Phases and Words

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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, Chomsky's 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, (at least some) words also seem to be units of independent sound and meaning, suggesting that words, too, may be phases. In Marantz (2001) 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 (see, e.g., Marvin 2002).

In this chapter I would like to re-visit the 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 for identifying lexical categories with phases 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, then 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-phasal, 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 (perhaps paired 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 idiosyncrasies 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. Adjectival passives show lexical properties, as opposed to verbal passives.

i. lexical formation associated with idiosyncrasy in meaning
the hung jury (one does not "hang" a jury)
ii. lexical formation associated with idiosyncrasy in form
the shaven man vs. John was being shaved
iii. lexical formation cannot 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)
iv. 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 1970's and early 1980's saw the development of a competing "strict lexicalist" approach to morphology and syntax in which all affixation and word formation was performed in the lexicon, along with all rules affecting the argument structure of verbs. The strict lexicalist theory was explored in the context of syntactic theories that rejected transformational accounts of, e.g., passive, raising, and control (as well as in conjunction with standard generative theories). Such lexicalist syntactic theories found support from the contemporary work on morphology and phonology. 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 (see, e.g., Lieber 1980). 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 to this view, some generalizations concerning the effects of derivational morphology followed from correlations between lexical category and other properties. So, for example, the failure of adjectival passive formation to interact with raising to object (see (1iii)) could be accounted for by reference to the default argument-structure properties of adjectives, which generally require a (thematic) 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 category-changing morphology from attaching outside tense and agreement morphology on a verb – and also prevent adjectival passive formation from operating on 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 & Simango (1996) 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., de-verbal adjectivals, Dubinsky & 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 the outer but not vice versa.

Dubinsky & Simango 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.

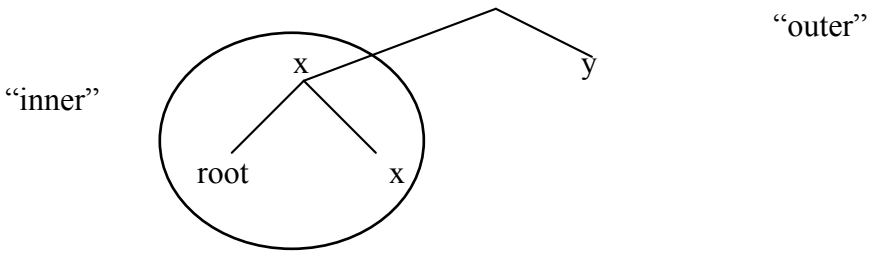
Generalizing from Dubinsky & Simango's work and the literature on adjectival passives, we find that inner word formation is characterized by (a) potential unpredictability in phonology and in semantics (potential special form and special meaning) and (b) an inability to take as input a stem that already 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, e.g., Travis (2000, to appear) on Austronesian, Sugioka (2001, 2002) on Japanese nominalizations, and Svenonius (2005) on causatives).

(2) Inner vs. Outer Morphology (Dubinsky & Simango (1996) et al.)

	Inner Affixation	Outer Affixation
Regularity	Potential special form and special meaning	Predictable form and predictable meaning
Selection	Attaches inside morphology determining lexical category	May attach outside morphology determining lexical category

In Marantz (2001), I proposed that the inner vs. outer distinction be analyzed not as a distinction between lexical and syntactic word formation, as proposed by Wasow and supported by Dubinsky and Simango, 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 in the syntactic tree from an 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 phases, if each category-determining head defined a phase. The root domain closed by the first category-determining head constitutes what Ramchand (2006) calls the first-phase syntax, roughly corresponding to Hale & Keyser's l-syntax (2002).

(3) "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 correlations of properties associated with the original lexical vs. syntactic distinction and Dubinsky & 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. Only the innermost category-determining morphology corresponds to the "lexical" morphology of earlier split morphology theories.

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 an Aronoff-style theory as well as the present one, 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 (see the discussion of Malayalam in section IV below). 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 passive head appears. See Embick (2004) and Kratzer (2004) on passive particles for a discussion of this issue.

The ability of the same little x head to merge either with a root or with a little y-headed construction raises important questions about the compositional semantics of category-determining phase heads and the semantics of roots. If the same head may merge both with a root and with a little x, does this imply that roots must belong to the same semantic categories as little x's? In recent work I've been exploring the possibility that 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. Questions arise, then, about so-called "causative" little v heads that might attach either to roots, to create "lexical causatives," or to little vPs, to create "syntactic causatives" (see section IV below). On the most straight-forward approach to these causative constructions, the roots in lexical causatives would need to name events (eventualities – including statives and standard events) in order to participate in the same compositional semantics as a little vP. Similarly, a little n head that nominalizes roots or v's would seem to require that roots be of the same semantic class as v's, to allow the same compositional semantics to apply. Careful lexical semantics research on these issues is called for.

Equating the little x category head with a phase head and endorsing the relative semantic independence of a "typed" (n, v, adj) constituent also raises a problem familiar from lexeme based approaches to morphology – a lexeme or typed stem in many languages 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 stem at the little x level, then, would be phonologically interpreted but incapable of being uttered by itself. The need for, say, case and number, would not then be attributable to an architectural feature of the 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: Licensing the Internal Argument

Active, transitive vP's have canonically been identified as phases. For present purposes, the features of vPs relevant to their possible phasal properties 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 would be replaced by a category neutral root; the verbal category is determined solely by the little v head. See also Pylkkänen (2007) 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 vP were a phase, any argument internal to the vP would need to be licensed inside the vP, with its case features determined, or to move to the edge of the vP before the vP is sent to phonological and semantic interpretation.

If transitive little v is a phase head, an object of the vP that surfaces with structural case 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 or with a higher v, as in ECM constructions.

If we assume a uniform structural architecture for transitive and unaccusative clauses, putting aside possible differences between flavors or types of little v heads, unaccusative vPs – and any vP lacking an external argument – would be headed by a v that might or might not Agree with an object but would not project a specifier as an external argument. By what has become known as Burzio's Generalization, vPs without external arguments will not assign or license structural accusative case on their objects. An object in an unaccusative clause will generally move to a position outside the vP, e.g., to spec of TP position, or receive nominative case and agree with a tensed verb in situ. Clearly, if unaccusative vP is a phase, then an object in an unaccusative vP must move to the edge of the vP if it is to move higher, to spec TP, and such an object must Agree with the v, if it is to trigger agreement on a higher T while remaining in situ within the vP. If unaccusative vP were not a phase, then movement to spec of TP could occur directly, and there would not need to be any agreement between little v and the moved or in situ object within unaccusative vPs. The crucial difference between a theory that says that unaccusative little v is a phase head and a theory that says it is not revolves around the objects of unaccusative vPs. For the unaccusative as phase theory, such an object will always stand in an Agree relation with the unaccusative little v, either prior to (or in conjunction with) movement to the edge of the vP or prior to agreement of the little v with a higher T node, in the case of long-distance agreement. For the unaccusative as non-phase head theory, an object will stand in an Agree relation directly with T (or a higher little v, in the case of ECM) within a single phase including T (or a higher v), the object and the unaccusative little v.

The general predictions of the unaccusative vP as phase hypothesis seem supported by the literature. Legate (2003) argues that an object undergoing A-movement from a passive or unaccusative vP does in fact show evidence of passing through a spec of vP position on its way up. suggesting an Agree relation with v. The strongest prediction of this hypothesis is also supported by the literature on long-distance agreement in well-studied languages such as Icelandic. If the unaccusative vP is a phase, then all the information necessary to spelling out an object left in situ should be present within the vP – we shouldn't need to wait for T to be merged with vP to determine case on the object or to determine if the object will be licensed. As Sigurdsson (2000) argues from Icelandic, these predictions are confirmed. If an object is not assigned a "lexical" or "quirky" case, then it will need to bear direct case, either nominative or accusative. The decision as to whether the object gets accusative or nominative is determined at the little v level, essentially via Burzio's generalization. If the little v (or perhaps a voice head paired with little v) projects an external argument that is also eligible for direct case, then the object will be assigned accusative. Otherwise, an object destined for direct case will receive nominative. The necessity to check properties of the little v for determination of the case on the object suggests that little v always stands in an Agree relation with an object that will receive direct case. Such an Agree relation puts features of the object at little v, making them visible to T or any head in the next phase up from little v. Long-distance agreement between an object in situ and a higher T or v head may be mediated by the unaccusative v.

A typical example of long-distance agreement is shown in (4a) from Sigurdsson (2000). Plural on the matrix verb in (4a) agrees with the nominative object in the embedded clause. When a dative argument intervenes between the matrix verb and the lower object, agreement is blocked, as in (4b). Nevertheless, the sentence is grammatical and the lower object is licensed to appear in nominative case (in all Icelandic examples, I have replaced the thorn with "th" and the eth with "d").

(4) a. Okkur syndist/syndust [hafa verid veiddir fjórir fiskar]
us(D) appeared(3sg/3pl) [have been caught four fishes(N)]
'It appeared to us that four fishes had been caught.'
b. Okkur virtist/*virtust [henni hafa leidst their]
us(D) seemed(3sg/*3pl) [her(D) have bored they(N))]
'It seemed to us that she had found them boring.'

Similarly, a nominative object stays nominative in an embedded unaccusative infinitival vP like (4b), even when the matrix verb is an ECM verb, which would trigger accusative case on an argument that raises out of an embedded clause – see (5).

(5) Ég taldi [henni ekki hafa leidst their/*thá].
I believed(1sg) [her(D) not have bored they(N)/*them(A)]
'I believed her not to have found them boring.'

The data in (4) and (5) illustrate the crucial points about long-distance agreement into unaccusative vPs: the licensing of and case determination for the nominative object in such clauses is computed at the vP level and does not wait until a higher case-assigner (tense or

ECM little v) is merged. In some cases, a higher T might agree with the nominative object, presumably through the agreement features that the unaccusative little v acquired during the process of licensing the lower nominative object.

What Sigurdsson shows, then, is that nominative case on an unaccusative or passive object left in situ is locally determined at the vP level. No features of T affect case on such an object. The particular values for tense will determine the nature of agreement, if any, with the nominative object, but will not affect the realization of case.

In apparent disagreement with this conclusion, Schütze (1997) argues that T, not v, determines the properties of the object in unaccusative and passive clauses. But, in fact, his arguments are consistent with Sigurdsson's, rather than opposing them. The important point for Schütze is that an unaccusative or passive object, like the object of transitive vP or an external argument, is not licensed or case marked by any lexical information (e.g., associated with a "big V" in some frameworks or a root in others). A nominative object in situ, unlike a "quirky" dative, genitive or quirky (non-alternating) accusative object, finds its syntactic properties within the system of functional heads, not "lexical" heads such as roots or big Vs. Nevertheless, the properties of a nominative object are computable at the little v level – no reference to T is required, although the agreement implications of the nominative argument may be computed at T. A nominative object in situ bears a "grammatical" or "direct" case; such an object might have moved, if the syntactic environment of higher functional heads were appropriate, and may agree with a higher inflection.

There is one property of nominative objects in Icelandic that does suggest a role for tense in licensing the in situ objects of unaccusative verbs. As noted repeatedly in the literature, first and second person in situ nominative objects of tensed unaccusatives are judged ungrammatical.

(6) a. *Henni líkudum vid.
her(D) liked(1pl) we(N)
b. *Henni líkudud thid.
her(D) liked(2pl) you(Npl)
c. Henni líkudu their.
her(D) liked(3pl) they(N)
'she liked them'

This restriction on nominative objects seems related directly to the agreement morphology on the tensed verbs; if the agreement is non-distinctive between default 3rd singular and 1st or 2nd person, then these nominative objects are OK for some speakers with agreeing forms.

(7) Henni leiddist ég. *leiddist* = 1sg, 2sg, 3sg
her(D) bored I(N)
'She found me boring.

Whatever the correct account correlating the forms of first and second person agreement with the acceptability of nominative objects, these facts seem independent of the general licensing properties of nominative objects and can be handled as well within a theory

where unaccusative little v's are phases as within a theory where they are not. Note that first and second person nominative objects are licensed in the absence of agreement whenever the unaccusative little v is embedded as an infinitival. The problem, then, is not in the licensing of the nominative object within the vP but with the agreement on the tensed verb. On any theory in which unaccusative little v's are phases, the little v will Agree with an in situ nominative object. Thus the locus of the ungrammaticality of (6a,b) will be the relationship between Tense and the agreement features on little v; there is no reason to implicate the nominative object directly in this, since a nominative object of any person and number will be fine within the vP as long as no agreement is required with a higher Tense.

The phenomenon of long-distance agreement in Icelandic, then, is as compatible with a theory that treats unaccusative little v as a phase head as it is with one that treats only transitive vP as a phase. The local agree relation between little v and the object establishes whether or not the object will receive accusative case. All evidence suggests that the nominative case on an object left in situ is completely licensed within the domain of the vP, since no heads merged higher than v will have an effect on either the case or the licensing of such an object, although agreement morphology on Tense merged with little v may cause difficulties for a verb agreeing with a first or second person nominative object.

Although Icelandic long-distance agreement does not exhibit the behavior one would expect from a language in which little v were not a phase, restructuring constructions in German superficially show properties one might expect if the phasehood of a little v could be cancelled in certain environments. Under a restructuring predicate, the object of a German vP can have its case determined by the "Burzio" status of the restructuring predicate; if the restructuring predicate has an external argument, the lower object can be accusative, while if the restructuring predicate lacks an external argument, e.g., is passivized, the lower object must be nominative, as shown in (8) from Wurmbrand (2004), and the higher restructuring predicate will agree with this nominative object of the lower verb. Since the morphophonology of verbs themselves embedded under restructuring predicates in German does not also vary compared to other environments, we would want to claim that little v in German is always a phase for cyclic interpretation, even embedded in restructuring environments. Therefore, on standard assumptions about phases, the lower object in a restructuring construction whose case depends on the status of the restructuring predicate must escape from the vP when the v-head is merged, allowing its interpretation to hinge on the higher verb. For example, the lower object in (8) must move to the edge of the lower vP before entering into an Agree relation with the higher, restructuring predicate.

(8) …dass der Lastwagen und der Traktor zu reparieren versucht wurden
that the-NOM truck and the-NOM tractor to repair tried were
'…that they tried to repair the truck and the tractor'

In an important paper discussing this issue among others, Bobaljik and Wurmbrand (2005) demonstrate for German that in ("lexical") restructuring environments, the object of the embedded verb does and must in fact move out of the vP to a position to have its case determined by the higher predicate. That is, just in the situation in which the case of the object may not be determined within the phase of the vP, the object must raise to the next phase. Given the analysis in Wurmbrand (2004) and elsewhere of restructuring, in which the

embedded vP of restructuring constructions lacks its own external argument, one might suggest that such vPs lack voice. If voice were required to negotiate Burzio's generalization and determine case on an object in an Agree relation with little v, a little v not paired with voice in the relevant configuration might force movement of any object it Agrees with to the edge of its domain, to be potentially licensed by a higher v that is associated with voice, or with T. Whatever the correct analysis of the movement of objects from embedded vPs in restructuring, the necessity of such movement supports the general identification of little v as a phase head.

To conclude, the behavior of nominative objects reinforces the conclusion that unaccusative vPs serve as the domain for case determination on any object that remains within the vP at the point of cyclic interpretation. The facts of long-distance agreement in Icelandic and of restructuring constructions in German support rather than undermine the conclusion that all vPs are phases, allowing us to maintain the equation between little x category-determining heads and syntactic phases.

IV. The Phase-Hood of Unaccusative v's: Lexical Causatives

Another challenge to the claim that unaccusative little v is a phase comes from inchoative/causative alternations. In many languages, it is possible to transitivize an unaccusative predicate through the addition of an affix. From one point of view, the transitivization process would add to a change of state predicate both a "cause" predicate and a causer. For example, to go from inchoative "break" (the glass is breaking) to transitive "break" (John is breaking the glass), one adds an agent and a cause predicate to get, in paraphrase, "x causes y to become broken." If the affix associated with this transitivization were analyzed as a little v with causative meaning, projecting an agent as an external argument, transitivization could be seen as embedding an unaccusative predicate within a transitive little v environment. If the unaccusative predicate were simply the unaccusative verb, with its little v head, then the transitivization would create a verb with two little v's and thus two phases.

These transitivity alternations are considered to produce "lexical" as opposed to syntactic causatives. By most tests, a causative alternating with an unaccusative stem, as in English transitive "break"~inchoative "break" alternations, is as monoeventive as a simple accomplishment verb, such as "kill" (of course one might analyze accomplishments such as "kill" as involving multiple sub-events; in any case, transitive "break" does not seem to involve any more complex an internal event structure than "kill"). For morphologically simple, non-alternating accomplishment verbs such as "kill," there has been no reason to suggest an analysis involving multiple vP phases. Idiosyncratic meanings and special phonology for causative/inchoative alternations have made them prime examples of "lexical" processes, for those linguists arguing for a distinction between lexical and syntactic derivation (consider the special phonology of transitive "raise" related to inchoative "rise," and the special meaning of "raise" associated with "raising animals or children"). Therefore, if lexical causatives were built on top of unaccusative predicates, and if unaccusative

predicates were phases, there would be a mismatch between the monophasal appearance of lexical causative constructions and their bi-phasal syntax.

If unaccusative little v's are phases and transitive members of transitive/inchoative pairs are monophasal, transitive/inchoative alternations must involve transitive and inchoative little v structures merging with an un-typed root; i.e., the lexical causative must be built on the root, not on the inchoative verb. In recent work, Killimanganam & Michaels (2006) have provided an analysis of Malayalam causatives that supports this proposal and illustrates the phenomena in question.

A single vocabulary item in Malayalam, the suffix *ikk*, appears to derive verbs from nouns, as in (7i), lexical causatives from inchoatives, as in (7ii), and syntactic causatives from unergative verbs, as in (7iii).

(7) agentive activity verbs derived from nouns

(i)	kuli		'bath' (n)
	kulikk-	(kuli+ikk)	'bathe' (v)

lexical causatives derived from same stem as inchoative

(ii)	culi-		'get wrinkled' (intr)
	culikk-	(culi+ikk-)	'wrinkle' (tr.)

syntactic causative derived from unergative verb

(iii)	paat-		'to sing'
	paatikk-	(paat+ikk-)	'to make X sing'

If the lexical causative in (7ii) were derived via merger of a little v to a vP headed by the inchoative verb, the structure would involve two phases. However, if we associate *ikk* simply with an eventive little v and an agentive voice head or feature rather than a "causative" predicate per se, we can deny little v status to the stem that it embeds in lexical causatives. Both the lexical causative and the inchoative would be built by merging a v with the root; the non-agentive little v used for inchoative verbs would not be spelled out as *ikk*.

Killimanganam & Michaels (2006) provide extensive support for the view that the lexical causative in (7ii) involves merger of a v to a root, while the constructions in (7i) (denominal verb) and (7iii) (syntactic causative) involve merger of a v to a phase head – an n in (7i) and a v in (7iii). In particular, the phonological consequences of merging *ikk* in lexical causatives is different from its effects when attaching to a phase head, showing a kind of fusion with the stem in the former case but not the latter. The examples in (8-9) show the special gemination caused by *ikk* when in the same phase as the root.

(8)	aat-	'swing' (root)	aatt-	'to swing' (tr.)
(9)	kuump-	'fold' (root)	kuupp-	'to fold' (tr.)

The contrast between the lexical causative of unaccusative root meaning 'sink' (10) and the syntactic causative of the unergative verb built on the same root, meaning 'bathe' (11), illustrates the gemination in the former case but the blocking of gemination in the latter.

(10) Lexical causative built from root; phonological fusion of *ikk* with root

munn- munn+ikk → mu**kk**- 'to sink'
e.g., The bottle sank → I sank the bottle

(11) Syntactic causative built from unergative verb; no fusion

munn- munn+ikk → munn-**ikk**- 'to take a dip (bathe)'
e.g., I took a dip in the pond → John made me take a dip in the pond.

The creation of unergative verbs from nouns shows the same phonological properties as syntactic causatives – e.g., no phonological fusion – indicating that the denominal verbs embed a typed n head, i.e., a phase.

(12) Denominal verb formation from little n; no fusion

$[[\text{tool}]_n$ ikk$]_v$ → tooli**kk** 'bathe'
as lexical causative, would predict *toott-*

The literature on lexical causatives since Marantz (1984) has consistently reached the same conclusion as Killimanganam & Michaels draw from Malayalam about lexical causative/inchoative alternations: the lexical causative is not built on top of the inchoative unaccusative verb, but rather both the lexical causative and the inchoative are built from the same root. In an extended recent discussion of transitivity alternations, Alexiadou et al. (2005) specifically argue against treating the inchoative alternation as the addition of a causative v to an inchoative little vP. As they emphasize, in general this alternation seems mostly concerned with "voice," i.e., the presence or absence of an animate agent for a causing event, rather then with a causative predicate or the addition of an additional sub-event to the event semantics of a vP. As discussed in section III, unaccusatives and passives behave like phase heads from the point of view of the licensing of constituents within the vPs that they head. Thus considerations of voice and the presence or absence of an external argument do not in general seem to affect the phasehood of the vP, although voice does of course interact with the little v to determine whether accusative case is available for a vP internal constituent.

V. Summary

The combination of Distributed Morphology with phase-based syntactic theory makes strong claims about the locality of phonological and semantic interpretation in words, as well as in larger syntactic structures. The first phase above the root within a word shows

properties often associated with lexical word formation, while higher phases triggered, e.g., by category-changing little x heads, behave in accordance with generalizations about syntactic word formation. The novelty of the approach to derivational morphology supported here lies in limiting the "lexical" properties to a single domain connected to the first category-determining head above the root and in equating category changing morphology with inflection as far as properties associated with phase-by-phase cyclic interpretation are concerned. The tight connection between locality domains in morphophonology and in syntax would have been challenged if unaccusative verbs did not include a little v phase head, but the recent literature on long-distance agreement and on transitivity alternations strongly supports identifying the unaccusative vP as a phase.

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NOTES to editor:

In Example (4a), syndist and syndust should have an accent over the y – the same accent that occurs over the o in fjórir.

In Examples (7) – (11), some of the letters require diacritics – the "l"s in (7i, ii), the "t"s in (7iii), the "t"s in (8), and the "n"s in (10-11). See the correct symbols below:

(i)	ku**ļ**i		"bath" (n)
	ku**ļ**ikk-	(ku**ļ**i+ikk)	"bathe" (v)

(ii)	cu**ļ**i-		"get wrinkled" (intr)
	cu**ļ**ikk-	(cu**ļ**i+ikk-)	"wrinkle" (tr.)

(iii)	paa**ţ**-		"to sing"
	paa**ţ**ikk-	(paa**ţ**+ikk-)	"to make X sing"

(6)	aa**ţ**-	"to swing"	aa**tt**-	"to swing (tr.)"

	Unaccusative:	**Transitive**:
(42)	muŋŋ-	muŋŋ+ikk → mu**kk**-

Eg. The bottle sank → I sank the bottle.

	Unergative:	**Causative**:
(43)	muŋŋ-	muŋŋ+ikk → muŋŋ**-ikk**-