

An Amazonian Adventure: Syntax in Linguistics and Literature

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Although structuralism has lost much of its influence in the field of language studies, minimal pairs still play an essential role in linguistic analysis. Whether one subscribes to generative, functional, or connectionist linguistics, being able to provide minimal pairs to support claims makes one feel more confident. This essay will deal with a less usual minimal pair: a book-size minimal pair consisting of the two books in (1) below.

- (1) a. Dan Everett: *Don't Sleep, There are Snakes*
 b. Ian Watson: *The Embedding*

Why do the books form a minimal pair? Because they share the following elements:

Main character: a linguist- anthropologist- mystic

Story: The hero goes to the Amazonian rainforest to do research on a little known tribe and makes an important discovery concerning the ISSUE

Issue: The nature of language (biological or cultural) and its relation to thought

Crucial evidence: Recursion (embedded clauses)

What distinguishes the two books is the genre; one is a novel, the other a linguistic monograph. A naïve reader asked to match the title with the

genre might assign (1a) to the literary domain and (1b) to the linguistic one. That would be the wrong decision.

The aim of this article is to offer some reflections on the nature of linguistic and literary thought through the analysis of the minimal pair.

1. The Issue

The two books address the same topic: the nature vs. nurture issue in the domain of language. Is language biologically determined, or is it a cultural artifact? Is it an organ or a tool? Both Everett and Watson choose to consider this question in the context of the relation between language and thought. Serendipitously, both authors base their conclusion on the same syntactic phenomenon: recursion.

Answers to the nature-nurture question with regard to language are situated in the space delimited by two opposing hypotheses. On the one hand, Chomsky's theory of universal grammar claims that, beyond the apparent diversity, all human languages are essentially the same. All can be generated on the basis of the same biologically determined principles, referred to as Universal Grammar (UG). At the core of UG lies "*a primitive operation that takes objects already constructed, and constructs from them a new object.*" (Chomsky in Piatteli-Palmarini, 2009) This process, called MERGE, is not only at the core of language. It is what makes human thought possible. "*Emergence of unbounded Merge in human evolutionary history provides what has been called a language of thought, an internal generative system that constructs thoughts of arbitrary richness and complexity, exploiting conceptual resources that are already available or may develop with the availability of structured expressions.*" The appearance of Merge is assumed to be due to a "*small mutation*"

occurring in an individual. *“The individual so endowed would have had many advantages; capacities for complex thought, planning, interpretation, and so on. The capacity would be transmitted to offspring, coming to dominate a small breeding group”* (id).

The opposing view is represented by the Whorf-Sapir Hypothesis. According to this view, language is an instrument for communication shaped by social needs and habits. No a priori limit can be placed on the diversity of human languages. Although they are tools for communications, languages play an important role in shaping human thought. *“Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection.”* (Sapir, 1929: 209)

Where do Everett and Watson stand in this debate? Everett is Whorfian with respect to the relation between language and society. For him, language is a cultural artifact. Since language is shaped by cultural-communicative needs, there is, in principle, room for unlimited diversity. This position is supported with evidence from Pirahã, the language of the Amazonian tribe Everett has been studying for more than 30 years.

Pirahã is exceptional for its simplicity in some areas: the language has no numbers or quantifiers, no color terms, it has one of the sketchiest kinship terms systems, and it lacks pronouns. But what makes it really stand apart from other languages is its syntactic poverty. According to Everett, Pirahã lacks sentence embedding and poses very strict limita-

tions on other syntactic operations such as modification and coordination. Since embedding, Chomsky's Merge, has come to be seen as THE distinguishing property of human language, it is not surprising that Everett's claims have sparked a controversy that is still going on (Nevins et al 2009a, 2009b, Everett 2009) and which has brought linguistic matters into the eye of the media (see the articles in *The Chronicle of Higher Education*, *New York Times*, *Nature*, *Prospect Magazine*, *Chicago Tribune*, among others.)

When it comes to the question of the relation between language and thought, however, Everett distances himself from Whorfian determinism. Language does not have the power to affect our perceptions and judgment. Linguistic poverty does not signal cognitive poverty. The fact that Pirahã does not have complex syntactic structures does in no way make the Pirahãs less capable of complex thought. Everett seems to accept Merge as a cognitive process; he illustrates Pirahã cognitive complexity with intricate narrative structures, but denies its relevance for language.

Watson, on the other hand, is thoroughly Chomskyan in his answer to the nature-nurture question: language is genetically determined. There are strict limits on what can be a human language, and the limits are set by the structure of the human brain. Violating the rules of universal grammar can have palpable and frightening effect on human cognition. His book *The Embedding* explores the consequences of attempting to transcend the limitations set by our nature.

2. Truth and verisimilitude

Like many important concepts, the distinction between scientific truth

and artistic truth can be traced back to Aristotle. In his *Poetics*, Aristotle stated that art does not need to be true in the factual sense, but believable. Verisimilitude is achieved when the work of art captures the general in the particular, and, in this way, reaches a deeper truth. The minimal pair under consideration in this article offers an ideal context for comparing the two types of truth.

2.1. Facts and figures (of speech)

A linguistic hypothesis requires evidence: linguistic data carefully supporting each claim in the chain of reasoning. The treatment of the linguistic evidence places Everett's book into the popular book category rather than into the academic one. He offers data to illustrate claims, grammatical and ungrammatical examples, but the morpheme-by-morpheme glosses, which would give the reader the possibility to verify the claims, are missing and the literal translations provided are sometimes more exotic than they need to.

Generally, linguistic reasoning moves only with small steps, from one piece of evidence to the next one, without grand leaps and amazing revelations. Everett takes a bolder approach. He proposes to account for his amazing linguistic data by taking a great leap and offering an amazing theory: the Immediacy of Experience Principle (IEP). "*Declarative Pirahã utterances contain only assertions related directly to the moment of speech, either experienced by the speaker or witnessed by someone alive during the lifetime of the speaker.*"

According to Everett, the Pirahã culture restricts verbal and non-verbal activities to here and now. Linguistically, this results in a ban on talking about anything beyond immediate experience. The restriction has visible consequences on Pirahã behavior: the Pirahãs do not store

food, they do not make long term plans and they do not try to acquire new skills such as preserving meat or carving canoes even when they are obviously useful. Everett's contention is that IEP can account not only for such behaviors but also for the unusual properties of Pirahã morphology and syntax. He argues that linguistic categories such as number and color presuppose generalizations that go beyond immediate experience. *"Numbers and counting are by definition abstractions, because they entail classifying objects in general terms. Since abstractions that extend beyond experience could violate the cultural immediacy of experience principle, however, these would be prohibited in the language."*

Syntactic simplicity is another consequence of the IEP... *"they will use the simple present tense, the past tense, and the future tense, since these are all defined relative to the moment of speech, but not so-called perfect tenses and no sentences that fail to make assertions, such as embedded sentences."*

Such conclusions are less than persuasive to the reader familiar with linguistics. I will not dwell any longer on the evaluation of the arguments presented in the book, interested readers can follow the controversy between Everett and his critics in *Language* Vol 85, No 2 and 3. The goal of this article is not to provide criticism for Everett's theory, but to reflect on the rules, limits and style of linguistic inquiry as it compares to the artistic search for the truth.

One of the goals of linguistic analysis is to be objective. A consequence of the objective style is that the linguist, the author, should be as little visible as possible. Ideally, the author of a linguistic article should be absent. Everett deviates from this rule. What makes his book so appealing is the narrative surrounding his linguistic arguments. He offers the reader a taste of the immediacy of experience principle. The

linguistic discoveries are being made under our eyes, as Everett the narrator goes through adventures and misadventures. He captures the most satisfying moments of linguistic and anthropological fieldwork, the moments when some recalcitrant data suddenly make sense, and shares them with us, the readers, thus making us partners. It is hard to reject a theory when you have been part to every step in the, sometimes painful, process leading to it.

The very qualities that make the book readable and persuasive take away from its value as scientific proof. The emotion of the writer that permeates the pages, the fact that linguistic reasoning is narrated as a personal experience, the way in which life leaks into the account, all these make for the power of the book while disqualifying it as academic writing. Can *Don't Sleep, There Are Snakes* be regarded as a work of literature? A comparison with *The Embedding* shows that the similarities are superficial.

2.2. The Embedding in *The Embedding*

Watson's novel makes no claims to factual truth. The linguistic facts discussed are often inaccurate. In spite of this, Watson manages to reach, in 1973, some conclusions regarding Universal Grammar that prefigure Chomsky's present day position, quoted in Section 1. The details may be very wrong, as pointed by linguistically-trained readers, but this does not make his case less convincing.

The structure of *The Embedding* makes for difficult reading, prompting complaints from some readers (see the *Tenser, said the Tensor* blog). Actually, far from being a failure, the intricate plot of the novel is one of its main strengths. Watson offers us the chance to experience first hand the challenges of self-embedding. We find self-embedding at

the macro level of the plot, in the ‘constituent structure’ of the plot lines, as well as in the linearization of the narrative. The novel consists of three narrative threads listed below in order of diminishing plausibility.

Story A: The anthropologist

Anthropologist Pierre Darriand is struggling to decipher the self-embedded ritual language of the Xemahoa, a small, isolated tribe in the Amazonian jungle. The Xemahoa are in danger of being wiped away by the construction of a dam, a fact that does not seem to worry the bruxo, tribe’s shaman. In a trance induced by a mind-altering ritual drug, Pierre has a revelation concerning the Xemahoa language and its power to transform reality. The dam is destroyed, leaving Pierre to wonder whether the shaman brought about the incident or whether it was just a coincidence.

Story B: The linguist

Chris Sole is a linguist investigating the biological limits of language acquisition by conducting a secret experiment on children. This involves the use of a mind-altering drug and of an artificial language that makes heavy use of center-embedding. The experiment is successful beyond expectation: the children’s brains undergo rewiring giving them super-powers. Unfortunately, the subjects become violent and self-destructive. Chris is dragged into the alternative world of one of his children and loses grasp on reality.

Story C: The aliens

A spaceship carrying the alien race called the Sp’thra, the Signal Traders, visits Earth. The Sp’thra are inter-galactic typologists: their goal is to collect data on as many languages as possible, and discover the rules of Universal Grammar—a quest that seems to be prompted by religious

reasons. They believe that, if they could capture the rules of UG, they could transcend the limits of reality through a language that goes beyond those rules and gain access to the world of the mythical beings that once visited their home world. In exchange for language data, the Sp'thra are willing to share their advanced space-travel technology. Unfortunately, there is a twist to the trade: the Signal Traders require living brains separated from the bodies, not documents. The humans agree to the exchange eagerly and offer to throw a brain with a special (self-embedded) language into the bargain in order to get some extra benefits. The deal fails and the humans destroy the alien ship as part of a cover up.

Criticized by some as less compelling in execution (Anoop Sarkar), Story C serves as the semantic core of the novel connecting Stories A and B and giving them significance. It is in the chapters telling the story of the alien ship that we find most clues as to the message of the novel. Significantly, the account of the negotiations led by Sole, where he offers the Xemahoa shaman's brain in exchange for more information, thus bringing all the three story lines together, is situated precisely midway from the beginning and the end of the novel.

The three narrative threads are woven into an intricate pattern. Chris Sole, who happens to take part in the negotiations with the aliens, learns through a letter from his friend Pierre- who happens to be the biological father of his son, about the self-embedded language of the Xemahoa, and suggests the trade, thus setting in motion a chain of events that leads to the destruction of the Amazon dam and, ultimately, to that of the alien ship. During Chris's absence, and possibly because of it, destruction visits the self-embedded world he has created. The children become violent, smashing the Russian dolls from their carefully insulated

world, then break out of their cage before self-destructing.

The complexity is found not only at the level of the relations among the three narratives, but also in the linear structure of the novel. Stories are nested into one another, interrupted and continued at a dizzying pace. We find ourselves challenged and have to struggle to keep the narrative threads in our memory - just like Watson's characters struggle with the demands of the self-embedded language. Whether we lose the thread and give up the quest, or go beyond the visible patterns to achieve a deeper understanding is up to us.

2.3. Imagery

Scientific writing must convince through logical arguments presented with clarity and precision, without superfluous rhetoric. Literature, on the other hand, uses an array of stylistic devices to short-circuit the usual paths and sway our convictions in mysterious ways. In what follows, I will take a brief look at the use of metaphors in *The Embedding*.

Unsurprisingly, the prevalent metaphor is that of embedding: objects, people, places, ideas are presented as nested or enclosed into one another. The Haddon Institute, where Chris Sole performs his forbidden experiment is located in the middle of a large expanse of dead fields that encloses it and separates it from civilization. There, embedded in a perfectly insulated room, the children who speak the self-embedding language play with Russian dolls. On the other side of the world, the Xemahoa village, embedded deep in the Amazon jungle, is threatened by the construction of a dam. “*They embed the Amazon in a sea you can see from the Moon- and drown the human mind in the process,*” writes the anthropologist Pierre Darriand in his letter to Sole. The Xemahoa mythology relies heavily on the embedding metaphor; their creation myth

features the snake in the stone and the snake in the log. The shaman's body is covered with embedding tattoos, "*loops and whorls*". Even everyday activities seem to be organized according to the embedding principle. Little boys play with round marbles in a gourd. "*The women wove fish traps, winding the long strands of leaf fiber in and out according to traditional patterns that Pierre said were derived from the shape of the constellations - stars swam in the sky, a harvest of light trapped in imaginary lines, and so fishes were supposed to swim into the traps, attracted by these mimic lines, entangling their fins in them.*"

The alien race of the Sp'thra come from a planet situated "*towards the galaxy heart*", and roam the universe embedded in their huge spherical spaceship resembling a "*hollowed asteroid*" that is filled with row upon row of crystal cases containing the brains of thousands of species. They fly their "*cylinder-shaped* craft to a rendezvous place in Nevada for negotiations. "*So the aliens had invited the Leapfrog (n. a. human spaceship) crew into a cage of glass - and now this plane was heading for a manmade cage of sand hidden in Nevada.*"

In the second half of the novel, the predominant metaphor becomes the dissolution of the embedding structure. Sole's experiment at the Haddon Institute, goes awry when the children, in a fit triggered by an 'embedding story', smash the Russian dolls before destroying themselves. The incident is captured in a paragraph with center-embedding structure. [₁*I wonder if it might have had anything to do with the story itself - that business of mattress upon mattress upon mattress.* [₂*Then the hard pea* [₃- *the nub of the matter*] - *at the very bottom of the pile.*₂] *It's a sort of mocking comment on the embedded speech, isn't it Sam?*₁]

In the Amazonian jungle, the Xemahoa shaman had been preparing his defense against the threat of the dam. In a hut, isolated from the

village by jungle, a drug-dazed woman bears a child who will be the tribe's savior, the Maka'i. The pregnancy nears its term as the rising waters threaten to engulf the village. For a moment, the isolated Xemahoa village becomes the hub of all things, with guerilla-hunting police, American officials and alien negotiators gravitating around the ritual hut. When the shaman cuts the monstrous drug-conceived baby out of its mother womb, the ritual gesture coincides with the destruction of the dam by the American agents.

News of the bombing of the dam is leaked- another embedding structure destroyed- and the consequence is the annihilation of the alien ship in an attempt at cover-up. The mighty Sp'thra vessel is reduced to a *"split orange, burst egg, hank of venison."* A human crew, lead by the aptly named major Pip, land *"on different parts of this vast rent metal fruit whose segments had sprung apart through the rumpled rind, bursting deep black-shadowed canyons and crevasses down into it."*

The choice of metaphor is not gratuitous. Self-embedding and its dissolution come to represent the human condition and the attempt to transcend it. As Ph'theri, the alien visitor tells Sole *"This universe-here embeds us in it."* This embedding in reality is at the root of the tragedy inherent in our condition as thinking beings. Reason alone is not sufficient: *"Reason, rationality is a concentration camp, where the sets of concepts for surviving in a chaotic universe form vast, though finite, rows of huts, separated into blocks by electric fences, which the searchlights of Attention rove over, picking out one group of huts, now another. ... Thoughts, like prisoners - imprisoned for their own security and safety- scurry and march and labor in a flat two-dimensional zone, forbidden to leap fences, gunned down by laser beams of madness and unreason if they try to."*

The very process of reflection constitutes an attempt to see the world that embeds us from an external vantage point. Is it possible? *“Reality determines how you view things. There’s no such thing as a perfect external observer. Nobody can move outside themselves or conceive of something outside of the scope of the concepts they’re using. We’re all embedded in what you call This-Reality,”* Sole tells the alien.

Watson’s solution is *“faith... or science... or delusion: a queer fusion of the three that Man would maybe need to hypnotize himself with the like of, if he was ever to drive himself to the Stars,”* - a voyage to the stars, that is conceived in symbolic terms as a breaking away from the embedding of our physical and cognitive limitations.

Can enlightenment be reached? Watson’s characters achieve it through different means. Pierre by ingesting the Xemahoa hallucinatory fungus, Sole’s children through evolution by a rewiring of their brains: *“Fresh neural pathways fused open. The brain was blowing fuses - but the fuse wires sprouted across the gaps spontaneously, and rapidly - almost as a function of the fusing itself.”* Sole reaches enlightenment through empathy with Vidya, one of his subjects. *“Vidya’s thoughts spilled out - into Sole’s mind, and into that chaos beyond, ‘whereof we cannot speak’, dragging him after them.”* Only the Sp’thra *“wise calf waiting outside the slaughterhouse,”* perish before completing their quest, a sacrifice on the altar of science.

What would the experience of transgressing the limitations set by our brain feel like? Like an artistic experience, seems to be the answer: *“The world was about to be embedded in his mind in its totality as a direct sensory apprehension, and not as something safely symbolized and distanced by words and abstract thought.”* When describing the altered perceptions of the heroes, Watson’s prose breaks into poetry, with its

gentle allusion to the self-embedded nursery rhyme about the cow, the dog, the cat, the rat and the malt in the house that Jack built. *“He wore the sky close as a hat. He knew the moil and coil of wisþ clouds barely visible in the blue, intimately. His fingers branched the branching of the trees. His own tongue tasted one by one the rows of brick teeth in that closed red mouth of a house that would swallow him, swallow him. And, at the very same time, he knew he was already swallowed, by the pulsing translucent stomach of the outside world.”*

Watson offers his musings on the possible consequences of such an experience. His answer seems to be that a modification of the brain triggered by transcending our biologically limitations would confer on us new powers and would affect our relation to reality. *Suppose the PSF (n. a. memory-boosting drug used by Sole in his experiment) speeded up the manufacture of ‘information molecules’ to such an extent that the mind got over-saturated, would the mind be forced to create fresh symbols to carry on functioning? And would these symbols be formed in the action centers of the brain, if the normal symbol areas were already overloaded? Then these would be ‘action-symbols’ - symbols that sensed it as their duty to manipulate the outside world directly. The way that magicians used to believe they could, through their spells and magic shapes - their ‘reality symbols’.*

It is interesting to compare the passage above with Chomsky’s speculations on the effect of MERGE on our ancestors. We find the same elements: a syntactic process, a mutation and the resulting power to manipulate reality more effectively.

3. Conclusions

To round up this discussion of the two books, I will consider their overall message and the possible lessons for readers. Apart from the claims concerning the effect of culture on language and the implications of the IEP for the Chomskyan approach to language study, Everett's book offers some reflections on the human condition. He describes the Pirahãs, eternally embedded in the present, refusing to learn from the past or prepare for the future, as the happiest race on Earth. When he tells us how he renounced his Christian faith in favor of this simple wisdom, it is like listening to Master Pangloss' injunctions to cultivate our garden and forget about philosophy.

In contrast with this oasis of peace and contentment, Watson's novel is a theater of violence, deception and death. All the three stories building the novel end in disaster: Sole's experiment fails and all the children die gruesome deaths while Sole's fate remains unclear, the Xemahoa perform a cannibalistic ritual that leads to their shaman's death and the ascent of a new leader whose rule will probably mark the end of the tribe's innocence, the Sp'thra quest is brought to a violent end by a nuclear missile. In spite of this, the ending is not despair; human nature might be greedy and violent, yet, there is in us an urge to transcend our limitations. Like the Sp'thra, we feel "*this Bereft Love and this Anguish and this Grim Haunting all at once.*" The seeds of change, the urge to transcend our limitations, live within us like the mind-altering fungus of the Xemahoa and with a "*queer fusion*" of faith, science and delusion we can hope to make them grow.

Linguistic issues hardly ever make the headlines. Everett changed this state of affairs with his book *Don't sleep, there are snakes*. By

taking linguistics out of the dusty library halls and placing it at the center of public attention, Everett has done an unquestionable service to linguistics.

Apart from this service, however, how much does Everett's book contribute to the study of language, and more specifically to solving the Issue? The linguistic facts discussed in the book are unusual, but, as Geoffrey Pullum points out in his blog article, not unheard of. The analysis presented in the book is free from technical details that would make reading difficult for the linguistically untrained reader, a fact that makes it difficult to evaluate from a linguistic point of view. The hypothesized connection between cultural and linguistic facts is far from self-evident.

Like many other popular books, *Don't sleep, there are snakes* does a great job of bringing the issue into view. Unfortunately, the price paid for this simplicity is a dilution of the content that often diminishes the very cause the book is supposed to serve. The idea/theory/field is made accessible to many, but in the process it gets distorted and ends up being less significant than when it was inaccessible to public interest. The reader, instead of being kept on her toes, as she has to be when reading linguistic (or other scientific) work, is invited to defer to the expert writer and is thus turned into a consumer.

Good literature always manages to avoid this pitfall. While appearing to address the issue of UG through a discussion of embedding, Watson replaces the initial question concerning the relation between language and thought with a more complex one, involving human nature and the human condition. The endless variations on the embedding theme in the book present the Issue from various angles: linguistic, philosophical, moral, economic, and political. We are maybe further

from an answer than when we started, but we definitely understand the issue more deeply.

The difference between the two books follows from the genres to which they belong. Science has to remain embedded into facts and move with small logical steps. Literature, on the other hand, is free to perform forbidden experiments and break free from the constraints of reason. This allows literature to lead the way and go where science cannot. In this age, when information is at the tip of our fingers, when facts are cheap, and innovative thinking has become more important than ever, literature, with its power to expand our understanding, could acquire a new role in education.

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