

## Putting Phases in Perspective\*

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### 1. Introduction

The goal of the present contribution is to critically examine the notion of *phase*, introduced by Chomsky (2000: 106) as part of the attempt to refine the minimalist program for linguistic theory. Although we could not agree more with the general vision and virtually all the arguments made by Chomsky over the years regarding the motivations behind the Minimalist Program, and the importance of pursuing it, we think that phases *as currently conceived of* are poorly understood, and that we would do well to explore alternative strategies to deal with the syntactic phenomena that phases have been designed to address.<sup>1</sup>

We hasten to add that none of the arguments against phases made below invalidate the Minimalist Program as a whole. As a program, minimalism is open to many possible instantiations (for extensive discussion, see e.g. Lasnik et al. 2005, Hornstein et al. 2006, Boeckx, in press). Derivation by phase is but one of them. We do, however, hope that the present contribution will help redirect research in specific areas of grammar where phases have been involved. It may very well be that all the problems we point out below for phase-based derivations will disappear tomorrow; indeed, somebody might come up with a way of understanding phases and deducing their properties from first principles by the time we conclude this article. If this happens, it would be a great step forward. But the task is far from easy. For, as we show below, virtually all the properties ascribed to phases in the current literature have been recycled from the very first theoretical attempt to make sense of such

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<sup>1</sup> Developing such alternatives here would require much more than a few sections in a journal article, for we do not believe that there currently exists a single model that can replace the phase-based system, or the notion of phase, without radically changing other technical aspects. For what we take to be promising alternatives, see, among others, Epstein et al. (1998), Uriagereka (1999a, 2003), Grohmann (2003a, to appear), Boeckx (2005b), Epstein & Seely (2006).

phenomena as islands or successive cyclicity (Chomsky 1973). As we will argue, at this time in linguistic history, in many ways, phases are to minimalism what bounding nodes and barriers were to the Extended Standard Theory and Government-and-Binding Theory, respectively. In and of itself, the fact that phases have theoretical antecedents is not a bad thing. The ‘eliminative’ or ‘therapeutic’ effect of minimalism (Chomsky 1995: 233-234) does not entail that theoretical linguistics must restart from scratch (witness the revival of Generalized Transformations from Chomsky 1955/1975), but it does entail that all the tools we make use of must be well motivated conceptually, and that their properties must follow from virtual conceptual necessity (as is the case for the copy theory of movement, which follows from Inclusiveness). We think that this is far from being the case when it comes to phases. Like bounding nodes and barriers, phases beg questions that lead to persistent problems. Accordingly, phases do not enhance our understanding of syntactic phenomena like locality; they simply recode insights from the past. Maybe this is the best we can do at this point, but we think that highlighting the limitations of phases may lead to developing new ways of thinking about old problems.

Our presentation is organized as follows. In section 2, we briefly review what it means for derivations to be phase-based. In section 3, we review the empirical and conceptual arguments for phases and their specific properties that are currently entertained. In section 4, we show that none of the arguments actually go through, due in large part to the fact that proponents of phases have borrowed mechanisms from previous frameworks that have always been stipulative. Section 5 addresses further complications of the notion phase as currently understood. Section 6 concludes the article.

## **2. A brief overview of phase-based derivations**

In this section we briefly review the core properties of phase-based derivations, focusing on the aspects that will be relevant throughout this article.

Chomsky (2000) argued for a more radical departure from the standard Y-model of grammar inherited from the Extended Standard Theory and Government-and-Binding eras than the position he took in the original minimalist paper (Chomsky 1993) and early stage of minimalist research (Chomsky 1995). Chomsky proposed that syntactic derivations proceed in incremental chunks, called *phases*, with each phase built from a separate lexical sub-array.<sup>2</sup> According to Chomsky, the phases are *v* and *C*. *V* and *T* aren’t, and other categories are not discussed (although Chomsky 2005: 17-18 suggests that *D* may also be a phase).

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<sup>2</sup> For related proposals, see e.g. Epstein et al. (1998), Uriagereka (1999a, 2003), Grohmann (2000, 2003a), Platzack (2001), McGinnis (2001), Johnson (2002), Bošković (2005), Fox & Pesetsky (2005), Gallego (2005), Wagner (2005), and Epstein & Seely (2006).

The general idea behind phases is that once these domains have been built from a lexical sub-array, much of their content is immediately transferred to the interfaces and can therefore be ‘set aside’ for computational purposes, thereby alleviating the burden imposed on the computational system.

Within phases, Chomsky (2001) distinguishes between the phase complement (sister of the phase head), the phase head itself (*v* or *C*), and the edge of the phase (specifier domain). Chomsky formulates the *Phase Impenetrability Condition* (PIC), which says that once a phase has been completed, the internal domain of a phase (i.e. the complement of the phase head) is transferred to the interfaces, and thereby becomes inaccessible to operations outside the phase.<sup>3</sup> This in effect means that the edge of the phase and the phase head remain accessible to material outside the phase. Material inside the internal domain of a phase can bypass the effects of PIC by moving to the edge of the phase via ‘indirect feature driven movement’. This movement is triggered by a “P(eripheral)-feature” in Chomsky (2000), a “generalized EPP” in Chomsky (2001, 2004a), and an “edge feature” in Chomsky (2005). (It is not entirely clear whether the term feature used here is a feature in the technical sense, subject to checking, or is simply taken to be a grammatical property of some sort (such as a licensing condition that a specifier be filled).) In other words, the edge of the phase adds as an escape hatch for material that would otherwise be trapped inside the phase due to PIC. This designated escape hatch strategy immediately yields a version of successive cyclic movement, as it ensures that long movement proceeds phase-edge by phase-edge. Put in very general terms, with phases, syntactic computation gains in cyclic character. The alleged computational cost of carrying the entire derivation up to the end, as in previous minimalist incarnations, is reduced by transferring portions of the derivation step by step to the interfaces.

### 3. Motivations for phases

Computational cost reduction is the prime conceptual advantage and motivation for phases (see Chomsky 2000: 110-112). More recently, Chomsky has also noted that the adoption of a phase-based derivation leads to a drastic reduction in the number of independent cycles that have to be assumed to be part of the computational system (see Chomsky 2004b: 151, 2005: 11, to appear: 4). He says:

[In GB theory] there were three, four, I guess five relatively independent generative systems, each of them essentially a cycle, all doing the same thing, but operating separately. There was one that formed D-structure by X-bar Theory, which is basically

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<sup>3</sup> This definition is an updated version of PIC originally introduced in Chomsky (2000: 108), following arguments put forward in Nissenbaum (2000).

cyclic. There's the transformational cycle, which is mapping D-structure to S-structure. There's a covert transformational cycle, which is mapping S-structure to LF, with the same kinds of transformations and also cyclic. And there's something mapping LF over to the semantic interface, a compositional semantics of some kind and, again, cyclic. And there's something mapping S-structure to PF, which is also basically cyclic. (Chomsky 2004b: 151)

Chomsky has here identified a redundant feature of the computational system: different components cover the same space in the same fashion. Chomsky claims that a phase-based derivation, with its cyclic transfer property, allows one to contemplate a single-cycle architecture. Previous minimalist efforts have eliminated D-structure and S-structure (Chomsky 1993) as well as X-bar Theory (Chomsky 1994, 1995). Phases allow one to go one step further and eliminate LF by mapping chunks of syntax directly to the interfaces, providing for a less redundant, computationally more efficient system.

In addition to these conceptual considerations having to do with computational efficiency, Chomsky also provides two empirical arguments for phases. The first argument consists in showing how phases solve a problem that arises in the context of Chomsky's (1995) Merge-over-Move principle (henceforth, MOM; see Castillo et al. 1999 for extensive discussion). Consider the data in (1):

- (1) a. There seems to be a man in the garden.  
b. \*There seems a man<sub>i</sub> to be t<sub>i</sub> in the garden.

If, as Chomsky assumes, there is a feature-checking requirement on the intermediate infinitival T, a question arises why the requirement cannot be checked by the movement of the indefinite (1b). Chomsky proposes an account of the impossibility of (1b) in terms of a preference for Merge over Move. According to Chomsky, at the point when the embedded clause is built we need to insert something into the infinitival Spec,TP in order to satisfy the EPP. We have two possibilities for doing this in (1). We can either insert *there*, which is present in the numeration, into Spec,TP or we can move the indefinite to this position. Chomsky argues that lexical insertion is a simpler operation than movement. Therefore, the possibility of expletive insertion into the embedded Spec,TP, which for Chomsky takes place in (1a), blocks the indefinite movement to the embedded Spec,TP, which takes place in (1b). Here Chomsky makes use of his definition of Move as a combination of Copy plus Merge (alternatively, Agree, Copy, and Merge, as in Chomsky 2000 and subsequent work) to argue that Move is more complex than Merge, and therefore its use is restricted to the cases where simpler options are not available.

Although MOM accounts for (1), it faces a problem in contexts like (2) (as was observed independently by Juan Romero and Alec Marantz).

- (2) There was a rumor that a man<sub>i</sub> was t<sub>i</sub> in the room.

Here, an indefinite NP has moved to Spec,TP although an expletive was present in the numeration and available for lexical insertion.

To deal with this type of construction Chomsky (2000) introduces the concept of sub-numeration, defined over phases. More precisely, Chomsky proposes that each phase has its own sub-numeration or lexical sub-array LA. Since the expletive is not present in the LA corresponding to the embedded clause (recall that CPs are phases), the option of expletive insertion is not available, and MOM is satisfied. Although the argument based on (2) is really an argument for LA<sub>a</sub>, and not for phases *per se*, Chomsky turns the argument into one for phases by associating LAs with phases: not only are phases points of cyclic transfer, they also constitute points of cyclic access to the lexicon.

A second empirical argument for phases, specifically for cyclic transfer, comes from considerations of legibility at the interfaces. Chomsky (1995) takes it to be a fact that there are interpretable and uninterpretable features on lexical items. Considerations of Full Interpretation dictate that uninterpretable features be absent at the interfaces. Accordingly, any uninterpretable feature must be removed before the derivation meets the interfaces. Chomsky assumes that the operation Spell-Out strips away features from the syntax and transfers them to the interfaces. A look-ahead problem arises in this context, as Spell-Out must know which features are uninterpretable in order to strip them away and prevent the derivation from crashing at the interfaces. But in order for Spell-Out to know which features are uninterpretable, interpretation must have taken place. To avoid this look-ahead problem, Chomsky (2000) introduces a further distinction within features: valuation — features are either valued or unvalued. This distinction is assumed to be available to Spell-Out by inspection without recourse to the interfaces. Chomsky furthermore claims that there is a one-to-one correlation in the lexicon between valued/unvalued and interpretable/uninterpretable. This correlation offers a way for Spell-Out to target the right features (uninterpretable ones), while being blind to interpretive considerations. At this point, a timing issue arises. The syntactic operation Agree values lexically-unvalued features in the course of the derivation. Once valued, how can Spell-Out distinguish between valued and unvalued features, and transfer the (only) right ones to the interfaces? If Spell-Out applies before valuation, it will be too early, and unvalued features will be transferred to the interfaces, causing a crash. If Spell-Out applies after valuation, it is too late, as Spell-Out has no way of identifying which features were which any more, and unvalued (i.e., uninterpretable) features run the risk of making it to the interfaces. Chomsky's solution to this timing issue is to have Spell-Out apply right at the moment when valuation takes place, when the valued/unvalued distinction is still visible. Spell-Out must therefore be cyclic, and apply each time valuation takes place, which Chomsky assumes is at the phase.

In addition to these conceptual and empirical arguments for phase-based derivations, Chomsky (2000) notes that PIC not only yields a version of successive-cyclic movement as an immediate consequence, it also “suggests a new approach to some Empty Category Principle (ECP) issues, such as subject extraction” (Chomsky 2000: 144, note 46, crediting Idan Landau, personal communication), an approach explored in Chomsky (2005).

#### **4. Problems with phases**

Although we think that Chomsky has identified important issues in the context of phases such as computational efficiency, redundancy, locality, legibility of features, and trigger for movement, we don't think that phases as currently conceived offer insightful ways of solving these problems.

Consider the memory load reduction argument. Bearing in mind the (we think, very real) possibility that “our initial intuitions about perfection vs. imperfection (in this technical sense [of computational efficiency]) are not fully reliable” (Kayne 2004: 5, note 4), while granting Chomsky the possibility that cyclic transfer reduces computational load, it is not clear to us that phases as defined by Chomsky and currently used in the literature achieve the desired reduction. As Bouchard (2002: 343) notes, it is still the case that the computational system must be able to retrieve “previously spelled-out material” to provide a complete, coherent surface string — so it can't just forget about spelled-out elements. One may say that cyclic Spell-Out provides a way of forgetting the internal content of spelled-out element, but even that is not clear. As Norbert Hornstein (personal communication) has pointed out to us, interfaces appear to examine the internal content of full representations for specific processes. For example, the semantic component needs to see multiple spelled out chunks for pronominal binding. And PF quite possibly needs full clauses to determine intonational patterns, such as falling intonation ending up with a declarative (statement) or rising intonation yielding an interrogative (echo question) even for a simple expression like *John likes Mary./John likes Mary?*. Arguably, it may still be possible in the latter case to just look at spelled-out domains as opaque chunks or ‘giant compound’ words, as Uriagereka (1999a) has argued, but questions arise as to why the recombination of these chunks happens the way it does. We are not asking how this recombination takes place — we agree here with Chomsky that some such recombination is “easy enough to formalize” (LSA Summer Institute 2005 class lectures). We are asking why it takes place in the order it does. It cannot be the cumulative outcome of cyclic Spell-Out because syntactic derivations proceed in parallel. Some algorithm will therefore have to be found, and, more importantly from a minimalist perspective, justified. It is unclear to us what optimal justification could be advanced here.

The recombination problem carries over to the redundancy of levels of representation advanced by Chomsky in favor of phases. As the term recombination makes clear, it is still the case that the interfaces will do some combinatorial work that (we presume) will mirror, or at least follow very closely, the work that the syntactic component performed — just like LF cycled over the same chunks of structure that, say, S-structure did. It appears that this kind of redundancy cannot easily be eliminated.

When it comes to the MOM argument, as we noted above, Chomsky’s reasoning is really about LAs. That the point(s) of access to the lexicon correspond(s) to points of cyclic transfer is an additional assumption that may be correct empirically, but one that appears to be arbitrary, hence suspect from a minimalist perspective. Furthermore, the line of argumentation crucially relies on the existence of a non-finite Spec,TP, and the possibility of non-finite T bearing an EPP-feature. We cannot fail to notice that in recent years, MOM has become quite suspect. This is in part due to the fact that, since MOM was proposed, the conception of Move has dramatically changed. In more recent theorizing, “Move” is just one of the forms of the basic operation Merge. As Chomsky states:

NS is based on the free operation Merge. [The strong minimalist thesis] SMT entails that Merge of  $\alpha$ ,  $\beta$  is unconstrained, therefore either *external* or *internal*. Under external Merge,  $\alpha$  and  $\beta$  are separate objects; under internal Merge, one is part of the other, and Merge yields the property of “displacement”... (Chomsky 2001: 7-8, original emphasis)

The difference between internal Merge and external Merge is now restricted to the relation between objects to be merged. Under this conception of Merge and “Move,” it becomes less clear how the economy-based conceptual argument motivates MOM. Specifically, internal Merge (“Move”), as defined by Chomsky in the above quote, does not appear to be more complex than external Merge any longer. Thus, Merge-over-Move loses its conceptual argument.

Empirically, Castillo et al. (1999) have denied the claim that deficient, non-finite T bears an EPP-feature (i.e., make available a specifier position); see also Boeckx (2000), Grohmann et al. (2000), Hornstein (2001), and Bošković (2002,) among others. For Castillo et al., the question boils down to an EPP-issue: non-finite T does not have an EPP (feature or property), hence its specifier need not be filled.<sup>4</sup> According to them, the derivation underlying the licit (1a) above is that in (3), without any relevant movement steps:

(3) There seems [<sub>TP</sub> to be [ a man in the garden ] ].

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<sup>4</sup> We depart here from Castillo et al. (as well as Hornstein 2001 and Epstein & Seely 2002) in using the weaker term “need not” as opposed to “is not,” as alternative conceptions of successive-cyclic movement and expletive insertion may allow for non-finite T to be filled (see e.g. Boeckx 2000, 2005a, Grohmann 2003b, and Bošković 2002, 2005).

If true, they have eliminated the sole empirical data provided as evidence for MOM. If MOM does not have to be evoked, the Romero/Marantz problem doesn't arise, and the need for phases (*qua* cyclic access to the lexicon) is severely weakened.

Turning now to the argument for phases based on valuation of features, we want to note that the argument, even if it goes through, again rests on assumptions that are questionable. Specifically, it rests on the claim that valuation and interpretability go hand in hand. As Pesetsky & Torrego (2004) have pointed out (building on work by Brody 1997 on the non-existence of genuinely uninterpretable features), the biconditional is odd and unlikely. Why should the *lexicon* couple the disparate properties of *interpretability* ("Does the item have a message to send to the semantics?") and *valuation* ("Are any syntactically relevant properties of the lexical item left unspecified?")?

Furthermore, as Epstein & Seely (2002, 2006) argue at length, it is not clear that the mechanics Chomsky resorts to achieves the right result. As Epstein and Seely show, there is no point in the derivation where Spell-Out can distinguish between valued and unvalued features without either look-ahead or backtracking. In the absence of such undesirable strategies, Spell-Out will always be "too early" or "too late."

Finally, when it comes to locality (successive cyclicity and CED effects), it is again far from clear that phases achieve the right results. Put simply, in the domain of successive cyclicity, there just don't seem to be enough phases to accommodate all the landing sites that have been identified in the literature. We will not reproduce the evidence here (but see especially Boeckx 2005a on this, building on a notion of successive cyclicity proposed by Takahashi 1994). Suffice it to say that there is a growing consensus that movement proceeds through adjunction to each maximal projection along the way, in a manner similar to the percolation mechanism assumed in categorial grammar, (head-driven) phrase structure grammar, and other frameworks (see also Neeleman & van de Koot 2002). In a minimalist context, the proposal that 'every maximal projection is a cycle' has been argued for by Manzini (1994), Epstein et al. (1998), Fox (2000), Boeckx (2001, 2003, 2005a), Bošković (2002:, 2005), Richards (2002), and Fox & Lasnik (2003).<sup>5</sup> (As a matter of fact, Chomsky

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<sup>5</sup> Abels (2003) provides an empirical argument against the hypothesis that each maximal projection is targeted by successive-cyclic movement, and in favor of what he calls 'punctuated chains,' which are formed by targeting specific landing sites (such as phase-edges). The argument rests on the contrast between (ib) and (id) below; specifically, on the absence of reconstruction effects in the specifier of non-finite T.

Based on the ability to license an anaphor in an intermediate landing site (cf. (ia,b)), Abels argues that *wh*-movement does not target the non-finite Spec,TP in (id); if it did, the anaphor would be expected to be licensed, as it is in (ib). Abels concludes that the lack of reconstruction (understood as the lack of an intermediate landing site) follows under a phase-based or punctuated chain theory (non-finite T is not a phase), but doesn't under a theory that assumes that each maximal projection is targeted under Form Chain.

- (i) a. \*John said that Sue likes pictures of himself.  
b. Which pictures of himself did John say that Sue likes?

2005: 18 loosens the connection between successive-cyclic movement and phases.) One may say that under Boeckx's (2005a) version of successive-cyclic movement, every maximal

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- c. \*Mary seems to John to like pictures of himself.
- d. \*Which pictures of himself does Mary seem to John to like?
- e. Which pictures of himself does it seem to John that Mary likes?

Norbert Hornstein (personal communication) casts doubt on this paradigm on the basis of cases like (ii),<sup>5</sup>

(ii) \*Which pictures of himself does Mary seem to Susan to have told John that she likes?

where (ii) should pattern on a par with (ie), not (id). If Hornstein's observation holds, no argument can be put forward on the basis of (ia-e). Setting this empirical issue aside, we want to note that even if the facts are as Abels claims they are, the argument he provides based on them is incorrect, for it relies on the following logic.

- (iii) a. if movement → reconstruction possible
- b. if no reconstruction → no movement

There is ample evidence that (iiib) can't be maintained (see also Boeckx & Hornstein 2004). Consider, for example, the absence of reconstruction effects with A-movement recently discussed by Lasnik (1999). A relevant case is presented in (iv).

- (iv) No one is certain to solve the problem.  
(≠ It is certain that no one will solve the problem.)

As Boeckx (2000, 2001) has argued (contra Manzini & Roussou 2000), anti-reconstruction effects like (14) cannot be analyzed in terms of non-movement, since some instances of A-movement (especially movement involving indefinites) reconstruct. If this conclusion is correct, (iiib) cannot be right.

Another argument against (iiib) comes from the fact that even weak islands, those that permit a significant degree of movement, do not accommodate reconstruction, as witnessed in (v).

- (v) a. Which of his<sub>1/\*2</sub> pictures did Bill<sub>1</sub> ask me why nobody/everybody<sub>2</sub> hated *t*?
- b. Which of his<sub>1/\*2</sub> pictures doesn't Bill<sub>1</sub> think that everyone<sub>2</sub> liked *t*?

In a similar vein, Bobaljik & Wurmbrand (in press) provide compelling evidence that the lack of reconstruction effects in restructuring contexts in German (and other languages) must be analyzed as an anti-reconstruction effect in the presence of movement.

- (vi) ... weil er alle Fenster vergessen hat [ <alle Fenster> zu schliessen].  
      *because he all windows forgotten has to close*  
      '... because he forgot to close all the windows.'  
      (*alle Fenster* >> *vergessen*; \**vergessen* >> *alle Fenster*)

To conclude, it appears that, whereas reconstruction effects signal movement (copying), anti-reconstruction effects do not necessarily signal lack of movement. Therefore, the data in (i) are silent on the issue of successive-cyclic movement, and on the need for phases as distinct landing sites for that type of movement.

projection is a phase (as argued for in e.g. Epstein & Seely 2002 and Bošković 2005), but it is important to note that were one to do so, one would be using a very different notion of phase from the one used by Chomsky. For Chomsky, every phase induces a PIC effect. If every projection were a phase, no extraction would be possible, as the complement of any phrase would have to move to the edge of that phrase/phase, a movement step that would count as too local under any version of ‘anti-locality’ (see e.g., Grohmann 2003a, Boeckx 2005a, and references therein).

As for CED effects, specifically, subject condition effects (for Chomsky, adjunct island effects follow from his claim that adjuncts live in another dimension; see Chomsky 2004a: 118ff.), Boeckx (2003: 12) has argued on the basis of data like (4), that phase-based derivations are too permissive when it comes to predicting island effects.<sup>6</sup>

(4) ??Who did you say that [pictures of t] were stolen? (Collins 1994)

Specifically, Boeckx (following Brody 2002) argues that it is not clear what excludes the following derivation: *Who* moves out of [pictures of *who*] while the latter is in its theta-position. The movement would target the Spec of the passive VP phase (in light of Legate’s arguments that successive-cyclic movement targets passive VPs, which in Chomsky’s phase system should be interpreted as indicating that they are phases; see Legate 2003). Then [pictures of *t*] moves to Spec,TP via the Spec of the passive VP phase. Finally, *who* moves to Spec,CP. It remains unclear to us how to rule out this derivation.<sup>7</sup>

The problem with CED effects in a phase-based system is made clear in Ceplova (2001).

In the current theory [Chomsky (2001)], all phase-boundary-inducing heads can have P-features. A head with a P-feature can attract elements with unsatisfied uninterpretable features to its specifier, with the result that the P-feature is checked by the attractee, and the attractee is in a position from which it can move further to satisfy its uninterpretable

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<sup>6</sup> Chomsky (2005) provides data like (i) to argue that no CED effects obtain in (4), and goes on to develop an intricate account of how to predict when such CED effects arise.

(i) It was the car (not the truck) of which the driver was found.

We will not review Chomsky’s elaborate discussion here, as it seems to us that Broekhuis (2005) has demonstrated that the facts Chomsky uses are inconclusive. According to Broekhuis, Chomsky’s cases are instances of non-extraction (as indicated by the special focus effect and the lack of P-stranding). Furthermore, Broekhuis has argued in detail that even if the facts in (i) are as Chomsky assumes, his technical implementation is extremely problematic. For additional evidence against extraction out of displaced elements, see Gallego (2005).

<sup>7</sup> Notice that the derivation involves movement of *who* out of an object rather than a subject, hence does not involve a subject condition configuration.

feature (and thus prevent the derivation from crashing). The *problem* that arises by this proposal is that now *nothing should be an island* if all strong phases allow movement out of them (due to P-features). (Ceplova 2001: 2-3; emphasis ours — CB & KKG)

Faced with such a situation, Ceplova (and many others before her; cf. Chomsky 1986b) investigates “a possibility of restricting the distribution of P-features that depends on structural position of the category, a possibility reminiscent of L-marking in Chomsky (1986[b])”. We need not go into the details of her proposal, since it is just one variation of the same theme,<sup>8</sup> and details are available in Chomsky (1986a). So, locality doesn’t offer any argument for phases.<sup>9</sup> Not surprisingly, even people who assume some notion of phase argue it has nothing to do with locality (see e.g. Bošković 2005, Fox & Pesetsky 2005; see also Boeckx 2005b, Jeong, in progress).

To conclude, none of the motivations for phases follow. And the alleged advantages appear to be at variance with phases.

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<sup>8</sup> There appears to be a deep problem with the theme itself. Paul Postal observes that,

while there is far from agreement on what principles separate islands from non-islands, the many partially diverse approaches share a key property [...]: constituents are in effect taken to be *non-islands by default*. The problem for theory construction then reduces to a search for principles assigning *some* constituents to the island category [...]. (Postal 1997: 5, original emphasis)

Postal points out that taking elements to be non-islands by default may just be the wrong perspective if one aims at a natural characterization of islandhood. This is in essence Cinque’s (1978) proposal that constituents are taken to be *islands by default*, and that a special clause needs to be added to let extraction take place in a minimal set of cases. See Boeckx (2005b) for extensive discussion.

<sup>9</sup> Another problem for phases in the context of locality arises in cases offered as evidence for phases. Chomsky proposed a phase-based locality on the basis of sentences like (i):

(i) What did John [ *t<sub>what</sub>* [ *t<sub>John</sub>* buy *t<sub>what</sub>* ] ]?

At issue is the intermediate trace of *what*: why doesn’t it block the relation between *John* and T?

If locality were checked at each stage of the derivation (call this cyclic locality), blocking should take place. Chomsky (2001) suggested a different approach. According to him, movement can violate minimality, as long as the violation is hidden or repaired at the phase-level at which locality is checked. In particular, Chomsky proposed that locality is checked at the C-phase. At that stage, *what* in (i) has raised to Spec,CP. Since Chomsky assumes that traces are invisible for purposes of attraction/matching, they don’t block. So, at the CP-level, there is nothing relevant between T and *John* — locality is therefore satisfied.

Hiraiwa (2003) notes an inconsistency here. If we say that traces are irrelevant for locality, how can we still evaluate locality after movement has happened? Since Chomsky assumes that locality holds of chains, where the tail of a chain is a trace, how can a chain be evaluated for locality if one of its members is an invisible object?

## 5. More complications with phases

The previous section has argued that it is not so easy to motivate the need for phases. This section goes on to argue that, even if we can motivate the need for phases, it is less clear that one can motivate their properties in a non-arbitrary fashion, as minimalism would like. The problem here revolves around two related questions:

- (i) What exactly is the identity of phases?
- (ii) What exactly are the properties of phases?

Legate (2002) observes that some of the tests used by Chomsky to justify his characterization of *C* and *v*, to the exclusion of *V* and *T*, as phases fail to make the relevant cuts. In particular, she shows that raising and passive verbs pass three tests for phasehood the same way transitive verbs do: (i) they show instances of reconstruction of *wh*-phrases at their edge, (ii) they provide a target for QR, and (iii) they license parasitic gaps at their edge. (In addition, Legate shows that passive and raising verbs are as PF-isolable as full-fledged transitive verbs.)

These tests suggest, contra Chomsky's claims, that raising and passive verbs are phases too. To deal with Legate's findings, and while at the same time maintaining that transitive *v* is special, Chomsky (2001) makes a distinction between weak phases (raising/passive verbs) and strong phases (his original phases, *C* and *v*). As far as we can tell, this distinction plays no role in the theory, except that it restricts phase properties to strong phases. Weak phases act as if they weren't phases, in particular, they don't count as domains for the application of Spell-Out or PIC.

Bošković (2002) also notes that PF-isolability is problematic as a criterion for phases.<sup>10</sup> As the following right-node raising examples show, TP appears to be PF-isolable, hence, by that test, counts as a phase.

- (5) John believes that and Peter claims that – Mary will get a job.
- (6) I know when, but I don't know where – Amanda met Steve.

Matushansky (2004) casts further doubt on Chomsky's tests for phasehood by looking at the behavior of DPs. She shows on the basis of PF-diagnostics that DPs count as phases, but by LF- (and purely syntactic) diagnostics, they don't. Moreover, and not surprisingly, several authors have explored the claim that the identity of phases may be parametrized

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<sup>10</sup> See also Ko (2005: chap. 2, appendix) for arguments that phases do not provide the right units for linearization.

across languages (Gallego 2004, building on work by Uriagereka 1999b) or that some domains may count as phases for LF but not for PF, or vice versa (Marušič 2005).

Chomsky (2000: 107-108) also argues that phases can be identified because they are isolable at the interfaces.<sup>11</sup> But it is not clear why that it so. As Grohmann (2000, 2003a), Abels (2003), and Epstein (to appear) have independently noted, (strong) phases shouldn't be isolable at the interfaces if the mechanism of Spell-Out/Transfer assumed by Chomsky (2001, 2004a) is correct. According to Chomsky, once a phase is completed, its complement domain is transferred to the interface and frozen syntactically via PIC (but see Grohmann, to appear for an alternative take on Spell-Out/Transfer). If so, the edge (i.e. the head with all specifiers and adjuncts) and the complement of a phase are spelled out at different times! In other words, complements of phases should be isolable units at the sound and meaning sides.

In addition, Epstein (to appear: 12) also notes that the specification of a phase as having “*full* argument structure” (the term used by Epstein as introduced in Chomsky 2004a, original emphasis) cannot mean that all relevant  $\theta$ -roles are in fact discharged. This would have the unintended result that raising TPs as well as passive and unaccusative *v*Ps, for example, are phases, since all  $\theta$ -roles associated with the head *are* discharged. “So, full argument structure must be a *translexical* notion” (Epstein, to appear: 12, original emphasis), clearly an undesirable conclusion.<sup>12</sup>

The upshot is that Chomsky's characterization of C and *v* as phases does not receive independent support from interface diagnostics, and boils down to a stipulation. A similar conclusion obtains when it comes to properties of phases: why is the edge accessible, where does the EPP come from, what is being spelled out, etc.?

Perhaps all those problems will go away and, as a reviewer feared, our article will have a short shelf-life, but these are actually persistent problems. It should be obvious to anyone who knows the history of the field that phases are in many ways reincarnations of bounding nodes and barriers. For example, in both a phase-based system and in *Barriers*, an element can be both inside and outside a given domain (defined in terms of barrier or phase). Barriers and phases are notions that inherently trap elements inside them; they impose a very strict locality on syntactic computation. But in both systems there exists a possibility of

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<sup>11</sup> A reviewer complains that we don't define isolable. We agree with him, but it's a problem for Chomsky, not for us.

<sup>12</sup> Epstein introduces this notion to express that one can't just look at the verb in the sentence to know whether it is a *v*-phase or not — one has to look at the entire verbal paradigm (hence, *trans*-lexical): for example,

in executing the derivation of passive, I look up the lexical entry of the active form, notice that the passive form has morphologically reduced theta assigning properties (contra Baker, Johnson, and Roberts 1989) as compared to active, then return to passive, categorize it as *not* full argument structure, and then assign (somehow) *no separate array* for this not-yet-constructed construction. (Epstein, to appear: 12, slightly modified — CB & KKG)

circumventing this locality by adjoining to a barrier-projection — or moving to an additional specifier slot created by the phase-head (the generalized EPP-feature). In both cases, this additional adjunction/specifier position extends the syntactic life of a moving element. In *Barriers* (Chomsky 1986a: 6-7), this was justified by redefining adjunction in the light of May's (1985) discussion on scope and *wh*/quantifier-interactions, and also based on Koopman & Sportiche's (1982) arguments from quantifier raising.

Another, related parallelism between barriers and phases touches on the notion of successive-cyclic movement. If there is no phase (boundary) intervening between extraction site and landing site, there is no need for an intermediate touch-down. Movement can take place in one fell swoop. The same holds for the *Barriers*-framework, where clause-internal *wh*-movement of an object, for example, had to adjoin to VP (a barrier) prior to moving to Spec,CP, while a VP-adjoined adverbial or the subject (from then Spec,IP) were free to move in one go.

For illustration, the derivations for *Who did John kiss?* and *How did John kiss Mary?* in the two frameworks are provided below, indicating the parallelism between the barrier-defined framework (7a, 8a) and the phase-based system (7b, 8b).<sup>13</sup>

- (7) a. [CP who<sub>i</sub> did-C [IP John<sub>k</sub> I [vP t<sub>i</sub> [VP t<sub>k</sub> [VP kiss t<sub>i</sub> ] ] ] ] ]  
 b. [CP who<sub>i</sub> did-C [TP John<sub>k</sub> T [vP t<sub>i</sub> [vP t<sub>k</sub> v [VP kiss t<sub>i</sub> ] ] ] ] ]
- (8) a. [CP how<sub>i</sub> did-C [IP John<sub>k</sub> I [vP [VP t<sub>k</sub> [VP kiss Mary ] ] t<sub>i</sub> ] ] ]  
 b. [CP how<sub>i</sub> did-C [TP John<sub>k</sub> T [vP [vP t<sub>k</sub> v [VP kiss Mary ] ] t<sub>i</sub> ] ] ]

A third parallelism concerns the choice of barriers or phase heads. In both approaches, the relevant natural barriers/phase heads are C and *v* (topmost V in *Barriers*). In *Barriers*, IP is defined as a “defective” projection (Chomsky 1986a: 15): it is not an inherent barrier and can only become one by inheritance. The same is true of the phase-based approach: T (I) is not a phase-inducing head and in this sense defective. In other words, in both approaches, TP (IP) is special.

Yet another parallelism comes from the fact that, although in both *Barriers* and recent phase-work Chomsky restricts his attention to clausal properties, Chomsky (1986a: 80) opens the door for other barriers, such as AP. Incidentally, while painting a “simple” picture in which *v* and C are the only (strong) phase-inducing heads, Chomsky (2001, 2004b) alludes to the possibility that other heads may be phasal as well, such as D or P, and is even more

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<sup>13</sup> The *Barriers*-derivations are modeled on the discussions on p. 29 and p. 19 of Chomsky (1986a), respectively. For simplicity, we indicate all lower copies/traces as *t* and indicate the predicate-internal subject in Spec,vP in representations of the barrier-defined framework as well.

explicit concerning D in Chomsky (2005).<sup>14</sup>

It can in fact be argued that the notion of phase reinstates the notion “Complete Functional Complex,” the part of the derivation in which “all functional roles [are] satisfied” (Chomsky 1986a: 15). For example, for Chomsky (2000),  $\nu$  counts as a phase by virtue of being the domain where all theta-roles are assigned.<sup>15</sup>

Regarding locality, Chomsky (1986a) assumed two types: *barriers* (boiling down to subjacency: in the ideal case, movement does not cross any bounding node, or barrier) and *minimality* (a closer governor takes preference over a potential governor further away). The latter condition was then relativized by Rizzi (1990), and relativized minimality has enjoyed tremendous acceptance all the way to the current minimalist approach(es). In fact, up to Chomsky (2000), this was the only valid or relevant condition on locality, usually taken to be some form of closest movement (Shortest Move of Chomsky 1993, Minimal Link Condition and Attract Closest of Chomsky 1995). However, as we have seen, PIC imposed on phases now offers an approach to CED phenomena (see Chomsky 2004a).<sup>16</sup> As Norbert Hornstein has pointed out to us (personal communication), phases in this respect look more like rigid bounding nodes than barriers, which could acquire their ‘bounding node’ status in the course of the derivation. (For recent work that suggests that phase-hood may also be determined, at least in part, derivationally, see Bobaljik and Wurmbrand (in press) and Gallego (2005).)

Let us also mention that the major condition on phases, PIC, has its antecedents. As Abels (2003) correctly points out, the following two definitions show that the current version of PIC is essentially a modern restatement of van Riemsdijk’s (1978) Head Constraint.

(9) *Phase Impenetrability Condition* (Chomsky 2000: 108)

In phase  $\alpha$  with head H, the domain of H [= complement of H] is not accessible to operations outside  $\alpha$  [= HP], but only H and its edge [= H plus any/all of its specifiers].

(10) *Head Constraint* (van Riemsdijk 1978: 169)

No rule may involve  $X_i$  ( $X_j$ ) and Y in the structure ...  $X_i$  ... [ $_{\alpha}$  ... Y ... ] ...  $X_j$  ... if Y is c-commanded by the head of  $\alpha$ ;  $\alpha$  ranges over  $V''$ ,  $N''$ ,  $A''$ ,  $P''$ .

The above parallelism establishes a close connection between phases and barriers (which need not be perfect parallelism, as a reviewer notes). Such a connection indicates that phases are not a new tool in linguistic theory. This in and of itself is not a bad thing, but as

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<sup>14</sup> Recent work has explored this possibility systematically; see e.g. Abels (2003), Svenonius (2004), and Lee-Schoenfeld (2005).

<sup>15</sup> Recent work has explored the possibility of a phase being the domain in which all relevant features have been checked (Felser 2003, Svenonius 2004).

<sup>16</sup> See Ochi (1999) for an argument for a dual notion of locality.

we noted in the introduction, if it doesn't bring better understanding or empirical pay-offs, it becomes worrisome. And it is quite clear from the above discussion that many properties of phases are arbitrary. Phases do not refine barriers or bounding nodes, they simply restate them. For instance, Lightfoot and Weinberg (1988) criticize Chomsky's (1986a) mechanism of adjunction to void or escape barrierhood as a stipulation (see also van de Koot 1989). This point certainly carries over to the use of EPP-features in a phase-based theory. Certainly in a minimalist setting, the existence of indirect feature-driven movement clashes with the general tendency to reduce look-ahead and enforce Last Resort on syntactic processes locally.

## 6. Conclusion

Just like Sportiche (1990/1998: 6) said that his study “grew out of a certain dissatisfaction with the particular form that the *Barriers*-theory took in Chomsky (1986a), which was itself an attempt to synthesize a variety of attempts to derive the constraints on movement,” our article can also be seen as the result of a certain dissatisfaction with the *particular form* of current locality theory, viz. its phase-based implementation.

We do not have a comprehensive alternative to offer at this point, and, as we already stressed, we do not want to reject the intuition behind phases that focuses on computational complexity. We agree that a strongly cyclic derivation alleviates the complexity burden on the computational system, and we hope that this contribution will encourage researchers to develop alternative ways of cashing out this intuition.

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