

Labeling and Other Syntactic Operations

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This article proposes certain modifications to the minimalist system, among which labeling plays a prominent role. It argues for a specific model of cyclic Transfer, where every operation Merge constitutes a phase. The operation labeling is a prerequisite of Transfer and can be delayed. This allows syntactic objects to escape from a phase. Because of the early Transfer, movement is triggered by a greedy feature on the moving syntactic object. It will be shown that the proposed system can straightforwardly derive the following movement phenomena: freezing effects, order preservation in multiple movement, the prohibition of headless XP-movement and the ban on acyclic combinations of incorporations. It will be also shown that the proposal has certain advantages over Chomsky's minimalist system.

1. Introduction

Chomsky (2013) argues that the operation labeling can be delayed. In his proposal, labels are determined by a labeling algorithm, which operates at the phase level along with other operations. This means that first, the phase structure is built and then - at the phase level - the whole phase is labeled. For instance, in the case of successive-cyclic movement, labeling of a CP with a moving syntactic object in Spec,CP must wait until the next phase head v merges and attracts the moving syntactic object to its edge. Only then can the complement CP (and the higher phrases) be labeled and consequently be properly interpreted at the interfaces.

I follow Chomsky (2013) in assuming that labeling operates at the phase level. Since in my proposal every operation Merge constitutes a phase, as we will see below, labeling (and Transfer) should operate after every Merge. This, however, would block syntactic movement. Therefore, I also follow Chomsky (2013) in that labeling can be delayed. It does not have to happen immediately after Merger of the appropriate syntactic object; it follows movements related to the to-be-labeled syntactic object. Since labeling is necessary for interpretation, it means that movement feeds the operation labeling and labeling in turn feeds Transfer. To maintain advantages of the cyclic proposal, I assume that the moving syntactic object does not

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wait for a probe but that movement is triggered by an uninterpretable feature on the moving syntactic object.

The first motivation for setting up the system in this way is that it provides us with a straightforward analysis of several movement phenomena. It will rule out ill-formed sentences with freezing effects, acyclic incorporations or headless XP-movement and derive order preservation effects in multiple movement. Secondly, the proposed system also has other benefits. For instance, it does not employ the Phase Impenetrability Condition (PIC) and null phase heads; it does not stipulate special properties of phases and it can derive successive-cyclic movement targeting every phrase on its path.

The article is organized as follows. Section 2 briefly introduces the four constraints on movement. Section 3 discusses properties of the proposed system and advantages it has over Chomsky's approach. Section 4 demonstrates how the proposed system works and how it derives the four movement phenomena discussed in section 2.

2. The phenomena

2.1. Freezing effects

It has been observed that extraction out of moved syntactic objects is degraded; see, for instance, Ross (1967), Postal (1972), Wexler & Culicover (1980), Freidin (1992), Diesing (1992), Collins (1994), Müller (1998), Boeckx (2008), Gallego (2009), Lohndal (2011). Some definitions of freezing phenomena can be found in Ross (1967: 160, *Frozen Structure Constraint*), Wexler & Culicover (1980: 119, *Freezing Principle*), Diesing (1992: 128, *Revised Extraction Constraint*), Müller (1998: 22, *Freezing*). Generally, freezing can be schematized as in (1), where angle brackets mark copies.

(1) * ... β ... [_{αP} ... < β >...] ... <[_{αP} ... β ...]>

The following example, taken from Lasnik & Park (2003: 651), demonstrates the freezing effect for English subjects. As opposed to extraction from the subject *in situ* in (2a), with the subject position occupied by *there*, extraction from the moved subject is ungrammatical, as shown in (2b).

- (2) a. [*Which candidate*]₁ *were there* [*posters of t₁*] *all over the town*?
 b. *[*Which candidate*]₁ *were* [*posters of t₁*]₂ *t₂ all over the town*?

As far as extraction from objects is concerned, consider the Czech example in (3). Czech is an SVO language and allows left branch extraction. Therefore, when the direct object occurs *in situ*, as in (3a), extraction of the possessive *číslo* is possible. However, when the object is moved, as in (3b), the extraction of *číslo* is ungrammatical.

- (3) a. *Číslo Pavel políbil [t₁ sestru]?*
 whose Pavel kissed sister
 ‘Whose sister did Pavel kiss?’
 b. **Číslo₁ Pavel [t₁ sestru]₂ políbil t₂?*
 whose Pavel sister kissed

The following example from Postal (1972: 213) shows the freezing effect for extraction from a topicalized PP in English. In contrast to extraction from the *in situ* position in (4a), extraction from the topicalized PP in the lowest clause in (4b) or in the higher clause in (4c) is ungrammatical.

- (4) a. *Who₁ do you believe Mary thinks Joan talked [to t₁]?*
 b. **Who₁/Whom₁ do you believe Mary thinks [to t₁]₂ Joan talked?*
 c. **Who₁/Whom₁ do you believe [to t₁]₂ Mary thinks Joan talked?*

Similarly, extraction from the topicalized VP in German is bad, as shown in (5), taken from Müller (1998: 20). Example (5a) demonstrates that VPs can undergo topicalization and (5b) shows that movement of the embedded direct object *was* to the matrix clause is grammatical. Although both movements exist in German, extraction of *was* out of the topicalized VP is not possible, as shown in (5c).

- (5) a. *Ich denke [CP [VP das Buch gelesen]₁ hat keiner t₁].*
 I think the book read has no.one
 ‘I think no one read the book.’
 b. *Was₂ denkst du [CP t’₂ hat keiner [VP t₂ gelesen]]?*
 what think you has no.one read
 ‘What do you think no one read?’
 c. **Was₂ denkst du [CP [VP t₂ gelesen]₁ hat keiner t₁]?*
 what think you read has no.one

There are also some counterexamples to freezing; see, for instance, Abels (2007), Neeleman & Van de Koot (2010) (consider also discussions of various counterexamples in Broekhuis (2006), Boeckx (2008), Gallego (2009), Müller (2010)). In this article, I take the position that freezing is a real phenomenon and that in examples (2)-(5) there are genuine freezing effects.

2.2. The prohibition of headless XP-movement

Takano (2000) discusses restrictions on remnant movement and observes that remnant movement of a syntactic object is not possible if its head moved out. He proposes the following generalization in (2000: 146): “Remnant movement of α is impossible if the head of α has moved out of α ”. This is schematized in (6).

(6) * [_{XP} ... <X> ...] ... X ... <[_{XP} ... <X> ...]>

In the German example (7a), from Haider (1990: 96), VP undergoes remnant movement and contains the copy of the finite verb, which has moved to the second position. (7b) then shows the control verb-second sentence with the topicalized subject.

(7) a. * [*Ihr ein Buch* t_1]₂ *gab*₁ *Hans* t_2 .

her a book gave Hans

b. *Hans gab ihr ein Buch.*

Hans gave her a book

‘Hans gave her a book.’

The same phenomenon can be observed in English; consider (8), where remnant movement of *Anna a book* is ungrammatical.

(8) a. *Hans gave Anna a book.*

b. * [*Anna* t_1 *a book*]₂ *Hans gave*₁ t_2 .

According to Takano (2000:145), adjectival phrases show a parallel behaviour. He assumes a Larsonian shell structure with the adjectival head moving from the lower AP to the higher AP, as shown in (9a). Example (9b) shows that remnant movement of the lower AP results in ungrammaticality.

- (9) a. *Mary is* [_{AP} *grateful*₁ [_{AP} *to John* [_{A'} *t₁ for his help*]]].
 b.* *It's* [*to John t₁ for his help*]₂ *that Mary is grateful*₁ *t₂*.

2.3. Order preservation in multiple movement

It is well known that certain multiple movements preserve the base order; see Rudin (1988), Vikner (1990), Johnson (1991), Grewendorf (2001), Müller (2001), Williams (2003), Fox & Pesetsky (2005), among others. Order preservation effects – as schematized in (10) - can be found, for instance, with *wh*-movement in Bulgarian, pronoun fronting in German, clitic movement in Czech or object shift in Scandinavian.

- (10) [...XP₁ YP₂ ... t₁ t₂ ...]

The following example, taken from Rudin (1988: 472-473), demonstrates the shape conservation effect with multiple *wh*-movement in Bulgarian. The *wh*-subject must precede the *wh*-object.

- (11) a. *Koj₁ kogo₂ vižda t₁ t₂?*
 who whom sees
 ‘Who sees whom?’
 b.* *Kogo₂ koj₁ vižda t₁ t₂?*
 whom who sees

As to shape conservation effects in multiple clitic movement, consider the Czech example below. Since the indirect object precedes the direct object in base word order in Czech (Veselovská 1995, Kučerová 2007, Biskup 2011), (12) shows that clitic movement must preserve the pre-movement order.

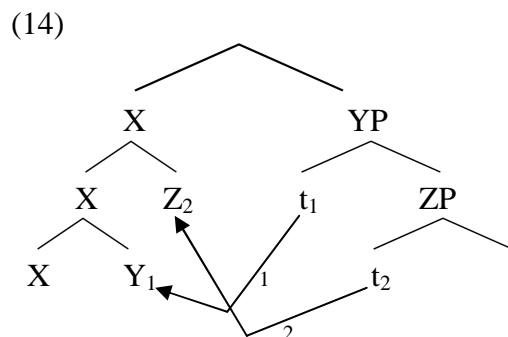
- (12) a. *Pavel ti₁ ji₂ představil t₁ t₂.*
 Pavel you.DAT her.ACC introduce
 ‘Pavel introduced her to you.’
 b.* *Pavel ji₂ ti₁ představil t₁ t₂.*
 Pavel her.ACC you.DAT introduce

Another case of order preservation can be found in the object shift example in (13), from Müller (2001: 288, originally Vikner 1990). It shows that in Danish the shifted pronouns preserve their base word order.

- (13) a. *Peter viste hende₁ den₂ jo t₁ t₂.*
 Peter showed her it indeed
 ‘Peter indeed showed her it.’
- b. **Peter viste den₂ hende₁ jo t₁ t₂.*
 Peter showed it her indeed

2.4. The ban on acyclic incorporation

Baker (1988) argues that acyclic combinations of incorporations are not allowed. Consider the derivation in (14), where the higher head Y incorporates into the head X before the incorporation of the lower head Z (Baker (1988) uses right adjunction). According to Baker, the reason for ill-formedness of derivations like (14) is that the higher trace (t_1) blocks antecedent government of the lower trace (t_2).



The government analysis can explain the ungrammatical status of the Tuscarora example in (15), from Baker (1988: 364, originally Williams 1976). Specifically, (15) shows that preposition incorporation (with the preposition glossed as APPL(ICATIVE)) cannot feed noun incorporation (of the prepositional complement *child*). According to Baker, the complement can never appear inside the verbal complex. The example can only receive the interpretation where the two objects – *children* and *him* - are switched, as shown in the translation. Baker’s reasoning, however, cannot be applied in the minimalist approach because there is no notion of government.

(15) * *Wa²-khe-yat-wir-ahninv-²-θ*.

PAST-1SS/3O-REFL-child-buy-ASP-APPL

‘I sold him to the children.’

(ok as ‘I sold the children to him.’)

3. Assumptions

The computational system works with syntactic objects, which consist of three sets of features, phonological, semantic and syntactic (formal); see, for instance, Chomsky (1995a: 394, 2001: 10), Collins and Stabler (2011: 1-2). Syntactic objects are combined by the operation Merge, which can be external or internal. In this respect, I follow Chomsky (2007: 8, 2008: 138-139, 2013: 8) and assume that Merge applies to two syntactic objects and creates a new syntactic object, a set containing the original objects, with no projection or order, as shown in (16).

(16) *Merge*

$$\text{Merge}(\alpha, \beta) = \{\alpha, \beta\}.$$

That is different from the earlier version of Merge, where labeling was part of the process of forming a syntactic object. For instance, in Chomsky (1995a: 396-397, 2000: 133, 2001: 3), Merge creates a new syntactic object with a label, which is identical to one of the two original syntactic objects: $\text{Merge}(\alpha, \beta) = \{\alpha, \{\alpha, \beta\}\}$, if α projects. This Merge - in contrast to (16) - is composed of two different operations, the set-constructing operation that combines α and β and the operation labeling, which constructs the superset with the label α (cf. Gärtner 2002: 64, Boeckx 2008: 84-85, Hornstein and Nunes 2008, Carnie 2010: 265)).¹ Because of the simpler form of Merge, Chomsky (2008, 2013) proposes a new labeling mechanism; labels are determined by a fixed labeling algorithm based on minimal search, which operates at the phase level.

According to Chomsky (2005, 2007), the third factor in growth of language in the individual, that is, principles not specific to the faculty of language, includes principles of efficient computation and efficient computation in turn requires some version of strict cyclicity. The idea behind the notion of cyclic computation is that what has been derived is not accessible to later stages of the derivation. This is ensured by phases in the late minimalist

framework (Chomsky 2000 *et seq.*). Once a phase is transferred, it is mapped to the interfaces and then “forgotten”. If it is correct that phases reduce computational load, they should be as small as possible. This is explicitly stated by Chomsky in his (2005: 17) article: “What objects constitute phases? They should be as small as possible, to minimize computational load”. For this reason, I assume that every operation Merge produces a phase, as stated in (17) (cf. Epstein and Seely (2002), Biskup (2013), also Bošković (2007a), Müller (2010) for the proposal that every maximal projection is a phase or Matushansky (2006) for a strongly cyclic Spell-Out needed for head movement).

(17) *Phase Formation*

Merge constitutes a phase.

Now we need to define a phase, which is done in (18).

(18) *Phase*

A phase is a syntactic object that is transferred to the interfaces.

The idea that every operation Merge constitutes a phase in the derivation can be taken to be the null hypothesis since no justification of particular phase projections is necessary (cf. Epstein and Seely (2002), Bošković (2007a)).

Chomsky (2000 *et seq.*) assumes that vP and CP are phases, possibly DP (Chomsky 2004, 2007). However, there are problems with the special status of these phases, for instance, with their propositional status, with their phonetic isolability, with the correlation between phases and the transferred domain, with reflections of successive-cyclic movement on the phase head; see Epstein and Seely (1999, 2002), Abels (2003: chap. 2), Boeckx and Grohmann (2007), Müller (2010), among others. Therefore, I define phases in terms of Transfer and do not run the risk of stipulation. Taken together, (17) and (18) say that the Merge operation produces a syntactic object that is transferred to the interfaces.

It has been argued that successive-cyclic movement targets every phrase on its path; see Manzini (1994), Takahashi (1994), Agbayani (1998), Bošković (2002a), Boeckx (2003), Müller (2004, 2010), Boeckx and Grohmann (2007). This is ensured in the phase model if every Merge forms a phase, as suggested above.

¹ There is no consensus in the literature as to whether or not labels are necessary in the derivation and how labeling works; see, e.g., Collins (2002), Seely (2006), Cecchetto and Donati (2010), Collins and Stabler (2011), Adger (2013).

The current proposal is more parsimonious than Chomsky's phase system because it does not employ the PIC and null phase heads. Here is why. Chomsky's model also needs to define phases (see, e.g., Chomsky (2000: 106)), which is done in (18) in my proposal, and determine which syntactic objects are phases (νP , CP), which is done in (17) here. It also assumes Transfer but in contrast to my analysis it also proposes the PIC. The crucial difference is that in the current proposal phases are defined in terms of Transfer. Given that every Merge operation constitutes a phase and that a phase is a syntactic object that is transferred to the interfaces, the whole merged constituent is transferred (not only the phase complement), which means that the PIC is redundant.

Concerning the null phase head, in Chomsky's phase model, where the transferred part of the phase differs from the phase itself, only the complement of the highest phase head is transferred, not the head itself and its edge. Therefore, some special null phase head needs to be merged on top of the built structure to transfer the rest of the sentence and to ensure the correct interpretation of the sentence at the interfaces (see Biskup (2014) for a proposal along this line). Such a null phase head is not necessary in the current proposal since given (18) it is the whole phase that is transferred.

Coming back to the labeling operation, I follow Chomsky (2013: 43) and assume that labeling operates at the phase level. Given that every Merge constitutes a phase, as stated in (17), one expects that labeling operates after every Merge (but see the discussion of delayed labeling below).

The question arises what the relation between labeling and Transfer is. Since labeling licenses syntactic objects so that they can be interpreted at the interfaces (see Chomsky (2013: 43) and also Boeckx (2008: 84), Ott (2011: 63), Blümel (2013: 34) for relating asymmetry/labeling to mapping to the external systems), ideally, Transfer of a syntactic object should happen after the object was labeled; consider (19).

(19) *Transfer*

Only labeled syntactic objects are transferred.

According to Chomsky (2008, 2013) movement feeds labeling. Specifically, inspired by Moro (2000), Chomsky proposes that in the case of the syntactic object $\{XP, YP\}$, there are two ways in which the element can be labeled. Either X and Y share some prominent feature, which is taken as the label of the syntactic object, or crucially, the syntactic object $\{XP, YP\}$ is modified so that there is only one visible head, that is, one of the phrases is moved. I

interpret it in the way that labeling generally follows movements related to the labeled syntactic object.

This is a more economical option than to assume that labeling can also apply before movement. If labeling applied before movement, then it could be unsuccessful – in the case of {XP, YP} – which given (19) would make the derivation crash. Further, it could also happen in a case different from the case of {XP, YP} that a syntactic object containing an uninterpretable feature relevant for movement will be labeled and transferred, which will again cause the derivation to crash.

At this point, the question arises how long labeling (and consequently Transfer) is going to wait for the appropriate movement. Given the cyclic proposal above - every Merge constitutes a phase -, the moving syntactic object should not wait for a (remote) probe; hence, movement should be of the greedy type. Otherwise strict cyclicity of the proposal would be lost or substantially weakened. Therefore, I assume that movement is triggered by an uninterpretable feature on the moving syntactic object (see Bošković 2007a). For ease of exposition, in what follows, I use the general “uF”, which stands for various features inducing movement. This feature forces the appropriate syntactic object to move immediately. Having said this, I now formulate labeling, as shown in (20).

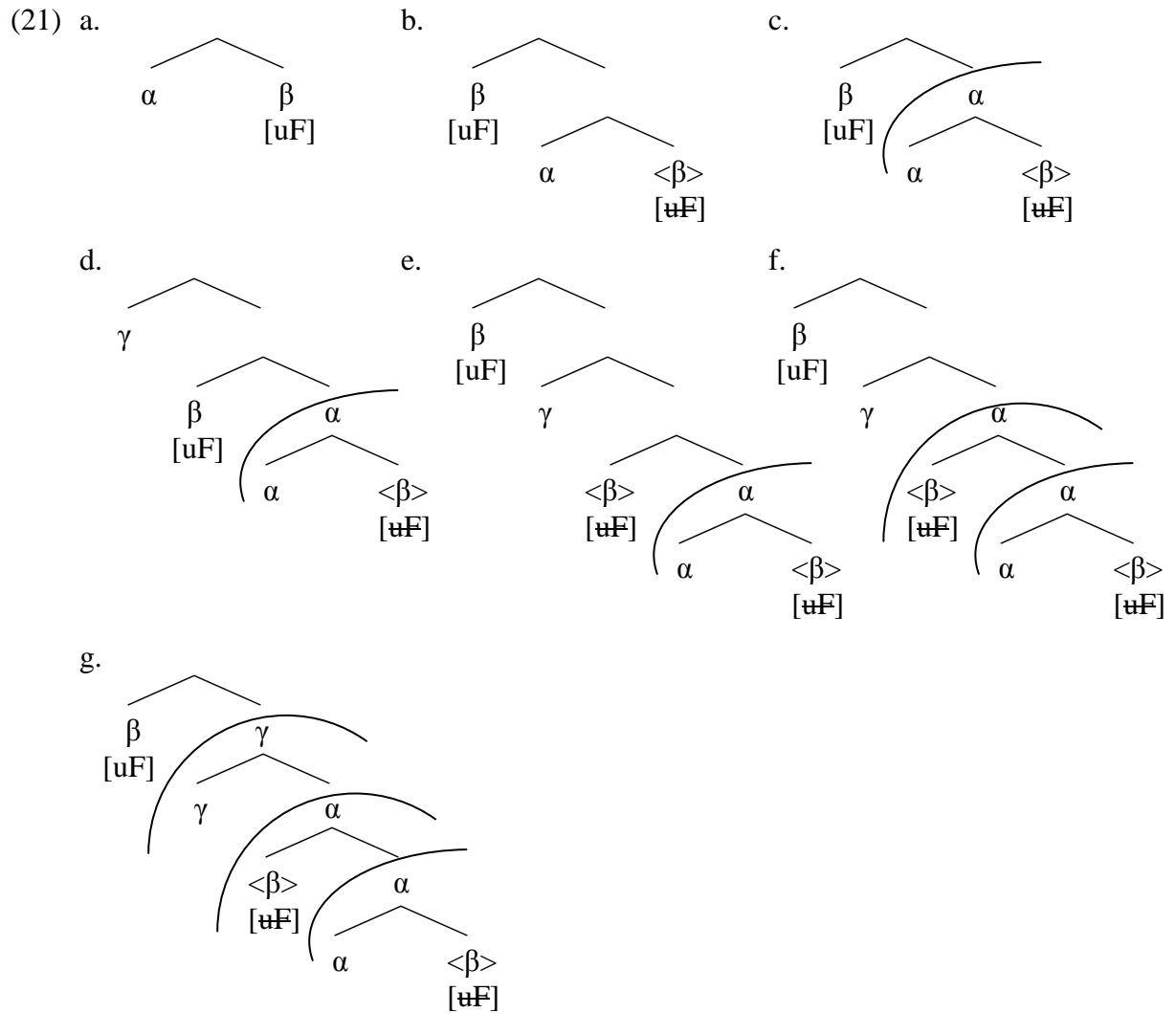
(20) *Labeling*

For every phase, labeling of a phase follows movements triggered by uF contained in the phase.

According to (20), a phase (i.e., the merged constituent) is labeled after all movements triggered by the movement feature uF present in the phase happened. In other words, (20) allows moving syntactic objects to escape from the to-be-transferred phase. Thus, labeling of a phase does not have to happen immediately after Merger of that phase. It also means that labeling can affect not only the newly built phase but also syntactic objects contained in that phase, similarly to Chomsky (2013). Note that according to Chomsky, first, the phase structure is built and then, at the phase level along with other operations, the whole phase is labeled. Let us now demonstrated with an abstract example how the proposal works.

The syntactic objects α and β are externally merged and β bears the movement feature uF, as shown in (21a). Given the Phase Formation in (17), the merged syntactic object is a phase and given Phase in (18), the syntactic object must be transferred to the interfaces. Further, because of Transfer in (19), Transfer waits for labeling. As discussed above, the

movement feature uF forces its bearer (here β) to move, as demonstrated in (21b). With respect to the lower copy, I assume that the uninterpretable feature becomes inactive - is deleted - upon movement, in order not to cause the derivation to crash at the semantic interface. Then, given Labeling in (20), the phase is labeled and consequently transferred to the interfaces, as illustrated in (21c). In the next step, γ is merged from the lexical array, as in (21d), and uF forces β to move, as in (21e), and uF on the lower copy is deleted. Given Transfer (19) and Labeling (20), the phase $\{\beta, \{\alpha, \beta\}\}$ can be labeled and transferred, as shown in (21f). The same also holds for the phase $\{\gamma, \{\beta, \{\alpha, \beta\}\}\}$; see (21g). Since derivations are assumed to proceed in the bottom-up fashion, labeling and Transfer of the phase $\{\beta, \{\alpha, \beta\}\}$ must precede labeling and Transfer of the phase $\{\gamma, \{\beta, \{\alpha, \beta\}\}\}$.



In this way, the moving syntactic object moves up until it reaches its ultimate landing position and its uninterpretable feature is valued.

Thus, labeling can be delayed in the sense that it does not have to happen immediately after the appropriate operation Merge. Since phases are defined in terms of Transfer in (18) (and the timing of Transfer is irrelevant for the phase status), also delayed phases are phases.

Given the early Transfer in the proposed system, the operation Agree must not be constrained by phases (and the operation Transfer). There are various approaches to long distance Agree and its exceptional behaviour in the literature, ranging from cyclic agreement analyses, through percolation approaches, to proposals treating agreement as a post-syntactic process; see, for instance, Stjepanović and Takahashi (2001), Legate (2005), Bošković (2007a, 2007b), Bobaljik (2008), Müller (2010), Biskup (2012), Richards (2012). I remain agnostic here about which of these analyses should be adopted; in what follows, I will just assume that Agree is not restricted by Transfer.

To sum up this section, the operation Merge forms syntactic objects (phases) that are transferred to the interfaces. The operation labeling feeds Transfer and movement in turn feeds labeling. We have already seen some benefits of the proposed system. In the next section, I will demonstrate that the current proposal can straightforwardly derive the four movement phenomena introduced in section 2.

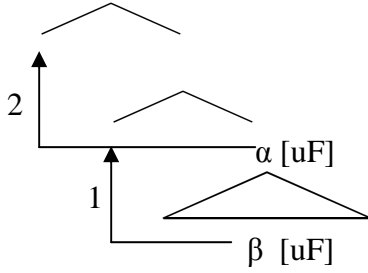
4. The analysis

4.1. Freezing effects

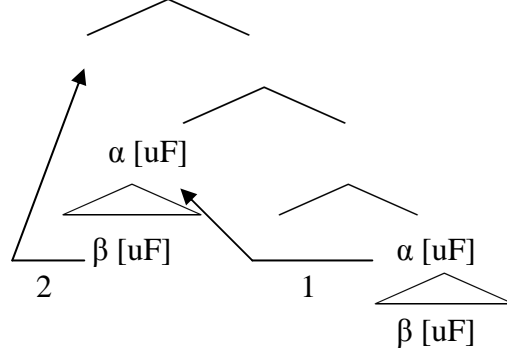
In section 2.1., we saw several examples of ungrammatical extraction from moved syntactic objects. This section aims to answer the question why such an extraction is bad. Recall from the preceding discussion that movement is triggered by the greedy feature uF , which forces its bearer to move immediately. Combining this with the assumption that derivations proceed in the bottom-up fashion provides us with the answer to the “why” question above.

Specifically, as shown in (22a), the embedded syntactic object (β) bearing the movement feature must move out of the dominating syntactic object (α) before the dominating element itself moves. Thus, it cannot happen that the higher syntactic object moves first and only then the embedded syntactic object; the derivation schematized in (22b) will always be ungrammatical. It is also not possible to add the movement feature to the embedded β after movement of α since it would violate the Inclusiveness Condition.

(22) a.



b.



Let us now demonstrate how the proposal works in the case of example (2), repeated below as (23). The relevant part of the derivation proceeds as in (24) (for ease of exposition, I will use the standard category labels in trees).

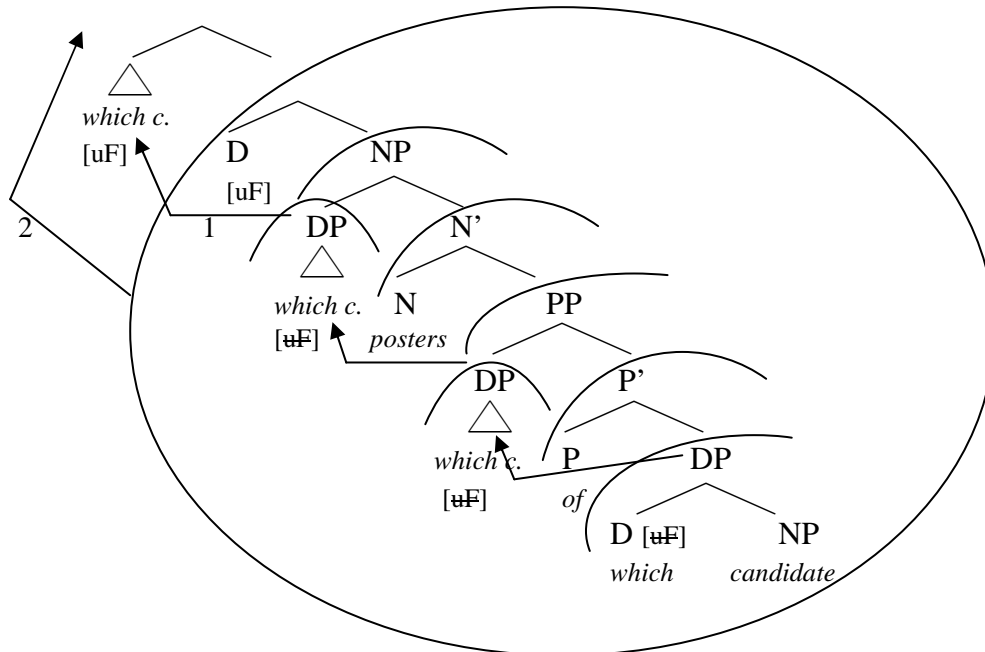
(23) a. [*Which candidate*]₁ *were there* [*posters of t₁*] *all over the town*?

b. *[*Which candidate*]₁ *were* [*posters of t₁*]₂ *t₂ all over the town*?

The noun *candidate* is merged with the determiner *which*, which bears the movement feature (that could be the usual *wh*-feature or Q-feature). Since the feature has the pied-piping property in (23), *which* does not move itself and the preposition *of* is merged.² After that, *which* pied-pipes *candidate* across *of* and the movement feature on the lower copy of *which candidate* is deleted. Given Labeling in (20) and Transfer in (19), the lower copy of *which candidate* is labeled and transferred (which could not happen before the movement). The phase {*of*, {*which*, *candidate*}} is also labeled and transferred since there is no movement feature in the phase that could trigger movement. The labeling algorithm does not have to look for movement features in transferred phases because, being transferred (that is, labeled), they cannot contain a movement feature. Hence, in (24) only the head *of* must be inspected. PP and the higher copy of *which candidate*, however, cannot be labeled and transferred because they contain an undeleted/active movement feature.

In the next step, the noun *posters* is merged and the movement feature forces *which candidate* to move across *posters*, with the consequence that the movement feature on the lower copy of *which candidate* is deleted. Now the copy of *which candidate* in PP is labeled and transferred. The same also holds true for the PP and N' since they do not contain any (active) movement feature, which could trigger movement; see Labeling and Transfer again.

(24)



Next, the phonetically null determiner is merged. Suppose that the determiner bears the movement feature and that its sister should be piep-piped. The fact that the determiner asymmetrically c-commands *which candidate* is crucial for the order of movements. Given the bottom-up assumption, *which candidate* must move first. So, it moves across the determiner in accordance with the Extension Condition, as illustrated with step 1 in (24). After this, the lower copy of *which candidate* and NP are labeled and transferred. Crucially, only then can the determiner with its movement feature pied-pipe the whole NP, as illustrated with step 2. Thus, we can conclude that extraction from a moved syntactic object is not possible because of the bottom-up application of the impatient movement features.

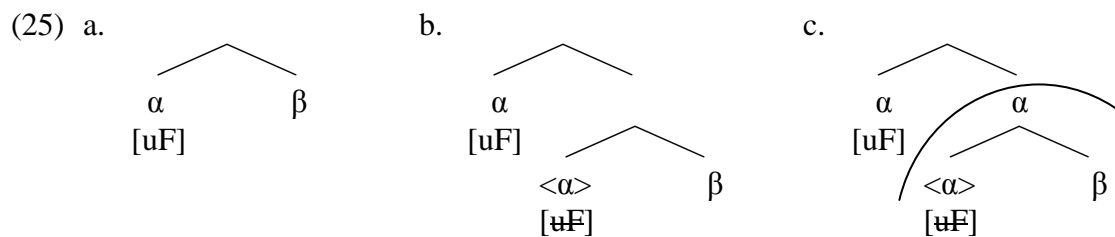
4.2 The prohibition of headless XP-movement

In section 2.2., I discussed the constraint on headless phrasal movement. I presented some examples showing that remnant movement of a syntactic object is not possible if its head moved out of the phrase. What is the reason for this behaviour?

The rationale is demonstrated in (25). Suppose that the lexical item α merges with the phrase β and that α bears the movement feature, as illustrated in (25a). This Merge operation constitutes a phase but given Labeling – and the presence of the movement feature –, labeling and Transfer cannot happen yet. The movement feature forces α to move and the movement

² I do not assume any particular theory of pied-piping here, but see, e.g., Horvath (2006), Heck (2008), Cable (2010).

feature on the lower copy is deleted, as shown in (25b). After that, the phase is labeled as α since only α is an atomic element; consider (25c). Then, Transfer can happen. From this is obvious that the headless syntactic object cannot move. Since the moving syntactic object always takes its movement feature along and the movement feature on the lower copy is deleted, the remnant does not contain a feature that could trigger movement. In this way, we receive the effect of Chomsky's (1995b: 304) and Takano's (2000) condition that only the head of a chain enters into the operation Move. Given the Inclusiveness Condition, it is also not possible to add a new movement feature to the remnant constituent, which would trigger its movement.

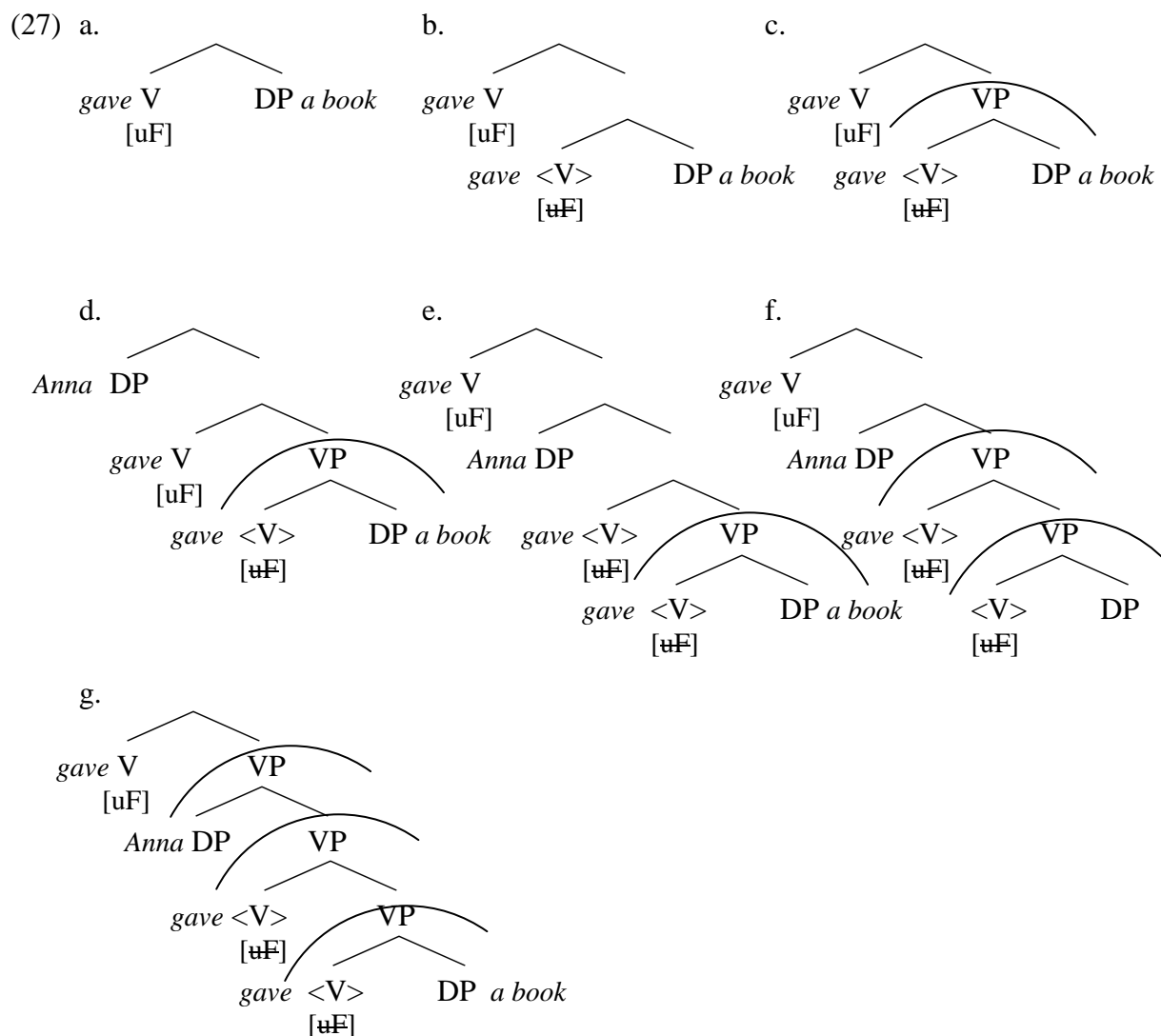


Furthermore, it does not help if two (or more) movement features are put on the moving head because the head takes all its syntactic features along (cf. Chomsky 1995b: 265). Thus, there will never be a situation where one movement feature or syntactic feature remains on the lower copy and another one moves together with the head; which seems to partially derive effects of the principle of lexical integrity (cf. Di Sciullo & Williams 1987: 49, Anderson 1992: 84, Bresnan 2001: 92, Spencer 2005: 81). To be more concrete, consider example (8b), repeated below as (26).

(26) *[*Anna* t_1 *a book*] $_2$ *Hans* *gave* $_1$ t_2 .

The relevant part of the derivation of (26) is demonstrated in (27). The verb *gave* merges with the DP *a book*, as shown in (27a). Since *gave* bears the movement feature, it must move and the movement feature on the lower copy is deleted, as in (27b). After this step, the phase is labeled and transferred, as shown in (27c). Then *Anna* is merged, as in (27d), *gave* moves across it and the movement feature on the lower copy is deleted, as demonstrated in (27e). Thus, on copies of *gave*, there is no active movement feature, which could pied-pipe the syntactic object [*Anna a book*]. The derivation proceeds with labeling and transferring the syntactic object {*gave*, {*gave*, *a book*}}; see (27f). The same also happens to the syntactic

object {Anna, {gave, {gave, a book}}}} because it contains no active movement feature anymore; consider (27g).



Some counterexamples to Takano's generalization can be found in Fanselow (1991), Lenerz (1995), Müller (1998), Abels (2003). For instance, Müller (1998: 260) proposes that in the following example, the verb *gibt* has raised prior to remnant VP topicalization.

(28) (*Ich glaube*) [_{VP2} *Kindern Bonbons t₁*] *gibt man besser nicht t₂*].

I believe children sweets gives one better not

'I believe that one should rather not give children sweets.'

However, there are data calling the remnant analysis into question. Example (29) shows that V2 movement strands the particle in German. Example (30), taken from Haider (1990: 96),

shows that when the particle is topicalized together with the object, the sentence is ungrammatical, which is unexpected in the light of the remnant analysis of (28).³

(29) *Hans schlug ein Buch auf.*

Hans opened a book on

‘Hans opened a book.’

(30) *[*Ein Buch auf*] *schlug* Hans.

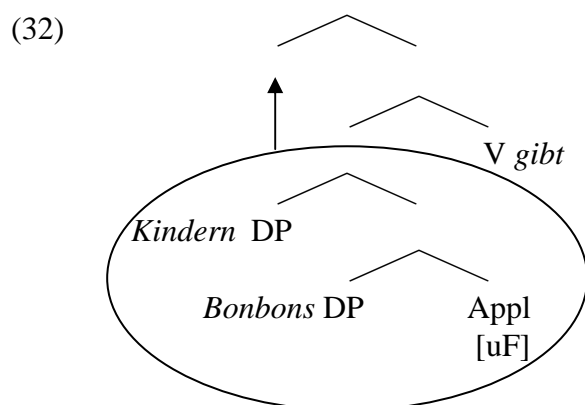
a book on open Hans

The counterexamples to Takano’s generalization, in fact, can be analyzed in terms of movement of a syntactic object headed by a phonetically null head. For instance, (31) can receive an analysis under which the moved putative remnant is a projection of an applicative head, as shown in (32) (cf. Fanselow (1993) and Müller (2005) for analyses of remnants in terms of a covert verb).

(31) [*Kindern Bonbons*] *gibt* man besser nicht.

children sweets gives one better not

‘One should rather not give children sweets.’



The applicative head, bearing the movement feature, is merged with the direct object *Bonbons*. Since its movement feature has the pied-piping property, the head does not move by itself and the indirect object *Kindern* is merged. The syntactic object cannot be labeled and transferred because of the presence of the movement feature. Then, the verb *gibt* is merged, the applicative head pied-pipes the whole constituent across it, as illustrated in (32), with the

³ There are also verb-particle combinations that allow such constructions; see, e.g., Müller (2002).

consequence that the movement feature on the lower copy is deleted and the copy is labeled and transferred. So, the applicative phrase moves successive-cyclically to its ultimate landing position.

To sum up, since movement is triggered by the movement feature on the moving head and the head takes all its syntactic features along and since the movement feature is deleted upon movement, the lower copy of the head has no movement feature, which could pied-pipe other constituents.

4.3. Order preservation in multiple movement

This section is concerned with the question why certain multiple movements show shape preservation effects. In the ideal case, shape preservation effects, as discussed, for instance, in section 2.3., should be derived in the same way. Another question, closely related to the preceding one, is why order preservation is often derived by syntactic objects belonging to the same class, by *wh*-elements, pronouns, clitics *etc.*

I propose that the reason for this is that the syntactic objects move to the same projection. If we combine this proposal with the assumptions from section 3. that movement is triggered immediately by the movement feature on the moving element and that derivations proceed in the bottom-up fashion, then we see why it must be so. As shown in (33), the moving syntactic objects move successive-cyclically across the higher elements, the lower syntactic object always moves first and then the higher syntactic object skips over the lower one in accordance with the Extension Condition. If the syntactic objects value their movement features with the same head, as with *Y* in (33), we receive the shape conservation effect.

(33) [WP₁ UP₂ [Y [t₁ t₂ [X [t₁ t₂ ...]]]]]

To be more specific, the Bulgarian *wh*-movement example in (11), for convenience repeated below as (34), shows that the *wh*-subject must precede the *wh*-object. The relevant parts of the derivation of (34) are shown in (35).

(34) a. *Koj₁ kogo₂ vižda t₁ t₂?*

who whom sees

‘Who sees whom?’

b.* *Kogo₂ koj₁ vižda t₁ t₂?*

whom who sees

cluster corresponds to positions of clitics in the clausal structure in Czech; consider the clitic order in (40).

(40) question clitic *li*, modal, auxiliary, reflexive, pronominal dative, pronominal accusative

The proposed analysis is also supported by the difference between scrambling and object shift. Scrambled syntactic objects in languages like German, Russian and Czech can occur in various projections and do not show order preservation effects (e.g. Müller (1995), Bailyn (1995), Veselovská (1995), Biskup (2011)), as predicted by the current analysis. In contrast, object shift, for instance, in Danish and Icelandic show order preservation effects (Vikner 1990, Collins and Thráinsson 1996) and the object shift position is fixed (Vikner 1994), again as expected. Consider the following examples demonstrating the difference in the flexibility of landing sites of scrambling and object shift.

(41) *Gestern hat Peter (das Buch) ohne Zweifel (das Buch) nicht (das Buch) gelesen.*
 yesterday has Peter (the book) without doubt (the book) not (the book) read
 ‘Yesterday, Peter certainly did not read the book.’
 (German, Vikner 1994: 493)

(42) *I gær las Pétur (bókina) eflaust (*bókina) ekki t_v (bókina).*
 yesterday read Pétur (the book) doubtlessly (the book) not (the book)
 ‘Yesterday, Peter certainly did not read the book.’
 (Icelandic, Vikner 1994: 494)

(43) *I går læste Peter (den) uden tvivl (*den) ikke t_v (*den).*
 yesterday read Peter (it) without doubt (it) not (it)
 ‘Yesterday, Peter certainly did not read the book.’
 (Danish, Vikner 1994: 494)

As to order preservation effects, consider the examples below, which show that in contrast to object shift in Icelandic and Danish, scrambling in German is not order preserving.

(44) *Peter hat (das Buch) dem Lehrer (das Buch) sicherlich gezeigt.*
 Peter has the book the teacher the book certainly shown
 ‘Peter certainly did not show the book to the teacher.’

(45) *Ég lána (*bærkurnar) Maríu (?bærkurnar) ekki.*

I lend the.books Maria the.books not

‘I did not lend the books to Maria.’

(Collins and Thráinsson 1996: 406, 409)

(46) *Peter viste (*den) hende (den) jo.*

Peter showed it her it indeed

‘Peter indeed showed her it.’

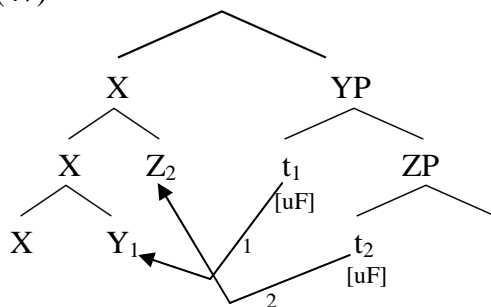
(Danish, Müller 2001: 288, originally Vikner 1990)

To summarize this section, if moving syntactic objects end up in the same projection, then, given the bottom-up assumption, the Extension Condition and impatient movement features, order preservation effects arise. If they land in different projections, their order can also be reversed.

4.4. The ban on the acyclic incorporation

In section 2.4., we saw that according to Baker (1988), acyclic incorporations like (47), where the second movement reaches down more deeply into the structure than the first one does, are excluded because the higher trace blocks antecedent government of the lower trace. In what follows, I show how such derivations are excluded by the current proposal.

(47)



Because of the bottom-up assumption and the presence of movement features on the heads Z and Y, Z – which is asymmetrically c-commanded by Y – cannot move after Y.⁴ More concretely, the movement feature forces Z to move immediately after Merger of Y, resulting

⁴ This reasoning holds independently of whether the standard head movement or reprojection movement or combination of both is adopted.

in the feature deletion and Transfer of the phase ZP. Only then can Y (together with Z) move and incorporate into the newly merged head X.

In the case of the Baker's ungrammatical example (15), repeated below as (48), the prepositional complement *child* corresponds to Z in (47), the preposition/applicative morpheme corresponds to Y and the verb *buy* corresponds to the head X. Given the argumentation above, when the noun *child* with its movement feature merges with the preposition, it must incorporate into it; it cannot undergo movement as late as after the preposition incorporation.

(48) * *Wa²-khe-yat-wir-ahninv-²-θ*.

PAST-1SS/3O-REFL-child-buy-ASP-APPL

'I sold him to the children.'

(ok as 'I sold the children to him.')

To sum up this discussion, acyclic incorporations can be excluded without recourse to the notion of government. This can be achieved under the assumption that derivations proceed in the bottom-up fashion and that movement is triggered by features forcing the moving element to move immediately.

5. Conclusion

I have proposed some modifications to the minimalist system that on one side can rule out certain types of ill-formed sentences – for instance, with acyclic incorporation or headless XP-movement - and on the other side can derive grammatical sentences with effects like order preservation in multiple movement. We have seen that the proposed system also has other benefits, such as not using the PIC and null phase heads or not stipulating specific projections as phases.

References

- Abels, Klaus. 2003. Successive cyclicity, anti-locality, and adposition stranding. Storrs: University of Connecticut dissertation.
- Abels, Klaus. 2007. Towards a restrictive theory of (remnant) movement. *Linguistic Variation Yearbook* 7. 57-120.
- Adger, David. 2013. *A syntax of substance*. Cambridge, MA: MIT Press.
- Agbayani, Brian. 1998. Feature attraction and category movement. Ph.D. dissertation, University of California at Irvine.

- Anderson, Stephen R. 1992. *A-morphous morphology*. Cambridge: Cambridge University Press.
- Bailyn, John F. 1995. A configurational approach to Russian “free” word order. Ithaca, NY: Cornell University dissertation.
- Baker, Mark C. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.
- Biskup, Petr. 2011. *Adverbials and the phase model*. Amsterdam & Philadelphia: John Benjamins.
- Biskup, Petr. 2012. Agree, move, selection, and set-merge. In Artemis Alexiadou, Tibor Kiss & G. Müller (eds.), *Local modelling of non-local dependencies in syntax*, 111-133. Berlin & Boston: Walter de Gruyter.
- Biskup, Petr. 2013. On the NTC and labeling. Ms., Universität Leipzig.
- Biskup, Petr. 2014. *For, zu* and feature inheritance. In Anke Assmann, Sebastian Bank, Doreen Georgi, Timo Klein, Philipp Weisser & Eva Zimmermann (eds.), *Topics at Infl*, 423-439. Universität Leipzig: Linguistische Arbeitsberichte 92.
- Blümel, Andreas. 2013. *Propagating symmetry. Case studies in exocentric syntax*. Frankfurt am Main: Johann Wolfgang Goethe University dissertation.
- Bobaljik, Jonathan David. 2008. Where's phi? Agreement as a postsyntactic operation. In Daniel Harbour, David Adger & Susana Béjar (eds.), *Phi-theory: Phi-features across modules and interfaces*, 295-328. Oxford: Oxford University Press.
- Boeckx, Cedric. 2003. *Islands and chains: Resumption as stranding*. Amsterdam: John Benjamins.
- Boeckx, Cedric. 2008. *Bare syntax*. Oxford: Oxford University Press.
- Boeckx, Cedric. & Kleanthes K. Grohmann. 2007. Remark: Putting phases in perspective. *Syntax* 10. 204-222.
- Bošković, Željko. 2002a. A-movement and the EPP. *Syntax* 5. 167-218.
- Bošković, Željko. 2002b. Multiple *wh*-fronting. *Linguistic Inquiry* 33. 351-83.
- Bošković, Željko. 2007a. On the locality and motivation of Move and Agree: An even more minimal theory. *Linguistic Inquiry* 38. 589-644.
- Bošković, Željko. 2007b. Agree, Phases, and Intervention Effects. *Linguistic Analysis* 33. 54-96.
- Bresnan, Joan. 2001. *Lexical Functional Syntax*. Oxford: Blackwell Publishers.
- Broekhuis, Hans. 2006. Extraction from Subjects: Some Remarks on Chomsky's ‘On phases’. In Hans Broekhuis, Norbert Corver & Riny Huybregts (eds.), *Organizing Grammar. Linguistic Studies in Honor of Henk van Riemsdijk*, 59-68. Berlin & New York: Mouton de Gruyter.
- Cable, Seth. 2010. The grammar of Q: Q-particles, *wh*-movement and pied-piping. Oxford: Oxford University Press.
- Carnie, Andrew. 2010. *Constituent structure*. Oxford: Oxford University Press.
- Cecchetto, Carlo & Caterina Donati. 2010. On labeling: Principle C and head movement. *Syntax* 13. 241-278.
- Chomsky, Noam. 1995a. Bare phrase structure. In Gert Webelhuth (ed.), *Government and binding theory and the minimalist program*, 383-439. Oxford, Cambridge: Blackwell.
- Chomsky, Noam. 1995b. *The minimalist program*. Cambridge, MA: The MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89-156. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In Michael J. Kenstowicz (ed.), *Ken Hale: A life in language*, 1-52. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2004. Beyond explanatory adequacy. In Adriana Belletti (ed.), *Structures and beyond*, 104-131. Oxford University Press.

- Chomsky, Noam. 2005. Three factors in language design. *Linguistic Inquiry* 36. 1-22.
- Chomsky, Noam. 2007. Approaching UG from below. In Uli Sauerland & Hans-Martin Gärtner (eds.), *Interfaces + recursion = language?*, 1-29. Berlin: Mouton de Gruyter.
- Chomsky, Noam. 2008. On phases. In Robert Freidin, Carlos P. Otero & Maria Luisa Zubizarreta (eds.), *Foundational issues in linguistic theory. Essays in honor of Jean-Roger Vergnaud*, 133-166. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2013. Problems of projections. *Lingua* 130. 33-49.
- Collins, Chris. 1994. Economy of derivation and the Generalized Proper Binding Condition. *Linguistic Inquiry* 25. 45-61.
- Collins, Chris. 2002. Eliminating labels. In Samuel David Epstein & T. Daniel Seely (eds.), *Derivation and explanation in the minimalist program*, 42-64. Oxford: Blackwell Publishers.
- Collins, Chris & Edward P. Stabler 2011. A formalization of minimalist syntax. Available at <http://ling.auf.net/lingbuzz/001691>.
- Collins, Chris & Höskuldur Thráinsson. 1996. VP-internal structure and object shift in Icelandic. *Linguistic Inquiry* 27 (3). 391-444.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.
- Di Sciullo, Anna Maria & Edwin Williams. 1987. *On the definition of word*. Cambridge, MA: MIT Press.
- Epstein, Samuel David & T. Daniel Seely. 1999. SPEC-ifying the GF “subject”: Eliminating A-chains and the EPP within a derivational model. Ms., University of Michigan and Eastern Michigan University.
- Epstein, Samuel David & T. Daniel Seely. 2002. Rule Applications as Cycles in a Level-Free Syntax. In Samuel David Epstein & T. Daniel Seely (eds.), *Derivation and explanation in the minimalist program*, 65-89. Oxford: Blackwell Publishers.
- Fanselow, Gisbert. 1991. *Minimale Syntax*. University of Passau habilitation thesis.
- Fanselow, Gisbert. 1993. The return of the base generators. *Groninger Arbeiten zur germanistischen Linguistik* 36. 1-74.
- Fox, Danny & David Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31. 1-46.
- Freidin, Robert. 1992. *Foundations of generative syntax*. Cambridge, MA: MIT Press.
- Gallego, Ángel J. 2009. On freezing effects. *Iberia: An International Journal of Theoretical Linguistics* 1. 33-51.
- Gärtner, Hans-Martin. 2002. *Generalized transformations and beyond. Reflections on minimalist syntax*. Berlin: Akademie-Verlag.
- Grewendorf, Günther. 2001. Multiple wh-fronting. *Linguistic Inquiry* 32. 87-122.
- Haider, Hubert. 1990. Topicalization and other puzzles of German syntax. In Günther Grewendorf & Wolfgang Sternefeld (eds.), *Scrambling and barriers*, 93-112. Amsterdam: John Benjamins.
- Heck, Fabian. 2008. *On pied-piping. Wh-movement and beyond*. Berlin: Mouton de Gruyter.
- Hornstein, Norbert & Jairo Nunes. 2008. Adjunction, labeling, and bare phrase structure. *Biolinguistics* 2.1. 57-86.
- Horvath, Julia. 2006. Pied-piping. In Martin Everaert & Henk van Riemsdijk (eds.), *The Blackwell companion to syntax, Volume III*, 569-630. Malden, MA: Blackwell Publishing.
- Johnson, Kyle. 1991. Object positions. *Natural Language and Linguistic Theory* 9. 577-636.
- Junghanns, Uwe. 2002. Untersuchungen zur Syntax und Informationsstruktur slavischer Deklarativsätze. Universität Leipzig: Linguistische Arbeitsberichte 80.
- Kučerová, Ivona. 2007. *The syntax of givenness*. Cambridge, MA: MIT dissertation.
- Lasnik, Howard & Myung-Kwan Park. 2003. The EPP and the subject condition under sluicing. *Linguistic Inquiry* 34. 649-660.

- Legate, Julie Anne. 2005. Phases and cyclic agreement. In Martha McGinnis & Norvin Richards (eds.), *Perspectives on phases*, 147–156. MIT Working Papers in Linguistics 49. Cambridge, MA: MIT Working Papers in Linguistics.
- Lenerz, Jürgen. 1995. Klammerkonstruktionen. In Joachim Jacobs, Arnim von Stechow, Wolfgang Sternefeld & Theo Vennemann (eds.), *Syntax, Vol. II*, 1266–1276. Berlin: Mouton de Gruyter.
- Lohndal, Terje. 2011. Freezing effects and objects. *Journal of Linguistics* 47. 163–199.
- Manzini, Maria Rita. 1994. Locality, minimalism, and parasitic gaps. *Linguistic Inquiry* 25. 481–508.
- Matushansky, Ora. 2006. The status of head-movement in linguistic theory. *Linguistic Inquiry* 37 (1). 69–109.
- Moro, Andrea. 2000. *Dynamic Antisymmetry*. Cambridge, MA: MIT Press.
- Müller, Gereon. 1995. *A-bar syntax. A study in movement types*. Berlin & New York: Mouton de Gruyter.
- Müller, Gereon. 1998. *Incomplete category fronting: A derivational approach to remnant movement in German*. Dordrecht: Kluwer.
- Müller, Gereon. 2001. Order preservation, parallel movement, and the emergence of the unmarked. In Géraldine Legendre, Jane Grimshaw & Sten Vikner (eds.), *Optimality-theoretic syntax*, 279–313. Cambridge, MA: MIT Press.
- Müller, Gereon. 2004. Phase impenetrability and *wh*-intervention. In Arthur Stepanov, Gisbert Fanselow & Ralf Vogel (eds.), *Minimality effects in syntax*, 289–325. Berlin: Mouton de Gruyter.
- Müller, Gereon. 2010. On deriving CED effects from the PIC. *Linguistic Inquiry* 41. 35–82.
- Müller, Stefan. 2002. *Complex predicates: Verbal complexes, resultative constructions, and particle verbs in German*. Stanford: CSLI Publications.
- Müller, Stefan. 2005. Zur Analyse der scheinbar mehrfachen Vorfelddbesetzung. *Linguistische Berichte* 203. 297–330.
- Neeleman, Ad & Hans van de Koot. 2010. A local encoding of syntactic dependencies and its consequences for the theory of movement. *Syntax* 13. 331–372.
- Ott, Dennis. 2011. Local instability: The syntax of split topics. Cambridge, MA: Harvard University dissertation.
- Postal, Paul M. 1972. On some rules that are not successive cyclic. *Linguistic Inquiry* 3. 211–222.
- Richards, Marc. 2012. Probing the past: On reconciling long-distance agreement with the PIC. In Artemis Alexiadou, Tibor Kiss & Gereon Müller (eds.), *Local Modelling of Non-Local Dependencies in Syntax*, 135–154. Berlin & Boston: Walter de Gruyter.
- Ross, John Robert. 1967. Constraints on variables in syntax. Cambridge, MA: MIT dissertation.
- Rudin, Catherine. 1988. On multiple questions and multiple WH fronting. *Natural Language and Linguistic Theory* 6. 445–501.
- Seely, T. Daniel. 2006. Merge, derivational c-command, and subcategorization in a label-free syntax. In Cedric Boeckx (ed.), *Minimalist essays*, 182–217. Amsterdam: John Benjamins.
- Spencer, Andrew. 2005. Word-formation and syntax. In Pavol Štekauer & Rochelle Lieber (eds.), *Handbook of Word-Formation*, 73–97. Amsterdam: Springer.
- Stjepanović, Sandra & Shoichi Takahashi. 2001. Eliminating the Phase iImpenetrability Condition. Ms., Kanda University of International Studies.
- Takahashi, Daiko. 1994. Minimality of movement. Storrs: University of Connecticut dissertation.
- Takano, Yuji. 2000. Illicit Remnant Movement: An Argument for Feature-Driven Movement. *Linguistic Inquiry* 31. 141–156.

- Veselovská, Ludmila. 1995. *Phrasal movement and X-morphology: Word order parallels in Czech and English nominal and verbal projections*. Olomouc: Palacký University dissertation.
- Vikner, Sten. 1990. Verb movement and the Licensing of NP positions in the Germanic languages. Genève: Université de Genève dissertation.
- Vikner, Sten. 1994. Scandinavian object shift and West Germanic scrambling. In Norbert Corver & Henk van Riemsdijk (eds.), *Studies on Scrambling*, 487-517. Berlin: Mouton de Gruyter.
- Wexler, Kenneth & Peter W. Culicover. 1980. *Formal principles of language acquisition*. Cambridge, MA: MIT Press.
- Williams, Edwin. 1976. *A grammar of Tuscarora*. New York: Garland.
- Williams, Edwin. 2003. *Representation theory*. Cambridge, MA: MIT Press.