

Let me very crisply have a look at some points mentioned in Piattelli-Palmarini's (P-P) (2010) text.

As his text has something of a *tour de force* through arguments on the evolution of language, in particular on the evolution of syntax, to it, some clarification might turn out to be helpful.

(a) On the notion of **edge features**, P-P writes:

“The phase edges are the loci of the transmission, checking, and matching of features. Edge features and their derivation, in the present reinterpretation, embody the specific kind of recursiveness that is at the core of natural language” (P-P: 151).

As we have already talked about phases<sup>1</sup>, here is, very roughly, what they look like and what they do (Figures (1) and (2)).

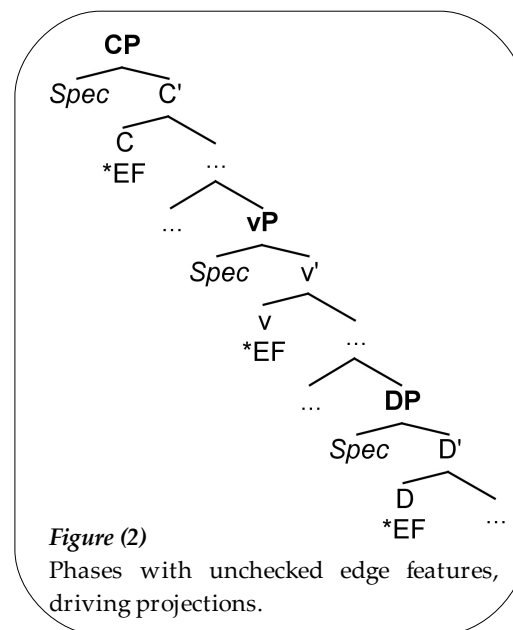
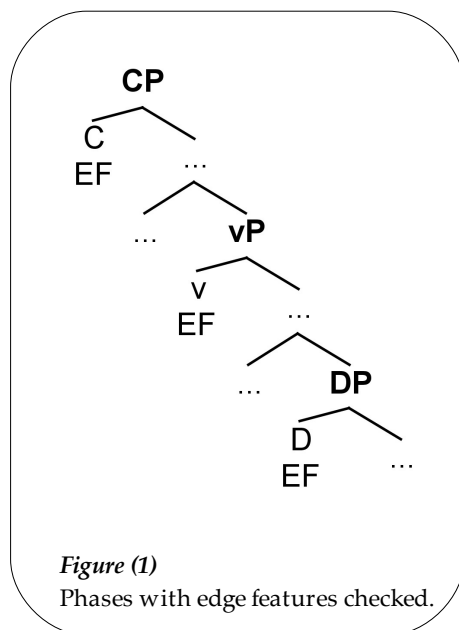


Figure (1) presents the three phases CP, vP, and DP. All of the edge features that stick to the functional heads C, v and D<sup>2</sup> are checked. Checkers are usually complements of the right sort – for instance carrying the right kind of interpretable features. I have left out the specification concerning **interpretable** or **uninterpretable** features. Usually, interpretable features are shipped off to the C-I interface; uninterpretable features have to be deleted by agree (i.e. Merge) operations; otherwise the derivation will crash. In Figure (2) there are left over some residual features (indicated by the asterisk) leading to a projection of the phasal head. Whether heads project or parts of a feature matrix (I believe the latter) shall not split the hair here. Important to remember is that **this creates a specifier slot (Spec)**. This may serve as a potential movement site, for instance movement of *wh*- elements. Note that L5 (p. 151) is that the evolution of language should be concerned with the specific evolution of these edge features. An interesting and daring hypothesis indeed.

(b) The work of famous D'Arcy Wentworth Thompson (1992[1917]) is often adduced. His work

“was centered on the thesis that biologists of his day had overemphasized the role of evolution, and underemphasized the roles of physical and mathematical laws in shaping the form and structure of living organisms” (P-P: 152).

1 The core texts surely are Chomsky (2001, 2008).

2 As to whether D is a purely functional head I am not sure. Let us assume this for the moment, making the phase heads uniform as to their “functionality”.

And when one jumps to the very first words of Thompson's momentous volume, one is going to find the following:

“Of the chemistry of his day and generation, Kant declared that it was a science, but not Science – *eine Wissenschaft, aber nicht Wissenschaft* – for that the criterion of true science lay in its relation to mathematics” (Thompson 1992[1917]: 1).

To be clear as to what all this amounts to and since the pictures are really neat, have a look at Figure (3). The skull shape of a *Homo sapiens*, for example, may be transformed into the skull shape of an ape-resembling creature. The mathematics is intricate but the take-home message is that **in natural selection often deeper laws of form apply than hitherto acknowledged**. These laws may well lie outside the realm of nature as a great tinkerer. The growth pattern of the shell on the right side of Figure (3) is inherently connected to the Fibonacci series.<sup>3</sup> The point here is simply that, from an ultra-Darwinian point of view, natural selection can not account for these apparent deep laws of form. Take one more example – daisies (Figure (4)). The strange thing is that such patterns of distribution also appear on a peacock's tail.<sup>4</sup> The offshoot is:

“There's obviously no evolutionary or functional connection between a plant's reproductive organ and a peacock's display, yet there *is* obviously a formal connection” (Uriagereka 1998: 68).

Let us return to some linguistics.

(c) Our entrée is this:

“Our central point was, and still is, that a vast collection of data on syntax from a variety of languages, patiently collected and analyzed over decades, defies all communication-based, praxis-based and motor-control-based explanations” (P-P: 158).

Lightfoot's (2000) article deals with a particular condition on movement traces. Now, what is it and how does it work? Some examples (mainly taken and adopted from Lightfoot 2000).

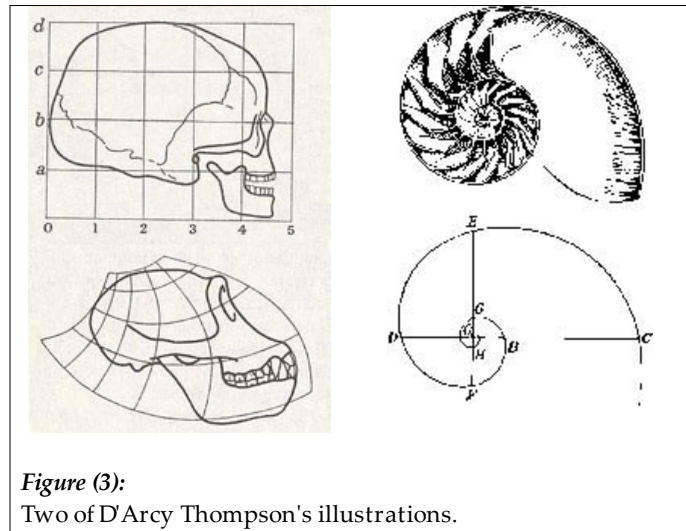


Figure (3):  
Two of D'Arcy Thompson's illustrations.

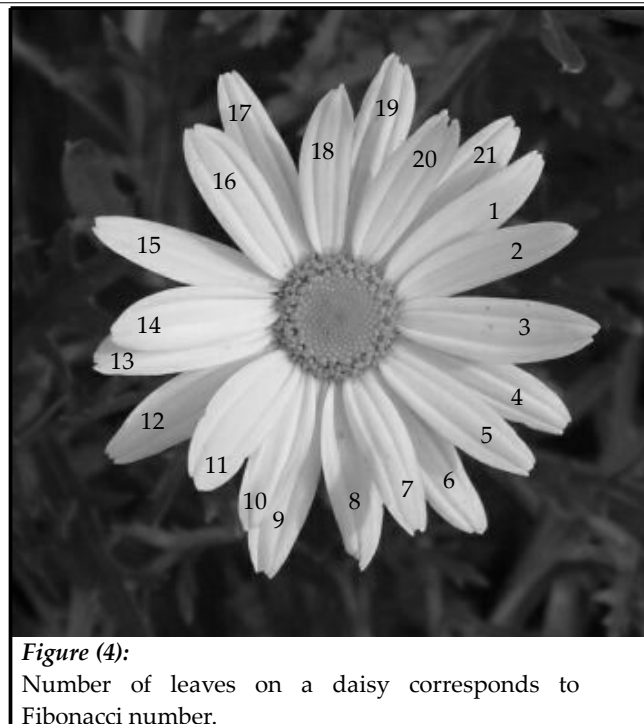


Figure (4):  
Number of leaves on a daisy corresponds to Fibonacci number.

3 I refer you to Uriagereka (1998: 68-74). Indeed a fine book.

4 Enough with pictures already.

- (1)
- a) It was apparent that Kay left.
  - b) It was apparent Kay left.
  - c) It was apparent yesterday that Kay left.
  - d) \*It was apparent yesterday Kay left.

Leaving out the bracketing and other analytical hints here for the moment, (1d) is said to be ungrammatical. Now this can be generalized to something like the following:

**Generalization: If *that* heads the complement of a directly preceding overtly realized word, it may be left out.**

This is quite a general condition. In (1d), *yesterday* does not directly precede its complement, it does not “need” or “have” a complement and therefore, if *that* is deleted it violates our general condition. (1b) is grammatical as *that* heads the immediately following complement of *apparent* and may therefore be left out. Note that no movement is involved yet. It turned out that the **same condition applies to traces of movements**.

- (2)
- a) Jay saw Kay.
  - b) Jay saw whom<sub>i</sub>?
  - c) **Whom<sub>i</sub>** did Jay see e<sub>i</sub>?

That's roughly the way one would try to grasp the concept of *wh*- movement in English. When we play around with this, we might find (3).

- (3)
- a) **Who<sub>i</sub>** was it apparent [<sub>CP</sub> e<sub>i</sub> that Kay saw e<sub>i</sub>]?
  - b) \***Who<sub>i</sub>** was it apparent yesterday [<sub>CP</sub> e<sub>i</sub> that Kay saw e<sub>i</sub>]?

In (3a), the CP is immediately adjacent to *apparent*. The head of the CP is of course C *that*. Note that in contrast to (1c), inclusion of C *that* in (3b) does not rescue the structure from being ungrammatical. In this case, it really looks as if the **mere linear yet covert presence of an element (e<sub>i</sub>) between the head of CP and the preceding element blocks a grammatical derivation**. One more point: Our generalization would **predict that in (3a) C *that* may be deleted**, regardless of whether it is preceded by empty (e<sub>i</sub>). The generalization said something about overt realization. So, (4a) should be grammatical:

- (4)
- a) Who was it apparent Kay saw?

I left out any annotations not to lead you astray. When something predicts something it's good science. Just a further note on the so-called **Fixed Subject Constraint**. Simply put, you cannot move a subject out of a tensed subordinate clause. I hope (5) sheds some light on this.

- (5)
- a) This is the sweater **which<sub>i</sub>** I wonder who bought e<sub>i</sub>.
  - b) \*This is the student **who<sub>i</sub>** I wonder **what<sub>i</sub>** e<sub>i</sub> bought e<sub>i</sub>.

In (5b), [e<sub>i</sub> bought e<sub>i</sub>] is just not the complement of *what*.

As I struggled with some examples,<sup>5</sup> nevertheless **subjects appear to be “frozen in place”**. The trace condition explanation is one attempt at capturing this fact. The problem of **communicative dysfunction** arises (*independently* of UG explanations):

“So the UG condition on traces has a negative effect, blocking the movement of wh-items from the subject of tensed clauses. To this extent, the UG condition is dysfunctional. It apparently conflicts with the desire/need to ask questions about subjects of tensed clauses, just as one may ask questions about entities in other structural positions” (Lightfoot 2000: 240).

Those phenomena are very similar across a variety of genetically unrelated languages.<sup>6</sup> A possible reflection of deep laws of form.

## References

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5 \*Who<sub>i</sub> did you think [<sub>e</sub><sub>2</sub> that e<sub>1i</sub> saw Fay]? Lightfoot says that the subject trace (1) is not licit. Why not? Because it doesn't head the complement of *that*? T would be head of the complement, right? Hierarchy of projections: CP>TP>vP. In (3b), the head is present, and still it is ungrammatical as it is not an *immediate complement*. How consistent is Lightfoot's notion of a head?

6 I refer you to Lightfoot (2000: 241-243).