

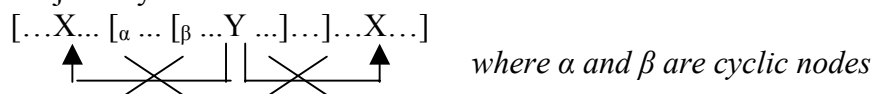
Phase Featuring-driven EPP-features and EPP-feature-driven Subjacency in Czech¹

1. Introduction

In this paper, I propose the Phase Featuring principle that drives the presence of intermediate features in successive cyclic movement.

At least since Chomsky (1973) it is known that movement applies in a successive-cyclic fashion, that is, movement takes place in a series of small steps. The locality of movement is determined by the Subjacency Condition (1), taken from Chomsky (1977, 73), which states that movement cannot cross more than one cyclic (bounding) node.²

(1) Subjacency Condition



In the 1980s, the Subjacency Condition was formulated in terms of barriers. As earlier, every link of a chain has to meet the Subjacency Condition and 1-subjacency has a special status: crossing one barrier still is well-formed movement, but crossing two barriers makes the movement step unacceptable (for details, see Chomsky 1986).

In the minimalist framework, the small steps are ensured by the Phase Impenetrability Condition (2). This condition determines that an operation does not have access to a phase below its head, hence ‘The Phase-Impenetrability Condition yields a strong form of Subjacency.’ (Chomsky 2000, 108). Consequently, long movement successively targets the edge of every phase.

(2) Phase Impenetrability Condition (Chomsky 2000, 108)³

In phase α with head H , the domain of H is not accessible to operations outside α ; only H and its edge are accessible to such operations.

It is standardly assumed that movement obeys the Last Resort principle, see, for example, Chomsky (1995, 253).

(3) Last Resort

... Move is driven by feature checking ...

This means that in the case of successive-cyclic movement, the movement steps to intermediate positions should be feature-driven as well. However, there is a problem with the intermediate features. It has been argued that they are stipulative, and they were called ‘pseudo-features’ or ‘spurious’, see Boeckx (2001), Bošković (2002, 2005), Heck & Müller (2000), McCloskey (2002).

2. Two options

¹ I would like to thank the participants of the FDSL-6 conference for their comments and suggestions.

² It has been argued that a parametrization of the set of bounding nodes is necessary, see, for example, Sportiche (1981) and references therein.

³ Compare the weaker version of the Phase Impenetrability Condition in Chomsky (2001a, 14) and in Chomsky (2001b, 5).

There are two main options for dealing with the intermediate features in successive-cyclic movement. Either one treats them as unnecessary, as for example Heck & Müller's (2000) in their optimality-theoretic model or Bošković (2002, 2005), or one tries to keep the idea that long movement is driven by the features present on the intermediate heads as Chomsky (2000; 2001a, b; 2005).

2.1. Intermediate features are not necessary

Heck & Müller (2000) propose that the intermediate steps of successive-cyclic movement, in contrast to the final step, do not have to be feature-driven because the Last Resort principle can be violated in their OT model.

Bošković (2002, 2005) argues that successive-cyclic movement does not involve checking of features on the intermediate heads and that the intermediate EPP-features can be eliminated because the EPP effects follow from the Activation Condition. This means that it is the uninterpretable feature on the moving element that forces it to undergo successive-cyclic movement, for details see Bošković (2005). Since I assume a Chomskyan phase-based model, I will not discuss the first option further and will concentrate on the second possibility here.

2.2. Intermediate features are present

This point of view is represented by Chomsky (2000; 2001a, b; 2005). He calls the intermediate features P(eripheral)-features (2000), EPP-features (2001a), OCC(urrence) features (2001b) or edge-features (2005). In the following, I show that there are some problems with Chomsky's features.

First, there are, in fact, two types of the EPP-feature behaving differently. The first type of the EPP is already present in the subarray and can be checked by external merger (it is the EPP-feature on the head T satisfied by an expletive). The second type of the EPP can be added after exhausting a subarray and is checked by movement (it is the EPP on the phase heads inducing object shift or long movement).

Second, the second type of the EPP-feature violates the Inclusiveness Condition (4), taken from Chomsky (2001a, 2), because it is assigned to the phase head in the narrow syntax component.

(4) *...Inclusiveness Condition, which bars introduction of new elements (features) in the course of computation...*

Third, another problem is that the presence of the EPP-feature, which is optional, is driven by its consequence because this EPP-feature can be used only if it brings about something, see the principle (5), from Chomsky (2001a, 35).

(5) *v* is assigned an EPP-feature only if that has an effect on outcome.*

Thus, this proposal works with looking ahead in the case of successive-cyclic movement and intermediate features because at the time when the intermediate EPP-features are assigned, it is not known what will happen in the next phase and whether the next step brings some effect (see also discussion of the look-ahead problem in Bošković 2005). In order to avoid looking ahead, one could let the derivation work freely with the EPP-feature(s) and let the semantic interface decide whether the EPP-feature brought an effect or not. However, this way of derivation would be computationally inefficient (see Frampton & Gutmann 2002) because the computational effort would be lost if the derivation crashes at the semantic interface. It would also mean that the derivation must be able to look back or somehow remember the fashion of

the original copy to recognize the effect, which is a problem again because there can be several phase edges between the head copy and the tail copy and so, the tail copy can be already spelled-out and forgotten.⁴

The fourth problem is that the movement operation driven by the EPP-feature is not based on agree because the goal element does not bear a matching feature, in contrast to Chomsky's (2001a, 10; 2001b, 11) proposal that movement is composed of agree + pied-piping + merge. But see also below.

The fifth problem is that the movement driven by the EPP-feature violates locality principles, as demonstrated by the scrambling (object shift) examples in (6) and (7). One would expect that the EPP moves the closest element. That is how, according to Rackowski & Richards (2005), object shift works in Icelandic or Tagalog. However, in (6) the scrambled adverbial *na ruku* (onto hand) crosses the direct object that is closer to the head *v* with the EPP-feature. And in example (7) with the moved direct object *dopisy* (letters), there is also at least one phrase closer to the head *v* with the EPP.⁵

(6) Pavel₁ políbí na ruku₂ [_{VP} zítra [_{VP} t₁ Marii t₂]].
 Pavel_{NOM} kiss onto hand_{ACC} tomorrow Marii_{ACC}
 'Pavel will kiss Marie onto her hand tomorrow.'

(7) Pavel₁ pošle dopisy₃ [_{VP} odpoledne [_{VP} t₁ dětem t₃]].
 Pavel_{NOM} sends letters_{ACC} in the afternoon children_{DAT}
 'Pavel will send the letters to children in the afternoon.'

Thus, in order not to violate locality, the EPP-feature must know which element it shall attract. This means that the scrambled element should carry a feature that is not present on the intervening elements. Chomsky (2001b) is aware of this problem and suggests that some feature of the phrase moving to the edge of a phase matches the OCC-feature. In contrast, Chomsky (2005) tries to avoid this problem proposing that the edge-feature probing does not involve agree and that the edge-feature can seek any goal in its domain.

Sixth, there is a need for more than one EPP-feature on the phase head or at least more its applications and every moving element must carry a feature matching the EPP-feature. Otherwise it would be difficult to account for why in certain cases only one object (7) or adverbial (6) moves and in another case (8), both objects move.

(8) Pavel₃ dětem₁ dopisy₂ [_{VP} odpoledne [_{VP} t₃ pošle t₁ t₂]].
 Pavel_{NOM} children_{DAT} letters_{ACC} in the afternoon send
 'Pavel will send the children the letters in the afternoon.'

3. The proposal

⁴ For the looking-back problem see also Epstein & Seely (2002).

⁵ To show that the direct object in (6) and the indirect object in (7) can also move, see (i) and (ii), respectively.

(i) Pavel₁ políbí Marii₂ [_{VP} zítra [_{VP} t₁ t₂ na ruku]].
 Pavel_{NOM} kiss Marii_{ACC} tomorrow onto hand_{ACC}
 'Pavel will kiss Marie onto her hand tomorrow.'

(ii) Pavel₁ pošle dětem₂ [_{VP} odpoledne [_{VP} t₁ t₂ dopisy]].
 Pavel_{NOM} sends children_{DAT} in the afternoon letters_{ACC}
 'Pavel will send the children letters in the afternoon.'

In this section, I will propose the Phase Featuring principle that determines the presence of intermediate features in successive-cyclic movement and that can overcome the problems discussed in the preceding section.

I here adopt Chomsky's proposal (2001a) that each phase has a separate lexical subarray and lexical subarrays are identifiable by the (single) phase head. Thus, first a lexical array is chosen from the lexicon, then a subarray is chosen from the lexical array and the computation works on this subarray. After its exhausting a new subarray is chosen from the lexical array and the computation works on the new subarray and so forth until the lexical array is exhausted. So, the Phase Featuring principle that I would like to propose applies to subarrays as stated in (9).

(9) Phase Featuring

Iff a matching feature F does not have its probe feature F_{EPP} in its current phase subarray (workspace), add an F_{EPP} -feature onto the phase head.

What the Phase Featuring principle does is that when a subarray with a matching feature is chosen from the lexical array, it checks whether the matching feature has its probe feature in the subarray. If this is not the case, then, given the intermediate feature is added onto the phase head, the element with the matching feature is subsequently moved to the phase edge in the derivation, where the element then becomes part of the next subarray (workspace). The notion of workspace here means that elements moved to the edge of a phase belong to the next higher subarray but they still are present in the structure, that is, they are not 'returned' to the next subarray.⁶ Then, if the probe feature again is not present in the current workspace, the process is repeated and so on.

Let us now specify what I mean by the 'matching feature F '. I will adopt Müller's (2004) Feature Balance and modify it as in (10).

(10) Feature Balance

For every probe feature F , there must be exactly one matching feature F in the lexical array⁷.

This principle applies to the lexical array. When the lexical array is chosen from the lexicon, the Feature Balance principle checks whether every probe feature⁸ has its matching feature. If it is the case, the derivation can continue and a lexical subarray is chosen from the lexical array and the Phase Featuring principle can be applied.⁹

The advantage of the Phase Featuring principle is that it is in line with a crash-proof approach to the syntax and so it reduces the computational complexity. See Frampton & Gutmann (2002), who claim that in an ideal case, the computational system generates only well-formed objects.

⁶ As pointed out to me by Gereon Müller (p.c.).

⁷ Müller's Feature Balance (2004, 9) states that 'For every feature specification $[*F:\alpha*]$, there must be a matching feature specification $[F:\alpha]$.'

⁸ The probe feature would be an uninterpretable unvalued feature in Chomsky's (2000, 2001a) terms, but compare Pesetsky & Torrego's (2004) proposal that the (un)interpretability and (un)valuation of features can be, in fact, freely combined, giving four possibilities. They propose that in long wh-movement, the final probe feature is interpretable and unvalued, whereas the intermediate features are uninterpretable and unvalued, therefore their valuation does not affect semantics. Thus, from this point of view, here the Phase Featuring generally adds uninterpretable unvalued features, regardless of the (un)interpretability of the probe feature.

⁹ Although the Phase Featuring principle in (9) is defined for overt movement, it could also be restated for covert movement. Note that the Feature Balance principle in (10) holds for agree, overt and covert movement.

In particular, the Phase Featuring removes the unchecked matching features from the phase so that the phase can converge at the interfaces. This is in accordance with the current minimalist approach, where the narrow syntax computation is driven by the interface requirements.

From the definition of the principle in (9) it is obvious that this process does not work blindly; the Phase Featuring uses the intermediate features exactly when it is necessary; there is no optionality, see the discussion in the preceding section. Consequently, there is no overgeneration with subsequent filtering the derivation and also no undergeneration. Simply, the element with the matching feature is (successive-cyclically) moved so that it can meet its probe feature. This is possible because it is clear that the probe feature will appear in the course of the derivation. That the appropriate derivation will not crash because of the lack of the corresponding probe feature is ensured by the Phase Balance principle (10), see also discussion in Müller (2004). The principle (10) has the same effect as look-ahead. In the case of successive-cyclic movement, the important point is that lexical subarrays, as subsets of the lexical array, take the Phase Balance principle for granted and then in the appropriate cases the Phase Featuring, in fact, must apply. This way, the look-ahead problem is done away with.

4. The analysis

In this section, I will demonstrate how the Phase Featuring principle works in some particular derivations. Let us begin with successive-cyclic movement in the case of long topicalization.

4.1. Long-distance topicalization

Take, for example, sentence (11). The relevant parts of the derivation look like (12).

- (11) [_{CP} [_{ΔP} Tuhle knížku_I [_{vP} myslím, [_{CP} že Pavel [_{vP} přečetl t₁]]]]].¹⁰
 this book_{ACC} think that Pavel_{NOM} read
 ‘This book, I think that Pavel read.’

After selecting the lexical array (LA) from the lexicon, the Feature Balance principle is applied. It is satisfied because, among others, the probe Topic-feature on Δ has an appropriate matching Topic-feature (12a). The derivation continues and the vP lexical subarray (SA_{vP1}) is selected from the LA. Now, the Phase Featuring applies and since the matching Topic-feature on *tuhle knížku* (this book) does not have its probe feature in the SA_{vP1}, the Topic_{EPP}-features is added onto the phase head v₁ (12b).¹¹ Then, in the proper syntax, this feature agrees with the matching Topic-feature and moves the DP with the matching feature to the edge of vP. After the vP cycle, the SA_{CP1} is chosen and the Phase Featuring applies. Since the matching Topic-feature on *tuhle knížku* does not have its probe feature in the SA_{CP1} workspace, the Topic_{EPP}-feature is added onto the phase head C₁ (12c), which then moves *tuhle knížku* to the edge of CP. The same process is repeated for the matrix vP cycle (12d). And when the SA_{CP2} is chosen, the matching Topic-feature does have its probe feature in the current phase workspace, therefore no feature is added (12e). Finally, in the proper syntax, the probe Topic_{EPP}-feature on Δ moves *tuhle knížku* to Spec,ΔP.

- (12) Relevant parts of the derivation of (11)
 a. LA: (10) satisfied: {**Top_{EPP} on Δ** **Top on *tuhle knížku***}

¹⁰ ΔP = discourse-related projection (see Lambova 2003, Reglero 2003).

¹¹ Elements base-generated at the vP edge and belonging to the vP lexical subarray, like subjects or certain adverbials, satisfy the added intermediate feature trivially by external merger.

- b. SA_{VP1}: (9) applied: {**added Top_{EPP} on v₁** **Top on *tuhle knížku***}
- c. SA_{CP1}: (9) applied: {**added Top_{EPP} on C₁** **Top on *tuhle knížku***}
- d. SA_{VP2}: (9) applied: {**added Top_{EPP} on v₂** **Top on *tuhle knížku***}
- e. SA_{CP2}: (9) applied: {**Top_{EPP} on Δ** **Top on *tuhle knížku***}

4.2. Multiple movement

Another interesting issue is how the proposal works in the case of multiple movement. First, I will consider multiple scrambling. Second, I will be concerned with multiple wh-movement.

4.2.1. Scrambling

There are no superiority effects with multiple scrambling in Czech, as demonstrated in (13). The unmarked word order is shown in (13a); in sentence (13b) the subject *Pavel* and the adverbial *na ruku* (onto hand) are scrambled. In (13c) the relative order of the scrambled elements is reversed and the sentence is as well-formed as (13b).

- (13) a. [CP [ΔP Pavel₃ políbí [TP [VP zítra [VP t₃ Marii na ruku]]]]].
 Pavel_{NOM} kiss tomorrow Marii_{ACC} onto hand_{ACC}
 ‘Pavel will kiss Marie onto her hand tomorrow.’
- b. [CP [ΔP Marii₁ políbí [TP Pavel₃ na ruku₂ [VP zítra [VP t₃ t₁ t₂]]]]].
 Marii_{ACC} kiss Pavel_{NOM} onto hand_{ACC} tomorrow
 ‘Marie, Pavel will kiss onto her hand tomorrow.’
- c. [CP [ΔP Marii₁ políbí [TP na ruku₂ Pavel₃ [VP zítra [VP t₃ t₁ t₂]]]]].
 Marii_{ACC} kiss onto hand_{ACC} Pavel_{NOM} tomorrow
 ‘Marie, Pavel will kiss onto her hand tomorrow.’

In Biskup (2006a,b) I argue that scrambling gives rise to specificity, which can be partitive, epistemic or generic, and that scrambling is driven by a Specificity-feature. I will here follow the proposal and assume that it is the Specificity-feature with the EPP-property on T that triggers movement of the subject and the adverbial to Spec,TP in (13b) and (13c). Then, the relevant parts of the computation of sentences (13b) and (13c) look like (14). The lexical array with the satisfied Feature Balance principle is in (14a). The lexical subarray of vP after the application of the Phase Featuring principle is illustrated in (14b). The null assumption is that features of the same class on the same head – here the Specificity probe features on T and the Specificity intermediate features on the head v – can apply in any order.¹² This and the 1-to-1 relation between the probe features and the matching features (indicated by the indices in (14)) bring about the desired non-superiority.

- (14) Relevant parts of the derivation of (13b,c)
- a. LA: {**Spec1_{EPP} on T, Spec2_{EPP} on T** **Spec1 on *na ruku*, Spec2 on *Pavel***}
 - b. SA_{VP}: {**added Spec1_{EPP} on v, added Spec2_{EPP} on v** **Spec1 on *na ruku*, Spec2 on *Pavel***}

¹² There can be a parametrization for particular languages. So, if in certain languages, the Phase Featuring (the adding and consequently the application of the intermediate features in particular phases) must always apply in the same order, one obtains linearization effects as in Fox & Pesetsky’s (2005) model.

From the analysis above it is obvious that the Phase Featuring principle overcomes the problems discussed in section 2.2.

In particular, there is only one type of the EPP-feature, the one already present in the lexical (sub)arrays.

Consequently, the Inclusiveness Condition is not violated. The Inclusiveness Condition should be restricted to proper syntax, that is, it should be possible to add features in the lexical array or subarrays because not all features present in the derivation are inherent to lexical items in the lexicon.

The presence of the intermediate F_{EPP} -feature is determined by the biconditional in (9), not by its consequence. Thus, as already discussed in section 3, the look-ahead problem does not arise here.

The movement driven by the intermediate F_{EPP} -feature is based on agree; the F_{EPP} -feature agrees with the matching feature F .

And since the movement driven by the intermediate F_{EPP} -features is based on the operation agree, it does not violate locality principles.

And in the case of multiple movement, every moving element is attracted by its own F_{EPP} -feature.

4.2.2. Multiple wh-movement and bad coindexation

Now the question arises what happens if in the lexical array, a ‘bad’ feature is chosen as the matching feature of the probe feature with the EPP-property. Consider example (15). I follow Meyer’s (2003) suggestion that wh-phrases move to some projection lower than CP (here I assume that it is ΔP) and then one of them moves to Spec,CP.

- (15) a. [_{CP} Koho₂ bude [_{ΔP} kdo₁ [_{VP} zítra [_{VP} t₁ líbat t₂ na ruku]]]]?
 who_{ACC} will who_{NOM} tomorrow kiss onto hand_{ACC}
 ‘Who will kiss who onto his hand tomorrow?’
- b. [_{CP} Kdo₁ bude [_{ΔP} koho₂ [_{VP} zítra [_{VP} t₁ líbat t₂ na ruku]]]]?
 who_{NOM} will who_{ACC} tomorrow kiss onto hand_{ACC}
 ‘Who will kiss who onto his hand tomorrow?’

It is theoretically possible that in the case (15a), the wh-feature of the wh-phrase *koho* is coindexed as the matching feature of the probe wh_{EPP} -feature on C. And that *koho* moving from Spec, ΔP to Spec,CP crosses the wh-phrase *kdo*. In (15b) the situation can be reversed, *kdo* with the coindexed matching wh-feature crosses *koho* on its way from Spec, ΔP to Spec,CP. One can ask why superiority effects do not arise in these sentences. Why does the wh-phrase in the higher Spec, ΔP not block movement of the lower wh-phrase with the coindexed matching wh-feature?

There are a few possible answers. The first possibility is that in fact, the probe wh_{EPP} -feature on C moves always the highest wh-phrase and the wh-phrase with the matching wh-feature coindexed with the probe wh_{EPP} -feature can stay in ΔP .¹³ For the sentence to be grammatical it would mean that this matching wh-feature is checked either by the intermediate wh_{EPP} -feature on the head v or covertly by the head C. This cannot be tested in Czech, therefore let us examine English examples. The English sentence (16) shows that this possibility is not correct because then (16) should be grammatical: the wh-phrase *what* with

¹³ Note that there can be more wh-features on C (coindexed with the appropriate matching wh-features on wh-phrases) under the assumed 1-to-1 relation between the probe and matching features and that only one of them has the EPP-property.

the checked matching wh-feature occurs in Spec,vP and the probe wh_{EPP}-feature on C is checked by *who*. However, this is not the case.

(16) *Who what bought?

The second possibility is that given some version of feature-based relativized minimality, elements with the wh-feature coindexed with the probe wh_{EPP}-feature can cross other wh-phrases.¹⁴ This answer cannot be correct either because in example (17), the wh-phrase *who* in Spec,TP blocks movement of the wh-phrase *what*, which theoretically can bear the matching wh-feature coindexed with the probe wh_{EPP}-feature on C.

(17) *What did who buy?

From this discussion I conclude that the element coindexed with the probe feature with the EPP-property must move to the specifier position of the head with the probe feature and that this movement cannot violate locality principles.

There still remains an option that superiority effects do not arise in (15) because multiple specifiers in ΔP are equidistant from the probe feature on C. Thus, I propose that here Chomsky's (2001a, 27) Equidistance Principle is at work, see (18).¹⁵

(18) *Terms of the edge of HP are equidistant from probe P.*

Chomsky (2001a) employs this principle for the edge of the vP phase and I assume that it holds for edges of other phrases as well.

5. Conclusion

In this article, I have proposed the Phase Featuring principle. This principle can regulate the presence of intermediate features in successive-cyclic movement and can get over problems of Chomsky's (2000; 2001a,b; 2005) approach.

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¹⁴ Regardless of whether the crossed wh-phrases bear a matching wh-feature or not, see note 13.

¹⁵ In other versions, the equidistance is defined for 'terms of the same minimal domain' (Chomsky 2000, 122) or for 'terms of the minimal domain of H' (Chomsky 2001a, 27).

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