The H-α Schema and Phonological Derivation by Phase

This talk will propose a specific characterization of *phases*, incorporating insights of both Chomsky's (2000 et seq.) phase theory and Uriagereka's (1999) multiple Spell-Out model, based on the notion of edge-feature (EF) and the lack of feature-percolation thereof. We will then provide pieces of supporting evidence for our view from data regarding phonological phrasing of constituents in various syntactic environments.

First, we will adopt Chomsky's hypothesis that Lexical items (LIs) are computational atoms of syntax, each of which is associated with "a feature that permits it to be merged to some SO," called an *edge-feature* (EF) Chomsky (2008). We specifically follow Chomsky in assuming that the EF is "a property at least of LIs—*and optimally, only of LIs*" (*ibid*, emphasis ours). We will point out that one of the logical consequences of this hypothesis is that *no phrase can be merged to some SO*, since only LIs, not phrases/non-LIs, have EFs. Consequently, all instances of Merge must take an LI as at least one of its inputs (utilizing its EF as the locus of Merge), merging it with another SO, obeying the form $\{H, \alpha\}$ (call this *the H-α schema*).

The H-α schema immediately predicts that *no two XPs can be merged*. We claim that this is a sustainable conclusion in Chomsky's cyclic Transfer model, where syntax cyclically feeds instructions to SEM and PHON in a phase-by-phase fashion. Each application of Transfer strips off the phase-interior domain of a designated LI (called a *phase head*) from the derivational workspace to SEM and PHON. We specifically propose that Transfer (and only Transfer) can 'peel off' the phase-interior domain from the phase head LI, letting the latter count as a 'revived' LI again. Consider, e.g., the case of external merger of an external argument $\{D, NP\}$ and a verbal phrase $\{v, \{V, Obj\}\}$. The phase head v can eliminate its complement from the workspace by Transfer, so at the point of being merged with $\{D, NP\}$, such a revived LI can utilize its EF again to be merged to $\{D, NP\}$, in conformity with the H-α schema (as in (1)). Or, if D also counts as a phase head, as we will assume, Transfer of NP by D will also make it possible for D (a revived LI) to be merged to $\{v, Obj\}$ (as in (1)).

(1) $\{v, \{\text{V, Obj}\}\} \rightarrow v \rightarrow \{\{D, NP\}, v\}$.

(2) $\{D, \text{NP}\} \rightarrow D \rightarrow \{D, \{v, \{V, Obj\}\}\}$.

In short, a phrase XP can be merged to another phrase YP only when XP can constitute a phase, whose head LI can count as a revived LI after it Transfers its phase-interior domain. This way, the hypothesis that EFs are properties only of LIs derives the fact that recursive Merge in human language makes crucial use of cyclic Transfer.

We will argue that this conception of cyclic Transfer can account for a number of data on phonological phrasing in various syntactic environments. First, we will point out that the H-α schema necessitates that the phrasal subject DP and the VP-constituent comprising V and the object DP have to belong to separate Transfer domains as we have seen above (see (1) and (2)).

If, as Samuels (2009) argues, spell-out domains constitute the domains used in phonological phrasing, we derive Richards (2004) observation that a phonological phrase can be no larger than a phase (i.e., a domain that is subjected to Transfer). We show that the H-α schema combined with this conception of the syntax-phonology mapping correctly derives the typology of phonological phrasing found in SVO languages, shown below. Dobashi (2003) observes that there are essentially four types of attested SVO languages:

(3)   Typology of ϕ-domains in SVO languages (Dobashi 2003: 38)
        a. $(S)_\phi (V)_\phi (O)_\phi$
        b. $(S)_\phi (V)_\phi (O)_\phi$ or
            $(S)_\phi (V O)_\phi$ if O is non-branching
        c. $(S)_\phi (V O)_\phi$
        d. $(S)_\phi (V O)_\phi$ or
            $(S V)_\phi$ if S is non-branching

Specifically, the H-α schema predicts that the subject and VP are phonologically phrased separately in transitive clauses, but it also makes the reverse prediction that if the subject is a simplex LI (say a pronoun) it does not have to consititute its own phonological phrase, a prediction borne out by the typological data.

Moreover, our theory also predicts that a phrase that undergoes 'XP'-movement will constitute an independent phonological phrase. This is because the proposed H-α schema predicts that *only LIs can undergo internal Merge*, given that internal Merge is always to the edge of

some XP/non-LI (containing an occurrence of the moving element) that corresponds to α in the H-α schema. Thus, there should be no such thing as pied-piping of phrases/XPs in syntactic derivations, unless the moving phrase is reduced to an LI by means of cyclic Transfer, constituting its own phase. We will also point out that this prediction is also supported by the widely attested freezing effects, given the standard assumption that Transferred phases become impenetrable for further syntactic operations (Chomsky's Phase-Impenetrability Condition).

Further, if we adopt a null hypothesis that the H-α schema also applies to external merger of adjuncts, our theory predicts that phrasal adjuncts, but not necessarily simplex LI adjuncts, obligatorily constitute separate intonational phrases, as has been reported in the phonological literature (see, e.g., Zec and Inkelas (1990) and Bošković (1995) on Serbo-Croatian).

Finally, although we follow Uriagereka (1999) in assuming that CED effects for most adjuncts arise as a result of derivationally prior Transfer/Spell-Out of the adjunct-interior domain, it is also known that subextraction from some 'lower' adjuncts is possible (e.g., *what$_i$ are you working so hard in order to achieve t_i?*; see Truswell (2007) for recent discussion). Our phase-based theory of phonological phrasing predicts that in such cases the relevant adjunct clause must not constitute a separate phase/phonological phrase, since otherwise the availability of subextraction out of it should be impossible. This correlates with the fact that a pause, which is diagnostic of an intonational phrase boundary, cannot be inserted before such adjuncts (# below indicates a pause).

(4)   Truswell (2006)
    a.   John drove Mary crazy [whistling hornpipes].
    b.   What did John drive Mary crazy [whistling t]?
    c.   *What did John drive Mary crazy, # whistling?
    d.   What did John arrive [whistling t]?
    e.   *What did John arrive, # whistling?

We argue along with Uriagereka (1999) that syntactic domains which deviate from the main head-complement clausal spine (typically Specs and adjuncts) each constitute their own phonological cycles, but contra him, this situation should not be captured by means of Kayne's (1994) Linear Correspondence Axiom, since noncomplement phrases show this effect irrespective of their surface linear order. Rather, our discussion points to the conclusion that cyclic Transfer driven by the H-α schema (which itself is a theorem deduced by the hypothesis that only LIs have EFs) gives us the right cut for phonological phrasing, achieving a more transparent conception of the syntax-phonology interface.

References

Bošković, Željko. 1995. Participle movement & second position cliticization in Serbo-Croatian. *Lingua* 96:245–266.

Chomsky, Noam. 2000. Minimalist inquiries: the framework. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. Cambridge, Mass: MIT Press.

Chomsky, Noam. 2008. On phases. In *Foundational issues in linguistic theory*, ed. Robert Freidin, Carlos Otero, and Maria Luisa Zubizarreta, 133–166. Cambridge, MA.: MIT Press.

Dobashi, Yoshihito. 2003. Phonological phrasing and syntactic derivation. Doctoral Dissertation, Cornell University.

Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, MA.: MIT Press.

Richards, Marc D. 2004. Object shift, scrambling, and symmetrical syntax. Ph.D. dissertation. University of Cambridge.

Samuels, Bridget. 2009. The structure of phonological theory. Ph.D. dissertation. Harvard University.

Truswell, Robert. 2007. Locality of wh-movement and the individuation of events. Ph.D. dissertation. University College London.

Uriagereka, Juan. 1999. Multiple Spell-Out. In *Working minimalism*, ed. S. D. Epstein and N. Hornstein, 251–282. Cambridge, MA.: MIT Press.

Zec, Draga, and Sharon Inkelas. 1990. Prosodically constrained syntax. In *The phonology-syntax connection*, ed. Sharon Inkelas and Draga Zec, 365–378. Chicago: U. of Chicago Press.