope of an element like negation in (17) does not extend across the sentence boundary (unlike such phenomena as pronominal anaphora). Thus the interpretation of elements like negation may itself guide us in deciding on the correct syntactic analysis. For example, the English discourse in (18b) cannot be understood as synonymous with (18a), despite the fact that the complement of *order* has essentially the semantics of an imperative:

- (18) a. I am not ordering you to make an arrow.
- b. I am not giving you an order. Make an arrow!

The negation associated with *order* may take the complement of *order* in its scope, but it may not take within its scope an independent sentence — even one that specifies an order.

Exactly this sort of example appears to be found in Pirahã as well, as documented by Everett (HAL 254 ex (210a)) in connection with example (19) below. The glosses, as is the case throughout the present paper, are Everett's, and reflect an ambiguity or vagueness in the meaning of the verb *xibíib*.

- (19) ti xibíib-i- hiab- iig- á kahaí kai- sai
- 1 order-EP-NEG-CONT-REMOTE arrow make-NOMLZR
- (i) 'I am not ordering you to make an arrow' or
- (ii) 'I will not let you make an arrow.'

Example (19) contains a negated main verb *xibíib* 'order' whose negation clearly takes the post-verbal *-sai* clause in its scope. If (19) simply displayed two loosely connected sentences, the example

would presumably mean something like (18b), or perhaps the senseless "I am not ordering you. Arrow making!". Based on Everett's own previous research, we deduce that the correct analysis of this sentence is presumably one in which the speaker denies that an intentional relationship of order-giving holds between the himself/herself and the embedded proposition "that you make an arrow".

It is also of interest that the non-finite verb in (19) is the creation verb "make", and that the direct object of 'make' is understood as indefinite ('an arrow'). Given the semantics of 'make' and the use to which sentences like (19) are normally put, it is overwhelmingly likely that the main-clause negation takes the embedded direct object within its scope in the reading in (i). The speaker is probably not discussing a *particular* arrow that already exists but somehow remains unmanufactured. More likely, the speaker is discussing the absence of an order requiring the addressee to perform the activity of arrow-making. This is a reading in which the semantic argument of the verb 'order' is not 'arrow', but the proposition 'that you make an arrow'. It is as a consequence of this fact that negation and the intensional verb 'order' can also take semantic scope over the direct object within that proposition.

Indeed, Everett (HAL 278) notes specifically that when associated with verbs like 'want', *-sai* corresponds in meaning rather closely to the irrealis use of the infinitive in English, and does not even have the kind of meaning for which English would use a gerund in *-ing*. Thus, in connection with (17), he notes that the example means only 'he doesn't want me to go', and not 'he doesn't like my going' (a reading that Everett marks with an asterisk to indicate its unavailability). As Everett puts it (HAL 278), "There is no gerundive use of *-sai*."

All these considerations seem to us to argue strongly that when it comes to embedding, Pirahã is a language like any other. Everett's argument from word order, while it does point to facts of interest in Pirahã, does not bear on the question of recursion, but merely situates the language securely in the firmament of human languages everywhere.

***-sai* and the verb 'say'**

The nature and distribution of *-sai* are of some independent interest, of course. The nominal status of *-sai*²³ is supported by the fact that it may be suffixed to an argument-taking verb to yield an instrument nominal:²⁴

²³ The suffix is also used as a valence-reducing device (a phenomenon just touched on in HAL 219), comparable to passive (or perhaps reflexive) morphology in other languages. It is possible that *-sai* is thus analogous not only to infinitival morphology in other languages but perhaps also to participial forms.

²⁴ This use is reminiscent of the function of bare stems in Romance languages and others to form instrument nominals. For example Portuguese *tocadiscos* 'play-records' = 'record player'; *guardachuva* 'protect-rain' = 'umbrella'; *portamalas* 'bear-luggage' = 'car trunk'; *lavalouças* 'wash-dishes' = 'dishwasher'. See Gračanin-Yuksek (2006) for some recent discussion of such compounds. It is also worth noting that if the Pirahã nominals in (20) have the structure [N [N V + N]], they are examples of nominal recursion of the sort allegedly absent in Pirahã. It may be interesting to ask whether further embedding is possible (e.g. whether *xiohói xiboít-i sai kai sai* might be acceptable Pirahã for 'propeller maker'), or whether, as in Swedish (Roeper and Snyder (2005)), nominal compounds may not have recursive left branches.

(20) **-sai instrument nominals**

- a. xiohói xiboít-i- **sai**
 wind cut- EP-NOMLZR
 'wind cutter (i.e. propeller)' [HAL 277 (284)]
- b. xií kai- **sai**
 thing make-NOMLZR
 'thing maker (i.e. factory)' [HAL 277 (285)]
- c. xaoói hi [tábo xait- i- **sai**] xao- xaagá
 foreigner 3 board sleep-EP-NOMLZR POSSN-have
 'The foreigner has a sleeping-board (i.e., a bed).' [HAL 278 (289)]

The salient property of *-sai*, however, is the absence of tense and aspect morphology that it imposes on the verb. One might take this as an indication that *-sai* is indeed a nominalizer, since nouns across languages typically lack tense and aspect morphology (though not always; see Demirdache (1996)), Burton (1996), Nordlinger and Sadler (2004), among others). An alternative hypothesis, however, might attribute the absence of this morphology to embedding itself, as in (21):

(21) **Parameterized Tense constraint (operative in languages like Pirahã)**

Tense may not be overtly realized in the scope of another instance of Tense.²⁵

The affix *-sai* does have at least one property noted by Everett that might be regarded as puzzling in light of (21). In reported speech introduced by the verb 'say' (*gái*)²⁶, it is the verb 'say' that usually bears *-sai* — and therefore lacks tense and aspect inflection. It is the clause containing the reported speech, in turn, that lacks *-sai* — and contains normal tense and aspect inflection). Example (22) shows this extremely common pattern. We have boldfaced the two verbs, for convenience. Note the presence of tense and aspect marking on 'want', and its absence on 'say-NOMLZR':

- (22) kohoibíhai hi **gái- sai** hi hi **xogi-hiab-iig- á** gáihí
 Kohoibíhai 3 say-NOMLZR 3 3 want-NEG-CONT-REMOTE that
 'Kohoibíhai said (that) he's not wanting that.' [HAL 259 (223)]

²⁵ The underlined antecedent of the conditional in (i) below (HAL 264, ex. (239)), might suggest that (21) should be refined in some way, since *-sai* (whose high tone distinguishes it from nominalizing *-sai*) apparently is compatible with tense and aspectual distinctions:

- (i) [pii boi- hiab-i- sai] ti ahá-p- i- í
 water come-NEG-EP-COND 1 go- IMPERF-PROX- COMPLETE CERT(?)
 'If it doesn't rain, I'll go.'

In the more recent article, which presents an example identical to (i) except for a non-negative antecedent to the conditional (and a gloss of *boi-* as 'vertically move'), Everett (CA 630) comments that such examples "are best analyzed as simple juxtaposition of two clauses. There is a clear semantic dependency, but this does not necessarily translate into a syntactic relation." Conceivably, one might translate *-sai* as something like English *suppose* in "Suppose it doesn't rain", which would render (i) as consisting of two sentences, as Everett suggests.

²⁶ One instance of this form in HAL (p. 121 (233)) gives the verb as *gá-* (rather than *gái*) and treats the following *i* as epenthetic. We follow the norm in HAL, DISS, and CA (including the wordlist in HAL (p. 355), which omits the high tone) and cite the verb as *gái* throughout, but a number of examples cited in this paper will show instances of *gá-* 'say' without the following vowel.

Everett (CA 629) suggests that this phenomenon provides an additional argument for the absence of "embedding", and therefore as evidence that Pirahã lacks recursion. As noted above, he claims that the "simplest translation" of *gái-sai* in examples like (22) is:

"as a possessive noun phrase 'my saying,' with the following clause interpreted as a type of comment. The 'complement clause' is thus a juxtaposed clause interpreted as the content of what was said but not obviously involving embedding."

It is in this spirit that Everett offers the "literal" translation of (23) below (CA 629, ex. 24):

- (23) ti *gái-sai* kó'óí hi kaháp -íí
 I say-nominative [sic] name he leave -intention
 "I said that Ko'óí intends to leave."
 (lit. "My saying Kó'óí intend-leaves")

We are in fact not sure what Everett means by "juxtaposition" or "a type of comment", nor is the "literal" translation helpful in this regard.

Everett is presumably not claiming that examples like (22) and (23) are instances of direct quotation (e.g. 'Kohoibiihai said "I intend to leave"'). As Everett himself noted in his earlier work (HAL 232), direct quotation can be distinguished from indirect speech in Pirahã by the "intended reference of pronominals", much as in English. At the same time, it is worth noting that *gái-sai* does introduce direct as well as indirect speech. Thus, as Everett points out, on the direct quote parse of (24) given in (i), the first-person pronoun (or pronominal agreement marker) *ti* is understood as referring to Xahóápátí, but on an indirect speech parse, given in (ii), it refers to the speaker of the utterance:

- (24) hi *gái-sai* xahóápátí ti xi aagá- hóág- a
 3 say-NOMLZR Xahóápátí 1 hunger have- INGR-REMOTE

- (i) 'Xahóápátí said, "I am hungry" ' or
 (ii) 'Xahóápátí said (that) I am hungry.' (i.e. that the speaker reporting (24) is hungry)
 [HAL 269 (256)]

Since Pirahã does in fact express indirect as well as direct speech with *gái-sai*, what kind of syntax could it use, if no embedding is involved? Everett (CA) offers no actual proposal, and we suspect that there cannot be any such proposal that involves lack of embedding. A syntactic relation between an expression containing a *verbum dicendi* and a clause of reported speech is of necessity *some* kind of embedding relation. The open question concerns the nature of the embedding. We can imagine three possibilities:

- (25) a. the clause of reported speech is a syntactic dependent of the *verbum dicendi*;
 b. the expression containing the *verbum dicendi* is a syntactic dependent of the clause of reported speech;
 c. the expression containing the *verbum dicendi* and the clause of reported speech are both syntactic dependents of another element

Languages like English allow all three options, as in (26):²⁷

²⁷ The use of pronouns is uniform across the two English constructions. Thus in *According to John, I am hungry*, "I" refers only to the speaker of the utterance, just as in *John said that I am hungry*.

- (26) a. John said that Mary is hungry.
 b. According to John, Mary is hungry.
 c. John's claim was that Mary is hungry.

The question is which proposal or proposals for Pirahã can best make sense of the non-finite morphology commonly found on *gái*. The non-finite inflection on *gái* might be taken to favor an analysis of Pirahã examples like (22)-(24) that is more like (26b) or (26c) than (26a). Consequently, let us put (26a) aside.

Consider (26b) first. If this possibility is correct, *gái-sai* heads an embedded adjunct used adverbially, and the absence of tense and aspect in the embedded clause follows straightforwardly from the Parameterized Tense Constraint (21). As Everett notes [HAL 263], "Temporal and conditional clauses precede the matrix clause, whereas other types of subordinate (adverbial) clauses usually follow the matrix clause" — so "according to" clauses would be behaving just like many adverbial clauses. Indeed, *-sai* appears to have a use as an adjunct-introducer, as in (27):²⁸

- (27) pii boi- sai ti xahá-p- i- hiab-i- haí
 water come-NOMLZR 1 go- IMPERF-EP-NEG-PROX- RELATIVE CERT
 'Raining (i.e., if it rains), I will not go.' [HAL 208 (38)]

A possible objection to this proposal is the use of *gái-sai* with direct quotation as in (24) with meaning (i). This is a property perhaps unexpected of an adverbial modifier, as one can see from the unacceptability of English examples like **According to John, "I am hungry"*.

Given the possibility of direct quotation with *gái-sai*, one might then turn to (26c). Like many languages (such as Hebrew and Russian), Pirahã omits the verb 'be' in certain sentence types:²⁹

- (28)a. giopaíxi hi sabí-xi
 dog 3 wild-EMPH
 'The dog is really wild.'
- b. kohoibíihai hi kaiíi gáihí
 Kohoibíihai 3 house that
 'That is Kohoibíihai's house.' [HAL 205 (26)-(27)]

The presence of the third person pronoun in such examples is mirrored again by languages like Hebrew (Rapoport (1987); Shlonsky (1997)) in which just such a pronoun seems to serve in lieu of a copula (or perhaps the Pred of Bowers (1993), Baker (2003), Den Dikken (2006), and others):

- (29) **Hebrew copular sentence**
 Mary **hi** rofah.
 Mary **she** doctor
 "Mary is a doctor"

²⁸ If *-sai* should be marked with a high tone in (27), as is the case with other particles that introduce conditionals, it might be a morpheme distinct from the *-sai* that we have been discussing. See HAL (p. 264) for discussion of a high-tone conditional *-sái* which, however, cooccurs with tense and aspect on the verb, not (overtly) present in (27).

²⁹ One might also entertain the hypothesis that the Pirahã clitic pronoun *hi* may function as the copula. This would bring Pirahã much closer to Hebrew.

Given the existence of null copulas in Pirahã, it is not unreasonable to gloss examples like (23) in accordance with (26c) as involving a nominal subject, a null copula, and an embedded clause complement (e.g. "my claim is (that) Ko'oi intends to leave").³⁰ It is worth noting that here Hebrew once again behaves like Pirahã in showing a pronoun that agrees with the subject possibly in lieu of the copula:

- (30) **Hebrew copular sentence of the form *X's claim is CP***³¹
 Ha-te?ana šel ruti **hi** še avi nasuy
 the-claim of Ruti **she** that Avi married
 "Ruti's claim is that Avi is married"

Such an analysis for Pirahã, however, raises concerns about the finiteness of the second clause — that is, about the presence of tense and aspect morphology on its verb. This would appear to violate (21), which otherwise appears to be exceptionless in Pirahã. Perhaps it is the very absence of tense and aspect in the matrix clause that is the key to the presence of these elements in the embedded clause. We hope this possibility will serve as a topic for further investigation into the choice among the possibilities in (26).

If (26c) is correct, we still need an account of the apparent absence of clausal complements to the verb *gái-*. A straightforward account would treat this fact as a special selectional property of *gái-*: it does not select for a CP, and perhaps does not allow any normal, headed syntactic complement. Such an account is not enlightening in itself, but does have a consequence of relevance to the current discussion. Indirect speech reports in Pirahã that use the verb *gái-* show a nominalized form of the verb simply because it is a way to express the meaning CP complement to *gái-* without actually merging a CP as a complement to the verb. In particular, there is no need to suppose that finite forms of *gái-* are excluded in general.

As it happens, however, Everett (CA 629) claims the opposite, asserting that "the verb 'to say' (*gái*) in Pirahã is always nominalized. It takes no inflection at all."³² In fact, however, Everett's own earlier published work on Pirahã, as well as available texts, show numerous counterexamples to the claim that *gái-* always appears with the nominalizing suffix *-sai*, and to the claim that it takes no inflection at all. The relevant uses of *gái-* are boldfaced below, and include remote, bare and atelic forms.³³

³⁰ In (24), the two readings would correspond to English examples in which *His claim is...* is followed by a quotation or a *that*-clause, respectively. Note that the omission of *that* in the *that*-clause variant is somewhat deviant, a factor that limits the ability of strings like *his claim was I am hungry* to have anything other than the direct-quotation reading in which *I* refers to the author of the claim.

³¹ We thank Danny Fox for this example.

³² Everett makes this claim in the context of his overall assertion that Pirahã lacks recursion. The claim seems to be that true recursion would permit a verb phrase inside a verb phrase. If *gái* is never a "true" verb, then the Pirahã for "I said that you left" is not showing recursion, but some other strategy that does involve embedding at all. In other words, clausal complementation to a noun might be possible, but never clausal complementation to a verb. It is, of course, far from obvious how a cultural restriction to "immediate experience" could distinguish complementation to a noun from complementation to a verb.

³³ It is also worth noting that in both of these examples, the verb "to say" is not merely inflected, but actually bears "remote tense". Remote tense morphology is described by Everett (HAL 293) as used with descriptions of "actions which occur within a relatively large time span in relation to the moment of utterance or which are perceived as less 'relevant'" (HAL 293). The presence of remote tense on a verb of saying in these examples might in fact be an indication that the speaker is

- (31)a. xoogíái hi xá-**ga- a** kokahá-p- i- t- aó
 Xoogíái 3 ?- **say-REMOTE** awake-IMPERF-PROX- ITER-TEMP

kaopá-p- á- há
 leave-IMPERF-REMOTE-COMplete CERT

xái xab-op- ai- ta xoogíái hi xa-ga
 then turn-go-ATELIC-ITER Xoogíái 3 ?- say

xahoigí- o kaop- ái- ta- ha- á
 afternoon-OBL leave-ATELIC-ITER-COMplete CERT-REMOTE(?)

xopa-ta- há
 go- ITER-COMplete CERT

'Xoogíái said, "When I awake, I will leave. Then he will return." Xoogíái said that he will leave in the afternoon, (Then he) will go.'

[HAL 232 (ex 120)]

- b. hi gáí -sai **ga-á**
 3 say-NOMLZR say-REMOTE [gloss ours]
 "Ele disse assim." ("He said thus") [DISS 198 (420)]³⁴

- c. ?ái kopái ti **gáí** ?akí si
 then panther I say here place

?ís -a -p -i k -ob -ab -á -o p íí haí
 animal move down.vert. sudden undergoer see remain move onto vertical intend relative.certainty
 'Then I said with respect to the panther, "Here is where it went. I think I see (where it went)".'
 [?ahóápati (1980, 2 ex. 8)]

- d. kaapási ?ái ti **gáí** kaapási ka?áowí k -ob -á -aá -ta -haí
 name then I say name basket undergoer throw causative imperative iterative relative.certainty
 "'Kaapási", I said, "Throw a basket (to me)".' [?ahóápati (1980, 3 ex. 13)]

- e. ti xagía **gá- xai-aí** ko kab- i- si³⁵ baósaápi
 1 DISC.PRT say-be -ATELIC eye NEG-EP-NOMLZR hammock

bag- áo- b- á- há
 sell-TElic-PERF-REMOTE-COMplete CERT

'I was saying "(The man) without eyes sold the hammock"

[HAL 275 (280)]

not describing immediate experience (or the immediate experience of someone known to the speaker) — though one would need more information about the context in which the examples were uttered or elicited to verify this point.

³⁴ In HAL (310, (420)), Everett omits the morphemic analysis of *ga-á* and glosses it as "thus(?)", presupposing that the nominalized verb is the main predicate. The example seems to us to make sense with the non-nominalized verb as the main predicate and the nominalized verb as its object, in line with the SOV order of Pirahã: 'He said [this] saying'.

³⁵ *-si*, discussed in HAL (p. 279) is another nominalizer, distinct from *-sai*.

f.	hi-gá-xai-híai	batío	ao-aópá-xai
	he-say-prog-hearsay ³⁶	Martins	Braz.-angry-prog
	He said, "Martins is angry."		[Everett (transcr.) Itaipigai (1998), segment 1.53]

The ease with which we found such examples sharply contradicts Everett's claim in CA that *gái* is "always nominalized".³⁷

Note that if the translations offered in (31a) and (31c-f) are correct, *gái-* does support the embedding of direct quotations, even though it does not allow CP complements in indirect discourse constructions. (We have found no examples of finite *gái-* in which one could firmly conclude from the translations offered that we are dealing with indirect discourse rather than with quotation.) To judge from the information available to us, *gái-* appears to be a verb that semantically supports embedding, much like 'say' in other languages, but has one special syntactic selectional property. This conclusion is consistent with our more general claim that Pirahã has no general syntactic constraint against clausal embedding, as our earlier examples with verbs meaning 'order', 'want', 'know', etc., all of which allow a clausal complement, have demonstrated. Of all these verbs, only *gái* has the special behavior discussed in this section. Thus, not only does the behavior of *gái* provide no argument for IEP, but *gái* is itself exceptional, and not typical of Pirahã verbs that take clausal complements — which themselves provide no argument for IEP.³⁸

Alleged gaps in the Pirahã lexicon

Though he is not fully explicit about the matter, Everett (CA) also seems to advance the argument that the Pirahã lexicon reflects the special properties that, in his view, entail absence of syntactic recursion — by lacking certain verbs that in other languages might necessarily take propositional complements. It appears to be with this claim in mind that Everett asserts (CA 629) that

³⁶ We gloss *-híai* as 'hearsay' following HAL, in place of an absent gloss on the website from which the example is taken.

³⁷ In HAL (p. 278), Everett stated that "With rare exceptions *gái* only occurs in nominalized form". This might also have overstated the case, though we cannot tell for sure, of course, how representative the examples available to us might be.

³⁸ One example found in HAL and DISS might even show recursive embedding of the *gái-sai* construction:

(i)	hi gái- sai- híai	hoáipi hi gái- sai- xóai	
	3 say-NOMLZR- HSY	Hoáipi 3 say-NOMLZR- REPORTED INFORMATION(?)	
	hi gái- sai	hi apióxiái hi xai-xí	
	3 say-NOMLZR	3 another 3 do-EMPH	[HAL 260 (226)]

In HAL, the example is glossed as follows: *Hoáipi said it is said that he said "Someone else did (it)".* The example is presented mainly to call attention to possible cataphora (backwards coreference) — on the assumption that *hoáipi* is the subject of the second verb and corefers with a pronominal subject of the first verb. (An alternative view, it seems to us, would identify *Hoáipi* as a postposed subject of the first nominalized verb, with the sentence initial *hi* functioning as agreement with the full NP. On this analysis, there is no cataphora.) The gloss, which incorporates the apparently conjectural treatment of *-xóai* as a kind of evidential, seems to reflect a hypothesis that the example shows recursive embedding. If (26c) offers the right model for Pirahã *gái-sai* sentences, a closer translation might be *His/Hoáipi's claim is that his/Hoáipi's (reported) claim is that his claim is that someone else did (it)* — as clear a demonstration as one could wish that Pirahã allows recursive embedding.

The same example in DISS (p. 113 (226)), however, is given a Portuguese translation as "Hoáipi [sic] disse, ele disse, ele disse 'outra pessoa fez (aquilo)", i.e. *Hoáipi said, he said, he said "Someone else did (it)"*, which suggests mere repetition (yielding a very different meaning for the example). We look forward to future research that may establish whether the recursive parse is in fact available, as we suspect it will be.

"Pirahã has no verb 'to think', using instead (as do many other Amazonian languages [...]) the verb 'to say' to express intentional contents." As far as we have been able to confirm, this claim is factually correct.

Presumably, the absence of a verb whose sole meaning refers to mental states might be deemed significant because it could reflect not only the alleged absence of recursion but also the restriction of Pirahã culture to "immediate experience". In fact, however, Pirahã, does have a word *hoagá* 'contrary to what you might expect' (HAL 225, 303-4). The meaning of this word requires clear reference to the abstract mental states of others, as well as an evaluation of the counterfactuality of such beliefs. Furthermore, a word with this meaning semantically embeds the sentence in which it occurs, even though the surface syntax might not reflect this fact transparently, since the semantics must specify that *what you expected* is the opposite of what occurred.

The Pirahã can, in fact, discuss the content of thoughts, as Everett notes. Everett's glosses (CA 629) call attention to the fact that the Pirahã word that expresses "know" is the same as the word "see" (as in (7) above), which might once again be taken as an argument that the Pirahã are special in lacking vocabulary for mental states. (Everett does not offer this argument explicitly.) Since Ancient Greek famously had the same property (using the perfect tense of 'see' to mean 'know'), we doubt that a language that associates seeing and knowing must reflect an intellectual restriction to the here and now. Certainly the Classical Greek cultural tradition is not known for an absence of myths (including creation stories), nor for a restriction to the here and now. English, in fact, is not too different from Pirahã either. Though English has a distinct verb *think*, it also uses *see* for a similar notion, as in the common expressions "I see" and "I see your point".³⁹

We conclude that none of Everett's (CA) specific empirical claims about embedded clauses and intentional verbs in Pirahã are supported by the available documentation of the language. Everett's own earlier work reveals propositional complements with the properties one expects of CP complements (including appearing in complement position). It also shows non-nominalized and tensed instances of *say*, as well as lexical items referring to mental states.

***Wh*-constructions and embedding**

We have little doubt that Pirahã syntax (like the syntax of other languages) will turn out to display properties or combinations of properties that are unique and of special interest to linguists and others. Nonetheless, we have seen so far that many of the alleged features of the language singled out by Everett (CA) as support for IEP are either misanalyzed or irrelevant to IEP (or both). Instead, as far as we can tell, in the domains discussed by Everett, Pirahã is an entirely normal and (in a general sense) unsurprising language. The properties of Pirahã we have discussed here, in response to Everett (CA), are properties attested in other languages of the world. These properties are not necessarily universals in the sense of properties uniform across the species, but they are clearly universals in that they are chosen from a common *menu*, apparently uniform across the species.

³⁹ There is in fact apparently a distinct word for "ignorance" in Pirahã, seen in the following example.

xi	gái-sai	xioitaábi	ti	xóos	aagá
3FEM	say-NOMLZR	Xioitaábi	1	ignorance	have
'Xioitaábi, she said, "I don't know."				[HAL 283 (314)]	

Thus, for example, data concerning interrogative clauses in HAL suggests that Pirahã differs from English but resembles many other languages of the world in lacking overt *wh*-movement.

(32) **Wh-interrogatives**

a. xabagi **go gíiso** xigí xog- i (híx)
 Xabagi WH DEM ASSOC want-PROX (INTER)
 'How much does Xabagi want?' [HAL 239 (149)]

b. gahió **go gíiso** xab-óp-ai
 airplane WH DEM turn-go-ATELIC
 'When will the airplane return?' [HAL 239 (150)]

c. xisaabi hi **go gi** ái ko- ab- ái- p-í⁴⁰
 Xisaabi 3 WH DEM(?) be(?) die-DUR-ATELIC- IMPERF -PROX
 'Why did Xisaabi die?' [HAL 240 (160)]

This observation is confirmed by Everett (HAL 245) in a short section entitled "Position of the Questioned Element", which we reproduce in full:

"There is no movement of the questioned element."⁴¹

It thus seems clear that one of the choices made by Pirahã from the menu of choices available to human language is the choice to leave question words *in situ*. In this, Pirahã is just like Japanese, Korean, Chinese and countless other languages whose interrogative syntax has been studied intensively over the past quarter century.

Since Pirahã is a *wh*-in-situ language, it is more than a little surprising that Everett uses as an argument for the non-existence of clausal embedding the observation that a "questioned element" may not move from (what we would call) an *embedded* clause. He presents this argument with no reference whatsoever to his earlier (and apparently correct) discovery that the language lacks overt *wh*-movement entirely. Everett's newer argument is advanced on the basis of the unacceptability of (33b), an attempted interrogative counterpart to (33a) (= our example (6):

(33)a. hi ob- áaxái [kahaí kai- **sai**]
 3 see/know-INTNS arrow make-NOMLZR
 'He really knows how to make arrows.' [HAL 263 (232)]

b. *hi go 'igi -ai 'ob -áa'ái [__ kai -sai]
 3 WH ASSOC do/be⁴² see/know-INTNS make-NOMLZR
 'What thing [does he] know well to make?'
 (lit. "What associated thing he knows well to make/ making?")
 [i.e. 'What does he know how to make well.' - *authors*] [CA 629 (27)]⁴³

⁴⁰ A chart provided by Everett (HAL 239) appears to suggest that the *hi* in this and similar examples might be part of the *wh*-phrase rather than a clitic doubling the subject, widely seen elsewhere in the language. It is unclear to us whether every case of *hi* preceding *go* has this analysis, especially when there is no overt subject otherwise.

⁴¹ As (32a) shows, an optional clause-final interrogative particle may mark the construction as a question.

⁴² The combination '*igi + ai*' is translated as 'ok' in HAL 249. We guess that it is the source of the translation 'well' in CA, in which case we do not understand Everett's gloss 'associated thing' for *go + igi*.

Surely if Pirahã is as a language without overt *wh*-movement, we should hardly draw any conclusions about whether a particular phrase is an embedded clause or not on the basis of the failure of a *wh*-phrase to extract from it! We conclude that the unacceptability of example (33b) teaches us nothing about the right analysis of the bracketed phrase in (33a), much less about the existence of embedding in Pirahã more generally.

On the other hand, we might ask whether the *wh*-phrase may remain *in situ* within the putative complement clause selected by 'ob- 'see/know', but take scope over the higher clause — yielding the intended meaning for (33b). The answer to this question appears to be yes, given the acceptability of Everett's own (34), in which the interrogative expression *hi go 'igi-ai* 'what' remains within the clause whose verb is *kai-sai* 'making'. In this example, *go* 'what' is clearly the object of *kai-* 'make', but the meaning of the example as a whole is interrogative:

- (34) [hi gó 'igi -ai kai -sai] hi 'ob -áa'ái
 3 WH ASSOC do/be make-NMLZR 3 see/know-INTNS⁴⁴
 [translation as in (33b)] [CA 629, (26)]

Everett claims that the *kai-sai* clause must precede 'ob-áa'ái here, a fact that might suggest a limitation on the otherwise common extraposition of *-sai* complements that we have seen throughout this section.⁴⁵ Everett does not offer the relevant example, but we presume that what he has in mind is (35), with the judgment given:

- (35) *hi 'ob -áa'ái [hi gó 'igi -ai kai -sai]
 3 see/know-INTNS 3 WH ASSOC do/be make-NOMINALIZER
 [based on CA 629, (26), judgment as given in text]

For Everett, the impossibility of (35) is presumably due to the fact that "there is no embedding" in Pirahã and that "the interrogative word must always be initial in the phrase". But if we are correct, neither claim is true. In fact, Pirahã in (34)-(35) is once again behaving in a manner familiar from other languages — in this case Bengali.⁴⁶ As Bayer (1996, 272-3) notes, embedded clauses in Bengali may be either preverbal or postverbal, but if an embedded clause contains a *wh*-phrase that takes main-clause scope, the clause must be preverbal:

⁴³ The gloss to this example, missing from CA, is supplied in the style of HAL, using other glosses in CA and HAL. The translation is from CA.

⁴⁴ We depart from our policy of reproducing CA glosses verbatim and give a gloss here parallel to the one we supplied for (33b). The gloss in CA has "information question" for *WH*, "attractive" for *INTNS*, and as noted in section 1, "nominative" for *NMLZR*.

⁴⁵ If *hi* belongs to the matrix clause in (34), then this provides another example like (17) of SOV order in which the object is clausal.

⁴⁶ We owe this observation to Norvin Richards (personal communication).

(36) **Bengali counterparts to (34)-(35)**

a. **preverbal embedded clause**

ora [ke aS-be] Sune-che [cf. (34)]
 they who come-FUT3 hear PST3

matrix scope: 'who have they heard will come?'
 [also: **embedded scope:** 'they have heard who will come']

b. **postverbal embedded clause**

ora Sune-che [ke aS-be] [cf. (35)]

***matrix scope:** *'who have they heard will come?'
 [ok **embedded scope:** 'they have heard who will come']

The reasons for the effect can be debated. One might attribute it directly to an impact of word order or syntactic position on extraction possibilities. Alternatively, one might argue that prosodic requirements related to the presence of an interrogative *wh*-word are at stake here, as in languages like Basque and Hungarian in which the location of *wh*-phrases has been argued to be partly determined by prosody (Arregi-Urbina (2002), Szendrői (2003)). We leave the actual resolution of these questions open, except to stress two key points: first, that no argument against embedding follows from the data of this section; and second, that once again Pirahã appears to show behavior familiar from other languages. No argument can be advanced for Pirahã exceptionality, and quite possibly an argument can be advanced for the opposite perspective.

A language without overt *wh*-movement might, of course, show other types of movement as well. Chinese, for example (Huang (1981), Xu and Langendoen (1985), Ko (2005)), though it lacks overt *wh*-movement, does have a process of leftward movement for topicalizing constituents. In this connection, (37) below might in fact be displaying extraction from an embedded clause.⁴⁷ The exact nature of the structure depends, of course, on the correct analysis of the *gái-sai* 'say-NMLZR' construction.⁴⁸

⁴⁷ It is not inconceivable that *ao-gá-sai-hiai* is a parenthetical within a direct quotation, in which case (37) does not necessarily show extraction from an embedded clause. See Stowell (2005), however, for arguments that parenthetical structures should in fact be analyzed as embedding an apparent main clause.

⁴⁸ Everett in HAL (p. 228) suggests that topicalization in Pirahã is more like left-dislocation, and involves a resumptive pronoun or clitic. The gloss on *ao-hoaxá* provided by our source is 'it look.for', which might suggest a similar analysis here, but we are uncertain what morpheme is pronominal here.

(37) **Non-*wh* extraction from an embedded clause**

poogaihia⁴⁹ ao- gá-sai-híai ahóahi-o ao – hoaxá isaihiaí
 bananas Steve⁵⁰-say-NMLZR-hearsay tomorrow-in [Steve]⁵¹ it.look.for HSY⁵²
 [?] 'Bananas is Steve's claim [that [he] will look for __ tomorrow]'
 i.e. 'Bananas, Steve said he would look for tomorrow.' (translations ours)

[source: Itaibigai (1998, segment 1.12); and Filomena Sandalo (p.c.): Text: *Martins visit*.
 Informant: Itaibigai – Cassette 1]

Putting topicalization aside, we return to the question of *wh*-phrases in Pirahã. In the subsections that follow, we argue that Pirahã appears to fit perfectly the well-known profile of a *wh*-in-situ language in several respects. As we will show in the next subsection, for example, Pirahã allows *wh*-phrases to take scope out of adjunct islands that block overt *wh*-movement in languages like English, and show *wh*-in-situ in constructions besides interrogatives — in particular, in correlatives. Everett (CA) uses each of these phenomena as part of arguments for the non-existence of clausal embedding in Pirahã. Once one recognizes that Pirahã is simply a *wh*-in-situ language like Chinese, Japanese, Korean and others — with clausal embedding like any other language — these arguments vanish.

***Wh*-scope from adjunct islands:** Though adjunct clauses are generally islands that prevent *wh*-movement extraction cross-linguistically (as seen in (38); Cattell (1978), Huang (1982), Longobardi (1985)), it is apparently possible for an in-situ *wh*-phrase in an adjunct to take scope out of the adjunct:

(38) ***Wh*-movement from adjunct clause (English)**

*Who, when the foreigner pays __, will you buy merchandise?

(39) ***Wh*-in-situ within adjunct clauses (Pirahã)⁵³**

a. xaoóí hi kaoí hiabaí-so gixai⁵⁴ xoá- boí- hái
 foreigner 3 who pay- TEMP 2 buy- come- RELATIVE CERT
 '[When the foreigner pays whom] you will buy (merchandise)?'

b. kaoí hi gí hiabaí-so gíxai xoá-boí- hái
 who 3 2 pay- TEMP 2 buy-come- RELATIVE CERT
 '[When who pays you] you will buy (merchandise)?'

[HAL 243, (167b-c)]

⁴⁹ Our sources segment *-hiaí* in *poogaihiaí* as a distinct word with the gloss 'is', but HAL (104, 105, 114) and other glosses in our source suggest that it forms part of the word for 'banana', which is what we have indicated here.

⁵⁰ We reproduce the gloss of *ao-* as 'Steve', though we suspect that it is actually the pronoun *xao* (*ao*) used for Brazilians (sometimes glossed 'foreigner' or just 'man' in our sources).

⁵¹ It is unclear what our source intended as the gloss of *ao-* here. We assume it is the same morpheme as that discussed in the preceding footnote.

⁵² "Hearsay", called "restative" in the on-line texts at

<http://web.archive.org/web/20001212005600/amazonling.linguist.pitt.edu>. Except for the separation of *-sai* in the third word, we retain the morpheme divisions of our sources. Comparison with morphemes discussed in HAL suggests other possibilities for morpheme division, which are probably irrelevant to our point. See Everett (HAL 298) for discussion of the "hearsay" suffix.

⁵³ The examples are described by Everett as "accepted by my informant although they would be very rare in actual speech".

⁵⁴ A high tone on the *i* of *gixai* is found in (39b), but not in (39a) in HAL. We have left the discrepancy intact.

This is of course a phenomenon well-attested in languages like Chinese that lack overt *wh*-movement (Huang (1981, 1982)).

In keeping with his general claim that Pirahã lacks clausal embedding, Everett (CA 630) asserts that the language actually has no embedded *when*-clauses in the first place. In support of this claim, he offers only one argument: that in examples like (40) below (and presumably (39a-b) as well) "[t]here is almost always a detectable pause between the temporal clause and the 'main clause.'"

- (40) kohoai -kabáob -áo⁵⁵ ti gí 'ahoai -soog -abagái
 eat -finish -temporal I you speak -desiderative -frustrated initiation
 "When [I] finish eating, I want to speak to you."
 (lit. "When eating finishes, I speak-almost want.") [CA 630, (31)]

From this, Everett concludes:

"Such clauses may look embedded from the English translation, but I see no evidence for such an analysis. Perhaps a better translation [of (40)] would be 'I finish eating, I speak to you.'"

Everett's "better translation" for (40), however, has two startling properties. First, it ignores the import of the suffix *-áo* glossed in CA as "temporal". Second, it ignores the desiderative suffix *-soog* on 'speak'. The latter is an omission of particular significance. If Everett's initial translation offered in (40) is correct, rather than the "better" one, the *when*-clause almost certainly modifies the time of *speaking*, not the time of *wanting*. As a consequence, the *when*-clause is also in the semantic scope of 'want', much as in (17), discussed earlier. This makes it entirely unlikely that we are dealing with independent sentences. We also find it completely plausible that an embedded temporal clause might be followed by a detectable pause, marking a prosodic boundary also apparent in exactly the same place in such languages as English, and represented orthographically with a comma.

Needless to say, it is also hard to see how any similar "better translation" could be offered for the *wh*-constructions in (39a-b). To judge from Everett's discussion of these examples in HAL, these structures, though unknown in spontaneous speech, were understood and accepted by Everett's Pirahã consultants. We may presume that they were not understood in the spirit of Everett's (CA) discussion of (40) as "Who does the foreigner pay? You will buy (merchandise)." or "Who paid you? You will buy (merchandise)" — which would be incoherent discourse.

Correlatives: Relative clauses of the type commonly found in English are clauses embedded within other clauses (albeit with nominal phrase boundaries intervening). Thus, they are textbook examples of recursive embedding. In support of the claim that such embedding is altogether absent from Pirahã syntax, however, Everett asserts that "Pirahã has no relative clauses proper." "However", he continues, "it does have a co-relative clause". The remark is curious, of course since co-relatives (which we will call *correlatives*, following much of the literature) involve recursive embedding no less than other relative clauses. A correlative construction consists of a subordinate adjunct clause that contains a relative or interrogative phrase, and a main clause that contains a non-relative, non-interrogative *counterpart* to the relative or interrogative phrase. Examples from Hindi (Bhatt (2003)) and Tibetan (Cable (to appear)) are the following:

⁵⁵ The temporal suffix *-ao* here is a post-consonantal allomorph of *-so* seen in (39a-b) (HAL 263).

(41) **Hindi correlative**

[**jo** CD sale-par hai], Aamir **us** **CD-ko** khari:d-ega:
rel CD sale-on be Aamir **that** **CD-acc** buy-fut.Msg
 'Aamir will buy the CD that is on sale.'
 (Lit. 'Which CD is on sale, Aamir will buy that CD')

(42) **Tibetan correlative**

[Deb gagi khyodrang gis mthong na] nga de nyon gi yin.
 book which you erg see if I that buy non.past aux
 'I will buy whatever book you see.'

The syntax and semantics of correlatives have been the subject of extensive investigation in a number of languages (e.g. Keenan (1985)). It is not in doubt cross-linguistically that a correlative clause belongs to the same sentence as the phrase it semantically modifies. (Note, for example, that the Tibetan correlative ends with the subordinator *na* 'if'.) In fact, correlatives often obey even stronger locality conditions. Bhatt (2003), for example, offers a series of arguments that identify the position in which correlative clauses are attached in the Indo-Aryan languages as a position as close as possible to the phrase that they semantically modify.

Everett in HAL offers an observation (not repeated in CA) that suggests much the same thing for Pirahã. He notes that "Pirahã only relativizes direct objects and subjects" (p. 277). He takes this restriction to support the cross-linguistic relevance of the well-known "accessibility hierarchy" for relativization proposed by Keenan and Comrie (1977). There is no reason to expect such a restriction to hold of distinct sentences that are merely juxtaposed. (We cannot see how one might even describe such the facts in these terms.) As a restriction on syntactic attachment, however, it is unexceptional. Pirahã thus seems to present relative clauses whose syntax is certainly somewhat different from English, but Pirahã relative clauses seem to be very much "relative clauses proper".

Not surprisingly, the *wh*-phrase in a Pirahã correlative, like its counterpart in Pirahã interrogatives, does not undergo overt movement, and remains in situ. In this respect, the Pirahã correlative is just like the Tibetan correlative in (42) above. More generally, though the available data on Pirahã correlatives are limited to a very few examples, we find *no* evidence of significant differences between Pirahã correlatives and their counterparts in other languages. The examples offered in HAL, for example, look quite unexceptional from a cross-linguistic standpoint. A literal rendition of (43a) might be "What lead-shot X sent, [that] lead-shot ran out".

(43) **Pirahã correlative (HAL 275-6)**

a. [xoogíái hi **go- ó** **hoasígikoi** bíib- i **híx**]
 Xoogíái 3 **WH-OBL lead shot** send-PROX **COMPLMTZR/INTER**

hoasígikoi koab- áo- b- i- i
lead shot run out-TELIC-PERF-PROX-COMPLETE CERT
 'The lead shot which Xoogíái sent ran out.' [HAL 276 (282)]

b. ti **baósaápi**si og- abagaí gíxai [go- ó baósaápi
1 **hammock** want-FRUST.INIT 2 **WH-OBL hammock**

big- áo- b- í- i xai **sigíai**]
show-TELIC-PERF-PROX-COMPLETE CERT be(?) **same**

'I want the same hammock which you just showed me.'

[more lit. What/That very hammock you just showed me, I want the hammock.] [HAL (281)]

Everett's (CA) discussion of correlatives focuses on (44).⁵⁶

(44) ti baósa -ápi sí 'ogabagaí. Chico hi goó bag -áoba
I cloth -arm want. name he what sell -completive [CA 630 (33)]

This example is quite similar to (43b), except for the absence of *sigíai* (and *híx*), which HAL indicates is optional. Everett analyses the example as follows:

"The two sentences are connected contextually, but this is not embedding. Each is an independent, well-formed sentence. The second sentence, on its own, would be a question, "What did Chico sell?" In this context, however, it is the co-relative."

Had this example appeared in HAL, it would presumably have been translated as 'I want the hammock which Chico sold me', but it appears that Everett now believes that a better gloss might be: *I want the hammock. What did Chico sell?* We cannot begin to imagine by what semantic or pragmatic twist the latter meaning could be used to express the same thing as the former, yet by calling the construction a correlative, Everett clearly suggests that it does. Likewise, we find it hard to understand how (43a), which expresses the thought 'The lead shot which Xoogíai sent ran out' might actually require translation as "*What lead shot did Xoogíai send? The lead shot ran out.*" This seems to us an absurd conclusion, especially compared to the simple alternative: Pirahã correlatives involve clausal embedding, just like correlatives in other languages.⁵⁷

⁵⁶ We reproduce Everett's etymological rendition of 'hammock' (cf. (31e) and (43b) as 'cloth-arm'.

⁵⁷ The fact that the string starting with *Chico* in (44) or the first part of (43a) could be alternatively used as an independent question does not make it an independent question in these examples — any more than a similar fact about *who left the room* in the English sentence *The man who left the room was sleepy* allows us to conclude that English lacks true relative clauses as well. Cross-linguistically, relative clauses and questions often share structural features, and this simply seems to be the case in Pirahã as well.

The fact that the verb of the correlative bears tense and aspect morphology also does not argue for independent status. If the correlative is attached high enough in the clause to escape c-command by the matrix tense, the condition we have stated in (21) will predict the possibility of finiteness in the correlative.

Finally, though it is true that the element *híx* in (43a) is also a clause-final marker in interrogative sentences, this does not appear to be true of the alternative relative marker *sigíai* seen in (43b) and other examples in HAL. We have found no examples of main clauses that terminate in *sigíai*, making an analysis in terms of parataxis particularly implausible. Indeed, the only examples of *sigíai* that we have found involve relative clauses. HAL states that it appears to be used interchangeably with *híx* in this context (making us wonder why it is even glossed as 'same' rather than simply as a complementizer). Everett notes further (HAL 276) that *sigíai* is only found at the right edge of *finite* (relative) clauses — and also that it is not found in "non-finite" clauses (the kind of clause that Everett now wishes to analyze as instances of "paratactic conjoining of a noun phrase" (CA 629)). A clause with *sigíai* thus looks nothing like a candidate for noun phrase status and nothing like an independent utterance. The distribution of *sigíai* is thus fully consistent with the view that it is a complementizer dedicated to embedded clauses of a certain semantic type. If this view is correct (and no evidence has been offered against it), *sigíai* looks like the kind of lexical tool that languages routinely use to mark recursive embedding.

Interim Conclusions

Though we leave open, as always, the possibility that further research on Pirahã might reveal that apparent embedded clauses in Pirahã truly have a different analysis (e.g. as paratactic conjoining), we believe that the evidence available at present argues firmly against this position. We remain unclear exactly how IEP predicts the general absence of such structures, but to the extent that there could be a link between IEP and lack of embedding, our arguments militate against IEP as well.

3. The quantifier "gap" in Pirahã

Numerals and other Quantifiers

The property of Pirahã that has probably attracted the greatest attention and interest is its alleged "absence of numbers or any kind or a concept of counting and of any terms for quantification". Most of the public discussion of this issue has concerned the numeral system and what connections there may be between the ability to reason quantitatively and the presence or absence of numeric vocabulary in a language (a debate spurred for the most part by Gordon (2004)). The evidence from HAL and DISS suggests that Pirahã is at least significantly deficient in number words, HAL and DISS offering only words for 'one' and 'two', which CA claims actually mean "small size or amount" and "somewhat larger size or amount". Because of our lack of expertise in this area, and because of extensive discussion already underway in the literature, we will put aside the question of Pirahã numerals — except to note Levinson's (2005) remark (in his commentary on CA) that "[i]t is far from clear that Pirahã is the only language without a counting system (cf. Aboriginal languages of Australia [Dixon (2002, 67)])".

Levinson's observation makes it clear that it will be important (just as it was in our discussion of embedding), to determine whether there are meaningful correlations between independent aspects of culture and the absence of numeric vocabulary, e.g. whether the speakers of Australian languages without numerals share other properties with the Pirahã not shared with neighboring communities that have numerals. Be that as it may, we cannot see how the absence of numerals is *predicted* by IEP (and Everett does not explain the claimed connection), though of course if recursion is absent from the language, this gap might have consequences for the development of a numeral system as well (a speculation discussed, for example, by Hauser, Chomsky and Fitch (2002), discussed above).⁵⁸

⁵⁸ Everett in CA also notes that Pirahã lacks the grammatical category of number, describing this property as "very rare", and suggesting that "[t]here may be no other language that lacks the grammatical category of number" (CA 623)." In this connection, Everett cites Corbett (2000, 50)), who does indeed cite Pirahã as the sole example of a language without number. He also discusses at length, however, a class of languages that show the phenomenon of *general number*. These are "languages in which the meaning of the noun can be expressed without reference to number" (p. 10), in which a sentence glossed as 'I saw dog' (with 'dog' showing general number) is true if the speaker saw one or more dogs. As he notes, "there are many languages of this type from various linguistic families". Languages with general number also have one or more forms that disambiguate in favor of a particular number: singular, plural or both. It is this property that distinguishes such languages from Pirahã as described by Everett. We suspect, however, that this description might be faulty. Pirahã might actually fall into the category of languages with "general number". If so, Pirahã is once again not special, but looks like a wide range of other languages.

Corbett discusses Japanese as a language with the opposition: general number vs. plural. As he notes, for example, the form *inu* 'dog' does not "specify number", and may be used to refer to a single dog or a group of dogs. He also notes that there is a form *inu-tati*, which Corbett glosses as 'dogs' and calls a "plural form". In fact, however, recent work on Japanese *-tati* (e.g. Kawasaki (1989); Nakanishi and Tomioka (2004)) shows that its semantics are more complex. *X-tati* actually means something like "group represented by X". Thus, it may be suffixed to a proper name, e.g. *Taro-tati*, with a meaning something like "group headed by Taro", and when suffixed to a description like *inu* 'dog' may denote a group containing

Similarly, we see no link between IEP and the alleged absence of quantifiers in Pirahã. This is perhaps fortunate, since we also see no evidence that quantifiers are actually missing.

Everett asserts (CA 624) that "there are no quantifier terms like 'all,' 'each,' 'every,' 'most,' and 'few' in Pirahã." This is a surprising claim, since his earlier work contains extensive discussion of the quantifiers in Pirahã, including the following, drawn from a vocabulary list of *quantidades* (quantities) that includes quantifier-words:

(45)	Pirahã quantificational vocabulary		[DISS 352, translation ours]
	xogió	'all'	xaibóai 'half'
	xaibái / báagiso	'many' (count nouns)	hói 'one'
	xapagí	'much' (non-count nouns)	hoi 'two'
	xoihi	'a little'	xi ába 'nothing'

As Wierzbicka notes in her commentary that we cited in section 1, Everett (CA) supports the claim that words such as *xogió* (= *'ogió*) 'all' are non-quantificational principally by noting that they have other uses in the language. This claim is reinforced by interlinear glosses in CA that, unlike the glosses in HAL and DISS, resolutely reflect the non-quantificational uses of quantificational morphemes, and "literal" translations that, by following the same policy, yield gibberish.

Thus, for example, as part of a demonstration that Pirahã lacks a word for 'most', example (46) is offered as "the closest expression[] Pirahã can muster" to 'We ate most of the fish':

(46)	Pirahã 'most'						
	ti 'ogi -'áaga	-ó	'ítii'isi	'ogi-ó	'i	kohoi-baái,	
	I big -be (permanence)	-direction	fish	big-direction	she	eat -intensive	
	koga	hói	hi	hi	-i	kohoi -hiaba	
	nevertheless	small amount	intensive	intensive	-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.') "						
							[CA 624, (11)]

The expression *ti 'ogi-áaga-ó*, despite its incomprehensible literal translation and gloss, is in fact composed of the first-person pronoun, as noted, and the expression *'ogiáagaó*. This expression in turn is used in the succeeding example in CA, which is described as "the closest I have ever been able to get to a sentence that would substitute for a quantifier like 'each,' as in "Each man went to the field". This

non-dogs, so long as dogs somehow represent the group. Similar phenomena have been discussed in Chinese (Nakanishi and Tomioka (2004)) and Afrikaans (Den Besten (1996)).

Pirahã appears to have a form that may have properties in common with Japanese *-tati*: the postnominal element *xaitiso*, sometimes glossed as 'also'. According to Everett (HAL 281), Pirahã N+*xaitiso* is one way of expressing the "notion of plurality" in Pirahã. Unlike Japanese N+*tati*, the noun in the Pirahã construction does not pick out the representative of a group, but rather the *other* members of the group, i.e. the participants in a group who participate in a situation 'in conjunction with the primary participant'. As Everett notes, *xaitiso* has other uses (including a more straightforward 'also'), so there is clearly more to discover about *xaitiso*. Nonetheless, the existence of *xaitiso* suggests that Pirahã is not unique in lacking number in the sense discussed by Corbett, but falls together with languages like Japanese that have both general number and other devices for expressing plurality. See the subsection on pronouns (below) for more discussion of *xaitiso*, in particular, the analysis by Sheldon (1988, 16 n. 1) of pronoun + *xaitiso* sequences as instances of plural pronominals.

time *'ogíáagaó* is not broken into distinct morphemes (though this fact receives no comment) and is glossed as 'bigness' rather than 'big-be (permanence)-direction'.

By contrast, in the on-line dictionary of Pirahã (Everett (1998c)), the phrase in (46) is translated straightforwardly as 'all of us, todos nós',⁵⁹ and in HAL, Everett describes *'ogíáagaó* as follows:

"There is only one collective form in my data, *xogíáagaó* 'everyone'. This is probably another case of a complex morpheme which has come to function as a crystallized form. I have not yet attempted an analysis of its component morphemes." (HAL 282)

Now it is certainly possible that *'ogíáagaó* is etymologically a combination of *'ogi*, glossed as 'big' in HAL, and a copular verb used to denote permanent states (plus the oblique marker *-ó*, inexplicably glossed in CA as 'direction'). We can even imagine that the expression historically derives from a relative clause whose meaning might be explicated with the stative relative clause 'which is in all circumstances big'. Added to a noun phrase which denotes a set of entities that satisfy some particular condition (e.g. being human), such a relative clause returns the maximal set of such entities. This does not mean, however, that the expression is computed in this way by living speakers, any more than the origin of English *every* as a compound of *ever* + *each* or the literal meanings of *lot* in *a lot of* requires us to imagine that English speakers compute their meanings from their etymological component parts. Everett (CA) provides no actual reason to think that *'ogíáagaó* is anything other than a universal quantifier in the contemporary language, as he suggested in his own earlier work. Furthermore, even if speakers are sensitive to the components of *'ogíáagaó*, Everett provides no argument against the hypothesis that it is simply an idiom whose meaning is the universal quantifier.⁶⁰

Likewise, there is no particular reason to believe that the oblique case-marked *'ogi-ó* in (46), glossed as 'big-direction' (and translated as 'at a bigness of'), should be understood in any manner more complicated than shown in HAL (290, (334)) and elsewhere — as a universal quantifier:

(47) *xogió* *xap-áo-b-í-hi*
 all break-TELIC-PERF-PROX-COMPLETE CERT
 'Everything/it all broke.'

The gloss 'eat-intensive' for the verb given as bimorphemic *kohoi-baái* is most likely misleading as well. To judge from HAL, the actual morpheme 'eat' is *koho-* and *ái-* is an atelic suffix. Recall now that (46) is presented as "the closest expression[] Pirahã can muster" to 'We ate most of the fish'. We can now suggest that the actual "literal" translation of (46) is most likely not the exotic:

'My bigness ate [at] a bigness of fish, nevertheless there was a smallness we did not eat.'

— but the more straightforward:

"We were in the process of eating all the fish, but we didn't eat a (very very) small amount".

Recall now Everett's main point, which was the absence in Pirahã of quantifiers found in languages like English. It might very well be true that Pirahã lacks a simple expression that corresponds to English *most*, but this does not entail that it lacks quantifiers in general. In fact, the

⁵⁹ <http://web.archive.org/web/20001109203800/amazonling.linguist.pitt.edu/dictionary.html>

⁶⁰ Compare also English *whole* as in *the whole afternoon*, which is a universal quantifier for mass terms. Would we expect a fieldworker to insist on glossing this as *without being divided* based on its use in expressions like *swallowed it whole*?

absence of a lexical item whose sole meaning is 'most' is not unique to languages spoken in cultures allegedly restricted to "immediate experience". Russian, for example, also lacks a quantifier 'most' and it too "resorts" to an expression that one might etymologically gloss as 'bigness': *bol'sinstvo* (from *bol's-* 'big') — though its more normal translation is 'majority'. Likewise, the Portuguese counterpart of *most* is *a/uma maioria*, which derives from *maior* 'bigger'. English has similar deficiencies. Though English does have a word *most*, it lacks a word for the complement set of *most*, and resorts to circumlocution (*a minority of, less than half of, etc.*). Since the cultures in which Russian, Portuguese and English are spoken have counting, rich arrays of color terms, and fairly complex kinship systems, we once again see a dissociation among the properties that Everett claims are linked.

Everett's sole non-etymological argument for the absence of quantificational vocabulary in Pirahã comes from the allegedly non-quantificational truth conditions for the word *báaiso*. Though the word is glossed as 'whole' in three examples in CA (examples (15)-(17)), it is broken (without comment) into four component morphemes in the gloss to (14), where it is rendered as 'touch-causative-connective-nominalizer'.⁶¹ Be this as it may, Everett goes on to claim that in fact "there is no truly quantificational-abstract usage of *báaiso* 'whole'", because, more generally its "truth conditions are not equivalent to those of real quantifiers". He offers two arguments.

Argument 1: Everett (CA 625) cites a discourse in which "someone takes a piece" of an anaconda skin, and the following dialog ensues (translations by Everett, except for the italicized word, which he glosses as "whole", with scare-quotes):

"The foreigner will likely buy *báaiso* anaconda skin."
"Yes, he bought *báaiso*."

Everett asserts that "it would simply be dishonest and a violation of the meaning of 'whole' to say, 'He bought the whole anaconda skin,'" when a piece had been removed. Consequently, he concludes that *báaiso* cannot actually mean 'whole' in Pirahã. Though we have no particular commitment to the translation of *báaiso* as 'whole', we see no merit in the argument that it means anything else. What the foreigner will buy is the entirety of the skin that remains (the entire portion available for sale). There is nothing dishonest or linguistically deviant in using the word 'whole' to refer to the entirety of a remnant.

Just the opposite, in fact. Among the most intensively studied properties of quantification in human language is the phenomenon of *domain restriction*. There is considerable controversy in both linguistic and philosophical literature on semantics about the nature and sources of the phenomenon (see, for example, von Stechow (1994) and the papers cited by Stanley and Szabó (2000)). There is agreement, however, on the ubiquity of the phenomenon. Stanley and Szabó characterize the problem as follows:

"What is the problem of quantifier domain restriction? Consider the sentence:

[(48)] Every bottle is empty.

"Suppose someone utters [(48)] in a conversation. It is unlikely that what she intends to convey is that every bottle in the universe is empty; she most likely intends to convey that every one of a restricted class of bottles (say, the bottles in the room where she is, the bottles purchased recently, etc.) is empty. And, if the context is right, she can succeed in communicating such a proposition.

⁶¹ There is no support in DISS for *bá* = 'touch', which gives instead *xab-*.

Permanent linguistic features of [(48)]—its phonological and morphological constituents, its syntactic structure, the meanings of the lexical items it contains— do not determine the proposition thereby communicated. They cannot do so, for these features are the same on every occasion when the sentence is used, but on most of those occasions the speaker would communicate a different proposition by the sentence. The problem of quantifier domain restriction is a special case of the problem of context dependence, because, to solve it, we need to explain how context, together with permanent linguistic features of quantified sentences, helps determine the proposition conveyed by an utterance of such a sentence, a proposition in which the domains of the quantifier expressions are suitably restricted."

As Lewis (1986, 164), cited by von Stechow (1994, 28) notes:

"Remember that part of the ordinary meaning of any idiom of quantification consists of susceptibility to restrictions; and that restrictions come and go with the pragmatic wind ."

As far as we can tell, the Pirahã anaconda anecdote probably reveals nothing more surprising than the fact that Lewis's pragmatic wind blows across the Maici River in Brazil just as it blows everywhere else that human speakers use language. If anything, the anaconda story provides a clear argument that *báaiso* is (unsurprisingly) a quantifier, and that once again, Pirahã is for the most part a language just like any other.⁶²

Argument 2: With reference to an example (CA 625, (17) containing the sequence '*isi báaiso*, glossed as 'animal "whole"', Everett notes that "[s]entences like this one cannot be uttered acceptably in the absence of a particular pair of animals or instructions about a specific animal to a specific hunter. In other words, when such sentences are used, they are describing specific experiences, not generalizing across experiences". We also find this argument without force. If the facts are correctly reported, it may mean nothing more than that *báaiso* should be translated as "all of *the*" or "the entirety of *the*", i.e. as inherently partitive.⁶³

4. Color terms, pronoun inventory, relative tenses

As we indicated in section 1, we will not deal in depth with the remaining three grammatical properties alleged to represent significant "gaps" in the grammar of Pirahã, but will confine ourselves mainly to short remarks and pointers to previous critiques (for the sake of completeness).

Colors

Pirahã speakers offer words of their language to describe colors, much like speakers of other languages. The following list is from Everett (HAL 352):

⁶² It could also be the case that *báaiso* simply means 'almost all' (or 'approximately all'). If so, it is still quantificational, but just has a meaning slightly different from that first supposed.

⁶³ In this context, it is worth noting that the form *báaiso* seems not to appear in the earlier literature. These sources do, however, contain *báagiso*, glossed as 'many' in HAL, but also occasionally parsed as *báa giso* 'many DEM' [e.g. HAL 260, ex (225)]. *Giso* is elsewhere glossed as demonstrative 'this' [HAL 308]! It may therefore be the case, if *báaiso* and *báagiso* are the same (as we suspect), that the form is discourse-old or specific in reference simply because it contains a definite demonstrative determiner in addition to a quantifier. Everett (HAL 274), however, compares *báagiso* with another quantifier *xai báai*, and notes that "the former is mostly used with less tangible elements such as *hoa* 'day'". This runs counter to the description in CA of the use of *báaiso*. We leave these murky questions open.

(49) **Color terms**

bíisi	'yellow', 'orange', 'red'
xahoasai	'blue', 'green'
kobiaí	'white', 'bright'
kopaíai	'black'
tixohói	'purple'
tioái	'dark'

A slightly different list from Kay et al. (n.d.), cited by Everett (CA 627) (who does not mention his own earlier list), is criticized for presenting as color terms words that are not monomorphemic. The word for 'red' on both lists, for example, contains a root that on its own means 'blood', while the word for 'blue' and 'green' (often called 'grue') contains a root that means 'immature'. On these grounds, Everett concludes that color terms, in some pure sense of the word, are lacking in Pirahã.

Everett reports and attempts to counter the objection, which was made to him by Paul Kay (personal communication): "that if the Pirahã use these phrases regularly in normal speech to describe exactly these colors and the related color 'space,' then the phrases themselves count as color terms." Everett replies that "this is a different concept of color term from the one I had in mind (namely, morphologically simple terms for colors)[...]"⁶⁴

The issue here is similar to the issue of etymological glosses that we have discussed above, and we suggest a similar resolution of the issue. To these and to Everett's other claims concerning Pirahã color naming, Kay (2005) replies:

"In deciding whether the Pirahã color expressions are proper color terms, the issues are just two: (A) Are the color meanings consensual and applicable to unfamiliar objects that exhibit the color property (as well as familiar objects)? (B) Are the color meanings not predictable from the meanings of the words or morphemes that make up the expressions and the rules of the language?"

Kay argues that the available evidence suggests a positive answer to both questions, though he also notes that it will be useful to repeat earlier studies under more carefully controlled conditions. Given that the Pirahã color naming system, as reported earlier by Sheldon on behalf of the World Color Survey, falls into an otherwise well-known pattern ("a stable stage III_{G/Bu} system"), we once again are led to the now familiar conclusion that Pirahã fits into an already established picture of cross-linguistic variation, and presents few if any features that set it apart from the better studied languages of the world.⁶⁵

⁶⁴ Everett goes on to claim, if we understand him correctly, that a language with true color terms will also be able to use color names as nouns, and to quantify over them. We suspect that this requirement would exclude a large number of languages (for example, Russian) from the list of languages with true color terms in Everett's sense, and cannot see why use as a noun should be a relevant criterion for any point of interest in this discussion.

⁶⁵ Furthermore, as Kay (2005) notes and substantiates in detail: "Experience of color is about as direct as experience gets. [...] Color sensations would appear to qualify as exemplifying "direct, concrete experience" if anything does." Consequently, if IEP is true of the Pirahã and has any obvious consequence for the Pirahã language, it should entail the *presence* of color terms, not their absence.

Pronoun Inventory

Everett (CA 628) lists as another gap that follows from IEP the fact that "Pirahã has the simplest pronoun inventory known". We find no connection between simplicity of pronominal inventories and IEP. If the referent a pronoun's antecedent forms part of a speaker's "immediate experience", surely the pronoun should be usable. Thus the simplicity or complexity of Pirahã's pronoun inventory should be irrelevant to the discussion.

What may be surprising about the Pirahã pronominal inventory is the fact that it is limited to three persons, and supposedly makes no number distinctions. Thus *ti*, *gí* and *hi* are said to be first, second and third-person pronouns, respectively, usable for both singular and plural. If we take this description at face value, Pirahã is a counterexample to Greenberg's (1963, 96) Universal 42: "All languages have pronominal categories involving at least three persons and two numbers", which is further expanded by Ingram (1978, 227) as "There are at least four persons in every language: *I, thou, he, we*". Harley and Ritter (2002, 503) cite two languages, Maxakalí and Kwakiutl, as examples of such a system. Their work provides a general feature system for pronominal inventories, and predicts a simpler system, which happens to be exemplified by Pirahã. Though Pirahã is the only such language that they were able to find, the key point (if they are correct) is that one needs no appeal to IEP to explain the existence of such a language. It is a predicted point in an overall typology.

Once again, however, these claims about Pirahã merit some caution. As Everett (HAL 281 ff.) noted in his own earlier work, Pirahã can indeed express plural anaphora, and has a number of ways of doing this. One of them involves the morpheme *xaitiso* discussed in footnote 58 above, glossed as 'also' in HAL. The glosses and first translation below are from HAL, following our standard policy in this paper. The second translation reflects the surrounding discussion:

- (50) *ti xaitiso xis ohoa- i- hai*
 1 also food search-PROX-RELATIVE CERT
 'I also will search for food.'
 ('We will search for food.') [HAL 281 (303)]

Everett (HAL 281) notes that Stephen Sheldon views such forms as *ti xaitiso* as constituting a single word, and indeed Sheldon (1988, 16 fn. 1) offers the following pronominal paradigm for Pirahã (orthography adapted to HAL's conventions):

- (51) **Pronouns in Pirahã** (*per* (1988, 16 fn. 1))
- | | <i>sing</i> | <i>plur</i> |
|---|-------------|------------------|
| 1 | <i>ti</i> | <i>tixaitiso</i> |
| 2 | <i>gí</i> | <i>gíxaitiso</i> |
| 3 | <i>hi</i> | <i>hixaitiso</i> |

It may be that we are once again faced with a Pirahã that looks exceptional only when we insist on etymologizing our glosses. That is, we might be faced with a Pirahã pronominal system no more unusual than Mandarin:

(52) **Pronouns in Mandarin**

	<i>sing</i>	<i>plur</i>
1	wo	women
2	ni	nimen
3	ta	tamen

If, however, Pirahã should turn out to lack a number distinction in its pronominal system, there is still no argument that we must attribute this property to a principle like IEP. There are other languages look like Pirahã even under this description of the facts. As discussed by Müller, Storto and Coutinho-Silva (2006a, 2006b) and Storto (2007), for example, Karitiana, a Tupi language (Arikém branch) of Rondonia (Brazil), lacks number marking in the nominal system, and displays no singular-plural distinction in the third person:⁶⁶

(53) **Karitiana: no number distinction in nominals or 3rd person pronoun**

ta-'it okoot naka-ja-t i
 3anaf-son bite decl-caus-nfut he/they
 'He made his son(s) bite' or
 'They made their son(s) bite'

The further discussion of Karitiana syntax by Storto (1999;2003) makes it clear, at the same time, that in other respects, Karitiana syntax is quite different from Pirahã. (For example, though embedded clauses are "deranked" in lacking certain morphological distinctions, they show a greater variety of functional elements and syntactic processes than is attested for Pirahã.) As we have seen throughout this paper, the features of Pirahã that Everett attributes to IEP can all be seen instead as particular choices from a repertoire that all languages choose from.

Everett also calls attention to the possibility that the Pirahã pronouns were "borrowed recently" from another language (Thomason and Everett (2001)) as evidence that the language "seems to have gotten by without them". No evidence is presented, however, for the claim that the borrowing was recent (a claim not made in the paper by Thomason and Everett), and no evidence is offered against the proposition that the borrowed pronouns replaced an earlier set of pronouns. Furthermore, as Thomason and Everett (2001) themselves point out, Pirahã is not the only language to borrow pronouns. Thomason and Everett cite the example of Miskito, Alesa (Kinkade (1978)), Iatmul (Foley (1986)), Proto-Chamic, and Chavacano. Indeed, they note that "a search of the literature, especially for Southeast Asia and the Pacific but also in the Americas and elsewhere, turns up a sizable number of examples of borrowed pronouns", and discuss the types of contact situations that might be likely to lead to such borrowing. Once again, there is no particular evidence that Pirahã is unique. Furthermore, it is not clear how IEP is relevant. If "Old Pirahã" obeyed IEP but lacked pronouns, and "New Pirahã" also obeys IEP and has pronouns, we cannot imagine a more straightforward argument that IEP is irrelevant to the issue.

Relative tenses

Everett (CA 631) takes it as a significant consequence of IEP that Pirahã lacks a "perfect tense". No explanation is offered as to why IEP should entail the absence of perfect tense. At the same time, many languages throughout the world (for example, Russian) lack perfect tense. As far as we can tell nothing can be concluded from Everett's observation about the lack of perfect in Pirahã.

⁶⁶ It is possible to disambiguate singular and plural reference in the first and second persons by suffixing the third person pronoun and an anaphoric morpheme to the singular pronouns.

5. Culture

If we are correct, all or almost all the supposed "inexplicable gaps" in Pirahã syntax and lexicon that Everett (CA) attributed to IEP are either not gaps at all or are properties shared by other languages for which explanations have been offered in the literature. In addition, as we saw, it would remain unclear how IEP actually explains or predicts the phenomena in question, even if we were to grant the characterization of these properties as otherwise inexplicable gaps.

We have not so far discussed the "inexplicable gaps" alleged to exist in Pirahã culture and their relation to IEP. In this section, we briefly consider this aspect of Everett's claims. Our main goal is to suggest some reasons for skepticism in this domain as well. Since we are not anthropologists, we will not comment on the Pirahã kinship system (claimed by Everett to be the simplest documented) nor on their material culture (claimed to be one of the simplest documented) — though some of our concluding remarks may bear on these issues.

In the area of myths, however, we can rely on a very detailed presentation offered by Gonçalves (1993; 2001). Gonçalves, an anthropologist, lived with the Pirahã for 18 months over a period of eight years (1986-1993), documenting their cosmology (first in the context of their conventions for naming children, and then more generally).

Recall now that the property of Pirahã culture allegedly responsible for such gaps as the "absence of creation myths and fiction" (or the "absence of myths and fiction" more generally; see footnote 3) is "the restriction of communication to the immediate experience of the interlocutors" — the principle that we have called here IEP. In this light, what are we to make of such Pirahã narratives as the following?

"In the beginning of the world, the first level immediately above that of the Pirahã was situated much lower than it is today. It was situated very close to the level in which they live. The moon, when it rose, appeared very low. One day, at night, a man decided to shoot arrows at the moon. He climbed a high tree and released the arrow. He hit the moon in the middle and its blood began to spurt. With all the blood that ran, the moon perished. The sky above began to fall. The men ran and cut long and thick tree-trunks to support the upper earth that was descending upon them. They succeeded in avoiding the collapse but not the darkness. The world became dark. All of the forest animals came close to where the Pirahã lived. Fearfully, they went to live atop the trees. The water of the rivers began to dry and all of the fish died. The forest animal also went dead with thirst. The Pirahã were able to survive because they obtained water from a *hoi* plant [*Tynnanthus fasciculatus* Miers] and ate the only animal that remained: *paba*, a species of snake that lives in small ponds of mud in the interior of the forest. It is a very small snake. So, they only ate that snake — they didn't have fish or any other animal in the world. *Igagai* [a demiurge] knew how to make fish and other animals. He had made many, but they inhabited the level above where the Pirahã lived. *Igagai* decided therefore to slowly bring the beasts to an intermediate level that was empty. He threw them, because he was afraid of breaking his arm with the heavy beasts. He threw the fish but always missed the river, and the fish fell in the forest and died. In view of this situation he created the *boto* [Amazon river dolphin] and threw it in the river, teaching it at the same time how to create fish. From that time forth, the creation of all fish was the responsibility of the *boto*. The tortoise *Igagai* could actually throw outside the river because it knows how to find water on its own. He continued throwing all the animals onto the earth, such as the tapir, paca, capybara, jaguar, etc. *Igagai* put down a few of each and told

the Pirahã not to prey upon the animals or the fish. It was necessary to wait until there were enough to eat. *Igagai* made another moon, and made a small hole in the earth above, in the direction of the river above, so that enough water could fall into the Pirahãs level and fill the rivers below. *Igagai* made first the river Maici and afterward the river Marmelos. During this time, the Pirahã fought a lot with other Indians in the region. They fought so much that all the men died, only leaving three women in the world. *Igagai* gave a fruit, *tobahai* (*sorvinha*, milk tree) for them to become pregnant and have male sons. The male sons were born, only without a penis, so *Igagai* made a penis of straw. The women that were alone were also without fire to cook their food. They couldn't stand eating it raw anymore. One day they cried until *Igagai* heard them and sent fire". [Gonçalves (1993, 39-41)]⁶⁷

Technically speaking, it is true, this is *not* a myth in which the world comes into existence out of nothingness. It is not a creation myth in that narrow sense. As Gonçalves comments:

"From this narrative, one can observe that the myth is not about the origin of the world proper, but about the recreation of the world. *Igagai* recreated the world, permitted the *ibiisi* to reproduce, and created the animals. There is no reference to the origin of *Igagai* and the other *abaisi* that inhabit the cosmos. They are as a given, created eternally."

Indeed, it appears to be a feature of Pirahã cosmology that the world has always existed, though it is recreated anew each day (hence the title of Gonçalves (2001): *The Unfinished World: Action and Creation in an Amazonian Cosmology* [translation ours]). This is no doubt a feature of importance and intrinsic interest, and it makes a distinction relevant to IEP: it is nowhere claimed that the events described are part of the immediate experience of the narrator.

As stressed by Gonçalves (personal communication), formal and/or ritualized story-telling is not a feature of Pirahã culture in the same way that it is among some other indigenous groups in Brazil. Gonçalves notes, for example, that there are other tribes in Brazil (for example, the Paresi, an Aruak group of Mato Grosso, with whom he has also worked) who offer clear evidence of a rich mythology supported by a story-telling tradition and a special type of "mythological speech". In this respect, the Pirahã are different. With the Pirahã, the researcher learns about the knowledge of various narratives most typically in a context in which they are asked questions about particular facts or beliefs. When asked about the structure of the cosmos, for example, the Pirahã describe the series of "levels" alluded to in the mythical narrative cited above. These have the following properties, as summarized by Gonçalves:

"We said above that the other levels are like replicas of the reference level [the level of the Pirahã], where fauna, flora, and natural elements exist. However, in the other levels, the animals are not exactly equal to those existing in the level of the Pirahã. In the others, the animals present a mixed-up form: the paca is big and looks like a *caititu* (wild pig), the *caititu* has a short head and looks like a jaguar, the jaguar has an elongated head and looks like a *queixada* (peccary), the pacu fish has an elongated body and looks like the tucunaré fish, the tucunaré fish has a small mouth like the jatuarana fish. From these examples it seems that we have an inadequacy between the body and the name in the other levels. This is what we call imperfection. The *abaisi* and the animals that live in the other levels, are imperfect. The *abaisi* are actually incomplete and deformed bodies. To be an *abaisi* involves a physical defect as a characteristic feature of one's identity. In the case of the animals, the same thing happens. Only

⁶⁷ We have translated from Portuguese all quotations from Gonçalves (1993; 2001).

in the Pirahã level are they complete, unmixed, perfect. The *ibiisi*, with perfect bodies, inhabit the intermediate level and are the Pirahã proper." [Gonçalves (1993) 39-41]

"An *abaisi*, formed of an *ibiisi* deformed by an accident, maintains with the *ibiisi* that yielded him a relationship of simultaneity throughout the whole life of this *ibiisi*. While this *ibiisi* is alive, any alteration of his body provokes a simultaneous alternation in the body of the *abaisi*, whether a new deformation, or a simple haircut. An *abaisi* linked to a particular *ibiisi* will have the same characteristics as him. It is as though there is a replica of the body – although deformed – connecting an *ibiisi* to the *abaisi* that he yielded.

"The *abaisi* is like a type of immortal prolongation of the *ibiisi*. We could say that the *abaisi* is the double of its *ibiisi*. It is worth remembering that not all *ibiisi* have a double but that all *abaisi* are the result of duplication of an *ibiisi*. The Pirahãs' theory does not require the coexistence of the double and its body in synchrony. One datum that explains the idea that the *abaisi* are doubles of the *ibiisi* is the fact that they complete a path, initiated much after the death of an *ibiisi* that bore his name, through the place where this *ibiisi* passed during his existence. To traverse a lifetime, retrospectively, is to arrive at the place of one's origin, up to the birth of the *ibiisi*. After having completed this path, the *abaisi* becomes free from that *ibiisi*, and its name can be transmitted to another *ibiisi*. This indicates that the *abaisi* is in fact a double when its origin is linked to a particular *ibiisi*. They may be understood as doubles, by right, when they fabricate the duplication of *ibiis*, at least temporarily, by means of the names of *abaisi* that *ibiisi* bear during their lives. [Gonçalves (1993) 53-54]

An example of the process by which an *abaisi* is created is the following story:

"Tseheepoe emerged by way of the following event: a man, Ka'a'ai, climbed a nut-tree to collect buds that were still green, and one of the branches broke, causing him to fall from a height of more than 10 meters. The plummet caused exposed fractures in the arms and legs, and one of the hands was twisted sideways. The result of the accident was the emergence of the *abaisi* Tseheepoe, named after the nut-tree (*tsehe*), responsible for his creation. The bodily form of this *abaisi* is described on the basis of the same physical defects present in the *ibiisi* after having fallen from the tree. Tseheepoe will live forever in the subterranean level, in the exact direction where one finds the nut-tree that yielded him. When he appears in shamanic sessions, he exhibits his physical alterations: he limps and has one of his hands twisted sideways." [[Gonçalves (2001, 187)]

As Gonçalves (personal communication) has pointed out to us, "What is important to emphasize is the evident existence of a mythological imagination, reflected in all spheres of Pirahã culture (in the description of the cosmos, in the description of beings that inhabit the cosmos, in their dreams, in their shamanism, in their songs, and in some mythical fragments". What the Pirahã lack is a ritualized act of story-telling with the social function of formal myths in other cultures.

Thus, on the one hand (as was the case in our discussion of Pirahã grammar) we do not conclude that all groups are the same. Though there are other Amazonian tribes that lack formal mythological narration in a manner reminiscent of the Pirahã, there are also many groups that are quite different.⁶⁸ On the other hand, the Pirahã's knowledge of the mythological world, as displayed in their

⁶⁸ In addition, Bruna Franchetto (personal communication) points out that many Lowlands groups in Brazil, while possessing myths of the origins of various entities, lack a distinct indigenous myth in which the universe comes into

verbal interactions, is not compatible with the claim of IEP that Pirahã discourse is confined to the "immediate experience" of the narrator.⁶⁹

In this connection, we are also struck by the drawings of the correspondences between *abaisi* and *ibiisi* at the various cosmological levels that ornament Gonçalves (1993)). While it may be true that the Pirahã do not cultivate the arts of drawing or sculpture, it can hardly be said, in light of these drawings, that their culture leaves them incapable of producing "drawing or other art" any more than it has left them bereft of myths, even creation myths (with the twist discussed above). The drawings provided by Gonçalves do not, perhaps, reflect a rich artistic tradition, but much of the distortion seen in these drawings in fact reflects their subject matter: *abaisi* and *ibiisi*.

Everett does not discuss the content of Gonçalves' research, but he does offer a criticism, which we quote in full:

"The longer-term studies of Pirahã cosmology and naming by Gonçalves are the most reliable ever done by an anthropologist, but one simply cannot come to the best conclusions about Pirahã meanings working through the medium of the very poor Portuguese of Pirahã informants. Gonçalves based much of his research on work with two Pirahã informants whose Portuguese was somewhat better than that of most Pirahã because they had been taken away from the village as boys and lived for several years with Brazilians along the Madeira River until they were discovered and restored to their people, but even their Portuguese was insufficient for getting at the meanings of terms as they emerge both from the culture and especially from the very complex morphological structure of Pirahã." (CA 632, note 19)

In a recent presentation at MIT, Everett went further, asserting that "All the stories that he tells in his dissertation I have also heard the Pirahã tell, but most of them are a mixture of Tupi and Christian stories that they've heard from missionaries. [...] But there is some indigenous Pirahã in there when he talks about 'constant creation'. So that book is really mixed."⁷⁰ Everett asserted further in his MIT presentation that Gonçalves' knowledge of Pirahã was so limited that "he based the dissertation largely on single words that he was able to pick out".

In fact, Gonçalves (personal communication; see also Gonçalves (2005)) acknowledges that the Pirahã's mythological views strongly reflect the influence of surrounding peoples. He sees this, however, not as evidence of a restriction placed on the Pirahã by unique features of their culture, but as a sign of their *integration* into a broader Amazonian culture. It is also, of course, not credible that the detailed recounting and discussion of Pirahã myth found in Gonçalves (1993; 2001) could have been the product of "single words that he was able to pick out". In this context, we are particularly struck by

existence ex nihilo, suggesting that the absence of a "genesis myth" per se is a widely-found trait and areal feature, even among Brazilian groups with ritualized storytelling and other myths.

⁶⁹ Everett (CA 633) writes that "there are no indigenous creation myths or fiction any longer, if indeed they ever existed, and there is not a single story about the ancient past told by any Pirahã other than bits and pieces of Tupi and Portuguese stories (not always acknowledged as such). When pressed about creation, for example, Pirahã say simply, 'Everything is the same,' meaning that nothing changes, nothing was created. Their talking about the stories of other cultures can be best understood, it seems to me, as 'mentioning' texts that they have experienced qua texts rather than 'using' them to discuss or explain anything in the world around them or the ancient world." Everett provides no evidence, however, for this claim. Furthermore, how is one to reconcile the idea that recounting someone else's words counts as a report of immediate experience with the claim that clausal embedding (a standard linguistic device for reporting someone else's words) is blocked in Pirahã by IEP?

⁷⁰ <http://tedlab.mit.edu/news//everett-recording-2006.wma>; from 8:22, transcription ours.

Everett's failure to reconcile his claim that the Pirahã lack myths, fiction and artwork with the published evidence to the contrary.

Also in need of further discussion and documentation is Everett's claim that the Pirahã are monolingual. Everett attributes the Pirahã's failure to speak Portuguese or other languages "after more than 200 years of contact with Brazilians and other non-Pirahã" to the supposed fact that "Portuguese [and, we must assume, the languages of the Pirahã's indigenous neighbors - *authors*] is incommensurate with Pirahã in many areas and culturally incompatible, like all Western languages, in that it violates the immediacy-of-experience constraint on grammar and living in so many aspects of its structure and use" (CA 634).

There are numerous reasons to question these claims. First, Gonçalves' report once again paints a picture of the facts quite different from CA:

"Most men understand Portuguese, though not all of them are able to express themselves in the language. Women have little understanding of Portuguese and never use it as a form of expression. The men developed a contact 'language' allowing them to communicate with regional populations, mixing words from Pirahã, Portuguese and the Amazonian *língua geral* (a Tupi-based trade language more commonly known as *nheengatu*)." [Gonçalves (2000), link entitled "Language"]

In addition, Everett's own research and reports contradict his claims of monolingualism and incommensurability. It is notable, first of all, that the examples of Pirahã speech included in HAL and DISS contain numerous clear borrowings from Portuguese (see (10b) above for a striking example). Everett himself (CA 632) notes, in discussing Pirahã myths, that "[i]n the early days, before I spoke Pirahã, I would occasionally try to use Portuguese to elicit the information. Often this or that Pirahã informant would tell me (in Portuguese) that they had stories like this and would even tell me bits and pieces, which I thought were similar to Christian stories or Tupi legends common in that part of Brazil (e.g., the widespread beliefs about river porpoises and dolphins, especially the pink dolphin, emerging from the rivers at night to take on human form and go in search of women to marry, rape, and so on). Indeed, now that I speak Pirahã, I know that even among themselves the Pirahã repeat and embellish these stories."

Likewise, in an on-line appendix to CA, Everett comments: "In my first visit to the Pirahã, they tended to give Tupian (Nheengatu) words as answers to my attempts to elicit vocabulary in their language. I might not have spotted this for a while, since this was my first field experience, except that my wife, Keren Everett, speaks a Tupi language, Sateré, and told me that those words could not be Pirahã unless Pirahã was Tupian."

While it is entirely possible that knowledge of Portuguese or knowledge of Tupi is less than widespread among the Pirahã, the facts discussed above clearly contradict the claim that languages such as Portuguese are inaccessible to the Pirahã because of "incommensurability".⁷¹ There may be personal or cultural reasons⁷² why some Pirahã do not learn other languages (for example, if the men and the

⁷¹ A similar point is made by Levinson (2005) in his commentary on CA.

⁷² There might also be political reasons. Nimuendajú (1948), reporting on "several brief contacts" in 1922, describes a negative, "unresponsive" attitude that "made field research among them difficult", but offers a very plausible reason for their behavior:

women differ as described by Gonçalves), but these are situations familiar from societies all over the world, and offer no evidence relevant to IEP.

6. Conclusions, non-conclusions and prospects

Our discussion of Pirahã grammar in sections 2-4 was informed mostly by HAL and DISS. As we noted at the outset, we found these works both insightful and extraordinarily thorough. Time after time, when we wished to check a grammatical claim presented in Everett's more recent paper (CA), or test a prediction, the earlier work contained exactly the information we sought. Nonetheless, we can well imagine that the earlier work might contain gaps or errors that subsequent efforts would seek to remedy. We can equally imagine that more recent advances in linguistics could offer insights in Pirahã that were unavailable when HAL and DISS were written. Consequently, where CA and the earlier work disagree, it could in principle be the more recent work that is correct.

In at least the most important instances, however, we would expect to find the disagreement acknowledged, and the considerations that motivate the new view made explicit. As we have noted repeatedly, this is not the case. CA asserts, for example, that the embedded clauses amply documented and described in the earlier work are not actually embedded clauses, but offers no account or even acknowledgment of the numerous facts that argue in favor of the old view over the new. Similarly, CA offers as an argument for the new view the absence of long-distance *wh*-movement, but offers no new account of the data that in earlier work motivated the claim that Pirahã has no overt *wh*-movement of any kind. Likewise, as we have seen, CA asserts that Pirahã lacks quantifiers, but offers no coherent evidence against the proposal that the words described as quantifiers in the earlier work were described wrongly. In section 5, we have suggested that the situation is little better with respect to CA's discussion of Pirahã culture.

CA simply *asserts* that Pirahã grammar has properties that, if true, would place it outside the pale of grammar and culture as we know it and would demand a special explanation for Pirahã's seeming uniqueness. The explanation offered is IEP. We have made two general points in response to these assertions.

First, concerning Pirahã grammar, we have argued that the actual properties of Pirahã grammar place it firmly within the range of known syntactic systems. Thus, the ban on prenominal possessor recursion, for example, looked like phenomena attested in German; similarly, the preference for postverbal embedded clauses in an otherwise SOV language looked like a phenomenon widely attested cross-linguistically. We are not denying of course, that Pirahã might have something new to teach us about these phenomena and the others that we discussed. It is also possible that further investigation will suggest that in one domain or another, Pirahã really *is* different.⁷³ We merely suggest that the

"Their indifference and aloofness is probably more apparent than real, and seems to stem from their deep resentment at seeing their old enemies, the *Parintinín*, being favored by the governmental authorities, whereas they, who had never been hostile to the Neo-Brazilians, were treated with much less regard.

"The vocabulary collected among them never exceeded 71 words. The *Pirahã* appeared to be completely indifferent as linguistic informants. In spite of several decades of contact with Neo-Brazilians, their knowledge of Portuguese and of the *Lingua Geral* never exceeded a dozen words."

If multilingualism today truly remains less common among the Pirahã than among other groups in their region, this might be a lasting legacy of the unequal political situation described by Nimuendajú.

⁷³ In which case, it will also be acting just like other languages. Every language that has been studied sufficiently reveals certain properties that have been found rarely or not at all in other languages, in addition to the wealth of properties that are

available evidence provides no support for Pirahã exceptionality. We have not undertaken an investigation of similar depth in the area of culture, but the information available to us suggested similar conclusions there.

Second, even if the alleged facts behind the Pirahã exceptionality claim were true, they do not follow coherently from IEP. Why IEP should bar clausal embedding, for example, but allow a word that means 'contrary to what you expected' remains unexplained. Why IEP should block possessor recursion or color terms likewise remained similarly unexplained, as did a host of similar problems.

Like some commentators on CA, we also have a more general discomfort with the overall presentation of Pirahã language and culture in CA (and related reports), to which we now turn. In an initial footnote to CA, Everett cautions the reader as follows:

"No one should draw the conclusion from this paper that the Pirahã language is in any way "primitive." It has the most complex verbal morphology I am aware of and a strikingly complex prosodic system. The Pirahã are some of the brightest, pleasantest, most fun-loving people that I know. The absence of formal fiction, myths, etc., does not mean that they do not or cannot joke or lie, both of which they particularly enjoy doing at my expense, always good-naturedly. Questioning Pirahã's implications for the design features of human language is not at all equivalent to questioning their intelligence or the richness of their cultural experience and knowledge." [CA 621 n. 1]

These remarks are echoed in the final section of CA:

"This beautiful language and culture, fundamentally different from anything the Western world has produced, have much to teach us about linguistic theory, about culture, about human nature, about living for each day and letting the future take care of itself, about personal fortitude, toughness, love, and many other values too numerous to mention here. And this is but one example of many other endangered languages and cultures in the Amazon and elsewhere with 'riches' of a similar nature that we may never know about because of our own shortsightedness." [CA 634]

Levinson in his commentary, objected to the latter remarks in the context of CA as a whole:

"Having made the Pirahã sound like the mindless bearers of an almost subhumanly simple culture, Everett ends with a paean to 'this beautiful language and culture' with 'so much to teach us.' As one of the few spokespersons for a small, unempowered group, he surely has some obligation to have presented a more balanced picture throughout." (Levinson (2005, 638))

In defense of CA, however, one might reasonably reply to Levinson that his call for a "more balanced picture" presupposes (probably falsely) that we know what a balanced picture of the Pirahã would actually look like. We should entertain at least the possibility that the picture of the Pirahã that emerges from CA actually *is* the balanced picture. We do acknowledge this possibility. Nonetheless, given the inevitable impression left when one describes a people primarily in terms of what they lack, we would expect that this sort of characterization would be offered only as a last resort — and on the basis of the

shared by other languages. English, for example, is an outlier in allowing preposition stranding under passive (e.g. *Bill has already been spoken to*), even among closely related languages like Icelandic that allow preposition-stranding in other kinds of constructions. The range of variation allowed by UG does not seem to preclude areas in which individual languages might make unusual choices.

firmest possible evidence.⁷⁴ We have argued that in the present instance, the evidence is anything but firm. Hence our discomfort.

A similar logic governs our reaction as linguists to the claim that "the consequences are severe" for work that seeks to characterize Universal Grammar by studying the grammars of actual languages. In the "Conclusion" section of CA (p. 634), Everett makes the following assertion:

"For advocates of universal grammar the arguments here present a challenge—defending an autonomous linguistic module that can be affected in many of its core components by the culture in which it “grows.” If the form or absence of things such as recursion, sound structure, word structure, quantification, numerals, number, and so on is tightly constrained by a specific culture, as I have argued, then the case for an autonomous, biologically determined module of language is seriously weakened."

Our study, of course, has suggested a very different conclusion. The aspects of Pirahã discussed in CA not only fail to reveal grammatical properties "tightly constrained by a specific culture", they show just the opposite. Almost all the various grammatical properties discussed by Everett appear to be attested in other languages, and stand in no detectable law-governed relation to culture. In addition, as we conducted this investigation, we also repeatedly encountered respects in which Everett's (CA) description of the facts are were at unacknowledged odds with previous research, both grammatical and cultural, about the Pirahã.⁷⁵

Furthermore, we do not think there even exists a distinct class of researchers who can be called "advocates of universal grammar". To "advocate UG" simply means to advocate the existence of some biological capacity of some sort that supports the acquisition and use of language — surely not a controversial stance. There are, of course, many different views concerning the nature of UG, and advocates of *particular theories of UG* do face many evident challenges. If we are correct, however, Everett's presentation of Pirahã in CA is not among them. The principal challenge for those whose work advocates a particular view of the nature of Universal Grammar is obvious and familiar: to resolve long-standing questions of explanatory adequacy, and to try to resolve related questions that fall "beyond explanatory adequacy" (to use a phrase from Chomsky (2001)). That is, we should ultimately be able to specify the nature of UG and understand why it has this nature — and relate these discoveries explicitly and coherently to relevant facts that we discover about actual languages and the people who

⁷⁴An on-line description of the Pirahã (Everett (1998b)) raises related concerns and similar discomfort:

"As a people the Pirahã are lively, curious, suspicious, and very loud. Other than the full moon ritual there is little that is regular in their life. They find food and eat when they are hungry, the[n] sleep when they are tired. Marriage, like their homes and other belongings, is not meant to be permanent. They live life a day at a time and do not look to the future. Their village is alive twenty-four hours a day with constant chatter and movement. The local traders say they 'talk like chickens and act like monkeys.' They are pleasure seekers fond of bead necklaces, sugar cane, and whiskey. The Pirahã are not literate and, while they have been offered the opportunity to learn to read and write, they have no interest. But they are curious and like playing with crayons and pencils and paper."

This text is followed by a number of drawings done by Pirahã, including one described as "a sample of an attempt at writing numbers". As far as we can tell, however, the drawing is not an *attempt* at writing numbers but is, in fact, an *instance* of writing numbers. The numbers are entirely legible and are correctly formed. In a similar vein, a photograph of two Pirahã adults apparently deeply engaged in *writing or drawing on paper* by candlelight bears the caption "Xikaóshápoai and Xioitáhoagi *playing with pen and paper*" [italics ours].

⁷⁵ In replying to criticism by Levinson, Everett (CA 644) explicitly asserts that "all these claims have been independently established in publications listed in the paper" (i.e. in CA).

speak them. It may turn out that Pirahã is indeed important to such investigations. We might learn, for example, that Pirahã *wh*-in-situ constructions are *not* just like those in intensively studied languages, but present puzzles that might require revisions in our common understanding of these constructions. Likewise, we might learn through further investigation that current explanations for the lack of prenominal possessor recursion in German will not extend to Pirahã, which might make us rethink the analysis of the German examples or rethink the claim that Pirahã shows the same phenomenon. Work on these or any of the many issues discussed in our paper might be crucial to an entire host of questions — and who knows where such investigations might ultimately lead?

It is light of these real challenges that we consider it particularly unfortunate that so much attention has been diverted instead to the non-challenge launched by Everett (CA). If there is a bright side to the Pirahã affair, it consists in the possibility that linguists might now be particularly motivated to look more carefully at Pirahã grammar — with the outstanding work summarized in HAL and DISS already providing a first step in these efforts. The result is almost guaranteed to be of interest, since we have never yet seen a language that did not have something important to teach us.

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