

Deducing the Generalized XP Constraint from phasal spell-out*

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Abstract: I show extraction is banned from a phase that is immediately c-commanded by a phasal head, unifying this way a generalized version of the Complex NP Constraint that extends beyond NP and *CED*. An account of the ban is proposed where phase XP is completely inaccessible to higher phasal heads, with no edge exception. Under the account, what is sent to spell-out is phases but successive-cyclic movement does not proceed via phases. The PIC is eliminated.

Ross (1967) posits (1), illustrated by (2), where complex NP is a noun modified by a clause.¹

(1) The Complex NP Constraint (CNPC): Extraction from complex NPs is disallowed.

(2) *How_i did you hear [_{NP} rumors [_{CP} that [_{IP} John bought a house t_i]]]?

While extraction from complex NPs is disallowed, extraction from such VPs is allowed: there is no Complex VP Constraint.

(3) How_i did you [_{VP} think [_{CP} that [_{IP} a dog bit John t_i]]]?

Previous research on locality of movement has focused on (2), putting (3) aside. Bošković (2014b), however, argues that move has been misguided since (2) represents a pervasive pattern found in many contexts, (3) being highly exceptional. Thus, extraction is banned not only from clausal, but all complements of Ns, with APs, PPs, and ergative VPs patterning with NPs. The only exception is the case which has been used to build theories of successive-cyclic movement, namely transitive VP. This paper proposes a new account of this effect. In the system proposed here a phase is completely inaccessible to a higher phasal head, with no edge/PIC exception, which has important consequences for successive-cyclic movement and spell-out.² Thus, I argue that what is sent to spell-out is full phases. I will start by generalizing the CNPC.

1. On the Complex XP Constraint³

The CNPC is about clausal complements. However, extraction is banned from all complements of Ns. Witness e.g. (5) and (7), which contrast with (4) and (6) (Bach & Horn 1976, Chomsky 1973).⁴ Note I assume a reanalysis/pruning account of P-stranding, where there is no PP in (6) hence, like (4), (6) involves extraction of the N-complement, in contrast to (7), which involves extraction out of it. (Section 2.3 gives an account of P-stranding where there is a PP in (6) but its effects are voided so that for all intents and purposes *friends of* is a complex head that takes t_i as its complement; pending section 2.3 I will put aside P-stranding.)

(4) Of who(m)_i did you see [friends t_i]?

(5) ??Of who(m)_i did you see [enemies of friends t_i]?

(6) Who_i did you see [friends of t_i]?

(7) ?*Who did you see enemies of [friends of t_i]?

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¹I will ignore relative clauses, which involve extraction from adjuncts. (Note Safir 1985 shows (1) cannot be reduced to the adjunct condition by treating nominal clausal complements as appositives/adjuncts.)

²See Bošković (2014b) for an alternative account which is based on Chomsky's (2013) labelling system and antilocality.

³This section sums up some of the relevant arguments from Bošković (2014b); see that work for additional arguments and discussion. Since weak islands are sometimes completely weakened with argument extraction, adjunct extraction is more reliable, hence will be used whenever possible (another interfering factor with argument but not adjunct extraction concerns reanalysis and phase collapsing from section 2.3, see Bošković 2014b). However, in English it can be tested only with clausal complements, even **From which city_i did Peter meet [girls t_i]* being disallowed (Chomsky 1986).

⁴Since we are dealing here with argument extraction the locality violations are weaker.

In Greek, both genitive DPs and PPs function as nominal complements. Both cases exhibit a simple/deep extraction contrast, as illustrated below for the former.

- (8) tu vivliu_i mu ipes pos dhiavases [tin kritiki t_i]
the-gen book-gen me said-2s that read-2s the review
‘You told me you read the review of the book.’ (Horrocks & Stavrou 1987)
- (9) *tu vivliu_i mu ipes pos dhiavases (tin) enstasi [tis kritikis t_i]
the-gen book-gen me said-2s that read-2s the objection the-gen review-gen
‘You told me you read the objection to the review of the book.’

Turning to French *combien*-extraction, while simple *combien*-extraction, where the DP is a verbal complement, is allowed, deep *combien*-extraction, where the DP is a complement of a noun, is not.

- (10) Combien_i a-t-il consulté [_{DP} t_i de livres]?
how-many has-he consulted of books
- (11) *Combien_i a-t-il consulté [_{DP} (plusieurs/des) préfaces [_{DP} t_i de livres]]
how-many has-he consulted several/some prefaces of books
‘How many books did he consult several/some prefaces of?’

Serbo-Croatian (SC) allows extraction of adjectives and NP-adjuncts. They are both blocked when the NP from which extraction occurs functions as a nominal complement.

- (12) Pametne_i on cijeni [t_i prijatelje]
smart he appreciates friends
- (13) *Pametnih_i on cijeni [prijatelje [t_i studenata]]
smart he appreciates friends students
‘He appreciates friends of smart students.’
- (14) Iz kojeg grada_i je Petar sreo [djevojke t_i]
from which city is Peter met girls
- (15) *Iz kojeg grada_i je Petar kupio [slike [djevojke t_i]]?
from which city is Peter bought pictures girl
‘From which city did Peter buy pictures of a girl?’

A variety of extractions thus show that extraction from N-complements is disallowed. There is then nothing special about CPs: extraction from nominal complements is disallowed regardless of the category of the complement. We then have the Generalized Complex NP Constraint.

- (16) Extraction out of nominal complements is disallowed.

Turning to other lexical heads, consider the CNPC context with adjectives. (17) is unacceptable if the adjunct modifies the embedded clause.

- (17) *How_i/Why_i are you [_{AP} proud [_{CP} that John hired Mary t_i]]?

Extraction is also banned from non-CP complements of adjectives.

- (18) a. Of who(m)_i is he [proud t_i]? b. *Of who(m)_i is he proud of [friends t_i]?

Greek adjectives take genitive or PP complements. In both cases, extraction from the complement of *responsible* is banned.

- (19) *Tu ktiriu_i ipeftinos [tu fotismu t_i /gia to fotismo t_i]
 the-gen building-gen is-responsible the-gen litting-gen/for the litting
 ‘the building he is responsible for the litting of’

APs thus pattern with NPs.

- (20) Extraction out of adjectival complements is disallowed.

The same holds for PPs. (21) replicates the simple/deep extraction contrast from NPs/APs.

- (21) a. About who(m)_i did you read t_i? b. *Of who(m)_i did you read about friends t_i?

Prepositions can take CP complements in Spanish. Significantly, such cases disallow extraction.⁵

- (22) *¿cómo_i se acordó de [que [Pedro preparaba la comida t_i]]
 how clitic (s)he.remembered of that Pedro prepared.imperfect the food

Greek (23) confirms the existence of the Generalized Complex PP Constraint (24).

- (23) *Tinos_i endhiaferese [ya [ti fili t_i]
 who-gen be-interested-2s for the friend
 ‘Whose friend are you interested in?’ (Horrocks & Stavrou 1987)

- (24) Extraction out of complements of prepositions is disallowed.

An obvious question arises now: why are VPs different? It turns out they are not always different. The effect in question is actually found with ergative VPs. Thus, (25) is better than ergative (26).

- (25) Who did they see (some) friends of t_i yesterday?
 (26) ?*Who_i did there arrive (some) friends of t_i last week?

Only argument extraction, which yields a weaker effect, can be checked with English DPs. Belletti & Rizzi (1988), however, show some psych verbs that take CP arguments are ergative (see below for ergatives with just a CP argument). (27)-(28) involve uncontroversially ergative psych verbs, with the CP located in the V-complement position (Belletti & Rizzi 1988, Pesetsky 1995, Landau 2010). Both argument and adjunct extraction are degraded here, the latter being worse, as expected.⁶

- (27) a. ??What_i did it appeal to Mary [that John fixed t_i]?
 b. *How_i did it appeal to Mary [that John fixed the car t_i]?
 (28) a. ??What_i did it depress Mary [that John sold t_i]?
 b. *How_i did it depress Mary [that John was fired t_i]?

There are also transitive ergatives that do not take CP arguments, where only argument extraction can be checked. Extraction is degraded in such cases (see Belletti & Rizzi 1988 for Italian).

- (29) ??Who did your behavior bother the sister of? (Johnson 1992)
 (30) ?*Who did John’s embarrassment escape friends of?

⁵Some languages treat (some) Ps as inherent Case-markers (see Nunes 2009). Such Ps are not relevant to our concerns.

⁶(27)-(28) may involve short V-movement, which may exist in English even independently of v (Johnson 1991).

The Generalized Complex VP Constraint effects thus emerge with ergative verbs.

(31) Extraction out of complements of ergative verbs is disallowed.

When properly generalized, the CNPC thus represents a pervasive pattern found in many contexts. Extraction is banned not only from clausal but all nominal complements, APs, PPs, and ergative VPs patterning with NPs (see Bošković 2014b on passives). With the exception of non-ergative Vs, extraction is then banned from complements of lexical heads.

(32) **The Complex XP Constraint** (where $X \neq$ non-ergative V)

Extraction out of complements of lexical heads is disallowed.

2. Deducing the Complex XP Constraint

This section restates (32) within the phase theory of Bošković (2014b) and proposes its deduction.

In Chomsky (2000), certain phrases (vP and CP) are always phases regardless of their syntactic context. Many have, however, argued that the phase status of X can be affected by its syntactic context. Thus, Bošković (2013a, 2014a) argues the highest projection in the extended domain of a lexical head/clause functions as a phase (see also Wurmbrand 2014). There, vP is a phase as the highest projection in the extended domain of V and CP as the highest clausal projection. There is a phase even with ergatives even if vP, which is responsible for external θ -role assignment, is absent; VP is a phase here as the highest projection in the domain of V. Another way to look at this is from the perspective of Grohmann (2003), where a clause is divided into three domains, the discourse, the agreement, and the θ -domain and movement must pass through each domain. Suppose we collapse the agreement and the discourse domain into one, giving us two domains: thematic and non-thematic. This in fact corresponds to Chomsky's original conception of phases if we assume, following Bošković (2013a, 2014a), that the highest projection in a domain functions as a phase. vP is then a phase as the highest projection in the thematic domain, and CP as the highest projection in the non-thematic domain. With ergatives, due to the lack of vP, VP is the highest projection in the thematic domain hence a phase. (A non- θ -marking vP with ergatives would not affect anything.) I will adopt here this approach to phases: the highest projection in the thematic domain of every lexical head and the highest projection in the non-thematic/functional domain function as phases.

Interestingly, under this approach all examples that instantiate (32) involve the context in (33), where a phasal head takes a phase as its complement.

(33) [XP=Phase [YP=Phase]]

E.g., NP is a phase in (2) as the highest projection in the nominal thematic domain. The same holds for AP in (17) and PP in (22) (as the highest projections in the A/P thematic domains). Focusing on the NP case, the noun takes CP, a phase, as complement in (2), hence (2) involves a double-phase context (33). The same holds for Greek (9), with a DP phase right below the NP phase. Slightly different (the moving element starts at the lower phase edge) but also involving (33) are French (11) and SC (13)/(15). All extractions from N-complements thus involve (33). The same holds for (20). The adjective, a phase head, takes a CP phase complement in (17) and a DP/PP phase complement in Greek (19). The preposition, a phasal head, also takes a phasal complement in all cases of (24) ((21)-(23)). Consider the VP cases (26)-(30). Recall ergatives behave differently from other Vs in showing Complex XP Constraint effects. The obvious conclusion is that vP is what matters here, which follows from the current phasal system. With non-ergative verbs, vP is the highest projection in the verbal thematic domain. VP is then not a phase. As a result, extraction from clausal complements of non-ergative verbs (34) does not involve (33). In contrast, ergatives lack the thematic vP layer. This means VP is the highest (and only) projection in the relevant thematic domain hence a phase in (35). (35) then involves a double phase configuration (I ignore V-movement).

- (34) How_i did you [_{VP} t_i [_{VP} think [_{CP} t_i that [_{IP} John [_{VP} fixed the car t_i]]]]]?
 (35) *How_i did it [_{VP} t_i appeal to Mary [_{CP} t_i that [_{IP} John [_{VP} fixed the car t_i]]]]]?

Extraction is thus disallowed in the configuration in (33), where a phasal head takes a phase as its complement. (32) can then be restated as in (36). ((36) will be slightly revised below).

(36) The Phase-over-Phase Constraint: Extraction is banned from phases that function as phasal complements (i.e. the double-phase configuration in (33)).

Recall now our initial question: why is there no Complex VP Constraint, in contrast to the Complex NP/AP/PP Constraints. A clue here is provided by the Complex VP Constraint effects with ergatives. The obvious difference between ergative and non-ergative Vs is the existence of vP with the latter. (36) capitalizes on this: the current approach to phases yields a principled difference between ergative and non-ergative verbs given the presence of vP with the latter. Generalizing, the reason for the contrast between acceptable (3) and ill-formed (2)/(17)/(22)/(27b), i.e. the reason for the different behavior of non-ergative VP and NP/AP/PP/ergative VP regarding the Complex XP Constraint, is the presence of vP, i.e. the assignment of the external θ -role in a projection distinct from VP. There is then no such projection with NP/AP/PP. nP/pP/aP are often posited merely for the sake of uniformity with VP. But the fact is that there is no uniformity here regarding extraction.⁷

I now turn to a deduction of (36), a restatement of (32) made possible by the approach to phases where the highest projection in thematic/non-thematic domains functions as a phase.

2.1. Deducing the ban on extraction in phase-over-phase configurations

A clue for the deduction of (36) can be found in Chomsky's (2001) approach to the PIC. While for Chomsky (2000), when a phase is assembled only its edge is accessible outside of it, for Chomsky (2001) the PIC kicks in only when the next phase head is merged. This means the complement of a phase head is accessible to the next head if that head is not a phasal head. However, it is inaccessible if that head is a phasal head. This kind of distinction between phasal and non-phasal heads is precisely what we are after: recall extraction from a phase is disallowed if the phase is merged with a phasal head, but not if it is merged with a non-phasal head. All we need is to modify Chomsky's (2001) approach to the PIC in a way that still makes a difference between phasal/non-phasal heads regarding the accessibility of a phase they are merged with. In particular, the edge of a phase is accessible only to non-phasal heads; a phase is completely inaccessible to the next phasal head. I.e., the PIC holds only for non-phasal heads. It can then be used as a gate for movement only if the head merged with a phase is a non-phasal head. This means the edge of phase XP in (37) is accessible to the non-phasal head Y, but not to the phasal head Z.

(37) Z (Y) [_{XP} wh X]

In (2)/(38), *how* then moves to the embedded SpecCP, CP being a phase. However, since CP is now completely inaccessible when the next phasal head is merged, when N, a phasal head, is merged, *how* can no longer move.

(38) N [_{CP} how C [_{IP}]]

How also moves to the embedded SpecCP in (3). However, the head merged with the CP in (3)/(39a) is not a phasal head. This means *how*, located at the CP phase edge, is accessible for movement to V. V then attracts *how*, which moves to SpecVP. Since VP is not a phase, in contrast to *how* in (38), *how* in (39b) is accessible to the next phasal head (v), hence can move to its edge.

⁷ nP/p/aP could still exist, but they would not be part of the thematic domain (they would not be assigning a θ -role).

- (39) a. V [CP how C [IP]] b. v [VP how V [CP how C [IP]]

There is a rather natural restatement of this account which preserves an assumption that was present at the inception of the phase theory but given up later. Suppose there is nothing like the PIC in the syntax. Under multiple spell-out, pieces of syntactic structure are transferred to the interfaces during the derivation. Assuming that what is transferred to the interfaces is no longer accessible in the syntax, there is no need to have anything like the PIC holding as a principle in the syntax itself, pieces of structure that are spelled out will anyway be inaccessible in the syntax (see Bošković 2005 and references therein). Now, in the original proposal regarding phases, what was sent to spell-out was the phase itself. The assumption was later modified in that what was sent to spell-out was the phasal complement. This left us with a rather strange situation: while phases are the crucial units in the multiple spell-out framework, for all practical purposes the crucial units are actually not phases but phasal complements. But, in contrast to phases, phasal complements have no theoretical status. Witness e.g. a great deal of effort that has gone into coming up with a proper, unified definition of what counts as a phase; there's been nothing like that regarding phasal complements—no one has even tried to come up with a unified definition of phasal complements. Phasal complements should then play no role in spell-out; what is transferred to spell-out should be phases, not phasal complements. Recall this was in fact the original assumption regarding spell-out (some of the arguments for multiple spell-out are actually based on it, see e.g. Franks & Bošković 2001). The original assumption is also simpler in that it does not require special provisos regarding matrix clauses: if only phasal complements are sent to spell-out we need an additional assumption regarding matrix clauses to ensure that not just IP but also CP, a phase not a phasal complement, is sent to spell-out in (40). No special assumption of this type is needed under phase spell-out.

- (40) [CP What did [IP John buy]]

I then assume that what is sent to spell-out is phases, not their complements. However, following Chomsky (2001) regarding the PIC and adapting it to the current assumption regarding spell-out, a phase is transferred to spell-out only when the next phasal head enters the structure. In particular, following Bošković (2014a), the transfer takes place as soon as the next phase head is merged. This analysis, which does not require the PIC at all and privileges phases, not phasal complements, for spell-out, accounts for (36). The gist of it is that the *wh* in (41) is accessible to Y, a non-phasal head, but not to Z, a phasal head, because merger of Z triggers immediate spell-out of the XP phase.

- (41) Z (Y) [XP *wh*]

Let us apply this to concrete cases. (2), a CNPC case, is straightforward. As soon as N, a phasal head, is merged, CP is sent to spell-out. As a result, nothing within CP is accessible for movement from CP, hence *how* cannot move out of it (it doesn't matter whether *how* moves to SpecCP or not).

- (42) N [CP ...*how*...]

In (3), CP merges with V, which is not a phasal head, in contrast to the head CP merges with in (2). CP is then not sent to spell-out in (3)/(43a). This means *how* is accessible for movement to V. (If its base position is above vP, *how* is accessible to V in its base position.) *How* then moves to SpecVP.⁸ Merger of v triggers spell-out of the lower phase, CP. However, since *how* has already moved out, it is not affected by CP spell-out in (43), in contrast to (42).

⁸See here Rackowski & Richards (2005) and den Dikken (2009), who also argue that successive-cyclic movement in (3) does not go through SpecCP (for them, the movement also targets the VP domain above the CP).

The contrast between (2) and (3) is thus captured. The analysis extends to all the cases from section 1, accounting for all the examples which have motivated positing (32)/(36).

The account has interesting architectural consequences. What is sent to spell-out is full phases. However, what is targeted by successive-cyclic movement (SCM) is not phases, but phrases above them (if TP is the only phrase above vP, movement targets TP (see Bošković & Lasnik 2003) and VP; unless additional assumptions are adopted, movement need not pass through phasal edges.

An appealing property of the phase system, emphasized already in Chomsky (2000), is that phases are relevant to many phenomena. In fact, we may expect all domain-based mechanisms to be stated in terms of phases. There is, however, a problem with spell-out and SCM. Assuming that what is sent to spell-out is no longer accessible to syntax, it is simply not possible to state the domain for both spell-out and SCM in terms of phases. If SCM were to target spell-out units, the moving element would get frozen since it would be a part of a spelled out unit. Only one of the two mechanisms, spell-out or SCM, can then be stated in terms of phases. In other words, for a moving element not to get caught in a spell-out unit, either the domain for SCM or the domain for spell-out can correspond to phases, but not both. This in fact is the property of both Chomsky (2001) and the current system. They both have the following property: XP is sent to spell-out and movement targets YP right above it. In both systems, one of the two is defined on phases. The difference between the two is which mechanism is defined on phases. For Chomsky, it is SCM: SCM targets phases, spell-out doesn't. In the current system, spell-targets phases, SCM doesn't. In this respect, the systems seem to be equal conceptually. There are, however, reasons to prefer the current system. We are dealing here with an issue of primacy, what should be privileged, spell-out or SCM. By defining the former on phases, with SCM piggy-backing on it, the current system privileges spell-out. Chomsky's system, on the other hand, privileges SCM. Many have, however, argued that SCM takes place so that the moving element escapes being sent to spell-out (Bošković 2007, Fox & Pesetsky 2005, Stjepanović & Takahashi 2001; the intuition seems to be present even in Chomsky's analysis). If this is the right way to look at it, it argues for the system where spell-out is privileged, i.e. for a system like the one argued for here where spell-out is defined on phases, but SCM is not. Furthermore, the current system does not need anything like the PIC, which is needed in Chomsky's system. All we have is the assumption that phases are sent to spell-out, with SCM taking place so that the moving element avoids being sent to spell-out. The current system also does not require any additional assumptions concerning spell-out of matrix clauses, in contrast to Chomsky's system.

At any rate, what is important for our purposes is that phase X is completely inaccessible when the next phasal head is merged. Movement from X is then possible only if X is first merged with a non-phasal head, which can "pull" the moving element out of X before the next phasal head enters the structure. *Wh* can then move out of CP in (44) only in the absence of Y.

(44) **H** L (**Y**) [_{CP} **C** [_{IP} *wh*]]

Extraction is thus banned in phase-over-phase configurations, i.e. we have just deduced the Phase-over-Phase constraint from (36) and the Generalized XP Constraint (32) on which (36) is based.⁹

An important point is in order. While extraction is disallowed from complements of lexical heads, the complement itself can move (unless independent factors interfere, as with movement of the CP complement of N). To account for this, I adopt Uriagereka's (1999) original conception of spell-out. Uriagereka argues that when a phrase is sent to spell-out, nothing within it is available for further syntactic operations but the phrase itself is available. In his terms, sending A to spell-out,

⁹We will see below that there are exceptional cases where (32)/(36) do not seem to hold; the above deduction of (32)/(36) leaves room to accommodate such cases.

(45) [_{DP} [_{XP} X [_{NP} N K]]]

(46) ...<sub>[NP prijatelje _[NP pametnih studenata]]
 friends smart students_{GEN}</sub>

(47) ?Kakvom_i ga je uplašila [prijetnja [t_i smrću]]?
 what-kind-of him is scared threat death_{INSTR}
 ‘Of what kind of death did a threat scare him?’ (Bošković 2013a)

(48) ..._{[NP prijetnja} _{[FP}_[NP kakvom smrću]]]

However, as S. Stjepanović (p.c.) notes, inherently case-marked complements might be adjuncts. Starke (2001) notes (for Czech) that extraction from inherently case-marked NPs is worse than from structurally case-marked ones, as in SC (49), where extraction from a dative object is worse than a nominative subject. This indicates they are islands, which follows if they are adjuncts. But (47) is then not inconsistent with (32) since it doesn't involve extraction from an N-complement.¹¹

(49) a. *Kojeg doktora_i si prijetio [prijatelju t_i]?
 which doctor_{GEN} are threatened friend_{DAT}
 ‘Which doctor did you threaten a friend of?’

¹¹FP is not needed under the adjunction analysis of (47). Below I suggest only merger of a phasal head triggers spell-out hence *kakvom smrću* is not spelled out when it adjoins to the higher NP. *Kakvom* is then accessible for later movement (note that (i) then shows that adjuncts to adjuncts can extract (see also (69)), an issue I address in work in prep.).

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- b. ?Kojeg doktora_i je to bila [greška t_i]?
 which doctor_{GEN} is that been mistake_{NOM}
 ‘Which doctor was that a mistake of?’

2.2. CED effects

The current analysis also captures the ban on extraction from subjects in SpecIP. Consider (50).

(50) [_{CP} [_{IP} Subject [_I]]]

Recall that a phase is completely inaccessible to the higher phase head. Since subjects are phases (possibly only DPs), the subject is inaccessible to C, the next phasal head, hence C cannot attract anything out of it. (50) does not literally involve a phase-over-phase configuration. IP, a non-phase, dominates the subject but not CP. However, this is not enough. What is needed is for a non-phasal head to intervene between the two phases, i.e. for a non-phasal head to c-command the lower phase so that it can probe into it, attracting the moving element out of it. Since I does not c-command the subject, it cannot attract anything out of it. Extraction from subjects in SpecIP is then banned.¹²

The analysis extends to the ban on extraction from adjuncts if adjuncts are adjoined to complements of phasal heads (VP and IP). Consider (51), where K is also a phase (CP, DP, or PP).

(51) [_{vP} [_{VP}] K _{VP}]

The only element that intervenes between the vP phase (which sends K to spell-out) and K is a VP-segment, which is irrelevant (V cannot attract anything out of K since V does not c-command K). Extraction from K is then impossible. The current analysis thus captures the ban on extraction from adjuncts.¹³ In fact, the ban on extraction from subjects and the ban on extraction from adjuncts are unified with the Complex XP Constraint, all three being reduced to the ban on extraction in phase-over-phase contexts. (36) should, however, be slightly revised in light of the above discussion.

(52) The Phase-over-Phase Theorem: Extraction is banned from a phase that is immediately c-commanded by a phasal head (where X is immediately c-commanded by head Y if there is no head Z such that Z c-commands X but not Y)

2.3. Phase collapsing

Consider now why P-stranding does not matter in the contrast in (6)/(4) vs (7)/(5), i.e. why (6) does not instantiate (16). Many authors have implemented the reanalysis approach to P-stranding in terms of P-incorporation (overt or covert). (6) then involves P-to-N movement.

(53) Who_i did you see [_{DP} [_{XP} t_i [_{NP} friends of_j [_{PP} t_j t_i]]]]?

Bošković (2014b) proposes phase collapsing for phasal projections headed by two phase heads (due to the movement of the lower phase head to the higher phase head): the two phases are collapsed into one, the lower phrase not being a phase. PP is then not sent to spell-out in (53) (there is a feature on the P and N that drives the movement in question which also indicates the phasehood of PP will be voided hence PP is not spelled out when N is merged). As a result, when X enters the structure *who* can move out of NP. XP not being a phase, *who* is available for movement after D is merged. Note (54) is still ruled out: merger of *of* causes spell-out of DP; *who* is then stuck within it.

¹²Subjects that remain in SpecvP allow extraction (Stepanov 2007). Here, a non-phasal head, I, intervenes between vP and CP hence can pull out a moving element from the subject before C is merged (section 3 proposes only merger of a phasal head triggers spell-out, hence subject in SpecvP is not sent to spell-out until C is merged).

¹³Adjuncts in ergative constructions require additional assumptions which I cannot go into here due to space limitations.

(54) *Who_i did you see enemies [PP' of' [DP [XP t_i [NP friends of'']_j [PP'' t_j t_i]]]]?

Of' behaves like a phase head at the point of merger, sending DP to spell-out. The reason for this may be that the noun which will void its phasehood (*enemies*) has not yet entered the structure (this doesn't affect (53)) or that P-incorporation in English occurs only under P-stranding, hence not for *of'*. There's reason to favor the latter analysis, where the phasehood of PP' is never voided.

Setswana, a Bantu language where the noun precedes all other DP elements, which is analyzed in terms of N-to-D movement (Carstens 2010), does not display CNPC effects.

(55) Ke m-ang yo o utlw-ile-ng ma-gatwe a gore ntša e lom-ile?
 it C1-who C1Rel 2sgSM hear-Perf-Rel C6-rumor C6SM that C9-dog C9SM bite-Perf
 "Who did you hear rumors that a dog bit?"

This follows from phase collapsing. Due to N-to-D, the object is headed by two phase heads, D and N. (I assume XP is either not present in Setswana or it is present, with X moving to D and N to the X+D head.) Due to phase collapsing, NP is then not a phase. Crucially, N does not cause spell-out of CP, hence movement from CP is possible. This means that already at the point of merger, N is treated as a non-phasal head. (The presence of a D feature on N, which drives N-to-D, is sufficient to determine locally that the phasehood of N will be voided.) The implication of this for (54) is that *of'* in (54) does not incorporate; P-incorporation in English occurs only in P-stranding contexts, hence *of'* is a phasal head in (54) (the alternative account of (54) suggested above would not extend to (55)). Returning to (55), since the first phase above CP is DP, the CP is not sent to spell-out until D is merged. Since there is at least one non-phasal head between CP and DP (NP and possibly XP), 'who' can move out of the CP phase before D enters the structure, triggering spell-out of the CP.

Recall now the deduction of the ban on extraction from adjuncts. *v* is the first phasal head above KP in (56), hence *v* cannot attract anything from KP. The account makes a prediction. If K moves to *v*, KP phasehood will be voided due to phase collapsing. KP will not be spelled out until C is merged. Movement from KP should then be possible since there are several heads lower than C that can pull the moving element out of KP before C is merged. The surprising prediction is borne out.

(56) [_{VP}] _{VP}] KP _{VP}]

Galician has a phenomenon of D-incorporation, which voids islandhood (Uriagereka 1988, Bošković 2013b). Extraction from adjuncts is banned in Galician. However, the ban is voided with D-incorporation, exactly as expected under the current analysis (I assume D incorporates into V+v).

(57) ??de que semana_j traballastedes [DP o Luns t_j]
 of which week worked the Monday
 'Of which week did you guys work the Monday?'
 (58) de que semana_j traballastede-lo_i [DP[D' t_i Luns t_j]]

3. Infinitives and extraposed clauses

Turning to infinitives, adjunct extraction is banned from non-verbal control infinitival complements.

(59) a. *How did he witness an [NP attempt [to fix the car t]]?
 b. *How is John able [to fix the car t]?
 c. *How is it possible/time [to fix the car t]?

Such cases instantiate (32). Control infinitives are standardly assumed to be phases. Since the phrase right above the infinitive is also a phase we have a phase-over-phase configuration here. The infinitive is spelled out as soon as the next head is merged, before *how* can move out of it.

Raising infinitives do allow adjunct extraction.

(60) How_i is John likely [to fix the car t]_i

This is expected under Chomsky (2000), where control infinitives are and raising infinitives are not phases, the reason being that control infinitives are CPs while raising infinitives are IPs and only CPs are phases. *How* is then accessible from outside the infinitive in (60). However, in Bošković (2014a), where the highest clausal projection is a phase, the infinitive in both (59) and (60) is a phase regardless of its category (see here Wurmbrand 2014). (60) seems to favor Chomsky's position. However, it turns out adjunct extraction from raising infinitives is impossible. A number of authors have argued traditional raising infinitives are ambiguous between the raising and the control option (e.g. Lasnik & Saito 1992, Martin 2001). There are several ways of disambiguating them, the most straightforward one being with expletive *there* since *there* cannot be a controller. Surprisingly, such disambiguation affects extraction. Thus, the embedded reading of *how* is not available in (61) (i.e. it is much more difficult to get it in (61) than (60)).

- (61) a. *How_i is there likely [to arrive someone t_i tomorrow]?
 b. *How_i does there seem [to have arrived someone t_i]?

Idiom chunks behave like expletives: the embedded-clause reading is not available in (62).¹⁴

(62) *How_i is the hatchet likely [to be buried t_i]/advantage likely [to be taken t_i of Mary]?

Consider also (63)-(65).

- (63) Some senator is likely to lie to every member of his committee.
 (64) Some senator tried to lie to every member of his committee.
 (65) How_i is some senator likely [to lie to every member of his committee t_i]?

While (63) is ambiguous the subject must take wide scope in (64). (63)-(64) illustrate the well-known raising/control difference. Interestingly, the subject must take wide scope in (65) (the low scope reading of the subject is more difficult to get in (65) than (63) on the embedded reading of *how*), which confirms that adjunct extraction forces the control option.

All this follows if the highest clausal projection is a phase regardless of its category, which makes both control and raising infinitives phases. Thus, Martin (2001) argues that *seem* assigns subject θ -role on the control option. There is then a vP above VP on the control option (66). No problem regarding extraction arises here. On the raising option, external θ -role is not assigned. vP is then not present, hence adjunct extraction is disallowed, (67) involving a phase-over-phase configuration.¹⁵

- (66) How_i did John [vP [vP seem [Infinitive PRO to have hit Bill t_i]]]?
 (67) *How_i does there [vP seem [Infinitive to have arrived someone t_i]]]?

¹⁴Since there are verbs that disallow expletive subjects and scope ambiguities from (63) but allow idiom chunks as subjects, idiom chunks are not a fully reliable diagnostic of raising.

¹⁵The analysis extends to *likely*, *likely* being verbalized on the control option with external θ -role assigned in a separate thematic projection on a par with verbs (see Bošković 2014b).

Note that these facts confirm the existence of the Generalized Complex VP Constraint which holds only for the contexts where the verb does not assign the external θ -role.¹⁶

Turning now to extraposed clauses, many such cases disallow extraction (e.g. **How is it possible [that John will fix the car t]* and (59c), which can be easily captured. However, at least for some speakers, some extraposed clauses allow extraction.¹⁷

(68) How is it likely [_{CP} (that) John fixed the car t]?

Extraposed CPs have been argued to be Specs/adjuncts (e.g. Reinhart 1980, Stowell 1981, Bošković 2002), which I also assume here for the extraposed CPs in question. Recall that what is at the heart of the current account of (36) is the precise timing of spell-out: Phase X is sent to spell-out when the next phasal head is merged. Let us take this literally: merger of the next phasal head, not its projection, triggers spell-out. Recall the CP in (68) is located in SpecAP. This means it is merged with a projection of A, not A. The merger then does not trigger spell-out of the CP. Since there are non-phasal projections between AP and the matrix CP, *how* can move from the extraposed CP before matrix C, the next phase head, is merged, triggering spell-out of the extraposed CP.

Adverbial extraction confirms this analysis (see Talić 2014 for an account of the English/SC contrast with such extraction). If merging AP with a projection of N were to trigger spell-out of AP, *extremely* could not extract in (69). However, if AP-adjunction to NP does not trigger AP spell-out since AP is not merged with a phase head, *extremely* is accessible outside of NP, hence can move.

(69) ?Izuzetno_i su kupili [_{VP} [_{NP} [_{AP} t_i skup]] [_{NP} automobil]].
 extremely are bought expensive car
 ‘They bought an extremely expensive car.’

4. Conclusion

Taking as the starting point the well-known fact that extraction from Complex NPs is banned while extraction from Complex VPs isn’t, we have seen that the former represents a pattern found in many contexts, the latter being highly exceptional. Extraction is impossible not only from clausal but all complements of nouns, with adjectives, prepositions, and ergative verbs patterning with nouns. The only context where extraction from the complement of a lexical head is possible involves non-ergative verbs. Adopting an approach to phases where the highest projection in the thematic domain of a lexical head as well as the highest projection in the functional/non-thematic domain function as phases, I have recast the ban on extraction from complements of lexical heads as a ban on extraction from double-phase configurations, i.e. a ban on extraction from phases that are immediately c-commanded by a phasal head, also extending it to *CED* effects (the ban on extraction from subjects and adjuncts), thus unifying all of these under the ban on extraction in phase-over-phase configurations. A deduction of this ban was proposed where phase XP is completely inaccessible, with no edge/PIC exception, once a higher phase head enters the structure. Returning to Chomsky’s original proposal regarding spell-out, I have argued that phases, not phasal complements, are sent to

¹⁶A question arises: why is it that subjects can move from raising infinitives while adjuncts cannot? (While the situation is less clear with objects (since some islands, e.g. wh-islands, are completely voided with object extraction from infinitives), they seem to pattern with adjuncts, modulo the difference in the strength of the violation, see Bošković 2014b). Bošković (2014b) suggests two accounts, one based on feature sharing between the infinitival subject and T and one involving phase-collapsing. The current analysis makes available another possibility. Suppose there is a dummy (hence non-phasal) linker-like projection FP between the raising VP and the infinitive and that this projection is an A-related projection whose Spec can only host elements undergoing A-movement. This means SpecFP can host the subject undergoing raising but not adjuncts. There is then a non-phasal projection between the infinitive and the raising VP, both of which are phases. However, this projection can pull only elements undergoing A-movement, hence only raising subjects, from the infinitive before the raising V is merged, sending the infinitive to spell-out.

¹⁷Subject extraction is still disallowed, see Bošković (2014b) for an account.

spell-out, as a result of which nothing within phase XP is accessible to higher phase Y, given that merger of Y leads to immediate spell-out of XP. Since phase XP is completely inaccessible when the next phasal head is merged, movement from it is possible only if XP is first merged with a non-phasal head, which can pull the moving element out of XP before the next phasal head is merged. In Complex XP Constraint (and *CED*) contexts, the first merged head is a phasal head, i.e. we are dealing here with phase-over-phase configurations, which disallow extraction. An interesting consequence of the proposed system is that while what is sent to spell-out is full phases, what is targeted by successive cyclic movement is not phases, but phrases above phases. Phases are relevant to many phenomena. There is, however, a problem with spell-out and successive-cyclic movement in this respect. Assuming that what is sent to spell-out is no longer accessible to syntax, it is not possible to state the domain for both spell-out and successive-cyclic movement in terms of phases. If successive-cyclic movement were to target spell-out units, the moving element would also be sent to spell-out. Only one of the two mechanisms in question can then be stated in terms of phases. We have here the following situation: XP is sent to spell-out and movement targets YP right above it, and either XP or YP is a phase. Chomsky (2001) takes YP to be the phase while the current system takes XP to be the phase. In addition to deducing the Complex XP Constraint, the current system allows us to dispense with the PIC and does not require any special assumptions regarding spell-out of matrix clauses. All we have is the assumption that phases are sent to spell-out, with successive-cyclic movement taking place so that the moving element avoids being sent to spell-out.

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