

## Word Phonology *is* recursive

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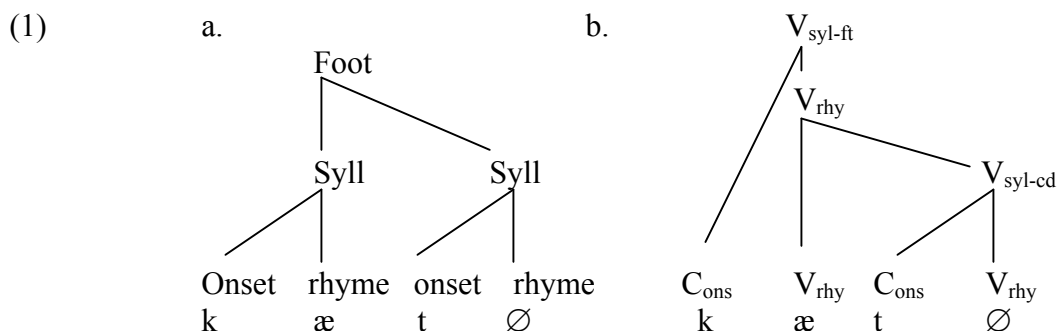
Pinker and Jackendoff (2005: 10): “...(As mentioned, HCF use “recursion” in the loose sense of concatenation within hierarchically embedded structures). Recursion consists of embedding a constituent in a constituent of the same type, for example a relative clause inside a relative clause (...). This does not exist in phonological structure: a syllable, for instance, cannot be embedded in another syllable.”

Neeleman and van der Koot (2006: 1524): “...syntax has recursive structures, whereas phonology does not.”

It is rather commonly stated that the formal organization of phonology is fundamentally different from that of syntax. Such claims regard either derivational aspects (Halle and Bromberger 1989) or representational aspects. In the latter domain, as illustrated by the two quotes, it is common to assert that phonological structure is non-recursive. Neeleman and van der Koot reject the idea that phonological organization appeals to any notion of constituency, whereas others, while acknowledging that phonotactic structure is constituency-based, propose that this constituency is ‘strictly layered’ which means that no constituent contains a constituent of the same type.

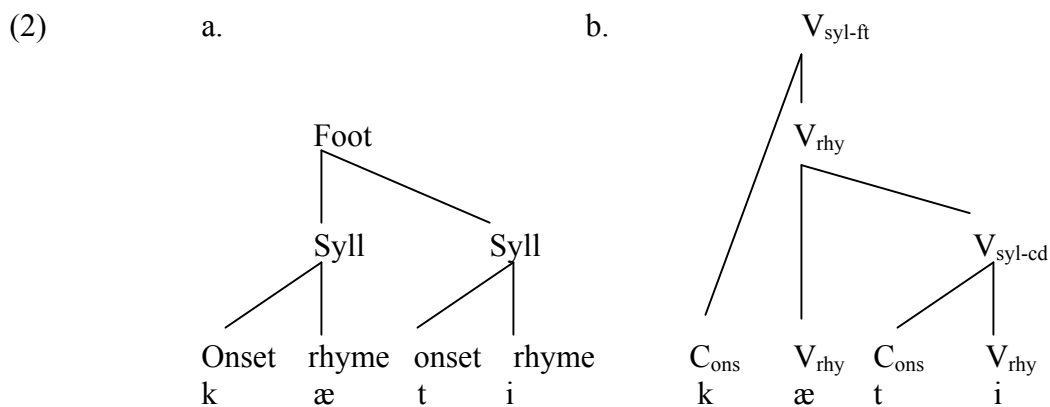
With reference to *prosodic* structure above the word recursion *has* been identified in works such as Ladd (1996 [2008]), Wagner (2005), Hunyadi (to appear) and others. In this paper my primary goal is to defend the idea that phonology is recursive *within the word* as well. The idea that syllable structure can display recursion can also be found in various works (Smith 1999, Garcia-Bellido 2005, Völtz 1999, Pochträger 2005 and others). However, my proposal is different from these in important respects, among others in integrating syllable structure and foot structure. I will argue that my account, apart from revealing important structural analogies between syntax and phonology – with potential wide ranging implications for the organization of the human language faculty – provides a basis for apparently unrelated claims on the equivalence of branching feet structure and heavy syllables and poetic mechanisms such as rhyme and alliteration. Accepting that phonology is recursive, we still can ask why recursivity in syntax is more pervasive and I will provide an answer to that question.

The central point of this paper lies in a particular construal of the idea that so-called ‘codas’ are syllables. In various frameworks, notably varieties of Government Phonology (Kaye et al. 1990), it has been argued that the ‘coda’ in a CVC string represents a syllable on its own: [CV] [CØ]. Typically this ‘syllable’ is represented as an onset followed by a contentless rhyme (or nucleus). What I here add to that idea is that the syllable in question is, *at the same time*, a coda and a syllable. I thus propose the following structure (1b) rather than the traditional (1a):



(In the notation in (1) the labels C and V are analogous to the labels N and V in syntax; they are phonological categories to which segmental units can be assigned. The subscripts are purely for mnemonic reasons, having no theoretical status.) Taking the V unit to be the head of a syllable (which therefore belongs to the category V as well), codas are complements, which are thus expected to be maximal projections themselves. My proposal differs from others such as found in Völtz (1999) in that the coda is not a projection belonging to a different category, namely C, but rather belongs, like the syllable that contains it, to the category V. This, then, is what most linguists would recognize as recursion: “Recursion consists of embedding a constituent in a constituent of the same type” (from the first quote).

The next step is to adopt the same kind of structure for more obviously bi-syllabic strings:



This establishes perfect isomorphy between a ‘closed syllable’ and a branching foot. This equivalence is widely acknowledged, yet does not find a formal basis in any other model. The embedding of syllables inside syllables does not stop here. A full structure of so-called ternary feet (as in *América*) displays degree 2 embedding.

An interesting consequence of this proposal is that it is now immediately clear why in rhyming the initial onset can be ignored, but not the second (or indeed the third in forms like *sanity - vanity*).

Having established that trochaic feet are, in fact, recursive syllables Further questions arise. What is structure of ‘iambic feet’ in this model? I will propose that the initial weak syllable is *adjoined* to the strong syllable, and subsequently argue that the structures that underlie trochaic and iambic ‘feet’ also underlie syllable with ‘overcomplex’ onsets (/spr/) and codas (/ink/).

The next step is to discuss the internal structure of words as groupings of syllables. Here an important question is whether there is an upper limit to the word as a phonological domain (cf. Helsloot (1993). I explore the idea that words are not ‘endless domains’, but rather tend to be binary (i.e. bisyllabic given the notion of syllable developed here). If this is true, very long words must show evidence of being analyzed as more than one phonological word which has indeed been argued in various places (cf. Drescher and van der Hulst 1997). But what is the nature of the unit formed by these phonological words?

Accepting that recursion is available to phonology does not entail that phonotactics will display the same kind of recursive structure as morphotactics. The kinds of structures that are employed in both modules do not exist in a vacuum, but rather are formed to iconically (i.e. isomorphically) accommodate whatever it is that these structures stand for. If we assume that semantic stuff is inherently recursive, we expect morphotactics to try and mimic this as much as is possible. If, on the other hand, phonetic stuff is not inherently recursive, but, being the result of motoric actions, is essentially ‘sequential, iterative and rhythmic’, there is no need for phonotactics to produce as much recursive structure. Recursion does occur, but if this causes disrhythmic structures, flattening kicks in (cf. Giegerich 1985).

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