Phases and Words

I. Phases and Cyclic Locality Domains

Chomsky’s suggestive clarification of the cyclic nature of syntactic computation in “Derivation by Phase” (Chomsky 2001) invites a new investigation of locality domains for semantic and phonological processes within a generative grammatical framework. On perhaps the most stringent view of compositionality (exemplified, e.g., by Montague Grammar), each syntactic operation would have a corresponding interpretation, making the result of every “merge” of items into a phase, in the sense of a domain for phonological and semantic processing. In contrast, The Minimalist Program instantiates a basic principle of standard generative grammar – interpretation waits a bit within a syntactic derivation, allowing for small apparent mismatches between syntactic hierarchical structures on the one hand and the constituents of phonological and semantic interpretation on the other. Syntax within a cyclic domain proceeds without interpretation at each generative step, but the merger of a phase head triggers the semantic interpretation and phonological spell-out of a chunk of syntactic structure. The investigation of locality turns on identifying the phase heads and the corresponding chunks of structure subject to interpretation.

Chomsky explores an equation between phases and linguistic units that have independent full semantic interpretations. So, for example, the little vP might constitute an event, with all its obligatory participants, and the CP a proposition, fully specified for tense and role in discourse. Events and propositions are both natural units for independent status; however, words also seem to be units of independent sound and meaning, suggesting that words, too, may be phases. In Marantz (2000) I proposed that the heads that form words identified by “lexical” category (noun, verb, adjective) – “little x” heads, to generalize from the little v head that creates verbs – may uniformly correspond to phase heads. As a consequence, syntactic computation could be unified above and below the word level. Category changing morphology could yield multiple phases within a single word, and cyclic phonological effects within words could be related to – hopefully reduced to – the cyclic operation of phase-based syntax.

In this chapter I would like to re-visit this initial claim that phases should be recognized within words, discuss some of the data originally motivating the proposal, then turn to two issues that threaten it. The first problem involves considerations that led Chomsky and others to distinguish between the transitive little v, which Chomsky identifies as a phase head, and the unaccusative little v, which he claims does not head a phase. If some verb-forming heads are not phases but the lexical category of “verb” is a significant unit for morphophonology independent of transitivity and the status of the external argument, the equation between cyclic domains in morphophonology and cyclic domains in syntax would be challenged. Although unaccusativity may correlate with morphological marking (e.g., “non-active” morphology) in some languages, unaccusative verbs do not involve unusual phonological or morphological domains relative to transitive verbs of the sort that would be diagnostic of a difference in phasal status. The second problem for a uniform identification of little v as a phase head is directly related both to the evidence
motivating phases within words and to the identification of unaccusative verbs as phases. So-called lexical causative constructions, unlike “syntactic” causatives, do not embed a phase from either a phonological or a semantic point of view. If lexical causatives were constructed by embedding unaccusative predicates under a little v causative head, and if unaccusative verbs were little v’s, we would expect lexical causatives to be bi-phasic, contrary to fact. Therefore, the approach in which all little v’s are phase heads is incompatible with an analysis in which causative/inchoative alternations involve adding a causative v head to an unaccusative little v verbal structure. Fortunately, the literature on long-distance agreement and on transitivity alternations offers promising solutions to both these problems. Locality domains for case assignment support the view that unaccusative v (along with a voice head or voice feature indicating the lack of an external argument) heads a phase while the syntax and semantics of transitivity alternations argue against deriving lexical causatives from unaccusative vPs.

II. Derivation Above and Below Little v

An appropriate starting point for a discussion of morphology/syntax interactions in the modern generative era is Wasow’s (1977) “Transformations and the Lexicon.” At the time of publication of Wasow’s chapter, much work following the spirit of Chomsky’s (1970) “Remarks on Nominalization” had raised the question of how much syntactic regularity could be accounted for via the use of lexical rules changing the morphophonology as well as the subcategorization frames of words and how much should be accounted for in the syntactic component of the grammar via transformations, which might also have an impact on the morphophonology of words through, e.g., “affix hopping.” Wasow provided arguments that the adjectival (stative) passive should be formed in the lexicon, while syntactic passives would be formed in the syntax, as then standardly assumed.

Key to Wasow’s analysis was the strong intuition that the traditional split between derivational and inflectional morphology has real consequences for grammatical analysis, if correctly defined. Derivational morphology was seen as relating words to words and changing grammatical category, e.g., from verb to adjective in the standard analysis of adjectival passives. Inflectional morphology, thought to implicate the syntax, creates forms of the same word, and does not change grammatical category. From this perspective, it is natural to assign derivation to the lexicon, where it could create – and relate – words of the various lexical categories. Inflection would be derived in the syntax, via then standard mechanisms of, e.g., affix-hopping (“lowering” tense onto a verb, for example) and the transformational realization of abstract feature bundles into phonological segments (replacing, e.g., “past tense” with /d/).

Wasow supported the claim that adjectival passive formation changed verbs into adjectives in the lexicon. Correlating with this lexical derivational function, adjectival passives could show idiosyncracies in form and in meaning not displayed by syntactic passives, since words in the lexicon may be assigned special listed properties. Further, adjectival passives could feed other derivational word-formation processes, such as un-
prefixation, but could not be fed by syntactic transformations, such as raising to object. A summary of this evidence is displayed in (1).

(1) **Correlation of properties** favors creating words in two different places, the lexicon and the syntax

i. lexical formation associated with idiosyncrasy in meaning 
   the *hung* jury (one doesn’t “hang” a jury)

ii. lexical formation associated with idiosyncrasy in form 
   the *shaven* man vs, John was being *shaved*

ii. lexical formation can’t interact with syntactic rules 
   John was *believed* to be sick vs. *John remained believed* to be sick 
   (no raising to object followed by passive for adjectival passive constructions)

iii. lexical formation associated with change in lexical category (verb to adjective) 
   a very *driven* worker (*the boss very drove the worker*)

While Wasow’s chapter had an immediate and lasting impact on the field, the late 70’s and early 80’s saw the development of a “strict lexicalist” approach to morphology and syntax in which all affixation and word formation was performed in the lexicon, along with all rules affecting argument structure. The strict lexicalist theory was explored in the context of syntactic theories that rejected transformational accounts of, e.g., passive, raising, and control. Such lexicalist syntactic theories found support from work on morphology. Morphologists investigating morphophonology could not maintain a distinction between a phonology of inflection and syntax on the one hand and a lexical phonology that dealt only with the type of derivational morphology that would be identified as “lexical” on Wasow’s criteria on the other. Rather, any split in morphology consistent with a lexical vs. post-lexical phonology, as in the theory of Lexical Phonology and Morphology, would put most “lexical” and “syntactic” morphology in Wasow’s sense on the Lexical side.

On the strict lexicalist view, a single place for word formation, the Lexicon, was sufficient to account for the correlations observed by Wasow. Of crucial importance, some generalizations followed from correlations between lexical category and other properties. So, for example, the failure of adjectival passive formation to interact with raising to object could be accounted for by reference to the default argument-structure properties of adjectives, which generally require an external argument. Levin and Rappaport (1986) provide an analysis of adjectival passives consistent with strict lexicalism that accurately portrays the spirit of the enterprise.

A theory like Wasow’s that distinguishes lexical from syntactic word formation has a directional property: lexical word formation may feed other lexical word formation and may feed syntactic word formation, but syntactic word formation may not feed lexical word formation. The strict lexicalist position makes no such claim. In fact, to account for the formal identity between the perfect participles of unaccusative verbs and their adjectival passives – the leaf had *fallen*; the *fallen* leaf – Levin and Rappaport analyze the
adjectival passive as formed from the perfect participle, where perfect participles would involve syntactic (post-lexical) word formation on any account that made a lexical/syntactic distinction here. A Wasow-like theory with two places for word formation also enforces a layering of morphology: morphemes associated with lexical word formation should all occur closer to the word root than the morphemes associated with syntactic word formation. The architecture of the grammar, then, would prevent, e.g., category-changing morphology from attaching outside tense and agreement morphology on a verb – and also prevent adjectival passive formation from perfect participles. A strict lexicalist approach requires independent principles to explain the consistently observed layering of morphemes, with inflectional outside derivation.

In an important article in *Language*, Dubinsky and Simango present a challenge to strict lexicalism by questioning the claim that independent lexical principles are sufficient to explain the layering of morphology in Chichewa and the correlation among semantic, phonological and morphosyntactic properties of Chichewa verbs. They show that it is necessary to recognize the distinction between an inner and outer domain of word formation, with the inner domain showing correlations of properties that would naturally be associated with lexical word formation. While strict lexicalism would allow the embedding of outer formations, e.g., participles, within inner formations, e.g., adjectival formation, Dubinsky and Simango argue that contrasts in Chichewa word formation processes require an analysis that separates inner and outer word formation and allows the inner to feed to outer but not vice versa.

D & S show that Chichewa has a stative morpheme that performs much the same function as the adjectival passive in English and shows similar “lexical” behavior. For example, the stative morpheme, unlike the non-homophonous Chichewa passive morpheme, may yield an idiomatic meaning and may trigger special morphophonology on the stem. The Chichewa stative, however, does not change the lexical category of the stem – the output of stativization is verbal and further verbal (e.g., inflectional) morphology may be added outside the stative. Thus no properties of the stative can be attributed to a change in lexical category or restrictions on the properties of adjectives.

Generalizing from D & S’s work and the literature on adjectival passives, we find that inner word formation is characterized by (a) potential unpredictability in phonology and in semantics (potential special form and special meaning) and (b) an inability to take as input a stem that already has been typed morphologically as belong to a lexical category. Outer word formation, on the other hand, is characterized by (a) regularity in phonology and in semantics and (b) the ability to take as input a stem that has already been typed as belonging to a particular lexical category. The literature on derivational morphology since Wasow (1977) includes examples of various contrasts in word formation that conform to this inner vs. outer pattern and are often treated as illustrating the difference between lexical and syntactic word formation (see Travis on Austronesian, Sugioka on Japanese nominalizations and Svenonius on causatives).

In Marantz (2000), I proposed that the inner vs. outer distinction be analyzed not as a distinction between lexical and syntactic word formation but rather as a difference
between functional heads that combine with roots and functional heads that combine with structures already headed by a node determining a lexical category. Thus so-called “lexical” word formation would involve the first category-determining head up from a open class word root, with all higher word forming heads falling into the so-called syntactic category. The contrasting properties of inner vs. outer word formation then followed from the cyclic interpretation imposed by phrases if each category-determining head defined a phase. The root domain with the first category-determining head make up what Ramchand (2006) calls the first-phase syntax, roughly corresponding to Hale & Keyser’s l-syntax (2002).

(2) “Inner morphology” attaches to roots or complex constituents below the first little x (x = \{v, n, a\}) node (phase head) above the root. All morphology above the first x node is “outer morphology,” including all “category changing” derivational morphology.

This approach should capture the inner vs. outer distinction associated with the original lexical vs. syntactic distinction and Dubinsky and Simango’s version. In addition, it captures the correlation between “lexical” properties and category-determining morphology, while putting a twist on the traditional notion that category-changing is the hallmark of derivation and thus lexical word formation. In fact, where true category changing is involved, the affixation patterns with inflection, not with category-determining root formations.

This view of the relation between roots and lexical categories is generally consistent with the insights of “lexeme-based” morphological theories such as Aronoff’s (2001). The word root plays an important role in this type of theory, capturing facts associated with families of words sharing the same root. However, the meaning contribution of a root is never independently realized within this version of Distributed Morphology, since the objects of interpretation are the phases, not the roots. A root with a category-determining head corresponds to the lexeme of Aronoff’s system, and such a constituent can have a particular meaning, a variety of uses, and a history, as Aronoff makes clear.

A crucial property of this view of phases within words is that the difference between inner and outer word formation does not lie with the nature of the category-determining head but with the structure below the head. Thus what is essentially the same little x head may participate in both inner and outer word formation depending on whether it attaches to a root or outside an additional category-forming head. Embick & Marantz (to appear) discuss some examples of this sort, but the stative vs. verbal passive formation in English – Wasow’s original example – illustrates the point. It’s not the “passive” head itself that differs between stative and verbal passives but the structures in which the

The ability of the same little x head to merge either with a root or with a little x-headed construction raises important questions about the compositional semantics of category-determining phase heads and the semantics of roots. In recent work I’ve been exploring the possibility that the little v heads introduce events or eventualities semantically and are not themselves carriers of anything like argument structures. On this view, a little v head does not take a complement by itself. A root merged with a little v head will generally have the semantics of an event modifier, while a DP merged with little v will require the addition of a semantic operator at the LF interface to produce an interpretable structure. Alternatively, one could imagine allowing little v heads to select for a complement of a particular semantic sort and acknowledge that roots may fall into some of the same semantic categories as little v heads (e.g., name eventualities).

Equating the little x category head with a phase head and endorsing the relative semantic independence of a “typed” (n, v, adj) constituent raises a problem familiar from lexeme based approaches to morphology – a lexeme or typed stem may often not be pronounced without the addition of a layer of inflectional morphology. For nouns, the needed additional material might realize case and number; for verbs, tense and agreement. On the face of it, we would expect that languages that require inflectional material for an independently pronounceable word nevertheless run a phonological (and semantic) cycle at the little x level. The need for, say, case and number, would not then be attributable to an architectural feature of grammar but to language-particular features of functional heads and morphological vocabulary items. Other approaches to these issues would be worth exploring.

III. The phase-hood of passive and unaccusative v’s

Active, transitive vP’s have canonically been identified as phases. For present purposes, the crucial features of vP’s involve the subject and object arguments. In a now traditional split-VP structure, the object is treated as the complement to the big V or lexical verb, while the external argument is generated in specifier position of the vP headed by the functional element, little v. In a theory such as that of Marantz (1997), the big V could be replaced by a category neutral root; the verbal category would be determined solely by the little v head. See also Pylkkänen (to appear) for discussion of the possible structural independence of a voice head, taking little vP as a complement and projecting the external argument in its specifier.

If “transitive” little v is a phase head, the object of the vP would be licensed (via, e.g., case valuation or other formal mechanisms) in place via an Agree relation with the little v. The external argument, at the edge of the phase, would be licensed in the next phase up, via an Agree relation with Tense.