Syntax is just a phonological construct!

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Changes since draft

Elaboration of constraints—more specific typology—minor spelling corrections—some added discussion

1 Intro

Notice some elementary facts about the typology of word orders. At a sentential level, if a language stresses a constituent in a transitive sentence with normal pragmatics, it is the object which takes sentential stress (Gundel 1988); languages which stress subjects or verbs in canonical sentences are conspicuously absent (Kahnemuyipour 2005).

Superficially, this might lead one to hypothesize that the phonology is senstive to syntax; that is, fate impells the phonology to stress the object, and enables it to discern the right category to do so. But what's non-trivial about this is that while the phonology has the goal in mind, it never needs to violate the other prosodic rules of the language to imbue objects with sentential stress.

Take the two sentences below, English and Persian, both characteristic of SVO and SOV languages respectively. The VPs have been annotated in brackets.

(1) a. Billy [bought *a book*].

b. Ali [*ye ketāb* xarid].
Ali a book bought
"Ali bought a book."

Stress on the object is acheived in both cases, but neither without stipulation. English independently assigns final stress to phonological phrases (such as the

VP above), while Persian shows initial stress in the same (Kahnemuyipour 2003, 2005).

This might seem like a coincidence; English and Persian may be *lucky* to get the desired stress pattern, but as stated before, this *luck* is universal. All languages acheive an object-oriented stress pattern without (so far as I know), out-of-place violations normal stress rules. While this might at first seem to be a coincidence, the biggest coincidences cannot be true coincidences.

2 Prosodic parameters

This is only a problem (or a coincidence) in traditional models of grammar where a module called "syntax" is prior to another called "phonology." In such a model, the "syntax" produces a linear string, to which stress is assigned according to metric rules by the phonology. This logically allows for the possibility of the metric rules applying sentential stress to the subject or verb in transitive sentences, again, unattested in typical sentences.

But what if these metric rules and constraints were prior to the linearization altogether? Instead of us having to keep our fingers crossed for a language with a harmonic pair of metrical constraints and linearization conventions, what if the metrical constraints motivate linearization at the earliest level?

That's to say, in keeping with minimalist principles, """Merge""" or whatever creates some kind of unordered heirarchical structure. It's not the narrow syntax which shoehorns this structure into a serial string, but only once the derivation reaches the phonological system (or sensory-motor system, if you please) that it must be ordered, and it is ordered by the constraints inherent to that phonological system.

3 Instantiation

Let's exemplify this. Let's suppose our phonology is constraint based, and we will model it in Optimality Theory. "Syntax" feeds the phonology unordered structure and Gen will produce all possible orders of the words with all possible phonological phrase configurations and stress patterns.

First, let's ennumerate and explain some potentially important constraints.

- TopicFirst– Incur a violation when focal/new information (the object)

is pronounced before topical/given information (the subject).[1]

- StressArg– Incur a violation for any noun without a type of phonological phrase stress. This can be related to stress-to-prominence constraints as in similar syntactic accounts (Guitiérrez-Bravo 2003). This constraint is partially empirically driven (by the mere fact that arguments take stress over their verbs), but can also be thought as being either pragmatically or perhaps even syntactically-driven. Since NPs are both syntactically islands and unlike verb heads, full phrases, this might encourage a higher stress prominence.

- InitialΦ– Incur a violation when a phonological phrase does not have stress on its first constituent. This is similar to trochaic stress rules in other words (Fitzgerald 1994).

- FinalΦ– Incur a violation when a phonological phrase does not have stress on its last constituent. This is merely the "reverse" of InitialΦ. The two are not necessarily contradictory, for example, if each phonological phrase contains one and only one constituent (which is stressed), then they both are satisfied.

- *Φ– Incur a violation for every phonological phrase. This is an economy constraint, presumably motivated by the phonological system no wanting to waste energy modulating voice for phonological phrases all over the place.

Now let's say that this constraint-based phonological system is fed an unordered set of a subject (S), object (O) and verb (V). We can parameterize the difference between English and Persian in terms of the ranking of InitialΦ and FinalΦ. While both languages rank TopicFirst and StressArg highly, English prefers final stress in phonological phrases (highly ranked FinalΦ, while Persian as Kahnemuyipour (2003) notes shows complete initial phonological phrase stress, represented by a higher ranked InitialΦ constraint.

As Figure 1 shows, a InitialΦ with a higher rank removes the possiblity of SVO order. We have OV order because StressArg and InitialΦ conspire for stressed elements to be VP initial, and for verbal arguments to be stressed. The presence of *Φ prohibits the easy way out of simply giving every argument its own phonological phrase, thus avoiding all violations of InitialΦ and FinalΦ.

[1]For now, this constraint could be thought of as being pragmatically-driven: a speaker prefers that new information fall on top of the listener's most recent memory.

[V,S,O]	TopicFirst	StressArg	Initial$_\Phi$	*$_\Phi$	Final$_\Phi$
☞ a. [Ś] [Ó V]				**	*
b. [Ś] [V́ O]		*!		**	*
c. [Ś O V]		*!		*	*
d. [Ó] [Ś V]	*!			**	*
e. [Ś] [V Ó]			*!	**	
f. [Ś] [Ó] [V́]				***!	

Figure 1: Persian word order driven by constraints

[V,S,O]	TopicFirst	StressArg	Final$_\Phi$	*$_\Phi$	Initial$_\Phi$
☞ a. [Ś] [V Ó]				**	*
b. [Ś] [Ó V]			*!	**	
c. [Ś] [O V́]		*!		**	*
d. [Ó] [Ś V]	*!		*		
e. [Ś V O]		*!	*	*	
f. [Ś] [Ó] [V́]				***!	

Figure 2: English word order driven by constraints

The English data in 2 is similar but with the Final$_\Phi$ and Initial$_\Phi$ constraints mirrored. English conspires to stress phonological phrases finally with a higher ranked Final$_\Phi$ constraint, and like Persian, StressArg encourages the object to be in that stressed location.

4 A Typology of Word Orders

Many theories of stress which attempt to separate syntax and prosody into different modules will often over-produce non-existent grammars, for example, as Kahnemuyipour (2005) notes of even Halle and Vergnaud (1987), there's no principled reason that languages where verbs take sentential stress should not exist.

Still this general theory of prosodically-motivated word order can be modified to produce different grammars, and I think they correspond to the actually existing typological categories of language.

Reordering these constraints will made predictions about the types of grammars we can have. I'll note some of the language types that are produced here.

- StressArg and Initial$_\Phi$ > *$_\Phi$ and Final$_\Phi$—A canonical SOV language.

Persian.

- StressArg and Final$_\Phi$ > *$_\Phi$ and Initial$_\Phi$—A canonical SVO language. English.
- *$_\Phi$ > Initial$_\Phi$ and Final$_\Phi$—A language where verbal constituents are smushed into one prosodic phrase. Basque.
- Initial$_\Phi$ and Final$_\Phi$ > *$_\Phi$—A language which can freely satisfy Initial$_\Phi$ and Final$_\Phi$ both by adding as many phonological phrases as possible. All nouns would be their own phonological phrases. This would also be a language with relatively free word order, since S and O will receive stress regardless.
- *$_\Phi$/Initial$_\Phi$/Final$_\Phi$ > TopicFirst—Languages permissive of object initiality. The TopicFirst constraint generally gives us the empirical fact that subject-before-object languages are highly preferred (Dryer (2013) notes that only about 3% of languages generally put objects before subjects.) The few languages of this type correspond to the fact that TopicFirst would have to be extremely lowly.
- *$_\Phi$/Initial$_\Phi$/Final$_\Phi$ > StressArg—When StressArg is lower than the phonological phrasing constraints, this would yield a free word order or non-configurational language where stress neededn't fall on every argument. This would be a language similar to Basque, where there is one mushed phonological phrase, but with freer word order (although we would still expect arguments to be either phrase-initial or final depending on the comparative rankings of Initial$_\Phi$ and Final$_\Phi$).

5 Planned improvements and additions

- A more overt demand for object stress. So far, objects still receive stress epiphenomenally (between StressArg and TopicFirst).
- There are a couple reasons that I don't like my current constraints. I see some holes in them, although I think they conceptually have their hearts in the right places.
- A more rigorous weeding-out of redundant typologies (perhaps by software). This might require getting more precise constraints, as having the "wrong" constraints would snowball into terrible mispredictions.

- Generalization to SV sentences—Why does English have ŚV, but SVÓ? How can I do this?
- Account of pragmatically-driven word order changes? (Bolinger 1954)

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