

Chapter 11

ON THE EDGE*

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1. Introduction

The notion that syntactic derivations are cyclic has a long history in generative grammar. The most recent incarnation of this idea is the notion of phase developed in Chomsky (2000, 2001b,a) and related work. That model postulates an ‘edge’ of each phase as central in the determination of the locality of movement.

In this paper I examine some different variants of the model, focusing especially on the edge and its role in determining locality. I suggest an extension of this model to the noun phrase, focusing on the ban on improper movement (movement from A-bar positions to A-positions). The basic idea developed is that the clausal projections Top, C, T, and v are closely related to nominal projections Op, Q, K, and *n*. These projections are organized in a strict hierarchy. A-movement is attraction of relatively low features, for example, attraction of K by T, and A-bar movement is attraction of relatively high features, for example Q-attraction by C. In phase theory, a lower phase becomes opaque to outside operations at a certain point in the derivation. I suggest that this kind of opacity has the effect, in the noun phrase, of making lower features inaccessible to outside attraction, yielding the effect that improper movement is disallowed.

I apply the model to some recent analyses of natural language phenomena which bear on the issue of phases and their edges, and discuss their ramifications. I focus especially on a few cases where phase boundaries seem not to be respected: for movement across v in Dyirbal and Tagalog (section 6.1), long-

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distance agreement across *v* in Icelandic (section 6.2), agreement across *C* in Tsez and Innu-aimûn (section 7.1), and movement across CP in Japanese (section 7.2). I suggest that phase boundaries are present in each case, and that the different languages employ different strategies to get features and constituents over the edge.

2. The cycle and locality: Background

In this section I briefly examine the motivations and background for the cycle in linguistic theory and its relationship to locality (for a more detailed examination, see Freidin 1999). The cycle was originally postulated in phonology to account for word stress (Chomsky et al. 1956) and has been extended to various phenomena there, in many cases as a limitation on rule ordering (cf. Cole 1995).

The introduction of the cycle into syntax made it possible for the rules of the base (basically phrase-structure rules) to create recursive structures without the need for generalized transformations to embed clauses (see for example Chomsky 1965:134-135). At this stage the cycle placed no limits on the locality of movement, but rather ensured that rules applied to embedded domains before they applied to superordinate ones. The Strict Cycle Condition (SCC), stated in (1), does not prevent long movement, but prevents movement in a lower domain after a higher domain has been accessed.

- (1) “No rule can apply to a domain dominated by a cyclic node *A* in such a way as to affect solely a proper subdomain of *A* dominated by a node *B* which is also a cyclic node” (Chomsky 1973:243)

The SCC in (1) prevents, for example, *wh*-movement from escaping *wh*-islands through the derivation sketched in (2a-c), a possibility which would lead to the degraded sentence in (2d).

- (2) a. [_A the election officials know [_B to place who where on the ballot]]
 b. [_A **who** do the election officials know [_B to place _ where on the ballot]]
 c. [_A who do the election officials know [_B **where** to place _ _ on the ballot]]
 d. ??Who do the election officials know where to place on the ballot?

In step (2b), a *wh*-expression is moved to the front of the cyclic domain labeled *A*. The step in (2c) occurs after (2b), and so violates (1) because it affects only the cyclic domain labeled *B* (trace theory provides an alternative account for this early argument for the SCC; see Freidin 1978).

The relationship of the cycle to locality was mainly indirect, in that rules like Subadjacency, stated in (3), referred to cyclic nodes (at first *S*, then later also *NP*).

- (3) a. No rule can involve X, Y, X superior to Y, if Y is not subjacent to X
 b. Y is “subjacent” to X if there is at most one cyclic category C $\neq$ Y such that C contains Y and does not contain X (Chomsky 1973:247-248)

The chief result of (3) is that movement can cross only one cyclic node at a time, forcing successive-cyclic movement (i.e. multiple clauses are crossed in multiple steps). However, Subjacency is conceptually disconnected from the original formulation of the cycle. The domains referred to in (1) and (3) could just as easily be different from each other. Consider, for example, the Extension Condition (Chomsky 1993:22), which states that tree-building operations apply only to the edge of a derivation. This means that in effect, every node is a cyclic node in the sense of (1), for the purposes of movement.¹ Agreement does not build trees, but the version of the Extension Condition proposed in Chomsky (1995) (what Richards 1999 calls Featural Cyclicity) requires that strong features be checked before being embedded in a larger structure, as stated in (4).

- (4) D [a derivation] is canceled if α [a node with a strong feature] is in a category not headed by α (Chomsky 1995:233-234)

This means that for strong features, every maximal projection is a cyclic node for the purposes of (1), but this is not usually assumed for (3); for example, (4) prevents a subject from moving to [Spec,TP] after the merging of a complementizer as ‘countercyclic.’ This blocks, for example, the bad sentence in (5f) from being derived as shown in (5a–e).

- (5) a. [_{VP} was [_{VP} taken a picture of who]]
 b. [_{TP} T [_{VP} was [_{VP} taken a picture of who]]]
 c. [_{CP} C [_{TP} T [_{VP} was [_{VP} taken a picture of who]]]]
 d. [_{CP} **who** C [_{TP} T [_{VP} was [_{VP} taken a picture of _]]]]
 e. [_{CP} who was [_{TP} **a picture of** _ T [_{VP} _ [_{VP} taken _]]]]
 f. *Who was a picture of taken?

Note that the SCC only blocks (5) if TP and CP count as distinct cyclic nodes (contrary to the assumptions of the seventies and eighties). Describing (5) in terms of (1), CP would be A, TP would be B, and the attraction of the DP *a picture of* _ by a strong feature on T would be the rule to be blocked (see Freidin 1999 for discussion of the status of this argument given a copy theory of movement).

¹Cf. also the commentary and refinements in Kitahara (1997) and Freidin (1999).

However, even with these assumptions, (3) is not updated to prevent movement to [Spec,CP] of a *wh*-expression from the verb phrase, crossing TP altogether (stated in terms of (3), the *wh*-complementizer would be X, the *wh*-expression targeted by that complementizer for movement would be Y, and a VP headed by an auxiliary would not count as a cyclic category C which, alongside TP, could block movement under (3)).

Subadjacency and other notions of barriers to movement have figured into explanations for a wide range of island phenomena, though the precise formulations have varied substantially from one analysis to the next (compare the definitions and roles of Subadjacency in Chomsky (1986a); Rizzi (1990); Cinque (1990), and Manzini (1992), for example). Increasingly through the nineties, the burden of explanation for locality shifted away from Barriers-type notions (Chomsky 1986a) toward Relativized Minimality (Rizzi 1990) and intervention effects, whereby α and γ do not enter into a relation across β , if β is too similar to them. This manifested itself, for example, in the Minimal Link Condition (Chomsky and Lasnik 1993) and later in Attract Closest (Chomsky 1995); essentially, in [$\alpha \dots \beta \dots \gamma$], α attracts the closest element of the right sort; if β is the right sort, then α cannot attract γ (see e.g. Starke 2001 and Sabel 2002 for discussions of locality in a Minimalist model). A significant challenge on such approaches is the proper characterization of the features relevant for determining intervention (i.e. what makes β and γ ‘similar’ for the purposes of attraction by α). The relevance of the cycle is quite indirect.

I argue below that the phase reintroduces a notion of cyclicity more like that embodied in the SCC of (1), and that it furthermore induces a brand of locality, in conjunction with the minimality-type conditions just discussed.

3. Phases

Chomsky (2000) presents new arguments for the existence of a cycle, called the phase, which is larger than that entailed by the Featural Cyclicity of (4). (Chomsky distinguishes between strong and weak phases, but I will only discuss strong phases here and so will use the term phase to mean strong phase.) As with the cycle of the seventies, the phase is conceived in a derivational model, and is a unit relevant to syntactic movement. However, there are two new aspects of the phase as well; one is the cyclicity of lexical access (Chomsky 2000:100-101) and the other is the cyclicity of the interfaces (cyclic Spell-Out; Chomsky 2000; Uriagereka 1999; Platzack 2000:131). The cyclic access of the PF interface in particular leads to the possibility of unifying the phonological and syntactic cycles; if Spell-Out is involved in associating phonological content with syntactic nodes, then the syntactic constituent which is the domain of such phenomena as successive-cyclic movement will also be a phonological constituent of a certain type (work on sentence prosody has long recognized

that prosodic constituents tend to also be syntactic ones; but most such work has ignored the special significance of syntactically cyclic nodes, a notable exception being Bresnan 1971).

It is widely recognized that the edges of CP represent prosodic boundaries, and that CP also provides a landing site for successive-cyclic movement; thus the brackets in (6) represent major prosodic boundaries, and the underlines traces of movement.

- (6) a. Anders didn't say [where he caught the fish _]
 b. Where did Anders say [_ that he caught the fish _]?

According to Chomsky (2000), vP is also a phase. Fox (2000) argues on the basis of carefully constructed sentences that there is a reconstruction site at the left edge of vP.

- (7) a. Which of the papers that he₁ wrote for Ms. Brown₂ did every student₁ get her₂ to grade _?
 b.*?Every student₁ got her₂ to grade the first paper that he₁ wrote for Ms. Brown₂.
 c. [_{TP} every student₁ did [_{vP} which of the papers that he₁ wrote for Ms. Brown₂ [_{vP} get her₂ to grade _]]]

The observation is that (7a) is perfectly good on a reading where the first pronoun is bound by the quantified subject and the second pronoun is coreferent with the name in the relative clause, as indicated by the coindexing. However, the surface structure in (7a) violates the c-command requirement on binding of pronouns, suggesting that the wh-expression must be reconstructed for interpretation. Reconstruction to the origin site, marked with an underline, should create a Principle C violation of the type seen in (7b), suggesting that there must be another reconstruction site between the quantified subject and the pronominal object, as depicted in (7c).

Legate (to appear) points out that vPs headed by passive verbs show the same effects. I illustrate with a pair of sentences from Norwegian.²

- (8) a. Hvilken av oppgavene som han skrev for Frøken Olsen
 which of the.assignments as he₁ wrote for Miss Olsen₂
 har hver elev blitt bedt av henne om å skrive om?
 has every student₁ become asked of her₂ about to write over
 (Norwegian)
 'Which of the assignments that he wrote for Ms. Olsen has every student been asked by her to write over?'

²See Holmberg 2002; Svenonius 2001a for discussion of whether passive v in Scandinavian is a phase head.

- b. Hvilken av oppgavene som han skrev for Frøken Olsen har
 which of the.assignments as he₁ wrote for Miss Olsen₂ has
 hver elev syntes henne å være fornøyd med?
 every student₁ seemed her₂ to be satisfied with
 ‘Which of the assignments that he wrote for Ms. Olsen has every
 student seemed to her to be satisfied with?’

If the quantified subject were to raise out of TP at LF, then the reconstruction sites in (7–8) could be higher up after all. However, even when QR is controlled for, edge effects can be detected. Sauerland (2003) demonstrates that there is a reconstruction site for A-movement at the edge of vP, below negation in (9) (on the ‘not every’ reading, which may require a special intonation).

- (9) Every child₁ doesn’t [_{VP} – seem to his₁ father to be smart].

Thus, it seems that both A and A-bar movement must stop at the edge of each verb phrase it crosses, whether that verb phrase be headed by a transitive, passive, or raising verb.

4. Over the edge

There are at present several different notions of phase, each with different ramifications for the nature of the edge. In discussing them, several different concepts must be kept distinct; first, there is the constituent which spells out, and becomes opaque for further operations. Sometimes this is taken to be CP and vP (Chomsky 2001b) and sometimes TP and VP (see below). I will restrict the term phase for whatever constituent spells out. Second, there is the nature of the ‘escape hatch’ for movement. Sometimes this is assumed to be part of what is spelled out. I will keep to the conceptually simpler assumption that everything in what is spelled out is opaque, and that the only features that can be attracted or agreed with in a spelled out phase are those at the top of the phase itself, i.e. the features of the head (this allows phases themselves to be moved, even after they have spelled out).

If a phase is opaque after Spell-Out, then in order for an XP to leave a phase, the phase must not spell out as soon as it is built, but only after a certain delay, long enough for the merger of heads with features that can extract XP out of the phase. A straightforward assumption is that a phase is spelled out when all uninterpretable features on its head are checked. For example, if a phase head H has uninterpretable features then HP will not have a coherent interpretation at one or the other interface. Assume that some higher head Z merges and values those features, allowing HP to be spelled out; call Z the trigger. If the trigger also has features that attract XP out of HP, then by assumption this occurs simultaneously with the checking of features on HP, and extraction is possible.

Formally, H has $u\alpha$ (uninterpretable α features) and Z has $i\alpha$ (interpretable α features), and feature valuation can occur downwards by the operation Agree. If only uninterpretable features can be probes, then valuation does not occur downwards, except when parasitic on upward valuation, and α must be bundled with another feature that goes in the opposite direction: H has $\{u\alpha, i\beta\}$ and Z has $\{i\alpha, u\beta\}$. The uninterpretable feature on Z allows it to probe to H. The features match and valuation occurs in both directions.

If phase heads are triggers for the Spell-Out of phases, then Subjacency is derived. To see this, consider (10) on the next page. At each step, the underlined portion is that which is accessible to the highest head. In (10c), C is merged. Material in TP, vP, and VP are accessible to it. It is the trigger for vP, so vP spells out. As a result, vP is opaque in (10d).

This is exactly the degree of locality encapsulated in Subjacency (cf. (3)), modulo the category of the cyclic node. An XP could cross one phasal boundary, in (10c), directly from VP to [Spec,CP], but not two; in order to get into [Spec,CP] of the higher clause, it would have to move first into the higher V domain in (10d) or into the higher v domain in (10e), before the lower CP spells out. However, this model does not predict the edge effects noted in section 3, because XP can move straight from VP to CP without stopping at vP.

On another popular conception of phases, the phases which spell out are TP and VP, and the triggers are the heads which select them, C and v, respectively (Nissenbaum 2000; Chomsky 2001a). This creates a narrow 'edge' at v and another at C. To see this, consider (11) on the following page.

Here all movement escaping the lower VP must first move to [Spec,vP], because by the time T is merged, VP is already spelled out, as in (11b). Similarly, movement out of CP necessarily passes through [Spec,CP], cf. (11d). For this reason, the specifiers of v and C are known as the 'edge,' on this model (along with the heads of v and C, assuming that head movement is also an option).

There are various other possibilities. For example, the identity of CP and vP as phases (from the model in (10)) can be combined with the idea that there is a narrow edge space for escape (from the model in (11)), by assuming additional heads. A simple example is sketched in (12) on the next page. The trigger for Spell-Out of vP is an Aspectual head Asp, and the trigger for Spell-Out of CP is a topical head Top. Then the edges are the specifier or specifiers of Asp and Top.

[Spec,vP] and [Spec,CP] here are not edges; they are accessible to everything that VP and TP are accessible to, respectively. It is Asp and Top which determine the edge. In order to distinguish the edge from the space between edges, we might call the space between the ‘Mittelfelt.’

If more functional heads are countenanced (cf. Cinque 1999; Rizzi 1997), the geometry of phases is straightforward: the edge of a phase HP consists of the specifiers (and head) of the trigger for Spell-Out of HP, again here called Z, plus the specifiers of whatever heads lie between Z and HP. The *Phase Impenetrability Condition* can be stated as in (13) (compare Chomsky 2001b:14; Chomsky 2001a:5).³

- (13) Material in HP is not accessible to features beyond Z; only H and its edge are.

The Mittelfelt is the area between phase boundaries. In model (10), there is no distinction between the edge and the Mittelfelt but in (12) there is. If, say, a Negation head were added to (12) below T, or if a Modality head were added above T, they would be in the Mittelfelt. But if a Finite head were added above C, it would be part of the edge, because C defines the phase and Top is the trigger for Spell-Out of C.

5. Phases in the DP

Parallels between clausal and nominal structure have long been noted (cf. e.g. Chomsky 1970; Abney 1987), and the functional structure in the noun phrase appears to be quite rich (cf. e.g. Vangsnes 1999; Zamparelli 2000; Julien 2002; Borer in press, etc.). I will assume that there are at least two phase heads in the DP, corresponding to C and v. I will furthermore assume that the triggers for these heads are features on higher heads, as in the clause. Simplifying slightly, when a trigger is merged, the phase spells out. The phase can still be attracted or agreed with (recall that the label of a phase is visible even after it has spelled out), but nothing inside it can be.⁴

Assuming that A-type attractors (driving e.g. movement to case positions, or to the subject position) attract features within a lower phase, while A-bar-type

³Chomsky (2001b:14): “The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations.”

Chomsky (2001a:5): “The domain of H is not accessible to operations, but only the edge of HP.”

⁴There are some difficult questions regarding pied-piping which I must unfortunately set aside. In brief, pied-piping of a higher XP by an embedded QP may involve non-phasal XP (e.g. PP might not be a phase in *to whom*), or movement of QP to a specifier outside phasal XP (e.g. in *whose promotion* or *how big a problem*), but sometimes neither of these seem to apply (e.g. in *a person every picture of whom I’ve seen is beautiful*, but cf. Kayne (1994) for a compatible analysis of relative clauses).

attractors operate on features in a higher phase, the ban on improper movement is derived immediately (as diagnosed, e.g. by binding of anaphors).

The geometry of the clausal and nominal phases, on the simple model in (10), could be as in (14), with brackets indicating Spell-Out phases and asterisks marking triggers.

- (14) $C^* \text{---}[T \text{---} v^* \text{---}[V$
 $Q^* \text{---}[K \text{---} n^* \text{---}[N$

Just as non-finite clauses might lack some of the upper projections, ‘weak’ interpretation and predicative noun phrases might lack some of the upper nominal projections.

On the more complex model in (12) there would be additional projections in the Mittelfeld, at least, giving an expansion something like the following (Borer’s in press ‘Quantity’ and ‘Classifier’ heads in the noun phrase might be models for Num and *n*, respectively):

- (15) $Top^* \text{---}[C \text{---} T \text{---} Asp^* \text{---}[v \text{---} V$
 $Op^* \text{---}[Q \text{---} K \text{---} Num^* \text{---}[n \text{---} N$

In (15), *K* is not a trigger for Spell-Out, but it dominates one. If all projections are always present, then presence of *K* implies that *nP* is spelled out.

A slight variant would be that rather than there being *Op* and *Num* projections, the triggers for *Q* and *n* are *Top* and *Asp* respectively; that is, the clausal triggers also trigger Spell-Out of nominal projections.

5.1 Case

The label ‘*K*’ above is taken from an old tradition of postulating a *K*[ase] projection in the noun phrase; however, I am not suggesting that *K* can be straightforwardly identified with case. On a fine-grained feature structure like the one here, it is to be expected that descriptive labels like ‘passive’ and ‘case’ are too coarse; what is identified as a passive morpheme in one language might be a type of *v*, whereas the passive morpheme in another language might be identified with *Asp* (cf. Chomsky 1981:121). Similarly, morphology associated with the descriptive label ‘case’ might reflect features of *Num* (possibly, Icelandic, cf. Svenonius 2002)⁵ or of *K* (especially when linked with specificity, as in Turkish) or even of *Q* (possibly, Japanese). The Case Filter (Rouveret and Vergnaud 1980; Chomsky 1980) would reflect the fact that no features in the space between the two phase boundaries in (15) may be left unvalued.

⁵The plural morpheme would be a realization of *n*, cf. Borer’s (in press) analysis of the English plural as a ‘Classifier.’

5.2 Why A-bar positions do not bind anaphors

The hierarchies in (14) and (15) are speculative, as are the identification of phase heads and triggers. What is important to derive the ban on improper movement is that A-movement attracts something low, while A-bar movement attracts something high, and that the attraction of the high projection leads to the opacity of the low projection.

However, the details need to be attended to carefully. For example, there is nothing in what I have said so far that suggests that QP should spell out when attracted; instead, QP will spell out when Op triggers that event (on the details, see section 5.4). In principle, then, Q-movement of a QP containing a KP might be followed by K-movement of the same constituent (because QP is transparent before Op triggers its Spell-Out). In principle, such movement might lead either to stranding of Q or of pied-piping of QP.

In a similar vein, Op-movement might be followed by Q-movement (because Q remains visible until Op itself spells out). What the model ensures so far is that Op movement cannot be followed by K-movement, or by movement of any category lower than K (a special exception will be examined below). In section 5.3 I examine a further restriction, that would prevent K-attraction of something which had previously been Q-attracted.

A chief diagnostic for the difference between A and A-bar movement is the binding of anaphors; it is generally recognized that arguments in A-positions may bind anaphors, while arguments in A-bar positions may not. Note that this restriction is asymmetrical: anaphors contained in A-bar positions cannot bind, as illustrated in (16a), but they may be bound, as indicated in (16b–c).⁶ In (16b), the anaphor is both within a QP and separated by a CP boundary from its binder, and in (16c), the anaphor must be bound in an intermediate position, for example the edge of the matrix vP or of the embedded CP.

- (16) a. *Who₁ do pictures of himself₁ annoy?
 b. Nobody₁ can guess which picture of herself₁ Bart will like best.
 c. Which picture of herself₁ did nobody₁ think Bart would like best?

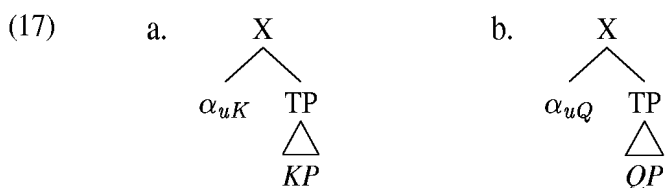
On the model presented here, (16a) suggests that anaphors must be bound by KP, and cannot be bound by a KP which is too deeply embedded. For example, if wh-movement is technically Op-attraction, and the presence of Op triggers

⁶I use quantified subjects to eliminate the possibility of so-called logophoric readings. The following is a context that would make (16b–c) natural. As a gift to Coach Bart on the occasion of his retirement, the soccer team put together a photo album containing one picture of each player on the team. They wanted the pictures to show some variety in their backgrounds, so they took a photo of each player at three different sites (*Labyrinten*, *Stortorget*, and *Fløya*). Each teammate chose the picture of herself that she thought the coach would like best (one could claim (16b)), but there was only limited variety in the end, since the backgrounds showed only two different places (one can ask (16c)).

QP Spell-Out, then K would not be visible from the high position in (16a). Example (16b) suggests, on the other hand, that the referential indices that anaphors offer up for binding are visible even when the anaphors are inside spelled-out phases such as QP and CP. (16c) shows that an anaphor inside a QP can be bound in an intermediate landing site.

5.3 Relativization

More radical relativization is worth exploring: that Num movement cannot follow K-movement, for example; this would derive some of the effects explored by Williams (2003). Substantial locality effects can be derived from a strong identification of the two hierarchies, along lines similar to those pursued in Starke (2001), in which island effects are derived from a featural hierarchy; an attractor for Q might not be able to attract QP across a CP boundary, for example, because Q and C are too similar (in a Relativized Minimality kind of way); nor could an attractor for K attract KP across a TP boundary, as illustrated in (17a), where α is a K-attractor, because TP is closer than KP. Q-attraction would be possible from a TP, as illustrated in (17b).



If Attract Closest is defined so that the specifier of TP is equally close to α as TP itself in (17a) then KP will be extractable just in case it is the specifier of TP. Of course, QP in (17b) will always be visible to α , and might contain KP.

There is reason to think that the attractors in the various clausal heads are typically matched to the corresponding nominal heads.⁷ For example, V might attract N (restrictive incorporation), *v* might attract *n* (possibly, argument-saturating incorporation of the type discussed in Chung and Ladusaw in press), Asp might attract Num (object shift, QR; cf. Svenonius 2000), T might attract K (EPP-type movement to subject position), C attracts Q (wh-movement), and Top attracts Op (operator and topic movement). Since each of these types of movement is absent in some languages, an obvious point of cross-linguistic variation would be whether there are movement-inducing features at all at each level.

In section 6 I discuss successive-cyclic movement, which shows that Q features must be available in Asp in some languages (whereas if the match of

⁷Cf. Haeblerli's (1999) idea that N is checked by V, and D by T, driving object shift and scrambling of DP, but allowing NP to be licensed in VP.

hierarchies were perfect, we would expect Asp to have only Num features). This might indicate that Q and Num share some important properties, or it might be because higher-level features are generally available on edge heads.

In general it is easy to find examples of ‘high’ level extraction out of ‘low’ level constituents (e.g. QP out of vP) but very hard to find examples of ‘low’ level extraction out of ‘high’ level constituents (e.g. nP out of CP; long-distance movement normally seems to be at least QP-like). Thus it is tempting to assume that it is banned altogether. I discuss some problematic cases in section 7, but until then will assume (18).

- (18) α enters into agree relations with β iff α and β have features of type f and there is no closer γ with type f features (closer: γ c-commands β but not α).

On the assumption that K features are of the same type as T features and so on, (18) derives a great number of locality effects, as noted, reducing the importance of the phase; for example, it can even prevent improper movement (depending on the definition of closeness and certain other assumptions). However, it does not predict, for example, the vP edge effects noted in section 3, and so does not replace the phase entirely.

5.4 Can an operator ever occupy an argument position?

An important question of implementation arises, on the model being sketched here. If a complete noun phrase with Op at the top (i.e. [_{OpP} Op [_{QP} Q [_{KP} etc.]]] as in (15)) were constructed and merged as the complement of V, for example, then no A-movement could occur out of VP, given what I have said so far. A simple solution provided by the feature checking system outlined in the previous section is to say that the uninterpretable features on the phase heads are not satisfied by the triggers themselves, but by features that are checked on the triggers by clausal heads. For example (drawing here on the feature-checking mechanisms adopted in Chomsky 2001b; Pesetsky and Torrego 2001; Frampton and Gutmann 2001), say that the trigger Num in the structure merged with V has trigger features which are uninterpretable until they are valued by a higher clausal head (e.g. Asp), so that Num does not function as a trigger until it is checked by Asp.⁸ In this way, a noun phrase as large as a full OpP could be merged quite low without any of its parts spelling out too early to be

⁸E.g. assume that n has $\{u_{Asp}\}$ while Num has $\{u_{Asp}, i_{Num}\}$. Num probes to n and the Asp features match, but neither Asp feature is valued (because Asp features are u , uninterpretable, in both places). When Asp is merged along the clausal projection, it has $\{i_{Asp}, u_{Num}\}$. It probes for Num, matching with it, at which point the Asp features on both Num and n are valued. Since n is a phase head and is now fully valued, nP spells out.

attracted by higher structure, as long as its Op features were uninterpretable and insufficient to trigger Spell-Out of QP.

More radical solutions are also possible, along lines suggested by Sportiche (2002) (an oral presentation). On this idea, the higher functional projections in the noun phrase would not be introduced in the VP, but would be introduced as the noun phrase moved up into the higher structure. This requires a non-standard version of Merge (e.g. allowing violations of the extension condition) or complicated remnant movement, but has the advantage that it makes strong predictions about the possibilities of reconstruction (a problem explored in Williams 2003). For example, if a quantifier representing the Num projection is introduced only outside VP, then it will not be able to reconstruct into VP. If a *wh*-operator is introduced in the CP domain, it will be interpreted there, and will not be able to reconstruct along with the rest of the noun phrase down into the TP.

Note that if Merge can insert material into phases without extending them (i.e. abandoning the Extension Condition), then the phase is the only guarantor of cyclicity (cf. section 2) and a certain redundancy is eliminated.

In the rest of this chapter I will explore issues of locality and not reconstruction, and the choice between the simple feature-valuing model and the radical model will not generally be important; I will simply assume that higher projections of the nominal domain are either inert or absent until features on them are checked. In section 8 I present a specific proposal regarding how this occurs. For purposes of exposition, I will also usually lump K and Num ('Quantity,' including various quantifiers) together as in (14). These can be distinguished from Q because Q is still visible after Op has triggered its Spell-Out, whereas both Num and K become invisible to outside agreement or attraction at that point.

6. The interaction of nominal and clausal phases at the vP edge

Summarizing the assumptions so far, I will assume that movement out of a phase is always via the edge; I will distinguish between Q-attractors (e.g. C) triggering A-bar-type movement (Q-movement) and K-attractors (e.g. T) triggering A-type movement (K-movement). QP spells out when its Op features are valued, which typically happens when Top is merged. Root sentences spell out with their topics, so TopP spells out without a trigger, except in exceptional (bridge verb) contexts to be discussed below. By parallelism it is expected that OpP can also spell out, when it has no uninterpretable features.

Once QP is spelled out, it is opaque, and K-attraction can no longer take place. This is the basis for the ban on improper movement.

It was noted above that languages may lack one or more of the various types of attractors. Languages with no K-attractors in Asp, for example, would have no A-movement out of vP, as Baker (1996) suggests is the case for the polysynthetic languages. Languages with no Q-attractors in C would have no wh-movement. This is also attested, e.g. in Chinese.

In order for a language to have successive-cyclic movement across clause boundaries, it must have at least two properties. First, it must have Q-features in Asp. Without Q-features there, QP cannot be attracted out of the embedded CP. With them, QP can be attracted, provided it is not trapped inside TopP. So the second property necessary for successive-cyclic movement is that TopP must not spell out too quickly—the bridge verb phenomenon, which I discuss in section 7. The discussion of Tsez in section 7 shows that these two properties are independent of each other: in Tsez, the Spell-Out of TopP is delayed, but there are no Q-attractors in Asp, so that the transparency of TopP can only be detected by agreement.

6.1 Movement across the vP edge

Dixon (1972:94) demonstrates quite convincingly that the absolutive argument in Dyirbal is syntactically subjectlike and occupies a high position in the tree. I will assume that the absolutive moves to [Spec,TP], while ergative case is assigned vP-internally (cf. Bittner and Hale 1996a,b; Bittner 1994 on Greenlandic). The absolutive argument originates in VP, so this is clearly a case where a VP-internal element moves to the Mittelfeld, as sketched in the gloss.

- (19) bayi yuŋi bangul yaŋangu bagan
[_{TP} there.ABS kangaroo.ABS [_{VP} there.ERG man.ERG [_{VP} spear t₁]]]
'The man speared the kangaroo' (Dyirbal) (Dixon 1972:100(284))

The model adopted here demands that this movement stop off at the edge of AspP, rather than moving directly from vP to TP.

Interestingly, there is some evidence that vP is opaque to extraction. An absolutive can be extracted (presumably from TP), e.g. in relativization, but to extract an ergative, an antipassive must be used (this is not uncommon for ergative languages, cf. (Nakamura 1996)).

- (20) bayi yara bagaljanu bagul
 there.ABS man.ABS spear.ANTIPASS.REL.ABS there.DAT
 yurigu
 kangaroo.DAT
 ‘... the man who speared the kangaroo...’ (Dyirbal)
 (Dixon 1972:101(286))

If the vP were transparent to attractors in the C-domain, it is not clear why an ergative could not be attracted. But if vP is a phase, as assumed here, then the ergative is trapped in [Spec,vP] as soon as AspP merges. A K-attractor in Asp targets the absolutive, pulling it into the edge and making it accessible. The antipassive, then, could be a manifestation of Asp which targets the ergative.⁹

A somewhat similar case is described by Rackowski and Richards (2002) for Tagalog. There, as in Dyirbal, only an element attracted to the phase edge can be wh-moved. Tagalog makes available a rich morphology of ‘passives’ (possibly Asp elements) which target different arguments. Adjuncts, which can be assumed to be generated outside AspP, may move directly to [Spec,CP], but arguments must first be attracted by the appropriate K-attractors in Asp, as illustrated in (21), from Rackowski and Richards (I use their abbreviations and identifications in the glosses; CS is a kind of determiner/case marker and the status of ANG is complex).

- (21) a. Sino ang binigy-an ng lalaki ng bulaklak ? (Tagalog)
 who₁ [ANG gave-DAT₁ CS man CS flower t₁]
 ‘Who did the man give the flower to?’
 b. *Sino ang i-binigay ng lalaki ang bulaklak ?
 who₁ [ANG OBL₂-gave CS man ANG flower₂ t₁]

In (21a), the verb has ‘dative subject’ or ‘dative topic’ morphology (DAT), indicating that the thematic goal has been promoted to subject (I indicate this by coindexing the ‘DAT’ morpheme and the goal in the gloss). Accordingly, extraction is permitted. In (21b), it is ‘the flower’ which is promoted to subject, as indicated by the coindexing, and the goal is not extractable. I assume, then, that there are no Q-attractors in Asp in Tagalog.

Interestingly, Tagalog allows successive-cyclic wh-movement. Assuming that movement to the TopP edge is Op movement, QP should be spelled out and Asp, lacking Q-features, should not be able to attract it, on my assumptions. K-attraction is impossible because QP has spelled out and is opaque.

Tagalog gets around this problem by moving the entire embedded clause to the edge, as indicated by the ‘passive’ morphology. In (22), as Rackowski and Richards show, the verb ‘say’ codes its CP complement as accusative for the purposes of the voice system, while the verb ‘promise’ codes its CP complement as oblique. Dative extraction requires dative agreement in the embedded

⁹A question which arises is how the K-attractor in Asp avoids the defective intervention constraint (i.e. why attraction of the absolutive is not blocked by the ergative). Jelinek and Carnie (2003) argue that in languages which license absolutives in TP, the absolutive is necessarily presuppositional while the ergative is asserted. If we associate presuppositionality with Q, then it is possible that the ergative is not a QP in these languages, rather a KP, while the absolutive is a QP. A Q-attractor in Asp would then ignore the ergative and attract the absolutive. The antipassive could be a K-attractor, attracting the closer ergative and bringing it close enough to T to allow Q-attraction.

clause, as shown, but in each case the higher (bridge) verb obligatorily shows that the CP has been promoted (though the word order does not change). As before, I indicate this by coindexing the argument promoted with the morpheme promoting it.

- (22) a. ang kalabaw na sinabi ng guro na bibigy-
 ANG water.buffalo₁ [that said.ACC₂ CS teacher [CP₂ that will.give-
 an ng lalaki ng bulaklak (Tagalog)
 DAT₁ CS man CS flower t₁]₂]
 ‘the water buffalo that the teacher said that the man would give a
 flower to’
- b. ang kalabaw na i-pinangako ng guro na
 ANG water.buffalo₁ [that OBL₂-promised CS teacher [CP₂ that
 bibigy-an ng lalaki ng bulaklak
 will.give-DAT₁ CS man CS flower t₁]₂]
 ‘the water buffalo that the teacher promised that the man would
 give a flower to’

The derivation must proceed as follows: first, the dative is K-moved to Asp (or Q-moved, cf. fn. 9), as indicated by the morphology, in the lower clause. Then it is Q-moved (or Op-moved) to Top (possibly via C). There must be a bridge-type delay in the Spell-Out of TopP, and the embedded TopP is K-attracted by Asp in the higher clause, again as indicated by the morphology. At this stage, Top or C in the main clause can attract QP or OpP in the specifier of TopP (assuming that specifiers and their mothers are equally close to higher attractors, cf. section 5.3), even though TopP itself is in the specifier of AspP.

6.2 Agreement across the vP edge

The Icelandic agreement system has been studied in more detail over a longer period than any other agreement system in the history of generative grammar (see in particular Sigurðsson 1989, 1991, 1996, 2000 *inter alia*, and references there). The facts are complex, but it is clear that a finite verb outside vP (for example an auxiliary) may agree in number with a nominative argument inside VP, across a ‘strong’ (transitive) v, as in the example in (23) ((23a) from Jónsson 1996:157, (23b) adapted from Holmberg and Hróarsdóttir 2003).

- (23) a. Jóni virðast hafa líkað þessir
 Jón.DAT₁ seem.PL [TP have.INF [vP t₁ like.PTCPL these.NOM
 sokkar.
 socks.NOM]]
 ‘Jon seems to have liked these socks’

- b. Jóni hafa virst hestarnir vera seinir.
 Jón.DAT₁ have.PL [_{VP} seemed t₁ [_{TP} the.horses.NOM be slow]]
 ‘The horses have seemed to Jon to be slow’

In (23a), the dative is the quirky subject of the embedded verb *líka* ‘like,’ which takes a nominative object. At least one vP boundary clearly intervenes between the agreeing verb in the main clause and the nominative. In (23b), the dative is the experiencer argument of the main verb *verða* ‘seem’; the nominative is the subject of a bare infinitival complement (here labeled TP). On the assumptions made in section 3, there is a vP boundary intervening between the agreeing matrix auxiliary and the embedded nominative, as indicated in the gloss.

This appears at first to be a straightforward argument against the phase-based model presented here, but it turns out not to be so straightforward. First, note that long-distance agreement is in number only, never in person, while in local agreement¹⁰ the finite verb obligatorily inflects in person as well as number, as illustrated in (24a), where in the absence of an intervening dative, the nominative may move into the higher clause. The difference is completely unexpected if agreement can simply see into the VP.

- (24) a. Núna hafið þið virst vera duglegir.
 now have.2PL you.PL.NOM₁ [_{VP} seemed [_{TP} t₁ be diligent]]
 ‘Now you have seemed to be diligent’
 b. *Núna hafið mér virst þið vera
 now have.2PL me.DAT₁ [_{VP} seemed t₁ [_{TP} you.PL.NOM be
 duglegir.
 diligent]]
 c. Núna hefur mér virst þið vera
 now has.3SG me.DAT₁ [_{VP} seemed t₁ [_{TP} you.PL.NOM be
 duglegir.
 diligent]]
 ‘Now you have seemed to me to be diligent’

Sigurðsson (1990) has proposed that long-distance agreement is conducted by a head-chain into the VP. Each head along the extended projection of the main verb passes agreement features up to the next one (cf. also Chomsky 2001b; Frampton and Gutmann 2001). This provides a rationale for why long-distance agreement is different: only finite verbs can bear person features, a fact overtly obvious from Icelandic morphology. Participles inflect for number, gender, and case, but not person. If infinitives can silently bear a plural feature, then it is

¹⁰I.e. not across a phase boundary; more descriptively, a finite verb (in T) locally agrees with a nominative which is its structural subject (in [Spec,TP]).

conceivable that a head-head chain might pass along number but not person features to the finite verb.

However, the head-chain story does not provide a natural explanation for why datives in situ tend to block agreement, as in (25a), while A-moved datives do not, as indicated in (25b) (exx. adapted from Jónsson 1996; not all traces are indicated).

- (25) a. Mér virðist/*virðast Jóni líka
 me.DAT₁ seems.SG/seem.PL [_{VP} t_v t₁ [_{TP} Jón.DAT [_{VP} like.INF
 þessir sokkar.
 these.NOM socks.NOM]]]
 ‘Jon seems to me to like these socks’
 b. Jóni virðast líka þessir
 Jón.DAT₁ seem.PL [_{VP} t_v [_{TP} [_{VP} t₁ like.INF these.NOM
 sokkar.
 socks.NOM]]]
 ‘Jon seemed to like these socks’

Linear order is not relevant here; a topic in [Spec,CP] allows the dative to remain in [Spec,TP], while the verb moves across it, but agreement is still permitted. Compare (26), a so-called Transitive Expletive Construction (from Holmberg and Hróarsdóttir 2003), in which (for some speakers at least) the low dative blocks agreement with the nominative, with (27), in which the dative subject does not, even though it intervenes (because of V-movement) between the finite verb and the nominative.¹¹

- (26) a. *Það hafa einhverjum manni virst
 it have.PL [_{AspP} some.DAT man.DAT seemed [_{TP}
 hestarnir vera seinir.
 the.horses.NOM be slow]]
 b. Það hefur einhverjum manni virst
 it has.SG [_{AspP} some.DAT man.DAT seemed [_{TP}
 hestarnir vera seinir.
 the.horses.NOM be slow]]
 ‘It has seemed to some man that the horses were slow’

¹¹Thanks to Þorbjörg Hróarsdóttir for discussion of the Icelandic, and for providing or checking the original examples used here. Not all speakers find the examples in (26a) and (28b) bad. Thanks to Höskuldur Dráinsson and Þórhallur Eyþórsson for additional discussion.

- (27) a. Einhverjum manni hafa virst
 some.DAT man.DAT₁ have.PL [_{AspP} t₁ seemed [_{TP}
 hestarnir vera seinir.
 the.horses.NOM be slow]]
 ‘To some man, the horses have seemed slow’
- b. Núna hafa einhverjum manni virst
 now have.PL some.DAT man.DAT [_{AspP} t₁ seemed [_{TP}
 hestarnir vera seinir.
 the.horses.NOM be slow]]
 ‘Now, to some man, the horses have seemed slow’

On the phase-based theory, in which Agree allows feature values to be shared from one node to another within a phase, the blocking effect of the dative is a matter of defective intervention. Assume that the probe, finite T, has $u\phi$. The dative has something like ϕ -features (probably number, in Num), and the probe cannot ‘see’ across it to the nominative. On a multi-attachment analysis of movement, it is strange that A-movement should obviate this.

The solution is two-pronged. First, I borrow from the head-chain analysis the idea that *v* can agree with the nominative in number, but not person. Then, even when *vP* spells out, the number feature is visible to the higher agreeing head T (possibly via *Asp*).

Second, I assume that movement to [*Spec*,*TP*] causes the dative to spell out as a QP, making its ϕ -features invisible to outside agreement. Prior to this movement, or if it does not occur (as in (26b)), the number features on the dative clash with the number features on *vP* and the only option is lack of agreement (surfacing as third singular, as in (26b); see Holmberg and Hróarsdóttir (2003) for evidence that for some speakers, plural agreement is acceptable if both *vP* and the dative are plural; for others, T cannot match two interpretable number features at once).

Is there independent evidence that T checks relatively high features in Icelandic, spelling out (at least) QP there? In fact there is. Holmberg and Hróarsdóttir (2003) show that *wh*-movement of the dative does not allow long-distance agreement (for some speakers).

- (28) a. Hvaða stúdent finnst tölvurnar ljótar?
 what student.DAT finds.SG the.computers.NOM ugly
 ‘To what student do the computers appear ugly?’
- b.??Hvaða stúdent finnast tölvurnar ljótar?
 what student.DAT find.PL the.computers.NOM ugly

This is quite surprising on usual assumptions, since the dative subject should have been able to stop off in [*Spec*,*TP*], allowing T to agree with the nominative

(indirectly, on the solution sketched above, via *v*). In other words, there should be an intermediate stage diagrammed in (29a) from which A-movement of the dative to the subject position is possible, as in (29b) (omitting the VP boundary and V trace from the diagram).

- (29) a. finnst hvaða stúdent
 [_{TP} find.PL [_{AspP} what student.DAT₁ t_{Asp} [_{VP} t₁ t_v [_{SC}
 tölvurnar ljótar
 the.computers.NOM ugly]]]]
 b. hvaða stúdent finnst
 [_{TP} what student.DAT₁ find.PL [_{AspP} t₁ t_{Asp} [_{VP} t₁ t_v [_{SC}
 tölvurnar ljótar
 the.computers.NOM ugly]]]]

Holmberg and Hróarsdóttir argue that the EPP feature in Icelandic is sensitive to phonological features. They argue furthermore that the dative does not move to T, because its *wh*-features are unchecked, and it has not spelled out (building on a model of cyclic Spell-Out in Svenonius (2001b,a)). On the model assumed here, however, some lower portion of the dative probably has spelled out and so there will be a phonologically visible part of the dative. Another solution is therefore necessary.

If movement to T checks Op features, spelling out OpP, then *wh*-features, by assumption in Q, are no longer accessible after that. This would imply that there is never movement in Icelandic (for these speakers) from subject position to [_{Spec},CP]; the only way to question a subject in Icelandic is to select T without Op features, allowing the subject position to remain empty.

7. The CP edge

If there are no attractors in Top, there will be no successive-cyclic movement, as everything will be trapped in CP when it spells out. Languages without successive-cyclic movement are widely attested.

In fact, successive-cyclic movement requires attractors both in Top and in Asp; if there are attractors only in Asp, you can escape vP but not CP, and if there are attractors only in Top, you can escape CP but not AspP.

In fact, even a language like English does not ordinarily allow successive-cyclic movement. TopP spells out as a matrix sentence, so requires no external licensors. I will assume that languages with successive-cyclic movement have a Top with an uninterpretable feature, and a class of verbs (bridge verbs) which value this feature. There must be some Q-attractor which is merged before the head which values Top. Since Asp independently must be a Q-attractor in any language with successive-cyclic movement, I will assume that it is Asp which triggers Spell-Out of TopP, in the following way. Top in this case has $\{u\omega\}$.

Bridge V (possibly *v*) has $\{u\omega, i\psi\}$, and the ω features match but are not valued. Asp has $\{i\omega, u\psi\}$. The uninterpretable ψ feature in Asp probes Bridge V, and all features match and are valued. Thus Asp triggers Spell-Out of *vP* and *TopP* at the same time, but simultaneously may attract Q features in a moved XP in *[Spec,TopP]*.

If *Top* had K features, then conceivably it could attract a K-element from within CP somewhere, and this could then be attracted by K-features in the matrix clause. This would be A-movement across a matrix clause. Such movement is at best rare, and is often assumed to be impossible; it is ruled out in the current model by (18) in section 5.3, given certain additional assumptions. Stated as is, (18) could allow a lower-level XP to escape through a higher-level specifier in one very specific set of circumstances: for example, if KP moved to *[Spec,QP]*, then KP and QP would be equally close to an outside attractor. Imagine that attractor to be Op itself. Then Op could in principle K-attract KP to its specifier. KP and OpP then being equally distant from a higher attractor, one might K-attract KP out of, say, *TopP* (in a bridge verb context where *TopP* does not spell out before a delay). I discuss two possible cases of this in the next subsections.

7.1 Agreement across a CP boundary

The most clearly understood case of agreement across a CP boundary is from the Nakh-Daghestanian language Tsez, thanks to an extremely careful and well-researched study by Polinsky and Potsdam (2001).

In Tsez, certain clause-selecting verbs may optionally agree with an embedded absolutive argument, as shown in (30) (from Polinsky and Potsdam (2001:606); simplified gloss).¹²

- (30) a. enir užā magalu bāc'ruḷi biyxo (Tsez)
 mother.DAT [boy.ERG bread.III.ABS III.eat] III.know
 'The mother knows the boy ate the bread'
- b. enir užī āyruḷi iyxo
 mother.DAT [boy.I.ABS I.arrive] I.know
 'The mother knows the boy arrived'

In (30a), the main verb agrees with the class III noun 'bread,' and in (30b), it agrees with the class I noun 'boy.' As can be seen from (30a), the DP controlling agreement need not be overtly at the edge of the embedded clause (marked with brackets in the gloss).

¹²The embedded clause may be some kind of nominalization and not strictly speaking finite; but it shows the same kind of case and agreement patterns as a main clause, and is a barrier for movement and quantifier raising.

Polinsky and Potsdam argue, however, that the controller of agreement does move to a topic position at the periphery of the embedded clause, albeit covertly (they also convincingly demonstrate that it does not move into the higher clause). They establish, for example, that when there is cross-clausal agreement, the embedded absolutive is necessarily interpreted as a topic. This is explained if it moves covertly to a high topic position. They show that there is a productive topicalization rule in the language, optionally fronting a topical XP to a left-peripheral position, and furthermore they show that if some other element is topic, then the embedded absolutive cannot control main clause agreement. This is explained if there is only one topic position in the embedded clause.

But is the topic position [Spec,TopP]? There is some reason to think it is not. Polinsky and Potsdam argue that in Tsez, unlike Dyrirbal, the ergative is higher than the absolutive (recall that only absolutives can control agreement in Tsez). Thus, the absolutive may remain relatively low in the clause, unless some A-bar process such as topicalization brings it forward. Movement to the topic position might not be movement to [Spec,TopP], but simply movement to [Spec,TP] (cf. the discussion above of ‘topical’ [Spec,TP] in Dyrirbal and Icelandic). Polinsky and Potsdam show that there is a wh-position to the left of the topic position, and that a wh-element there blocks cross-clausal agreement, as shown in (31a). Furthermore, they point out that an overt complementizer blocks agreement, as in (31b) (both sentence types are possible without the non-local agreement on the matrix verb).

- (31) a. *enir ɫu micxir bok’āk’ruhi bixyo (Tsez)
 mother.DAT [who.ERG money.III.ABS III.steal] III.knows
 ‘The mother knows who stole the money’
 b. *enir užā magalu bāc’si-ɣin biyxo
 mother.DAT [boy.ERG bread.III.ABS III.eat-C] III.knows
 ‘The mother knows that the boy ate the bread’

When a fronted topic cooccurs with a wh-element, the wh-element is to the left of the topic. Polinsky and Potsdam argue that wh-elements and overt complementizers indicate the presence of an optional C projection above the Topic projection, and that cross-clausal agreement is only possible when this C projection is absent. However, this assumption does not sit well with the model adopted here, with a rich decomposition of clausal functions into individual functional heads. I will assume instead that wh-C in (31a) and the overt C in (31b) in Tsez are incompatible with bridge Top, and that non-bridge Top causes Spell-Out of CP as usual, with the concomitant opacity. When bridge Top is used, then topical features are checked on topical OpP, with or without movement to [Spec,TopP]. Bridge Top does not spell out until bridge V is merged (or whatever head bears $i\omega$); this head also bears uninterpretable gender features and can agree with the embedded topic.

p. 389), the main verb ‘know’ agrees with its subject (second person) and with the subject of the embedded clause, which in this case has moved across the *wh*-expression. It is unclear whether the embedded topic has left the embedded CP.

- (33) a. Nuîtsishissenimâuat tshekuânnu.kuet mûpishtûtâu Pûn mâk
 I.want.know.3PL why visited.2SG/3PL Paul and
 Mânî.
 Mary
 ‘I want to know why you visited Paul and Mary’
 b. Tshitshissenimâuâ Mânî tshekuân.kuet aîmiât Pûna
 2.know.3.Q Marie why called Paul
 utshimâminua?
 boss
 ‘Do you know why Marie called Paul’s boss?’

This shows that the presence or absence of a projection hosting interrogative features cannot universally determine whether long-distance agreement is possible. Branigan and MacKenzie postulate a polyfunctional C with multiple specifiers, consistent with the assumptions here (though I have labeled the polyfunctional head Top) but also with the assumption that *wh* is in [Spec,CP] and topics move optionally to [Spec,TopP]. The phasal geometry is identical to that for Tsez, in that *iω* with these matrix verbs is equal to or higher than whatever head in vP bears agreement features, and whatever head (possibly the same one) attracts *wh*-expressions for cross-clausal movement (an option not exercised in Tsez).

7.2 Movement across the CP boundary

The solution sketched for the Tsez case raises the specter of A-type movement across finite clause boundaries, given a very specific constellation of featural specifications. First, there must be K-attractors in Asp, so this will not be a polysynthetic language, and is more likely a scrambling language since they make more exuberant use of K-attractors. Second, there must be Q in Top, so it must be a language with A-bar type movements to the top of the clause. These two features are common enough. Third, it must be a language with bridge verbs, to delay the Spell-Out of embedded TopP long enough for Asp to be merged. Thus it will be a language with cross-clausal movement of some kind. Fourth, it must be a language in which there is an overt topic suffix, indicating KP to [Spec,OpP] movement, so that K-attractors in Asp can attract K in [Spec,OpP] from [Spec,TopP] (OpP might pied-pipe, or be stranded). Fifth, the OpP attracted to [Spec,TopP] must not have all its features valued right away; otherwise, OpP would spell out and not even its specifier would be available to higher attractors.

It seems that Japanese has all these traits. Interestingly, Japanese also appears to have A-movement across a finite CP boundary, as discussed by Kuno (1976); Saito (1992) and others; see Tanaka (2002) for recent discussion and a summary of previous work. The Japanese construction is known as Raising to Object (RO) and is illustrated in (34) (from Tanaka 2002:638).

- (34) John-ga Bill-o orokanimo tensai-da-to omot-teiru.
 John-NOM Bill-ACC₁ stupidly [_{CP} t₁ genius-COP-C] think-PROG
 (Japanese)
 'John stupidly thinks of Bill as a genius'

The case on the raised argument is accusative, suggesting movement to the higher [Spec,vP], and it enters into various A-type relations in the higher clause, as Tanaka shows. In (34) it can be seen to precede an adverbial in the higher clause.

The example in (35a), a non-RO context, shows that a long-scrambled accusative is A-bar moved and cannot bind the reciprocal in the matrix subject. In (35b), however, the scrambled RO accusative can bind into the subject, consistent with the known properties of Japanese short scrambling. Short scrambling is, however, ordinarily clause-bound (exx. from Tanaka 2002:640, citing Saito 1992).

- (35) a. ??Karera-o otagai-no sensei-ga Mary-ga
 they-ACC₁ each.other-GEN₁ teacher-NOM [Mary-NOM t₁
 hihansita-to itta.
 criticized-C] said
 'Them, each other's teachers said that Mary criticized'
 b. Karera-o otagai-no sensei-ga baka-da-to
 they-ACC₁ each.other-GEN₁ teacher-NOM [t₁ fool-COP-C]
 omot-teiru.
 think-PROG
 'Them, each other's teachers think of as fools' (* in English)

Tanaka (2002) proposes that Japanese Raising to Object verbs select a CP with an A-specifier at its edge, and that the raised DP moves through this position, hence abiding by the strictest phase models. The equivalent in the model proposed here would be to simply say that Top in Japanese has an (accusative) K-attractor. However, I cannot connect the presence of this putative K-attractor to any other known quality of Japanese, and furthermore there is a problem with the model sketched here, in which TP is always a closer intervener for a K-attractor.

Taking the DP-final topic marker *wa* to be evidence that Japanese has K-attractors in Op, we might assume a solution along the lines of that proposed

above for Tsez, with KP moving to [Spec,OpP]. However, note that although KP in [Spec,OpP] can be visible to a higher verb for agreement, KP in [Spec,OpP] does not c-command out of OpP and so should not bind an anaphor as in (35b). The possibility of binding suggests that KP has actually left OpP altogether, stranding (null) Op in [Spec,TopP].

Note that nominatives cannot move across a CP boundary in Japanese.

- (36) *John-ga Bill-ga orokanimo tensai-da-to omot-teiru.
 John-NOM Bill-NOM₁ stupidly [_t₁ genius-COP-C] think-PROG
 (Japanese)
 (ok as #‘John thinks that Bill stupidly is a genius’)

Given the very specific constellation of K attractors that is necessary to derive the long A-movement here (in Q, in Op, and in the higher clause), it is unsurprising that the case of the raised argument should be highly constrained.

The similar case of Passamaquoddy as described in Bruening (2001c,b), deserves mention, though space precludes any treatment here. On Bruening’s analysis of the facts (which he also extends to the Japanese case),¹³ the raised object is actually base-generated in a specifier of C, receiving its theta-role under coindexation with a null pronoun in the lower clause and moving to the higher clause for case reasons.

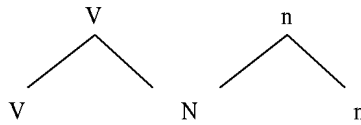
8. How to get functional heads into DP and still keep phases small

In section 5.4 I deferred the question of when and how the higher functional projections are inserted into the noun phrase. I outlined two possibilities. One was that they are merged early (i.e. before the noun phrases are embedded at all), with ‘inert’ structure. This is somewhat at odds with Chomsky’s (2001a) reasoning that phases reduce the amount of material that the computation has to keep track of. The other possibility that I sketched involved the abandonment of the extension condition, allowing functional projections to be inserted in internal positions in unspelled out phases.

Here I suggest a third alternative that keeps phases ‘small’ and is consistent with a version of the extension condition. Assume that N merges with V, getting a theta role. Now *n* also merges with N, creating a two-rooted tree, as shown in (37).

¹³But see Tanaka for challenges for Bruening’s account of Japanese.

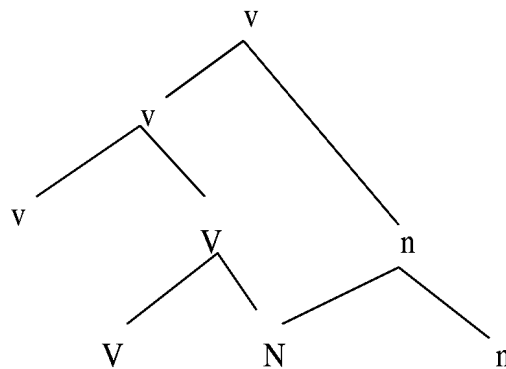
(37)



This is not compatible with an Extension Condition that demands that merge can only target the root; but nor is any version of Internal Merge or Rmerge (cf. Starke 2001). However, (37) is compatible with a version of the Extension Condition that insists that Merge always creates a new mother node for the items it targets.

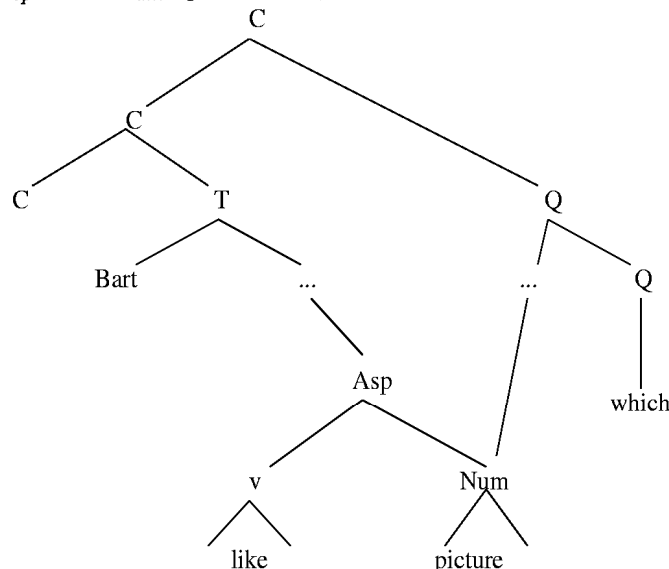
This tree cannot be interpreted at the interface because it has two roots. But if *n* remerges with *v* (internal merge) then a single-rooted structure is restored.

(38)



More interesting is the case in which a wh-expression, QP, is responsible for the remerge of an argument, NumP, as illustrated here for example (16c) *Which picture of herself did nobody think Bart would like best?* (for which the embedded clause reconstructs as something like [_{CP} [_{QP} which...] [_{TP} did Bart [_{AspP} like [_{NumP} picture]]])

(39)



Here the *wh*-operator would not reconstruct into *AspP*, because it is not dominated by it at any stage of the derivation, but anything inside *NumP* would. Note that since everything in *NumP* is also dominated by *CP*, a higher antecedent will be able to find a direct path to an anaphor in *NumP*, allowing the intermediate reconstruction site for *NumP* in (16c) in section 5.2.

9. Conclusion

Despite the great complexity and abstractness of the data, there is rich evidence that long-distance relations have a successive-cyclic character. This often gives rise to what appear to be edge effects, and can be taken as a strong argument for the importance of a special area at the edge of each cycle. The phase-based model gives the underpinnings of an explanatory account for these phenomena, rooted in a conceptually appealing model of syntactic structure. What I have tried to do here is to explore the extension of the phase-based theory to the nominal domain, and to explore the interaction of the nominal structure with the clausal structure. The interactions mainly express themselves not in edge effects, but in the successive opacity of different nominal domains, blocking relations from the clausal heads into spelled out projection of the extended DP. I have suggested a few points of parametric variation, relying mainly on the presence or absence of attractors of different types in different heads.