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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 2000MI, 2001DbP, 2001BEA 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 (§6.1), long-distance agreement across *v* in Icelandic (§6.2), agreement across C in Tsez and Innu-aimûn (§7.1), and movement across CP in Japanese (§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).

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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 Subjacency, 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 ≠ 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 □ [a node with a strong feature] is in a category not headed by □ (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

[1] Cf. also the commentary and refinements in Kitahara 1997 and Freidin 1999.

from moving to SpecTP 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).

However, even with these assumptions, (3) is not updated to prevent movement to SpecCP 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)).

Subjacency 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 Subjacency in Chomsky 1986, 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 1986) toward Relativized Minimality (Rizzi 1990) and intervention effects, whereby □ and □ do not enter into a relation across □, if □ is too similar to them. This manifested itself, for example, in the Minimal Link Condition (Chomsky & Lasnik 1993) and later in Attract Closest (Chomsky 1995); essentially, in [□ ... □ ... □], □ attracts the closest element of the right sort; if □ is the right sort, then □ cannot attract □(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 □ and □ 'similar' for the purposes of attraction by □). 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 2000MI 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 2000MI:100–101) and the other is the cyclicity of the interfaces (cyclic Spell-Out; Chomsky 2000MI:131, Uriagereka 1999, Platzack 2000). 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 2000MI, *v*P 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 *v*P.

(7) a. Which of the papers that he$_1$ wrote for Ms. Brown$_2$ did every student$_1$ get her$_2$ to grade _?
b. *? Every student got her$_2$ to grade the first paper that he wrote for Ms. Brown$_2$.
c. [$_{TP}$ every student$_1$ did [$_{vP}$ which of the papers that he$_1$ wrote for Ms. Brown$_2$ [$_{vP}$ get her$_2$ 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 *v*Ps 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 har hver
which of the.assignments as he$_1$ wrote for Miss Olsen$_2$ has every
elev blitt bedt av henne om å skrive om? (Norwegian)
student$_1$ become asked of her$_2$ about to write over
'Which of the assignments that he wrote for Ms. Olsen has every student been asked by her to write over?'
b. Hvilken av oppgavene som han skrev for Frøken Olsen har hver
which of the.assignments as he$_1$ wrote for Miss Olsen$_2$ has every
elev syntes henne å være fornøyd med?
student$_1$ seemed her$_2$ 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

[2] See Holmberg 2002, Svenonius 2001a for discussion of whether passive *v* in Scandinavian is a phase head.

the edge of *v*P, below negation in (9) (on the 'not every' reading, which may require a special intonation).

(9) Every child$_1$ doesn't [$_{vP}$ _ seem to his$_1$ 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 *v*P (Chomsky 2001DbP) 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*□ (uninterpretable □ features) and Z has *i*□ (interpretable □ 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 □ must be bundled with another feature that goes in the opposite direction: H has {*u*□, *i*□} and Z has {*i*□, *u*□}. 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). At each step, the underlined portion is that which is accessible to the highest head. In (10c), C is merged. Material in TP, *v*P, and VP are accessible to it. It is the trigger for *v*P, so *v*P spells out. As a result, *v*P is opaque in (10d).

(10) a. [$_{vP}$ *v* [$_{VP}$ V]]
b. [$_{TP}$ T [$_{vP}$ *v* [$_{VP}$ V]]]
c. [$_{CP}$ C [$_{TP}$ T [$_{vP}$ *v* [$_{VP}$ V]]]] *v*P spells out
d. [$_{VP}$ V [$_{CP}$ C [$_{TP}$ T [$_{vP}$ opaque]]]]
e. [$_{vP}$ *v* [$_{VP}$ V [$_{CP}$ C [$_{TP}$ T [$_{vP}$ opaque]]]]] CP spells out
f. [$_{TP}$ T [$_{vP}$ *v* [$_{VP}$ V [$_{CP}$ opaque]]]]
g. [$_{CP}$ C [$_{TP}$ T [$_{vP}$ *v* [$_{VP}$ V [$_{CP}$ opaque]]]]] *v*P spells out

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 SpecCP, but not two; in order to get into SpecCP 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 §3, because XP can move straight from VP to CP without stopping at *v*P.

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 2001, Chomsky 2001BEA). This creates a narrow 'edge' at *v* and another at C. To see this, consider (11).

(11) a. $[_{vP}\ v\ [_{VP}\ V\ ]]$ VP spells out
b. $[_{TP}\ T\ [_{vP}\ v\ [_{VP}$opaque$]]]$
c. $[_{CP}\ C\ [_{TP}\ T\ [_{vP}\ v\ [_{VP}$opaque$]]]]$ TP spells out
d. $[_{VP}\ V\ [_{CP}\ C\ [_{TP}$ opaque $]]]$
e. $[_{vP}\ v\ [_{VP}\ V\ [_{CP}\ C\ [_{TP}$ opaque $]]]]$ VP spells out
f. $[_{TP}\ T\ [_{vP}\ v\ [_{VP}$ opaque $]]]$
g. $[_{CP}\ C\ [_{TP}\ T\ [_{vP}\ v\ [_{VP}$ opaque $]]]]$ TP spells out

Here all movement escaping the lower VP must first move to Spec*v*P, because by the time T is merged, VP is already spelled out, as in (11b). Similarly, movement out of CP necessarily passes through SpecCP, 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 *v*P 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). The trigger for Spell-Out of *v*P 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.

(12) a. $[_{vP}\ v\ [_{VP}\ V\ ]]$
b. $[_{AspP}$ Asp $[_{vP}\ v\ [_{VP}\ V\ ]]]$ *v*P
c. $[_{TP}\ T\ [_{AspP}$ Asp $[_{vP}$ opaque $]]]$
d. $[_{CP}\ C\ [_{TP}\ T\ [_{AspP}$ Asp $[_{vP}$ opaque $]]]]$
e. $[_{TopP}$ Top $[_{CP}\ C\ [_{TP}\ T\ [_{AspP}$ Asp $[_{vP}$ opaque $]]]]]$ CP
f. $[_{VP}\ V\ [_{TopP}$ Top $[_{CP}$ opaque $]]]$
g. $[_{vP}\ v\ [_{VP}\ V\ [_{TopP}$ Top $[_{CP}$ opaque $]]]]$
h. $[_{AspP}$ Asp $[_{vP}\ v\ [_{VP}\ V\ [_{TopP}$ Top $[_{CP}$ opaque $]]]]]$ *v*P

Spec*v*P and SpecCP 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 2001DbP:14, Chomsky 2001BEA:5).[3]

[3] Chomsky 2001DbP:14
"The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations."
Chomsky 2001BEA:5
"The domain of H is not accessible to operations, but only the edge of HP."

(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 2001, 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 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* —[T— *v**—[V
Q*—[K—*n**—[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 Mittelfelt, 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*—[C—T— Asp* —[*v*—V
Op* — [Q—K—Num*—[*n*—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 *n*P 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.

[4] There 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).

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 & 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.

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 §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 followed by K-movement, or by movement of any category lower than K (a special exception will be examined below). In §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 *v*P or of the embedded CP.

(16) a. * Who_1 do pictures of himself_1 annoy?
b. Nobody_1 can guess which picture of herself_1 Bart will like best.
c. Which picture of herself_1 did nobody_1 think Bart would like best?

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

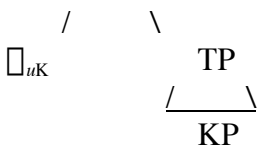
[6] I use quantified subjects to eliminate the possibility of so-called logophoric readings. The following is a context that would make (16b–c) natural. As a gift to Coach Bart on the occasion of his retirement, the soccer team put together a photo album containing one picture of each player on the team. 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)).

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 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.

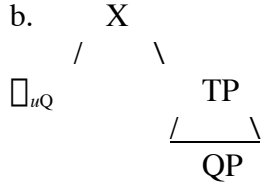
5.3. Relativization

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 □ is a K-attractor, because TP is closer than KP. Q-attraction would be possible from a TP, as illustrated in (17b).

(17) a.



b.



If Attract Closest is defined so that the specifier of TP is equally close to □ 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 □, 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 & 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 §6 I discuss successive-cyclic movement, which shows that Q features must be available in Asp in some languages (whereas if the match of 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 *v*P) but very hard to find examples of 'low' level extraction out of 'high' level constituents (e.g. *n*P 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 §7, but until then will assume (18).

[7] Cf. Haeberli's (1999, 2001) 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.

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

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 *v*P edge effects noted in §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 2001DbP, Pesetsky & Torrego 2001, Frampton & 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 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. §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 §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.

[8] E.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, *n*P spells out.

6. The interaction of nominal and clausal phases at the *v*P 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 *v*P, 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 §7. The discussion of Tsez in §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 *v*P edge

Dixon (1972, 1994) 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 SpecTP, while ergative case is assigned *v*P-internally (cf. Bittner & 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 Mittelfelt, as sketched in the gloss.

(19) bayi yuri bangul yarangu bagan (Dyirbal)
[$_{TP}$ there.ABS kangaroo.ABS [$_{vP}$ there.ERG man.ERG [$_{VP}$ spear t_1]]]
'The man speared the kangaroo' (Dixon 1972:100, (284))

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

Interestingly, there is some evidence that *v*P 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 bagalnanu bagul yurigu (Dyirbal)
there.ABS man.ABS spear.ANTIPASS.REL.ABS there.DAT kangaroo.DAT
'... the man who speared the kangaroo ...' (Dixon 1972: 101, (286))

If the *v*P were transparent to attractors in the C-domain, it is not clear why an ergative could not be attracted. But if *v*P is a phase, as assumed here, then the ergative is trapped in Spec*v*P 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 & 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 SpecCP, but arguments must first be attracted by the appropriate K-attractors in Asp, as illustrated in (21), from Rackowski & 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)
who$_1$ [ANG gave-DAT$_1$ CS man CS flower t$_1$]
'Who did the man give the flower to?'

b. * Sino ang i-binigay ng lalaki ang bulaklak?
who$_1$ [ANG OBL$_2$-gave CS man ANG flower$_2$ t$_1$]

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 & 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 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-an ng lalaki ng bulaklak (Tagalog)
ANG water.buffalo$_1$ [that said.ACC$_2$ CS teacher [$_{CP2}$ that will.give-DAT$_1$ CS man CS flower t$_1$]$_2$]
'the water buffalo that the teacher said that the man would give a flower to'

b. ang kalabaw na i-pinangako ng guro na bibigy-an ng lalaki ng bulaklak
ANG water.buffalo$_1$ [that OBL$_2$-promised CS teacher [$_{CP2}$ that will.give-DAT$_1$ CS man CS flower t$_1$]$_2$]
'the water buffalo that the teacher promised that the man would give a flower to'

[9] A 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 & 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. AQ-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.

The derivation must proceed as follows: first, the dative is K-moved to Asp (or Q-moved, cf. fn. 8), 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. §5.3), even though TopP itself is in the specifier of AspP.

6.2. Agreement across the *v*P 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, 1990–1991, 1996, 2000, inter alia, and references there). The facts are complex, but it is clear that a finite verb outside *v*P (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 & Hróarsdóttir 2003).

(23) a. Jóni virðast hafa líkað þessir sokkar. (Icelandic)
Jón.DAT$_1$ seem.PL [$_{TP}$ have.INF [$_{vP}$ t$_1$ like.PTCPL these.NOM socks.NOM]]
'Jon seems to have liked these socks'

b. Jóni hafa virst hestarnir vera seinir.
Jón.DAT$_1$ have.PL [$_{vP}$ seemed t$_1$ [$_{TP}$ 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 *v*P 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 §3, there is a *v*P 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 agreement[10] 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. (Icelandic)
now have.2PL you.PL.NOM$_1$ [$_{vP}$ seemed [$_{TP}$ t$_1$ be diligent]]
'Now you have seemed to be diligent'

b. * Núna hafið mér virst þið vera duglegir.
now have.2PL me.DAT$_1$ [$_{vP}$ seemed t$_1$ [$_{TP}$ you.PL.NOM be diligent]]

c. Núna hefur mér virst þið vera duglegir.
now has.3SG me.DAT$_1$ [$_{vP}$ seemed t$_1$ [$_{TP}$ you.PL.NOM be 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

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

features up to the next one (cf. also Chomsky 2001DbP, Frampton & 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 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 þessir sokkar.
me.DAT$_1$ seems.SG/seem.PL [$_{vP}$ t_v t_1 [$_{TP}$ Jón.DAT [$_{vP}$ like.INF these.NOM socks.NOM]]]
'Jon seems to me to like these socks'

b. Jóni virðast líka þessir sokkar.
Jón.DAT$_1$ seem.PL [$_{vP}$ t_v [$_{TP}$ [$_{vP}$ t_1 like.INF these.NOM socks.NOM]]]
'Jon seemed to like these socks'

Linear order is not relevant here; a topic in SpecCP allows the dative to remain in SpecTP, while the verb moves across it, but agreement is still permitted. Compare (26), a so-called Transitive Expletive Construction (from Holmberg & 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 hestarnir vera seinir.
it have.PL [$_{AspP}$ some.DAT man.DAT seemed [$_{TP}$ the.horses.NOM be slow]]

b. Það hefur einhverjum manni virst hestarnir vera seinir.
it has.SG [$_{AspP}$ some.DAT man.DAT seemed [$_{TP}$ the.horses.NOM be slow]]
'It has seemed to some man that the horses were slow'

(27) a. Einhverjum manni hafa virst hestarnir vera seinir.
some.DAT man.DAT$_1$ have.PL [$_{AspP}$ t_1 seemed [$_{TP}$ the.horses.NOM be slow]]
'To some man, the horses have seemed slow'

b. Núna hafa einhverjum manni virst hestarnir vera seinir.
now have.PL some.DAT man.DAT [$_{AspP}$ t_1 seemed [$_{TP}$ 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*□. The dative has something like □-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 *v*P spells out, the number feature is visible to the higher agreeing head T (possibly via Asp).

[11] Thanks 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 Þráinsson and Þórhallur Eyþórsson for additional discussion.

Second, I assume that movement to SpecTP 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 *v*P and the only option is lack of agreement (surfacing as third singular, as in (26b); see Holmberg & Hróarsdóttir 2003 for evidence that for some speakers, plural agreement is acceptable if both *v*P 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 & 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 SpecTP, 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. finnast hvaða stúdent tölvurnar ljótar
[$_{TP}$ find.PL [$_{AspP}$ what student.DAT$_1$ t$_{Asp}$ [$_{vP}$ t$_1$ t$_v$ [$_{SC}$ the.computers.NOM ugly]]]]
b. hvaða stúdent finnast tölvurnar ljótar
[$_{TP}$ what student.DAT$_1$ find.PL [$_{AspP}$ t$_1$ t$_{Asp}$ [$_{vP}$ t$_1$ t$_v$ [$_{SC}$ the.computers.NOM ugly]]]]

Holmberg & 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 2001a, b). 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 SpecCP; 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 *v*P 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 licensers. 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*□}. Bridge V (possibly *v*) has {*u*□, *i*□}, and the □ features match but are not valued. Asp has {*i*□, *u*□}. The uninterpretable □ feature in Asp probes Bridge V, and all features match and are valued. Thus Asp triggers Spell-Out of *v*P and TopP at the same time, but simultaneously may attract Q features in a moved XP in SpecTopP.

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 §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 SpecQP, 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 & Potsdam (2001).

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

(30) a. enir uza magalu bac'ruli biyxo (Tsez)
mother.DAT [boy.ERG bread.III.ABS III.eat] III.know
'The mother knows the boy ate the bread'

b. enir uzi ayruli 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).

Polinsky & 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

[12] The 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. Note also that topic markers are optional and happen to be absent in (30).

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 SpecTopP? There is some reason to think it is not. Polinsky & Potsdam argue that in Tsez, unlike Dyirbal, 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 SpecTopP, but simply movement to SpecTP (cf. the discussion above of 'topical' SpecTP in Dyirbal and Icelandic).

Polinsky & 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 lu micxir bok'ak'ruli bixyo (Tsez)
mother.DAT [who.ERG money.III.ABS III.steal] III.knows
'The mother knows who stole the money'

b. * enir uza magalu bac'si-Lin 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 & 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 SpecTop. Bridge Top does not spell out until bridge V is merged (or whatever head bears *i*□); this head also bears uninterpretable gender features and can agree with the embedded topic.

However, there is a potential problem. If movement to SpecTP is essentially topic movement, as in Icelandic, then it should check Op features, as it does there. This would result in the Spell-Out of the QP and make □-features inside the topic invisible before an agreeing head could be merged in the higher clause.

The only way out would be if some subpart of QP, say KP, were to move out of QP into SpecOpP (as outlined in the previous subsection). From this position it would be visible even when QP spells out. Such movement would allow certain kinds of improper movement violations, and since these are unusual this kind of movement must be unusual. It would require overt evidence to learn that it existed.

Overt evidence for noun phrase-internal movements might come in the form of structures in which an Op head overtly followed the rest of the noun phrase. Such orderings could arise in a variety of ways, but one way for them to occur would be for KP to move to SpecOpP. In Tsez, there are topical markers which optionally follow the noun, as in example (32) (these markers are absent in (30), but apparently could have been present).

(32) a. bikori-n uz-a bexursi (Tsez)
snake.ABS-TOP boy-ERG killed
'As for the snake, the boy killed it'

b. uz-a bikori-n bexursi

boy-ERG snake.ABS-TOP killed
'As for the snake, the boy killed it'

I will assume that KP moves to SpecOpP in Tsez, making gender features visible to the higher clause.

It is instructive to compare Tsez briefly with the very interesting Innu-aimûn case brought to light recently by Branigan & MacKenzie (2002; see references there for previous work on this Algonquin language).

In Innu-aimûn, just as in Tsez, certain clause-taking verbs optionally agree with an embedded topic (agreement is in person, number, and animacy). As in Tsez, non-topics cannot participate in this long-distance agreement. Also as in Tsez, the topic need not be overtly peripheral in the clause, but Branigan & MacKenzie argue that the topic does move to the edge of the embedded clause, covertly or overtly; thus the case so far seems closely parallel.

However, unlike Tsez, Innu-aimûn allows agreement into wh-clauses. There is wh-movement (again like Tsez), and a topic may occur either above or below the embedded wh-expression (in fact, agreement may even be with the wh-expression, according to Branigan & MacKenzie).

In (33a) below, from Branigan & MacKenzie 2002:395, the matrix verb 'want to know' agrees with both the subject (first person) and the object of the embedded clause ('Paul and Mary'), across a raised wh-phrase. In (33b) (ibid 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. Nuîtshissenimâuat tshekuânnu.kuet mûpishtûtâu Pûn mâk Mânî. (Innu-aimûn)
I.want.know.3PL why visited.2SG/3PL Paul and Mary
'I want to know why you visited Paul and Mary'

b. Tshitshissenimâuâ Mânî tshekuân.kuet aimiât Pûna utshimâminua?
2.know.3.Q Marie why called Paul 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 & 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 SpecCP and topics move optionally to SpecTopP. The phasal geometry is identical to that for Tsez, in that *i*□ with these matrix verbs is equal to or higher than whatever head in *v*P 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 spectre 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 SpecOpP movement, so that K-attractors in Asp can attract K in SpecOpP from SpecTopP (OpP might pied-pipe, or be stranded). Fifth, the OpP attracted to SpecTopP 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. (Japanese)
John-NOM Bill-ACC$_1$ stupidly [$_{CP}$ t_1 genius-COP-C] think-PROG
'John stupidly thinks of Bill as a genius'

The case on the raised argument is accusative, suggesting movement to the higher Spec*v*P, 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 hihansita-to itta.
they-ACC$_1$ each.other-GEN$_1$ teacher-NOM [Mary-NOM t_1 criticized-C] said
('Them, each other's teachers said that Mary criticized')
b. Karera-o otagai-no sensei-ga baka-da-to omot-teiru.
they-ACC$_1$ each.other-GEN$_1$ teacher-NOM [t_1 *fool-COP-C] 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 SpecOpP. However, note that although KP in SpecOpP can be visible to a higher verb for agreement, KP in SpecOpP 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 SpecTopP.

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

(36) * John-ga Bill-ga orokanimo tensai-da-to omot-teiru. (Japanese)
John-NOM Bill-NOM$_1$ stupidly [t_1 genius-COP-C] think-PROG
(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.

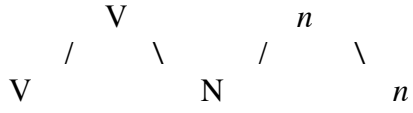
The similar case of Passamaquoddy as described in Bruening (2000, 2001) deserves mention, though space precludes any treatment here. On Bruening's analysis of the facts (which he also extends to the Japanese case),[13] the raised object is actually base-generated in a specifier of C, receiving its theta-role 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 §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 phraeses are embedded at all), with 'inert' structure. This is somewhat at odds with Chomsky's (2000MI) 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.

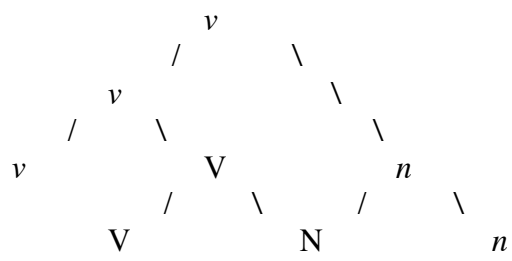
(37)



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 Remerge (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.

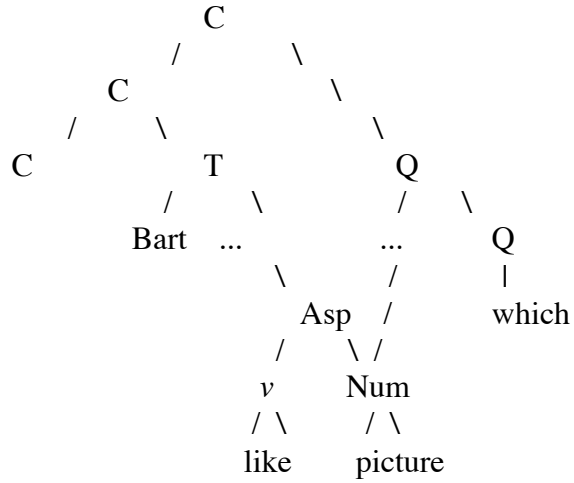
(38)



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]]]]*)

[13] But see Tanaka for challenges for Bruening's account of Japanese.

(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 §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.

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all special characters are underlined ascii letters, as follows:

SPECIAL CHARACTERS
underlined r is retroflex r (r with right tail; Dyirbal)
underlined n is engma (Dyirbal)

underlined ð is edh (Icelandic)
underlined þ is thorn (Icelandic)
underlined ý is acute accented y (Icelandic)

underlined z is z with hacek (Tsez)
underlined a is a with macron (Tsez)
underlined l is l with a diagonal going upward to the right, sort of Polish-looking (Tsez)
underlined L is barred lambda (Tsez)