

On Multiple Feature-Checking: Multiple Wh-Fronting and Multiple Head-Movement¹

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The goal of this paper is to examine the phenomenon of multiple movement to the same position, in particular, the driving force behind such movement. This will be done through case studies of two phenomena: multiple wh-fronting and multiple head-movement of verbal elements. Multiple wh-fronting is discussed in section 1. The discussion focuses on the order in which multiple movement of wh-phrases to the same position proceeds, i.e. on Superiority effects with such movement. The data is drawn from Serbo-Croatian and Bulgarian. Multiple head-movement is discussed in section 2, where I discuss partial V-movement derivations for Dutch V-clustering constructions and VP ellipsis in Serbo-Croatian double participle constructions.

1. Multiple wh-fronting

Rudin (1988) argues that in spite of the superficial similarity, Bulgarian (B) and Serbo-Croatian (SC) multiple wh-fronting constructions such as (1a-b) have a very different structure.

(1) a. Koj kakvo vižda? (B)

who what sees

‘Who sees what?’

b. Ko šta vidi? (SC)

who what sees

‘Who sees what?’

Rudin argues that in Bulgarian, all fronted wh-phrases are located in the interrogative SpecCP. According to Rudin, in SC only the first wh-phrase is located in SpecCP. Other fronted wh-phrases are located below the interrogative CP projection. They are thus fronted for reasons independent of the +wh-feature. I will refer to fronting of wh-phrases that is not motivated by checking the strong +wh feature of C as non-wh-fronting.

In Bošković (1997b,c, 1998) I show that there is even a deeper difference between Bulgarian and SC multiple wh-fronting constructions. In particular, I show that in SC constructions such as (1b) no wh-phrase has to move to SpecCP overtly. That is, the first wh-phrase in (1b) may also undergo non-wh-fronting. Since most of the arguments to this effect presented in Bošković (1997b,c, 1998) are rather involved I will repeat only one of them here. The argument concerns the interpretation of multiple questions.

It is well-known that a pair list answer is obligatory in English questions such as (2).²

(2) Who bought what?

(2) cannot be felicitously asked in the following situation: John is in a store and in the distance sees somebody buying a piece of clothing, but does not see who it is and does not see exactly what is being bought. He goes to the shop-assistant and asks (2).

Interestingly, questions such as (2) are not cross-linguistically banned from having single pair

answers. Thus, the Japanese and Chinese counterparts of (2) can have either single pair or pair list answers.³ That is, in addition to situations appropriate for pair list answers, (3) can also be used in the situation described above. (I illustrate the relevant points with respect to Japanese. Chinese patterns with Japanese in the relevant respect.)

(3) Dare-ga nani-o katta no?

who-nom what-acc bought Q

‘Who bought what?’

Non-subject questions such as (4) can also have single pair answers.

(4) John-wa dare-ni nani-o ageta no?

John-top who-dat what-acc gave Q

‘Who did John give what?’

One obvious difference between English and Japanese/Chinese is that the former is a language with overt movement of wh-phrases to SpecCP, whereas the latter are wh-in-situ languages; that is, interrogative SpecCPs are filled in overt syntax by a wh-phrase in English, but not in Japanese and Chinese.⁴ It is possible that syntactic movement of a wh-phrase to SpecCP for some reason forces the pair list interpretation. French confirms this conjecture.

French can employ either the in-situ or the wh-movement strategy in questions.⁵ Significantly, single pair answers are possible in French, but only with in-situ questions. Thus, the in-situ multiple question in (5a) can have a single pair answer. This answer is degraded with (5b),

involving overt wh-movement.⁶

(5) a. Il a donné quoi à qui?

he has given what to whom

‘What did he give to whom?’

b. Qu’a-t-il donné à qui?

The contrast between (5a) and (5b) strongly indicates that the single pair answer is possible only when no wh-phrase moves to SpecCP overtly.

Turning now to the interpretation of multiple questions in South Slavic, notice that, as expected, Bulgarian, a multiple wh-fronting language in which interrogative SpecCPs are obligatorily filled by a wh-phrase overtly, patterns with English in that (6) requires a pair list answer.

(6) Koj kakvo e kupil?

who what is bought

‘Who bought what?’

Significantly, SC patterns with languages in which wh-phrases do not have to move to SpecCP overtly in the relevant respect. Thus, SC (7) can have either a pair list or a single pair answer.⁷

(7) Ko je šta kupio?

who is what bought

‘Who bought what?’

This indicates that SC questions are well-formed even when no wh-phrase moves to the interrogative SpecCP overtly. For more evidence to this effect, see Bošković (1997b,c, 1998).

Apparently, fronting of SC wh-phrases is not necessarily driven by the checking of the strong +wh feature of C. Notice also that all wh-phrases must be fronted in SC questions, which confirms that the fronting is not driven by the checking of the +wh-feature of C.⁸

(8) a. Ko šta kupuje?

who what buys

'Who buys what?'

b. ?*Ko kupuje šta?

In fact, as noted in Bošković (1997b), SC wh-phrases generally cannot remain in situ even on the echo question reading. The unacceptability of (9) on the echo-question reading confirms that the obligatoriness of fronting of SC wh-phrases is independent of the +wh-feature.

(9) ?*Jovan kupuje šta?

John buys what

A question that arises now is what is the driving force of this obligatory non-wh fronting of wh-phrases in SC. Stjepanović (1995) argues convincingly that the driving force of this fronting is focus. She shows that contrastively focused non-wh-phrases must move overtly in SC. (*Jovana* in (10) is contrastively focused.)

(10) JOVANA_i su istukli t_i.

Jovan are beaten

‘Jovan, they beat.’

She furthermore argues that SC wh-phrases are inherently focused and therefore must undergo focus-movement (see Stjepanović 1995 for empirical evidence for this claim based on the distribution of sentential adverbs). This is not surprising given that a similar phenomenon is attested in a number of other languages, for example, Aghem, Basque, Hungarian, Somali, and Quechua (see Horvath 1986, Rochemont 1986, and Kiss 1995, among others). In fact, Horvath (1986) argues that if a language has a special position for contrastively focused phrases, wh-phrases will move to that position. This seems plausible, given the similarity in the interpretation of wh-phrases and contrastively focused phrases. In contrast to simple new information focus, with contrastive focus the set over which the focus operates is closed. As Stjepanović notes, a similar situation is found with wh-phrases, whose value is drawn from an inferable and therefore closed set of items, delimited by the question itself.

1.1. Multiple wh-fronting and Superiority

An interesting property of non-wh-fronting, or, more precisely, focus fronting of wh-phrases in SC is that it does not exhibit any Superiority effects. Consider the following multiple wh-fronting constructions from SC and Bulgarian.

(11) a. Koj kogo e vidjal? (B)

who whom is seen

'Who saw whom?'

b. *Kogo koj e vidjal?

c. Koj kak udari Ivan?

who how hit Ivan

'Who hit Ivan how?'

d. *Kak koj udari Ivan?

(12) a. Ko je koga vidio? (SC)

who is whom seen

b. Koga je ko vidio?

c. Ko kako udara Ivana?

who how hits Ivan

d. Kako ko udara Ivana?

The data in (11-12) indicate that fronted wh-phrases in short-distance matrix questions in Bulgarian are subject to strict ordering constraints, which is not the case in SC. The order of fronted wh-phrases in Bulgarian appears to follow from the Superiority Condition. Chomsky's (1973) original formulation of the condition, which accounts for the contrast between (14a) and (14b) (*who* is superior to *what*), is given in (13).

(13) No rule can involve X, Y in the structure ..X...[...Z...WYV...] where the rule applies ambiguously to Z and Y, and Z is superior to Y. The category A is superior to the category

B if every major category dominating A dominates B as well but not conversely.

- (14) a. Who_i did John tell t_i that he should buy what?
b. ?*What_i did John tell who that he should buy t_i?

We shall see in section 1.2. that multiple wh-fronting constructions provide support for the Economy account of Superiority (Chomsky MIT Fall Lectures 1989, see also Bošković 1997a, in press b, Cheng 1997, Kitahara 1993, and Oka 1993, among others), under which the effects of the Superiority Condition follow from the requirement that the +wh-feature of C be checked in the most economical way, i.e., through the shortest movement possible.⁹ The underlying assumption here is that movement to SpecCP obligatorily triggers Spec-Head agreement with C, which in turn results in the checking of the +wh feature of C. Rudin (1988) argues that adjunction to SpecCP in Bulgarian proceeds to the right, i.e., the wh-phrase that is first in the linear order is the one that moves first to SpecCP. Given rightward adjunction to SpecCP, (11a-d) indicate that the nominative *koj* must move to SpecCP before accusative and VP-adjunct wh-phrases, checking the +wh feature of C in the most economical way (i.e. through the shortest movement possible). (11b) and (11d), where the accusative and the adjunct wh-phrase move first checking the strong +wh feature of C, are then ruled out because the +wh feature of C is not checked through the shortest movement possible.

A slightly different account is available under Koizumi's (1994) proposal that instead of multiple adjunction to SpecCP, Bulgarian multiple wh-fronting constructions involve multiple specifiers of C. Under this analysis, Superiority still forces the highest wh-phrase in (11) (*koj*) to move to SpecCP first. Richards (1997) suggests that when the second wh-phrase undergoes wh-movement, Make the Shortest Move Principle forces it to move to the lower specifier. This way, the

wh-phrase crosses fewer nodes than it would if it were to move to the higher specifier.

We have seen that strict ordering of fronted wh-phrases in Bulgarian provides evidence that wh-movement in Bulgarian is sensitive to Superiority. Turning now to SC, recall that SC constructions such as (12) do not have to involve wh-movement at all, i.e. the wh-phrases in such constructions move overtly independently of the +wh-feature. Free ordering of fronted wh-phrases in such constructions then appears to indicate that non-wh-fronting (more precisely, focus-movement of wh-phrases) is not sensitive to the Superiority Condition.¹⁰ The correctness of the descriptive generalization that this movement is not subject to Superiority reached with respect to SC is confirmed by certain data from Bulgarian, noted in Bošković (1997a).

As noted above, Rudin (1988) shows that all wh-phrases in Bulgarian must be located in SpecCP overtly. We have also seen that, like English, Bulgarian exhibits Superiority effects in all types of questions. To account for this I assume that, as in English, in Bulgarian the interrogative C has a strong +wh-feature and its Spec must always be filled in overt syntax. However, checking the strong +wh-feature of C cannot be the only motivation for movement to SpecCP in Bulgarian. If this were the case it would suffice to move only one wh-phrase to SpecCP, as in English. However, in Bulgarian all wh-phrases must be fronted.

(15) a. *Koj e vidjal kogo?

who is seen whom

‘Who saw whom?’

b. Koj kogo e vidjal?

c. *Koj udari Ivan kak?

who hit Ivan how

‘Who hit Ivan how?’

d. Koj kak udari Ivan?

Bulgarian apparently also has obligatory non-wh-fronting of wh-phrases. Following Stjepanović’s (1995) proposal for SC, in Bošković (in press b) I suggest that Bulgarian non-wh-fronting is also an instance of focus-movement.¹¹ Under this analysis, one wh-phrase in Bulgarian multiple questions moves to check the strong +wh-feature of C (i.e. it undergoes wh-movement). Movement of other wh-phrases is an instance of pure focus-movement (i.e. it is motivated only by focusing). Observe now that, if wh-movement, which affects only one wh-phrase, is, and focus-movement, which affects all wh-phrases, is not subject to the Superiority Condition we would expect the Superiority Condition to affect only one wh-phrase. More precisely, the highest wh-phrase should move first (satisfying Superiority with wh-movement)¹² and then the order of movement should not matter (given that focus-movement is not subject to Superiority). As noted in Bošković (1997a, in press b) this is exactly what happens in Bulgarian. ((16) and (18) indicate that *kogo* is higher than *kak* and *kakvo* prior to wh-movement.)¹³

(16) a. Kogo kak e tselunal Ivan?

whom how is kissed Ivan

‘How did Ivan kiss whom?’

b. ?*Kak kogo e tselunal Ivan?

(17) a. Koj kogo kak e tselunal?

who whom how is kissed

‘Who kissed whom how?’

b. Koj kak kogo e tselunal?

(18) a. Kogo kakvo e pital Ivan?

whom what is asked Ivan

‘Whom did Ivan ask what?’

b. ?*Kakvo kogo e pital Ivan?

(19) a. Koj kogo kakvo e pital?

who whom what is asked

‘Who asked whom what?’

b. Koj kakvo kogo e pital?

We have seen so far that wh-movement is, and focus-movement is not, subject to Superiority. The question is now whether we can deduce the exceptional behavior of the latter movement with respect to Superiority (i.e. economy of derivation) from deeper principles. In the next section I will explore possible answers to this question.

1.2. Why is focus-movement of wh-phrases insensitive to Superiority?

One way of accounting for the lack of Superiority effects with focus-movement is to push this

movement into the PF component and assume that the relevant principles of economy of derivation do not apply there. In Bošković (1997b, 1998) I show that at least in certain cases phonological information has an effect on the focusing of wh-phrases. This indicates that PF plays at least some role in the phenomenon. The question is, however, whether the phenomenon can be pushed into the phonology in its entirety. I will not attempt to answer this question here. I merely note two potential difficulties for the all around PF movement analysis of focus-fronting. Focus-movement obviously has semantic import, which can be difficult, though maybe not impossible, to account for if the movement is pushed into PF and if the traditional model of the grammar, where the derivation splits into PF and LF, is adopted. Notice also that most other instances of PF movement argued for in the literature are very local, involving linearly adjacent words.¹⁴ This is not the case with focus-movement, which can take place across clausal boundaries. These are not necessarily insurmountable problems. The PF movement analysis certainly merits more serious consideration than I have given it here. I turn now to an analysis that considers focus-movement a syntactic operation.¹⁵

In Bošković (in press b) I present a principled economy explanation for the different behavior of focus and wh-movement with respect to Superiority. I argue that focus-movement and wh-movement differ with respect to where the formal inadequacy driving the movement lies. It is standardly assumed that with wh-movement, the inadequacy driving the movement, i.e. the relevant strong feature, lies in the target. This is why it suffices to front only one of the wh-phrases in (20) overtly. *What* checks the strong +wh-feature of C so that there is no need for other wh-phrases to undergo wh-movement.¹⁶

(20) What did John give to whom when?

Turning now to focus-movement, the very fact that every wh-phrase must undergo focus-movement indicates that the inadequacy driving the movement, i.e. the strong feature, resides in the wh-phrases, not in the target of the movement. If the relevant strong feature were to reside in the target it would suffice to front only one of the wh-phrases in SC multiple questions such as (21).¹⁷

(21) a. Ko šta gdje kupuje?

who what where buys

‘Who buys what where?’

b. *Ko kupuje šta gdje?

c. *Ko šta kupuje gdje?

d. *Ko gdje kupuje šta?

Focus-movement thus differs from wh-movement with respect to where the strong feature driving the movement resides. With focus-movement, the strong feature resides in the elements undergoing movement, and with wh-movement in the target. In Bošković (in press b) I argue that this difference is responsible for the different behavior of focus-movement and wh-movement with respect to Superiority.¹⁸ Consider the following abstract configurations for wh- and focus-movement. (In the following discussion I assume the Economy account of Superiority, which deduces Superiority effects from the requirement that each feature be checked in the most economical way, i.e. through the shortest movement possible. See section 1.1.)

(22)	Wh-movement			
F	wh-phrase1	wh-phrase2	wh-phrase3 ¹⁹	
+wh	+wh	+wh	+wh	
strong	weak	weak	weak	

(23)	Focus-movement			
F	wh-phrase1	wh-phrase2	wh-phrase3	
+focus	+focus	+focus	+focus	
weak	strong	strong	strong	

The functional head F has a strong feature in (22). The feature has to be checked through the shortest movement possible. Hence, wh-phrase1 will have to move to F. If wh-phrase2 or wh-phrase3 moves to check the strong feature of F we get a Superiority violation under the Economy account of Superiority.

In (23) the strong feature resides in wh-phrases. Again, the relevant feature must be checked through the shortest movement possible, which is movement to F. The order in which the wh-phrases are checking their strong focus feature against F, i.e., the order of movement to the FP projection, is irrelevant. For example, the derivation in which wh-phrase1 checks its focus feature before wh-phrase2 and the derivation in which wh-phrase2 checks its focus feature before wh-phrase1 are equally economical. The same nodes are crossed to check the strong focus feature of the wh-phrases. (I assume that only maximal projections count here.) Hence, we do not get a Superiority violation regardless of the order of movement of the wh-phrases.

Under the Economy account of Superiority, we thus correctly predict that Superiority effects

will arise in the constructions in question when the strong feature driving the movement belongs to the target (when we have *Attract*), but not when it belongs to the elements undergoing movement (when we have *Move*). On the other hand, under Chomsky's (1973) original formulation of the Superiority Condition, given in (13), as well as most other accounts of Superiority (see Cheng and Demirdache 1990, Lasnik and Saito 1992, and Pesetsky 1982, among others), the facts under consideration remain unaccounted for. Under the most natural application of these accounts to multiple *wh*-fronting constructions we would expect to get Superiority effects with both *wh*- and focus-movement.²⁰ The problem with these accounts is that it is simply not possible to make the information concerning where the formal inadequacy driving the movement lies, which determines whether a question will exhibit a Superiority effect, relevant to Superiority in a principled way. We thus have here empirical evidence for the Economy account of Superiority.

Before leaving the *Move/Attract* account, let me clarify how the account applies to Bulgarian. In Bulgarian constructions such as (16-19) and (ia-b) in note 14, the *wh*-phrases have a strong focus feature and *C* has a strong +*wh*-feature. None of the features can be checked before the interrogative *C* is introduced into the structure. Once *C* is introduced all the features can be checked. The question is in which order they will be checked. As far as the strong features of the *wh*-phrases are concerned it does not matter in which order they will be checked. For example, whether the strong focus feature of *koj* in (17) is checked first or last the same number of maximal projections will be crossed to check it. This is not true of the strong feature of *C*, which has to be checked by the highest *wh*-phrase, namely *koj*. Since *wh*-phrases do not care in which order they will move, and since *C* cares about the order (*koj* must move first), a way to make everybody happy is to move *koj* first and then we can move the remaining *wh*-phrases in any order.²¹

The account presented in Bošković (in press b) is based on the assumption that strength can

reside in elements undergoing movement, not just in the target. We have seen empirical evidence for this assumption from multiple wh-fronting constructions. Notice, however, that it would be conceptually more appealing if the formal inadequacy triggering movement were to always reside in the target. Then, it would be possible to overcome the inadequacy as soon as it enters the structure. This is generally not possible with formal inadequacies residing in moving elements. There, we need to wait until the checker enters the structure, which increases computational burden. I will show now that the relevant facts concerning multiple wh-fronting can be rather straightforwardly restated without positing strength in moving elements, given a particular view of multiple feature-checking. Furthermore, the above account of the exceptional behavior of focus-movement with respect to Superiority can be maintained in its essentials.

In his discussion of Icelandic multiple subject constructions Chomsky (1995) proposes that one and the same head can attract a particular feature F more than once. We can think of multiple attraction by the same head as follows: (a) there are elements that possess a formal inadequacy that is overcome by attracting 1 feature F, (b) there are elements that possess a formal inadequacy that is overcome by attracting 2 features F, (c) there are elements that possess a formal inadequacy that is overcome by attracting 3 features F, etc. In this system it seems natural to have elements that possess a formal inadequacy that is overcome by attracting all features F.²²

The attractor for wh-movement in languages like English (+wh C) is an Attract 1F head. When there is more than one potential attractee, Attract 1F elements will always attract the highest potential attractee (i.e., the attractee that is closest to them), given that every requirement must be satisfied in the most economical way. Hence we get Superiority effects with Attract 1F heads. Suppose now that the focus attractor is an Attract all F element. The focus attractor would then have to attract all focus feature bearing elements. It is clear that we would not expect any Superiority

effects with Attract all F elements. For example, the Attract all F property of the focus head in the abstract configuration in (23) is clearly satisfied in the same way from the point of view of economy regardless of the order in which the wh-phrases move to the focus head. Regardless of whether the wh-phrases move in the 1-2-3, 1-3-2, 2-1-3, 2-3-1, 3-1-2, or 3-2-1 order, the same number of nodes will be crossed to satisfy the Attract all focused elements inadequacy of the relevant head. Hence, by economy, all orders should be possible. We thus account for the lack of Superiority effects with focus-movement.²³

The Attract all F account maintains the essentials of the above analysis of the different behavior of focus-movement and wh-movement with respect to Superiority without positing formal inadequacies driving movement in moving elements (we are dealing here with a pure Attract system), which appears appealing conceptually. The different behavior of wh- and focus-movement with respect to Superiority follows from focus-movement having the Attract all F property, and wh-movement having the Attract 1F property.^{24,25}

2. Multiple head-movement

In this section I will consider some data that could potentially tease apart the strength in the moving elements and the Attract all F accounts of multiple movement to the same position. To find the relevant data I will go beyond multiple wh-fronting constructions. In particular, I will re-examine V-clustering constructions discussed in Bošković (1997d). The abstract pattern exhibited by these constructions is the same as that found in multiple wh-fronting constructions: a number of different elements move to check a feature against one head. As a result, both the account that posits a strong

feature in moving elements and the account that posits an Attract all F feature in the target can account for the basic V-clustering paradigm. However, we will see that V-clustering constructions provide us with ways of teasing apart the two accounts that are not available with multiple wh-fronting constructions.

In Bošković (1997d) I argued that in several languages (I examined SC, Standard Dutch, and Polish), in multiple V-constructions involving auxiliaries/modals and participles, all verbal elements adjoin in overt syntax to the highest verbal head in the V-sequence.²⁶ I will re-examine here some of the relevant data from Standard Dutch, where I argued the adjunction is optional (at least in overt syntax), and SC, where the adjunction is obligatory. I will first consider Dutch.

2.1. V-clustering in Standard Dutch

Following Zwart (1993, 1994, 1997), I assume that Dutch is a V-initial or, more generally, head-initial language. According to Zwart, direct objects in Dutch are generated following verbs and then undergo movement to the left of the verb. On this analysis, the surface order of the verbal elements in (24) corresponds to their base-generated order.²⁷

(24) Ik denk dat Jan het boek_i [_{VP} moet [_{VP} hebben [_{VP} gelezen t_i]]] 1-2-3

I think that Jan the book must have read

‘I think that Jan must have read the book.’

Under this analysis, constructions such as (25) then must involve participle movement.

(25) dat Jan het boek gelezen moet hebben 3-1-2

As illustrated below, no lexical material is allowed to intervene between the verbal elements in (25). (Compare (26) with (27) and (28)-(29)). This state of affairs can be accounted for if in such constructions the second and the third verbal element are adjoined to the first verbal element.²⁸

(26) a. *dat Jan het boek gelezen uit moet hebben 3-1-2

that Jan the book read out must have

‘that Jan must have finished reading the book.’

b. *dat Jan het boek gelezen moet uit hebben 3-1-2

(27) cf. dat Jan het boek uit gelezen moet hebben

Significantly, in constructions in which the surface order of verbal elements corresponds to the order in which they are base-generated non-verbal lexical material can intervene between the verbal elements. This indicates that *gelezen* and *hebben* do not have to move to *moet*.

(28) dat Jan het boek moet uit hebben gelezen 1-2-3

(29) dat Jan het boek moet hebben uit gelezen 1-2-3

The above data thus provide evidence for optional V-adjunction in Dutch. Verbal elements in Dutch V-sequences can, but do not have to, adjoin to the highest verbal element in the sequence in overt

syntax.

Consider now how this state of affairs would be formally implemented under the two analyses of multiple movement to the same position considered above. I will call the feature that drives V-adjunction feature X and leave its precise identity open. Under the analysis that posits a strong feature in the elements undergoing movement we would have to assume that *hebben* and *gelezen* can be optionally drawn from the lexicon with a strong X feature. Under the Attract all F analysis, on the other hand, we would assume that *moet* is optionally specified in the lexicon with the Attract all X property.

Although both analyses account for the above facts they make different predictions in other cases. Since under the multiple strength analysis *hebben* and *gelezen* can be optionally taken from the lexicon with a strong X feature nothing prevents us from deciding to take only one of these elements, say *gelezen*, from the lexicon with a strong X feature, while taking the other element without a strong X feature. Only *gelezen* would then move to *moet* overtly. Partial V-movement derivations, on the other hand, are ruled out under the Attract all X analysis. If *moet* has the property Attract all X both *gelezen* and *hebben* must move to it; if it does not, neither would move.²⁹ Under the strong feature in the moving elements analysis we would then expect it to be possible to move *gelezen* to *moet*, without moving *hebben*. Under the Attract all F account, this would not be possible. The ungrammaticality of (26b), repeated here as (30), indicates that the prediction of the Attract all F account is borne out.

(30) *dat Jan het boek gelezen moet uit hebben 3-1-2

If *hebben* could stay in situ when *gelezen* moves to *moet* we would expect it to be possible to have

non-verbal lexical material intervene between *moet* and *hebben* in (30), just as in (28). The fact that this is not possible indicates that when *gelezen* moves to *moet*, *hebben* also must move to *moet*, which can be readily accounted for under the Attract all F, but not under the strong feature in the moving elements analysis.³⁰

2.2. Double participle constructions in Serbo-Croatian

In Bošković (1995, 1997d) I argue that in SC double participle constructions both participles adjoin to the auxiliary, the direction of adjunction being free. (For ease of exposition, I will refer only to the finite auxiliary as auxiliary.) If the auxiliary moves to I to check its inflectional features it excorporates from the complex head created by the adjunction in accordance with Watanabe's (1993) economy theory of excorporation, which forces excorporation in certain well-defined configurations (see the discussion below). The movement of the auxiliary to I is optional in overt syntax. Constructions in (31)-(32), where the auxiliary remains in situ, illustrate participle adjunction to the auxiliary, which remains in situ overtly. The fact that no phrasal lexical material can intervene between the participles and the auxiliary provides evidence that the verbal elements in the constructions in question are located in the same head position.³¹

(31) Čekali_i ste bili t_i Marijinu prijateljicu.

waited are been Maria's friend

'You had been waiting for Maria's friend.'

(32) Bili_i ste t_i čekali Marijinu prijateljicu.

been are waited Maria's friend

‘You had been waiting for Maria's friend.’

(33) a. *Čekali ste Marijinu prijateljicu_i bili t_i.

waited are Maria's friend been

b. *Čekali Marijinu prijateljicu_i ste bili t_i.

(34) a. *Bili ste Marijinu prijateljicu_i čekali t_i.

been are Maria's friend waited

b. *Bili Marijinu prijateljicu_i ste čekali t_i.

(35) is an example involving auxiliary movement to I: the auxiliary moves excorporating from the complex head formed by the adjunction of the participles to check its inflectional features. The fact that no phrasal material can intervene between the participles, as illustrated in (36), is accounted for, since the participles are adjoined to the same head position (the base-generated position of the auxiliary), participle movement being obligatory in SC.

(35) Vas dvoje ste Marijinu prijateljicu_i bili čekali t_i.

you two are Maria's friend been waited

‘You two had been waiting for Maria's friend.’

(36) *Vas dvoje ste bili Marijinu prijateljicu_i čekali t_i.

The excorporation takes place under the same circumstances as the excorporation out of verbal clusters in Dutch. Roberts (1991) observes that although the participles in Dutch constructions such as (24) can adjoin to the modal (see section 2.1., in particular (25)-(26)), the modal must excorporate

from the complex head formed by the adjunction if it undergoes movement to C in V-2 constructions, as illustrated in (37).

(37) a. *_{[CP Gisteren gelezen moet hebben} _[IP Jan het boek]]

yesterday read must have Jan the book

‘Yesterday, Jan must have read the book.’

b. cf. _{[CP Gisteren moet} _[IP Jan het boek gelezen hebben]]

Watanabe’s (1993) economy account of excorporation (for additional evidence for this account, see Bošković 1997d) provides a straightforward explanation for excorporation in both (35) and (37). Since the movement to I in (35) and the movement to C in (37) are driven by the features of the auxiliary and the modal respectively (no feature of the participles is involved in checking), Principles of Economy (carry as little material as possible under movement) force the auxiliary and the modal to excorporate out of the complex heads formed by participle adjunction, moving alone to I and C respectively.

SC double participle constructions thus involve multiple movement to the same position. The basic paradigm in (31)-(32) is amenable to both the strength in the elements undergoing movement and the Attract all F account. Call the feature that motivates participle-to-auxiliary movement +participle.³² Under the strength in the moving elements account, the participles are lexically specified as bearing the strong +participle feature, which is checked against the auxiliary. Under the Attract all F account, the auxiliary is lexically specified as having the property Attract all +participle, which is satisfied by attraction of +participle feature bearing elements. Both analyses thus account for the basic paradigm concerning double participle movement to Aux. The analyses, however, make

different predictions with respect to double participle constructions involving VP ellipsis.

Stjepanović (in press a,b) shows that SC has VP ellipsis, an example of which is given in (38).

(38) On je čekao Marijinu prijateljicu, a i mi smo.

he is waited Maria's friend and also we are

'He waited for Maria's friend, and we did too.'

Assuming that only constituents can be deleted and given that SC participles must move to Aux for feature checking, constructions like (38) can be derived by excorporating the auxiliary after participle adjunction to the auxiliary. Ellipsis, which I assume involves PF deletion, can then affect VP1.³³

(39) On je čekao Marijinu prijateljicu, a i mi smo_i [_{VP1} t_i čekali_j [_{VP2} t_j Marijinu prijateljicu]]

Let us now turn to more complex examples involving double participle constructions. Significantly, such constructions are acceptable only if both participles are elided.

(40) On je bio čekao Marijinu prijateljicu, a i mi smo.

(41) ?*On je bio čekao Marijinu prijateljicu, a i mi smo bili.

The good example (40) can be derived in the same manner as (38): 1. the participles adjoin to the auxiliary; 2. the auxiliary excorporates to move to I; 3. the highest VP is deleted. It is easy to verify

that this derivation goes through under both the strength in the moving elements and the Attract all F approach to multiple movement to the same position. (41), however, appears to favor the Attract all F approach. Consider how (41) would be derived under this approach. Prior to excorporation, the auxiliary has to attract both participles to satisfy its Attract all +participle property. Given the standard assumption that only constituents can be elided we then cannot derive (41). Regardless of whether or not the auxiliary excorporates to move to I, there is simply no constituent that contains the second but not the first participle. The ungrammaticality of (41) is thus straightforwardly accounted for under the Attract all F analysis.

(42) ?*On je bio čekao Marijinu prijateljicu, a i mi smo_i [_{VP1} t_i+bili_j+čekali_k [_{VP2} t_j [_{VP3} t_k Marijinu prijateljicu]]]

Consider now how the strength in the moving elements analysis fares with respect to (41). Under this approach, the participles are drawn from the lexicon with a strong +participle feature, which needs to be checked against the auxiliary. The auxiliary itself does not have any strong features that must be checked against the participles. Lasnik (in press) observes that if strong features are defined as illegitimate PF objects we would expect it to be possible to rescue from crashing constructions containing a strong feature X even if X is not checked off in overt syntax by deleting a phrase that contains the strong feature X. X would then not be present in the final PF representation. Lasnik furthermore provides several examples where he suggests this scenario occurs. An element Y with a strong feature X fails to undergo movement that would check the strong feature X in overt syntax. The derivation is saved from crashing in PF by deleting the phrase containing Y, so that the strong feature X is not present in the final PF representation. Lasnik's derivation is available for (41) under

the strength in the moving elements approach. The sentence could be derived as follows: the first participle moves to the auxiliary to check its strong +participle feature, after which the auxiliary can, but does not have to, excorporate to I. We then delete in PF either VP2 or VP3, both of which contain the second participle with a strong +participle feature, so that no strong feature is present in the final PF representation. Since nothing appears to go wrong with the sentence on this derivation I conclude that the construction is incorrectly predicted to be grammatical under the strength in the moving elements approach.³⁴

(43) ?*On je bio čekao Marijinu prijateljicu, a i mi smo_i [_{VP1} t_i+bili_j [_{VP2} t_j [_{VP3} čekali Marijinu prijateljicu]]]

I conclude, therefore, that the data discussed in this section favor the Attract all F approach to multiple movement to the same position, which places the formal inadequacy driving the movement in the target, over the multiple strength approach, which places the inadequacy driving the movement in the moving elements. Since constructions involving obligatory multiple movement to the same position have previously represented the strongest argument for the possibility of strength, i.e. formal inadequacies driving movement, being present in moving elements, a possibility now opens up that formal inadequacies driving movement always reside in the target. The operation Move could then be handled with a pure Attract system, a conceptually appealing possibility that decreases computational burden, as discussed in section 1.2.

It also appears that the approach to multiple checking by the same element argued for here is somewhat more appealing than Chomsky's (1995) approach based on the deletion/erasure distinction, which is dispensable under the current analysis. Chomsky's (1995) system naturally

allows +interpretable features to be involved in multiple feature-checking. This not the case with -interpretable features, which under the most natural interpretation of Chomsky's (1995) system would not be expected to enter into checking relations more than once. Additional assumptions are needed to allow for the possibility of multiple checking of a -interpretable element. Chomsky argues on empirical grounds that this possibility needs to be allowed. He suggests one way of doing this based on the erasure-deletion distinction, which is relevant only to the checking of -interpretable features. (According to Chomsky, +interpretable features cannot be deleted at all due to the Principle of Recoverability of Deletion.) Chomsky assumes that "a checked feature is deleted when possible", and a deleted feature is "erased when possible", where deleted elements are "invisible at LF but accessible to the computation", and erased elements are "inaccessible to any operation, not just interpretability at LF" (p. 280). On this approach, certain -interpretable elements are lexically specified as being able to escape erasure when deleted, as a result of which they remain accessible to the computation (i.e. available for checking) even when they have already been checked once.

The erasure-deletion analysis appears to allow in principle even -interpretable features that are being attracted rather than serving as attractors to undergo multiple checking since there appears to be no principled reason why such -interpretable features could not be specified as being able to escape erasure after deletion. Constructions that would instantiate this option, however, do not seem to exist.³⁵ The current, Attract-based approach, which dispenses with the deletion-erasure loophole for allowing -interpretable features to undergo multiple checking, readily accounts for this state of affairs, since it allows -interpretable elements to undergo multiple checking only if they serve as targets of movement.³⁶

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Notes

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2. See, however, Ausín (in preparation) for some exceptions.

3. The Japanese data were brought to my attention by Mamoru Saito (personal communication).

4. I ignore here the possibility of null operator movement in Japanese questions (see Watanabe 1992) and concentrate on what happens to wh-phrases themselves.

5. I will confine my discussion of French to non-subject questions, where it is clear whether the wh-

movement or the in-situ option is employed.

6. As discussed in Bošković (in press a, c), French wh-in-situ constructions involve LF wh-movement. (I show that even argument wh-in-situ constructions in French are sensitive to locality restrictions on movement (see also note 26).) If this LF movement affects the whole wh-phrase, (5a) and (5b) will have the same structure in LF, which will make it very difficult to account for the fact that they receive different interpretations. In Chomsky's (1995) Move F system, on the other hand, (5a) and (5b) will have different LFs. The operation Move will affect only the formal features of the higher wh-phrase in (5a). In contrast to (5b), its semantic features will remain in their base-generated position in (5a). The fact that (5a) and (5b) receive different interpretations may thus provide an argument for Move F.

7. The element that intervenes between the fronted wh-phrases, *je*, is a second position clitic. SC second position cliticization is a very murky phenomenon that involves both phonology and syntax (see Bošković in press d and references therein). Throughout the paper I will ignore second position clitics. I discuss their relevance for determining the position of wh-phrases in work in progress.

8. There are a few exceptions to the obligatoriness of fronting of SC wh-phrases that need not concern us here. For relevant discussion, see Bošković (1997b, 1998).

9. Note that I will continue to use the term Superiority Condition for ease of exposition.

10. In Bošković (1997b,c, 1998) I show that in some constructions SC does exhibit Superiority effects with multiple wh-fronting. However, I also show that the constructions in question actually involve "real" wh-movement, i.e. movement to SpecCP. I will ignore such constructions here.

11. A somewhat similar proposal is made in Izvorski (1993). Notice that, as in SC, contrastively focused phrases undergo overt fronting in Bulgarian. Furthermore, as in SC, in Bulgarian wh-phrases are fronted even on the echo-question reading. Thus, (i) is ungrammatical even as an echo-question.

(i) *Ivan e popravil kakvo?

Ivan is fixed what

‘Ivan fixed what?’

In Bošković (1997c) I argue that Bulgarian differs minimally from SC in that in Bulgarian, the interrogative C is the focus licenser for wh-phrases, whereas in SC, either the interrogative C or I (Agr in the split INFL framework) can focus-license wh-phrases. (Both options are not always available in SC. See Bošković 1997c for details of the analysis. One of my Bulgarian informants does not front contrastively focused non-wh-phrases. This is not totally unexpected, given that, in contrast to Serbo-Croatian, the focus licenser in Bulgarian is a +wh-element, namely +whC. It is possible that for the speaker in question, +whC fails to attract -wh focused elements due to a feature conflict. Notice that Serbo-Croatian has a focus licenser unspecified for the wh-feature.))

12. Recall that movement to SpecCP obligatorily triggers Spec-Head agreement with C, so that the wh-phrase that moves first to SpecCP necessarily checks the strong +wh feature of C.

13. In Bošković (1997a) I argue that *kogo* is higher than *kak* prior to wh-movement because it moves to SpecAgrP before undergoing wh-movement.

Notice also that the ungrammaticality of (ia-b) indicates that we cannot be dealing here with the same type of phenomenon as in English constructions like (iia-b), noted in Kayne (1984), where addition of a lower wh-phrase for some reason saves the derivation from a Superiority violation.

(i) a. *Kogo koj kak e tselunal?

whom who how is kissed

b. *Kogo koj kakvo e pital?

whom who what is asked

(ii) a. *What did who buy?

b. (?)What did who buy where?

14. I have in mind here Morphological Merger and Prosodic Inversion.

15. Another syntactic analysis is presented in Richards (1997), based on Richards's Principle of Minimal Compliance. However, it is shown in Bošković (1998) that, though very interesting, the analysis cannot be maintained since it does not cover the full range of relevant data. The analysis accounts for the relevant data in Bulgarian, but cannot be extended to account for the entire relevant paradigm in SC.

16. Sam Epstein (personal communication) suggests that the ungrammaticality of (i) can be interpreted as indicating that adjuncts such as *why* and *how* have a strong +wh-feature and therefore cannot remain in situ. See, however, Bošković (in press a) for an alternative analysis of (i) which does not posit any strong features in *why/how*. The analysis also accounts for the fact that constructions such as (i) are acceptable in German (see Haider 1986 and Müller and Sternefeld 1996, among others.)

(i) *I wonder who left why/how.

17. Note that, as observed by Pesetsky (MIT lectures 1997) with respect to Bulgarian, (21b), where two wh-phrases remain in situ, is actually somewhat worse than (21c-d), where only one of the wh-phrases remains in situ. This is expected, given that in (21b) two strong features remain unchecked and in (21c-d) only one strong feature remains unchecked.

Notice also that the focus licensing head in Serbo-Croatian must be able to focus check more than one wh-phrase, a possibility available in Chomsky's (1995) system, which allows multiple

checking of the same feature by one element (see the discussion below.)

18. It is important to bear in mind that, as a result, the account holds even if something other than focus serves as the driving force of non-wh-fronting (i.e. if the relevant strong feature of wh-phrases is something other than focus). For example, as pointed out by Steven Franks (personal communication), the analysis to be given in the text can be applied to Bulgarian even if, instead of a strong focus feature, Bulgarian wh-phrases have a strong +wh-feature, i.e., if both the interrogative C and wh-phrases have a strong +wh-feature in Bulgarian.

19. Linear order indicates asymmetrical c-command in (22)-(23).

20. Hornstein's (1995) analysis of Superiority, based on Chierchia's (1991) weak crossover account of the pair-list interpretation, faces a different problem. Hornstein proposes two ways of accounting for the contrasts in Bulgarian (11a-d); one based on the impossibility of wh-traces within +wh CPs to be interpreted functionally and one based on semantic inertness of elements to which other elements have adjoined. It appears to me that the first analysis rules out all Bulgarian multiple questions with three or more preposed wh-phrases, while the second analysis allows even ungrammatical constructions such as (1a-b) in note 14.

21. Note that I assume that once the interrogative C is inserted, it is not possible to zero down on one particular strong feature (for example, the strong focus feature of *kogo*) and ignore other relevant strong features. All strong features (of both the target and the moving elements) must be considered in determining what to do next. This will become clearer under the alternative account sketched below.

22. This approach to multiple feature-checking by the same element is very similar to Chomsky's (1995) unforced violations of procrastinate analysis.

Notice that given that there is no natural place for counting in the natural language it would

not be surprising if only Attract all F, Attract 1F, and possibly Attract 2F options are utilized. Notice also that checking a feature of X through lexical insertion might also be considered to involve attraction, with X attracting an element from the numeration. (Chomsky (MIT Lectures 1997) in fact considers this an instance of Attract.)

23. Consider how this analysis applies to Bulgarian. In Bulgarian the interrogative C has two attracting features: an Attract 1F +wh-feature and an Attract all F +focus feature. It is clear that the most economical way of overcoming the formal inadequacies of C would require moving the highest wh-phrase first. After that it would not matter in which order the wh-phrases will move to C.

Notice also that again, nothing hinges on focus being the exact driving force of non-wh-fronting in SC and Bulgarian. However, we now do crucially need to have two different features involved in Bulgarian, which was not necessary under the Move/Attract analysis (see note 19.)

24. Under the Attract all focused elements analysis, it appears that we need to assume that phrases that are already located in a focus position are immune from attraction (i.e. cannot be caused to move) by another focus head; otherwise, the possibility of having focused elements in different clauses of the same sentence will be ruled out. (The matrix focus attractor would attract all focused phrases.) A similar assumption is actually needed in Chomsky's (1995) system even for Attract 1F cases, otherwise, the ungrammaticality of constructions such as (i) would remain unaccounted for. ((i) comes out as syntactically well-formed in Chomsky's system if we do not ban a +wh C from attracting (i.e. causing to move) a +wh-phrase located in a +wh-feature checking position (interrogative SpecCP).)

(i) *What_i do you wonder t_i John bought t_i (when)?

Notice also that although a head with an Attract all feature X property obligatorily undergoes multiple checking if there is more than one X present in the structure, it does not have to undergo checking at all if no X is present in the structure. The Attract all X property is then trivially satisfied. This seems desirable. Notice, for example, that although all contrastively focused elements and wh-phrases must undergo focus-movement in the languages under consideration, constructions in which focus-movement does not take place because no candidate for focus-movement (a contrastively focused phrase or a wh-phrase) is present in the structure are well-formed.

25. The Attract all F/Attract 1F distinction might also be relevant in LF. It is well-known that at least in certain contexts, French allows both the wh-in-situ (*Tu as vu qui?* ‘You saw who?’) and the wh-movement (*Qui as-tu vu?* ‘Who did you see?’) strategy in questions. In Bošković (in press c) I argue that French wh-in-situ constructions involve LF wh-movement, evidence for which is provided by severe locality restrictions they exhibit. Thus, (i) shows that long-distance wh-in-situ constructions are unacceptable in French. (See Bošković in press c for an explanation why, in contrast to overt wh-movement, covert wh-movement is clause-bounded based on Move F. Notice that I assume that, as argued by Watanabe 1992, Aoun and Li 1993, and Cole and Hermon 1995, languages such as Japanese and Chinese have overt wh-movement. The movement, however, does not affect wh-phrases themselves.)

(i) ?*Jean et Pierre croient que Marie a vu qui?

Jean and Pierre believe that Marie has seen whom

‘Whom do Jean and Pierre believe that Marie saw?’

In Bošković (in press c) I interpret the grammaticality of (ii) as indicating that only one wh-phrase

needs to move to the interrogative SpecCP in French, which in current terms means that French +wh C has an Attract 1F property. In (ii) the Attract 1+wh property of the C is satisfied by attracting the matrix wh-phrase, so that, in contrast to (i), there is no need for the embedded clause wh-phrase to move to C in the LF of (ii). The clause-boundedness of LF wh-movement therefore has no effect on (ii).

(ii) Qui croit que Marie a vu qui?

who believes that Marie has seen whom

It is well-known that some languages, in particular, Iraqi Arabic and Hindi, do not allow any wh-phrases to remain in situ within an embedded finite clause. (I ignore here constructions involving dummy scope markers, which are in many respects similar to German partial wh-movement constructions.) The counterparts of both (i) and (ii) are unacceptable in these languages. In fact, no matter how many wh-phrases are located in the same clause as a +wh C, as long as one wh-phrase is separated from the +wh C by a finite clause boundary we cannot get an acceptable construction in these languages. Given that, as demonstrated in Bošković (in press c), LF wh-movement is clause-bounded, this can be interpreted as indicating that in Iraqi Arabic and Hindi wh-in-situ constructions C Attracts all +wh-phrases in LF, whereas in French wh-in-situ constructions C attracts only one wh-phrase in LF.

26. I also conjectured that in languages in which the adjunction does not take place overtly the adjunction takes place in covert syntax. Empirical evidence is, however, difficult to find in such cases.

27. All the Dutch data discussed below are due to Zwart (1994) and Zwart (personal communication).

Following Zwart (1994), for ease of exposition, the SS order of verbal elements will be indicated through numbering next to the examples, the numbers corresponding to the order in which the verbal elements are generated. For discussion and further references concerning V-clustering in Dutch, see Broekhuis, Den Besten, Hoekstra, and Rutten (1995), Den Besten and Edmondson (1983), Den Dikken and Hoekstra (1997), Evers (1975), Haegeman (1992a, 1994, 1995b), Haegeman and Van Riemsdijk (1986), Hoeksema (1988), Hoekstra (1994), Kaan (1992), Rutten (1991), and Zwart (1993, 1994, 1995), among many others.

28. Following Bošković (1997d), who in turn essentially follows Zwart (1993, 1994), I assume that *uit*, the predicate of the small clause *het boek uit* ‘the book out’ which functions as the complement of *gelezen*, must move overtly to a SpecVP. (Ignoring V-2 clauses, *uit* is licensed by being in a Spec-head relation with a lexical verb at SS. See Bošković 1997d for details of the analysis.)

29. The X property in this case would probably have to be related to non-finiteness. Note also that under the Attract all X account we need to somehow ensure that only clause-mate non-finite elements can be attracted by the modal.

30. Optional multiple XP-movement, such as movement of negative constituents in West Flemish (see Haegeman 1992b, 1995a), is also potentially relevant here. Focusing on West Flemish, even if we disregard the potentially interfering fact that moved and unmoved negative constituents in West Flemish typically receive different interpretations it would be dangerous to try to draw any definite conclusions concerning multiple feature attraction based on West Flemish neg-movement due to the availability of scrambling in West Flemish. As a result of the availability of scrambling, it is not clear whether in the relevant examples in West Flemish we are dealing with optional multiple attraction of the neg feature or simply optional application of scrambling. (Simpson 1995 argues for the second possibility.) In fact, quite generally, for this reason it is difficult to reliably run the test

performed here on verb clustering with respect to XP movement in languages that have scrambling.
 31. Notice that Serbo-Croatian is a heavy scrambling language. (In fact, Serbo-Croatian is more permissive with respect to scrambling even than traditional scrambling languages such as Japanese.)

Notice also that the finite auxiliary in (31)-(34) is a second position clitic. The ungrammaticality of (33b) and (34b) then may be due to a violation of the second position requirement. (For discussion of the second position requirement on clitics in SC, see Bošković in press d and references therein. See also Bošković 1995, 1997d for additional evidence that the participles in (31)-(34) are adjoined to the auxiliary.) Notice that pronominal second position clitics can intervene between the participles and the auxiliary. Such clitics, however, also appear to undergo adjunction to the auxiliary in the constructions in question. Notice also that Stjepanović (in press a,b) shows that the internal order within the clitic cluster (which may contain question particle, auxiliary, and pronominal clitics) is at least to some extent determined in PF. This makes it difficult to draw any definite conclusions about syntax based on the order of clitics with respect to each other.

32. The precise identity of the feature is not important to us here. +Participle is used simply for ease of exposition. For some relevant discussion, see Bošković (1997d) and Boeckx (1998).

33. Notice that VP1 can also be fronted. As argued in Bošković (1995, 1997d), (i) involves auxiliary excorporation to Σ (note that *jesmo* is translated as emphatic *do*), followed by VP1 preposing.

(i) $[_{VP1} t_i + \check{C}ekali_j \ [_{VP2} t_j \text{ Marijinu prijateljicu}]] \text{ mi je} + \text{smo}_i$
 waited Maria's friend we ARE

‘Wait for Maria’s friend, we DID.’

34. The conclusion is, of course, somewhat tentative because we cannot with absolute certainty assume that no condition that is unrelated to multiple movement to the same position is violated in

the construction under consideration.

35. A relevant example would be a construction in which one NP would check the Case-feature of more than one "traditional" Case-assigner.

36. This is desirable. Although the situation described in the previous note does not seem to exist we do find examples of a target Case feature, a ϕ -interpretable element, undergoing multiple checking, as in the multiple nominative construction in Japanese. For another such case, see Boeckx (1998).