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# Multiple Source Left Branch Extraction in Bosnian-Croatian-Serbian

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ABSTRACT

This paper is concerned with multiple source left branch extraction in Bosnian-Croatian-Serbian, where left branch elements of multiple NPs are extracted. It shows that while multiple source left branch extraction is possible, it exhibits ordering restrictions. It demonstrates that these locality effects are based on an important fact that has also been noticed on completely different grounds for Case in left branch extraction by Dadan (2020): left branch elements enter feature-sharing with the elements they modify not in their base position, but after they undergo movement. It is argued that the observed locality effects can be accounted for in a system based on Bošković's (2007) proposal that movement is driven by the presence of an uniterpretable *u*K feature on the moving element, as well as Bošković's (2020, 2021) proposal that *u*K disrupts labeling (Chomsky 2013).

KEYWORDS multiple source left branch extraction · Agree · probing down · locality

## 1 INTRODUCTION

This paper is concerned with multiple source left branch extraction (msLBE) in Bosnian-Croatian-Serbian (BCS), where left branch (LB) elements of multiple NPs are extracted:

(1) a. Koja je kakvu juče kuću glumica kupila?
which is what-kind yesterday house actress bought
'Which actress bought what kind of house yesterday?'
b. Ova je skupu juče kuću glumica kupila.
this is expensive yesterday house actress bought
'This actress bought an expensive house yesterday.'

The paper shows that while msLBE is possible, it is constrained in that LBE-ed elements show ordering restrictions, as illustrated in (2).

(2) a. ?*Koja je kakvu juče glumica kuću kupila?
which is what-kind yesterday actress house bought
'Which actress bought what kind of house yesterday?'
b. ?*Ova je skupu juče glumica kuću kupila.
this is expensive yesterday actress house bought
'This actress bought an expensive house yesterday.'

I argue that these locality effects are based on an important fact that has also been noticed on completely different grounds for Case in LBE by Dadan (2020): LB elements enter feature-sharing with the nouns they modify not in their base position, but after they undergo movement, i.e., after probing down from their moved position. I show that the observed locality effects in msLBE that stem from this fact can be accounted for in a system that is based on Bošković's (2007) proposal that movement is driven by a formal inadequacy of the moving element (rather than the target), which is implemented through the presence of an uninterpretable *u*K feature on the moving element, ultimately responsible for its movement, as well as Bošković's (2020, 2021) proposal that *u*K disrupts labeling. The data also favor the direct extraction approach to LBE (Corver 1990, 1992, Bošković

2005, Stjepanović 2010, 2012, Despić 2015, Talić 2017, 2019, among others).

The paper is organized as follows. In §1, I introduce data illustrating msLBE and identify an ordering restriction on it, as well as an exception to the restriction. I show that the ordering constraint does not stem from Superiority (Chomsky 1973) or Relativized Minimality (Rizzi 1990), even though it may look so at first sight. Rather, the data crucially show that LBE-ed elements enter into a feature-sharing dependency with the nouns they modify not in their base position where they are merged, but after they undergo left branch extraction, and this dependency is subject to defective intervention effects. §2 introduces the theoretical framework which the account of the facts is based on. In §3, I turn to accounting for the facts presented in §1. I show that the fact that LBE-ed elements establish a dependency with the noun they modify after movement follows straightforwardly from the assumptions of the approaches presented in §2. Both the ordering restriction and the exception to it follow from the same assumptions. I test the analysis against further predictions and show that they are borne out in §4. §5 concludes the paper.

## 2 MULTIPLE SOURCE LBE: WHEN IT IS POSSIBLE

It is well-known that BCS allows violations of Ross's (1967/1986) Left Branch Condition in that it allows left branches of NPs (typically AdjPs) to be extracted (Browne 1974, 1975, Franks & Progovac 1994, Bošković 2005, among others). As pointed out by Bošković (2016), Stjepanović (2018, 2020), among others, BCS also allows multiple left branch extraction, where multiple left branches of a single NP can undergo movement.

What has not been discussed much in the literature is LBE out of multiple NPs, which I refer to as multiple source LBE, as illustrated in (1). One of the goals of this paper is to rectify this situation by showing that multiple source LBE not only is possible,[1] but also has important theoretical implications for our understanding of the mechanisms behind LBE and Move in general, the agreement relation that is established between AdjPs and the nouns they modify, and its locality.

Cases like (3) also confirm that there is nothing inherently wrong with msLBE.

(3) Koja$_i$ je (juče) [$_{NP}$ t$_i$ glumica] kakvu$_k$ sebi [$_{NP}$ t$_k$ kuću] kupila?
which is yesterday actress what-kind-of self house bought
'Which actress bought what kind of house for herself yesterday?'

A closer look at the above data reveals a generalization: Whenever the paths of extracted LB elements cross as in (2), msLBE is not possible, while if their paths nest as in (1), or involve no such dependencies as in (3), multiple LBE is allowed.

### 2.1 ARE THE OBSERVED CONTRASTS DUE TO THE SUPERIORITY CONDITION?

At first sight, the facts observed in the previous section seem to follow from a simple violation of Superiority (conceived in terms of Closest Attract/Shortest Move; Richards 2001), which is present in (2), but not (1) and (3). In unacceptable cases like (2), at the point in the derivation just prior to the first instance of LBE, the order of the NPs undergoing LBE is as in (4).

(4) [ X ... [ [koja glumica] ... [kakvu kuću] ]]
which actress what-kind house

I label the first head attracting an LB element as X. At the point when X is introduced, the closest LB element to X in (4) is *koja*, so it should move first, which is, however, not the case in (2). In acceptable cases like (1), at the point just prior to LBE illustrated in (5), the closest LB element to X is *kakvu*, which does move first:

[1] Fernández-Salgueiro (2006) and Grebenyova (2012) claimed the opposite. However, their claim was made based on a limited set of data. While multiple LBE is indeed bad in that set of data, there are a number of contexts, which they did not discuss, where multiple LBE is possible.

(5) [ X ... [ [kakvu kuću] ... [koja glumica] ]]
what-kind house which actress

Thus, on the face of it, it may be that cases like (2) are ungrammatical because they violate Superiority, unlike acceptable cases like (1). It is also obvious that grammatical examples like (3) do not violate Superiority.

However, even though at first sight the Superiority Condition seems to be able to make the right cut here, there are at least a couple of reasons to doubt this account. First, it is well known that wh-fronting in BCS matrix clauses with a null C is not subject to Superiority (Rudin 1988, Bošković 2002, i.a.). So, the counterparts of both (1-a) and (2-a) with wh-movement of full wh-phrases are grammatical. So are the counterparts of (1-b) and (2-b) with non-wh AdjPs that involve full phrase fronting, rather than LBE.

While these facts do not conclusively show that Superiority is not responsible for the contrasts in (1)-(3), they do cast doubt on it. The following contrast, however, provides a strong piece of evidence against the Superiority account of the observed patterns.

(6) a. Ko je kakvu kojoj (juče) glumici kuću kupio?
who is what-kind-of which yesterday actress house bought
'Who bought what kind of house for which actress yesterday?'
b. *Ko je kojoj kakvu (juče) glumici kuću kupio?
who is which what-kind-of yesterday actress house bought
'Who bought what kind of house for which actress yesterday?'

These examples involve three wh-phrases. In the literature on multiple wh-fronting, it is well-known that Superiority with wh-movement generally affects the ordering of the first and second wh-phrase, but not the ordering of the second and third wh-phrase (or beyond that; see Bošković 2002 for examples). Given this fact, it is clear that the ordering effect observed in BCS multiple source LBE examples like (2) cannot be due to Superiority. As shown in (6), the ordering effect is present even when there is a higher wh-phrase above the LBE-ed wh-elements. If the ordering effect was due to Superiority, then the ordering of the non-initial wh-elements (*kojoj* and *kakvu*) would be free, and both examples in (6) would be predicted to be acceptable, counter to fact.

There are other types of examples that also provide evidence against the Superiority account of the ordering restriction with multiple source LBE in BCS. Examples like (7) that involve LBE of an AdjP and a QP such as *koliko* 'how-much' show that it is not always the case that the crossed paths of LB-ed elements result in degradation:[2]

(7) $\text{Koji}_i$ je $\text{koliko}_k$ $[_{NP}\ t_i$ igrač] $[_{FP}\ t_k$ F $[_{NP}$ golova]] dao?
which.NOM is how-many player.NOM goals.GEN scored
'Which player scored how many goals?'

(8) [ $\text{koliko}_k$ X ... $[_{NP}$ koji igrač] ... $[_{FP}\ t_k$ F $[_{NP}$ golova ]]
how-many which player goals

As shown in (8), given that *koji* is in a higher position at the point in the derivation when *koliko* undergoes movement, the LBE of *koliko* should cause a Superiority violation, but it does not, as the example is grammatical. Therefore, I conclude that Superiority is not responsible for yielding the observed contrasts.[3]

## 2.2 ARE THE OBSERVED CONTRASTS DUE TO RELATIVIZED MINIMALITY?

While we were forced to conclude that Superiority is not responsible for constraining the order of the LBE-ed elements in msLBE structures in BCS, the contrast between examples like (7) and (2) raises the possibility that the ordering restriction in (2) may be some sort of Relativized Minimality effect. This is because one difference between examples like (2) and (7) is that in (2), both LBE-ed

[2] See below for an explanation of structure of phrases like *koliko golova* 'how many goals'.
[3] As pointed out by an anonymous reviewer, examples like (7), where crossed paths are allowed, are also problematic for purely parsing accounts of restrictions on crossed dependencies in the data above.

elements are AdjPs that agree with nouns in gender, case and number. I assume with Zlatić (1997), Stjepanović (1998), Bošković (2005), Despić (2013), Talić (2017), among others, that they start as NP adjuncts/Specs.[4] One of the LBE-ed elements in (7), on the other hand, is a morphologically invariant QP (*koliko*). It does not agree with the noun *golova* in phi-features. Rather, according to Bošković (2006), *golova* heads an NP that is a complement of a null head F, which assigns genitive case to the NP, and whose Spec is occupied by the QP *koliko*, as in (9).

(9) $[_{FP}$ koliko $F_{gen}$ $[_{NP}$ golova$_{gen}$] ]
how-many goals

Given this difference between (2) and (7), the contrast between them may seem to be due to the fact that an LBE-ed AdjP cannot cross another LBE-ed AdjP (2), but can cross an LBE-ed QP (7). In other words, examples like (2) would be violations of Relativized Minimality, unlike examples like (7). This possibility, however, is excluded by the grammaticality of examples like (1), which also involve movement of an AdjP over another AdjP. Given these facts, I conclude that the ordering constraints with multiple source LBE in BCS are not due to Relativized Minimality induced by LBE-ed elements crossing one over another.

To summarize, in this section we have seen that BCS allows multiple source LBE, but that there are restrictions on the ordering of the LBE-ed elements. We have also seen that these restrictions are not due to the Superiority Condition (i.e, not due to a lower LB element undergoing movement first) nor Relativized Minimality (i.e., not caused by LB elements crossing each other). Rather, the data we have seen so far yield the generalization in (10), with an exception in (12).

(10) *Generalization about when multiple source LBE in BCS is possible:*
MsLBE is possible as long as an NP with an AdjP at its edge that needs to undergo LBE does not intervene in a dependency between another LBE-ed AdjP and NP. I will refer to this NP as an NP with a ***problematic edge*** and label the problematic edge with a * for ease of exposition. Descriptively, a problematic edge means that an NP contains an AdjP that still needs to undergo LBE. This is schematically represented in (11).

(11) ... $AdjP_1$ ... $[_{NP_2}$ $AdjP^*_2$ $N_2]$ ... $[_{NP_1}$ $t_1$ $N_1]$ $NP_2$ has a problematic edge.

(12) *Exception to the generalization in (10):*
An intervening NP with a problematic edge does not act as an intervenor in a dependency between an LBE-ed QP and FP.

The question that arises at this point is how we can account for this generalization and the exception to it. Intuitively, it is clear what is going on here. In unacceptable cases like (2), schematically represented as (11), $NP_2$ with a problematic edge disrupts a dependency between the LBE-ed $AdjP_1$ and $NP_1$. In acceptable cases like (1), whose schematic representation is given in (13), no such intervention occurs.

(13) $AdjP_1$ ... $AdjP_2$... $[_{NP_2}$ $t_2$ $N_2]$ ... $[_{NP_1}$ $t_1$ $N_1]$ $NP_2$ has no problematic edge.

Even though $NP_2$ in (13) is found between $AdjP_1$ and $NP_1$, it does not act as an intervenor in the dependency between them.

Note that the situation in (13) is identical to the situation in sentences where $NP_2$ is an NP that does not undergo LBE. The NP does not act as intervenor, as evidenced by (14), where NPs *ko* 'who' or *koji glumac* 'which actor' and *ona* 'she' or *ova glumica* 'this actress' intervene between the LBE-ed *kakvu* 'which' and *skupu* 'expensive' and N *kuću* 'house' they modify.

(14) a. Kakvu$_i$ je $[_{NP_2}$ ko / koji glumac ] $[_{NP_2}$ $t_2$ kuću] kupio?
what-kind-of is who which actor house bought
'Who/which actor bought what kind of house?'

[4]Following these authors, I will also assume that BCS does not have DPs. In other words, nominal phrases in BCS are NPs.

b. Skupu$_i$ je [$_{NP_2}$ ona / ova glumica ] [$_{NP_2}$ t$_i$ kuću] kupila.
expensive is she this actress house bought
'She/this actress bought an expensive house.'

Descriptively, one difference between examples with the structure in (11) and those with the structure in (13) is that in (13) at the point in the derivation when AdjP$_1$ undergoes LBE, the LBE of AdjP$_2$ has already occurred, and a dependency that needs to be established between AdjP$_2$ and N$_2$ is established prior to the movement of AdjP$_1$. In fact, the dependency between AdjP$_2$ and N$_2$ here behaves as if the AdjP were in situ as in (14). I will refer to the relation between the AdjP$_2$ and NP$_2$ in (13) as a resolved dependency. This is not the case in (11), where at the point when AdjP$_1$ undergoes LBE, AdjP$_2$ still needs to undergo LBE and establish a dependency with N$_2$.

A question that arises at this point is how we can account for (10) and (12) formally. But, before we tackle this question, there is another issue that has to be resolved: What kind of dependency between an AdjP and its N does an NP with a problematic edge disrupt? A priori, there are two possibilities. One is that an NP with a problematic edge blocks movement of another problematic edge (e.g., AdjP) over it. However, we have seen above that this cannot be the case, as it would be difficult to explain the contrast between the unacceptable (2) and acceptable (7), where in both cases it is a problematic edge (AdjP) that moves over an element with a problematic edge and in both cases, it undergoes the same type of movement.

The remaining possibility is that an NP with a problematic edge disrupts an agreement relation between the LBE-ed element and its N. For this to happen, however, AdjP crucially has to agree with its noun not in the base position, but after it undergoes LBE. In other words, after the AdjP undergoes LBE, its phi-features probe down in search of an element with matching features. The NP with a problematic edge that has the matching features then acts as a defective intervenor blocking further search by AdjP and preventing AdjP from agreeing with its N.

Interestingly, on completely different grounds, Dadan (2020) argued that AdjPs undergoing LBE probe down from their moved position to enter into a case feature-sharing relation with N they modify. He argues for this based on the data in (15) and (16), from Bošković (2009).

(15) a. On je srušio čiča Tominu kolibu.
he is torn-down uncle Tom's.ACC cabin.ACC
'He tore down uncle Tom's cabin.' [Bošković 2009, (7d)]

b. *Čiča je on Tominu kolibu srušio.
uncle is he Tom's.ACC cabin.ACC torn-down
Intended: 'He tore down uncle Tom's cabin.' [Bošković 2009, (7b)]

(16) a. *On je srušio čičinu Tominu kolibu.
he is torn-down uncle's.ACC Tom's.ACC cabin.ACC
Intended: 'He tore down uncle Tom's cabin.' [Bošković 2009, (7c)]

b. Čičinu je on Tominu kolibu srušio.
uncle's.ACC is he Tom's.ACC cabin.ACC torn-down
'He tore down uncle Tom's cabin.' [Bošković 2009, (7a)]

As Dadan (2020) points out, the contrast in (15) shows that in BCS when uninflected *čiča* 'uncle' is found in a configuration where it modifies an Adj (*Tominu*), which modifies the head noun (*kolibu*), it is grammatical only when it occurs in-situ. LBE of *čiča* is ungrammatical, as shown in (15-b). On the other hand, the contrast in (16) shows that when 'uncle' is realized as an agreeing adjective, it cannot be in-situ. This leads Dadan to conclude that 'uncle' must be receiving the accusative case in the displaced position and not in its base position. Dadan (2020) then goes on to propose a system where after 'uncle' undergoes movement, it probes down from the displaced position and enters under c-command into a feature-sharing relation with the remnant NP headed by 'cabin' that bears accusative case. Thus, AdjP crucially needs to undergo displacement in order to get its case valued.

Going back to multiple source LBE examples above, they nicely dovetail with Dadan's proposal as they similarly show that LB elements agree with the noun they modify after movement. So, the question is how they can be accounted for formally.

I will argue that the contrasts with multiple source LBE observed above can be accommodated in

a system that assumes Bošković's (2007) proposal that movement is driven by a formal inadequacy of the moving element in the form of an uninterpretable/unvalued *u*K feature, and the assumption that feature-sharing/labeling between AdjP and NP that it modifies is disrupted by *u*K, as proposed in Bošković (2020, 2021). In the next section, I provide more background on the main ingredients of the analysis.

## 3 MULTIPLE SOURCE LBE: TOWARDS AN ACCOUNT

The gist of the proposal is that in cases with the abstract structure in (11), $NP_2$ with a problematic edge causes a defective intervention effect (Chomsky 2000, 2001) after $AdjP_1$ moves and probes down in search of $NP_1$, with which it needs to agree. Why the edge of $NP_2$ is problematic and why AdjPs undergoing LBE agree with their nouns after they undergo movement will fall out from Bošković's proposals mentioned at the end of the previous section. Let me first introduce these approaches.

### 3.1 MOVING ELEMENT DRIVEN MOVEMENT AND PROBING DOWN

Bošković (2007) argues that movement is driven by the presence of an uninterpretable feature *u*K on the moving element, unlike in the traditional approach (Chomsky 2000, 2001), where movement is target-driven. Bošković (2007) puts forth this proposal in order to solve a look-ahead problem with intermediate steps of successive cyclic movement that the traditional approach faces.

According to the traditional approach, in examples like (17-a) at the derivational stage in (17-b), where *what* needs to undergo movement to the edge of the CP phase to avoid violating the Phase Interpretability Condition (PIC), it is the presence of an EPP feature on the phase head *that* which drives the movement of *what* to the phase edge. Furthermore, according to Chomsky (2001) *that* is optionally assigned this EPP property – while the EPP feature is present in (17), it is not present in (18).

(17) a. $What_i$ does he think $[_{CP}\ t_i\ [_{C'}$ that Mary bought $t_i]]$?
b. $[_{CP}$ that Mary bought what]

(18) You think [that Mary bought a car].

However, Bošković (2007) points out a serious look-ahead problem with this approach. Given that in the traditional approach, a phase head can be optionally assigned an EPP feature, the question is what rules examples like (19) out, where *that* is assigned an EPP feature.

(19) *Who thinks what that Mary bought.

Chomsky's suggestion is that an EPP feature is assigned to C only if successive cyclic movement needs to be allowed. In (19), the embedded C cannot be assigned an EPP property, given that its assignment is not necessary to allow successive cyclic movement. However, as Bošković (2007) points out, this creates a look-ahead problem, given that there is a derivational point at which both (17) and (19) have the same structure:

(20) $[_{CP}\ what_i\ [_{C'}$ that Mary bought $t_i\ ]]$

In order to drive movement to SpecCP, *that* needs to have an EPP property during the construction of the embedded CP. But, crucially, at this point, we do not know whether the EPP property will be needed to drive successive cyclic movement. This depends on what kind of structure is built after this point. If the structure is built as in (17), the EPP property will be necessary, and therefore allowed. On the other hand, if the structure is built as in (19), it will not be needed, hence disallowed. So, crucially, in order to know whether the EPP feature is allowed on *that* at the point in (20), we need to know what is going to happen in the matrix clause. In other words, we have a look-ahead problem.

Bošković (2007) resolves the problem by proposing that it is not the EPP feature on the head (*that*) in the intermediate step of successive cyclic movement that provides information that the

goal (*what*) must move. Rather, it is the presence of an uninterpretable *u*K feature on *what* that determines that *what* must move. The *u*K, which cannot be checked/valued within the embedded CP, is an indicator that *what* will have to undergo movement out of it. Furthermore, if *what* does not move to the embedded SpecCP, it will be trapped within the embedded CP via the PIC.

Thus, in Bošković's system, movement is greedy, in the sense that it is driven by a property of the moving element itself, rather than the target. Furthermore, given that it is standardly assumed that a probe must c-command the goal, and given that the probe must have a *u*K for it to function as a probe, following an insight of Epstein & Seely (1999), Bošković (2007) assumes a two-way correlation between functioning as a probe and having a *u*K: just like a probe must have a *u*K, a *u*K must function as a probe. In other words, for a *u*K on X to be checked/valued, X must function as a probe and c-command the checker/valuator. This means that checking/valuing a *u*K via Agree is not sufficient. For example, it is not possible for *what* to remain in the embedded SpecCP and then check its *u*K via Agree with the matrix C, once it enters the structure. It simply must undergo movement outside of the embedded CP to license *u*K, or the derivation crashes. So, we can explain why examples like (19) are ungrammatical, which was a challenge in Chomsky's system. Another consequence of Bošković's system is that the role of traditional probes and goals is reversed (see also Zeijlstra 2012 and Bjorkman & Zeijlstra 2019 among others, for similar proposals in this respect).

### 3.2 *u*K BLOCKS LABELING (BOŠKOVIĆ 2020, 2021)

The final ingredient of the analysis is Bošković's (2020, 2021) proposal that the presence of a *u*K feature on an element blocks labeling. As Bošković points out, assuming that a *u*K blocks labeling fits the labeling framework (Chomsky 2013) naturally. In the labeling framework, the motivation for movement is essentially to enable labeling or, in other words, to resolve labeling problems. This is, for example, what happens in the case of successive cyclic movement, where XP and YP merge without feature-sharing. The movement of XP occurs to resolve the labeling problem. Thus, in the labeling framework, both the problem and the reason for movement are present in the structure that exists prior to movement. As Bošković (2020) points out, this is exactly the characteristic of Bošković's (2007) system, in which movement is implemented through the presence of a *u*K feature on the moving element, which forces movement. In other words, both Chomsky's labeling framework and Bošković's (2007) system involve base- rather than target-driven movement, so it seems natural to adopt Bošković's *u*K proposal here. If *u*K blocks labeling, then the element with *u*K must move to resolve the labeling problem.

I will show below that the properties of Bošković's system (moving element driven movement and probing down) coupled with Chomsky's labeling approach and Bošković's proposal that *u*K blocks labeling provide a framework for the account of multiple source LBE in BCS.

## 4 MULTIPLE SOURCE LBE: AN ACCOUNT

### 4.1 RESOLVING THE PROBLEM

In (10) and (12) above, I have provided a generalization that describes a restriction on multiple source LBE, as well as an exception to it. In this section I will account for these generalizations. As discussed above, (10) excludes cases of msLBE like (2), but allows cases like (1). So, the question is why NPs with resolved dependencies do not disrupt a dependency between an LBE-ed AdjP and its noun, while NPs with problematic edges do.

As mentioned above, I assume Bošković's (2007) system, where movement is driven by the presence of a *u*K feature on the moving element. Furthermore, recall that *u*K acts as a probe, which means that it must c-command the element it will agree with. Applied to LBE, this means that the AdjP undergoing LBE has a *u*K and the *u*K must act as a probe. Furthermore, given that BCS AdjPs occur as Adjuncts/Specs of NPs, merging an AdjP with a noun produces an $[_{XP}$ YP] configuration, or in other words an object that results from merging two phrases. In Chomsky's (2013) labeling framework, the resulting object is labeled through a feature-sharing algorithm, where a shared feature projects and provides the label for the object. The features that are shared by Ns and Adjs in BCS are the phi-features: number, gender and case, all of them uninterpretable/unvalued on AdjPs.

So, in simple cases without LBE (where Adj has no *u*K feature, because it does not move), when an AdjP is merged with NP, feature-sharing between them occurs, and the resulting object can be labeled.

When an AdjP undergoes LBE as in (21), it has a *u*K feature that drives LBE (related to topic/focus) in addition to its other unvalued/uninterpretable features.

(21) Skupu$_i$ je ona kupila [ t$_i$ kuću ]
expensive.ACC.F is she bought house.ACC.F
'She bought an expensive house.'

Recall that I have shown above that the AdjP with a *u*K does not agree with the noun it modifies in its base position. Rather it agrees with it from its landing site. The question is why. I propose that this is because the presence of *u*K on AdjP blocks feature-sharing between AdjP and NP, essentially following Bošković (2020), who proposes exactly this for *u*K on BCS AdjPs undergoing LBE, but on completely different grounds. However, I specify that *u*K does not disrupt feature-sharing/labeling generally, or, as pointed out by Bošković, there would be no feature-sharing between *what* and [+wh]CP in examples like *What did John buy?*, for example. Rather, I assume that *u*K on X disrupts feature-sharing for all unvalued/uninterpretable features on X, until *u*K probes. This essentially follows from Bošković's (2008) proposal, with considerable cross-linguistic justification, that X probes only once. The idea is that X maximizes its feature valuation under probing, thus valuing all of its features when it probes. Since *u*K on AdjP cannot probe in the base position, no other uninterpretable/unvalued feature on AdjP is available at this point to enter into agree relations.

After AdjP undergoes LBE, it needs to act as a probe due to the presence of a *u*K feature. *u*K is in search of an element with a K feature, which I assume is the head of the projection to which the LBE-ed AdjP moves. Once *u*K on AdjP probes, all other unvalued phi-features on AdjP become available as well. Since they c-command *kuću* 'house', they can enter feature-sharing with it at this point, which results in their valuation.[5]

Having seen how simple cases of LBE are derived, let us now turn to msLBE. I will first show what is responsible for the contrast in (1) and (2). In each of the examples, there are two NPs with AdjPs that undergo LBE. This means that both AdjPs will have a *u*K when merged with Ns, which disrupts feature-sharing between them and their NPs prior to LBE, so the resulting objects are unlabeled, as indicated by *?* in (22).

(22) ... [$_?$ koja glumica] ... [$_?$ kakvu kuću] ...
which actress what-kind house

These unlabeled objects with disrupted feature-sharing are, actually, what I referred to above as NPs with a problematic edge. Thus, a problematic edge is XP in an [$_{XP}$ YP] configuration with a *u*K on it that disrupts feature-sharing between XP and YP, and the labelling of the object. Later in the derivation, the head X with K is introduced, and *kakvu* undergoes LBE, given the surface word order:

(23) [ kakvu$_i$ X ... [$_?$ koja glumica] ... [$_?$ t$_i$ kuću] ...
what-kind which actress house

Having a *u*K, *kakvu* starts probing down. This also frees up the unvalued phi-features on it, which need to enter into a feature-sharing relation with *kuću*. Given that *kakvu* was a problematic edge disrupting feature-sharing with N, it is reasonable to assume that objects with a problematic edge and matching features act as its goals. In (23), *kakvu* needs to enter into feature-sharing with the phi-features of *kuću*. However, there is a closer object with a problematic edge, the unlabeled object containing the N *glumica* 'actress', which has valued matching features that *kakvu* is searching for. So, this object blocks further search by *kakvu*. In effect, it acts as a defective intervenor (Chomsky 2000) that prevents *kakvu* from looking further down.[6] At this point, there are two derivations to

[5]As for AdjPs that do not undergo LBE, they agree with N in situ, given that they are not assigned a *u*K feature that would disrupt this relation.

[6]The idea is that labeling has to occur as soon as it can, and here it could potentially occur if the unvalued phi-features

consider. On one derivation, if *kakvu* does not agree with the closer goal (i.e., with *glumica*), the derivation will crash, since probing below this goal is not possible. On the other hand, if *kakvu* does agree with it, it will be interpreted as its modifier. Either way, we do not have the right output.

As for acceptable examples like (1), it is easy to verify that the system successfully derives them:

(24) [ X ... [$_?$ kakvu kuću] ... [$_?$ koja glumica]] ...
what-kind house which actress

At this point, the head X is introduced and *kakvu* undergoes LBE to its Spec. The *u*K on *kakvu* starts probing, which makes all unvalued phi-features available as well. *u*K is valued by K on X, while phi-features look for the closest unlabeled goal. This turns out to be the unlabeled object containing N *kuću*. *Kakvu* and *kuću* enter into feature sharing, with the labeling of the object as a result. In the next step, the head Y is introduced. *Koja* undergoes LBE and moves to its Spec. The *u*K and phi-features on *koja* probe down. The closest element that the phi-features of *koja* can enter into feature-sharing with is the unlabeled object with a problematic edge that contains N *glumica*. Recall that the resolved dependency between *kakvu* and *kuću* does not count as an intervenor, just as a simple NP does not count as one. *Koja* and *glumica*, then, share features, and the derivation converges, yielding (1-a).

In sum, we have seen that the ordering constraint on multiple source LBE stems from a defective intervention effect that ensues after the LBE-ed AdjP phi-features probe down. Defective intervenors for this probe are NPs with a problematic edge. The problematic edge is defined as an AdjP with phi-features that are not shared with the noun yet, due to the fact that a *u*K disrupts feature-sharing and labeling. In other words, at this point, these objects are still unlabeled objects.

Now recall that there is another type of example that does allow a dependency between an LBE-ed element and the phrase it was originally merged with over an element with a problematic edge between them. This is example (7). As shown in (25), which represents the relevant portion of its derivation, it is obvious that at the point just after *koliko* 'how many' undergoes LBE, there is an unlabeled object with a problematic edge – *koji igrač*.

(25) koliko$_k$ ... [$_?$ koji igrač] ... [$_{FP}$ t$_k$ ... F [$_{NP}$ golova]] ...
how-many which player goals

Since *koji* needs to undergo LBE, it has a *u*K feature, which disrupts feature-sharing with NP *igrač*, leaving the whole object unlabeled. *Koliko*, however, can establish a dependency with the NP *golova* over it. So, the question is why this is possible.

Recall that one difference between examples like (25) and (2) is that in (2), both LBE-ed elements are AdjPs that agree with nouns in gender, case and number, and they start at the edge of NP. In (25), though, one of the LBE-ed element is a morphologically invariant QP (*koliko*), which does not agree with the noun *golova* in phi-features. Rather, as shown in (9), it occupies a Spec position of a null head F, which assigns genitive case to NP *golova* that it takes as its complement. It is reasonable to assume that this difference in features is responsible for explaining why *koji igrač* does not act as an intervenor here. A priori, there are two possibilities as to why it does not act as an intervenor. One is trivial. It could be that *koliko*, being morphologically invariant, simply does not have any features to share with F, so it does not need to enter into feature-sharing with it, and no dependency needs to be established over *koji igrač*. However, below we will see examples that show that this is not the case. The LBE-ed *koliko* does need to establish a dependency with FP. So, *koliko* and F do have a sharing feature, but crucially this is not a phi-feature, given that *koliko* is morphologically invariant.[7] It is reasonable to assume, then, that *koji igrač*, even though it is unlabeled, is not an intervenor, because *koji igrač* has no matching types of features that can be

of the probing AdjP and the valued phi-features of N in the unlabeled object enter into feature-sharing. Note that interestingly, Bošković (2020) argues that unlabeled objects do not count as intervenors for Move. If the proposal put forth in the current paper is on the right track, it shows that they do count as intervenors for Agree. If as Bošković (2007) shows, the PIC constrains only Move, but not Agree, intervention would then be the only locality constraint relevant to Agree.

[7] Feature sharing between *koliko* and F is also an expectation in Chomsky's labeling framework. *Koliko golova* is an [$_{XP}$ YP] object that undergoes labeling via feature-sharing, when *koliko* remains in situ.

shared with phi-featureless *koliko*. *Koliko* then can continue its search past it and find a matching goal, the unlabeled object containing F. Later *koji* undergoes LBE. Since there is no intervening object with a problematic edge between it and its goal, it can enter into feature sharing with the noun *igrač*, yielding an acceptable sentence. Recall that the exception in (12) to the generalization in (10) is based on examples like (25). Thus, in order to account for the exception to the generalization, we do not need anything above and beyond what we need to account for the generalization.

### 4.2 FURTHER PREDICTIONS

The analysis makes a prediction that an LBE remnant with no phi-features will not act as intervenor for AdjP-NP feature-sharing. The acceptability of (26-a) confirms the prediction.

(26) a. Koliko$_i$ se koji$_k$ [ t$_i$ često] [t$_k$ filter] mijenja.
how-much REFL which often filter changes
'How often does one change which filter?'
b. koji$_k$ [$_?$ koliko često] [ t$_k$ filter]
which how-much often filter

As shown in (26-b), which represents the derivational stage of (26-a) just after *koji* undergoes LBE, the unlabeled object *koliko često* 'how often' does not act as an intervenor for feature-sharing between *koji* and *filter*. It is clear why this should be so. Both *koliko* and *često* are adverbs with no phi-features to share with AdjP *koji*. The crossed paths of LB elements are then allowed.

A further consequence of the analysis is that that in examples with two LBE-ed QPs, crossed paths should be prohibited, and they are, as shown in (27).

(27) Koliko$_i$ je deset$_k$ juče [ t$_{k/*i}$ pjevača] otpjevalo [ t$_{*k/i}$ pjesama ]
how-many is ten yesterday singers sung songs
'How many songs did ten singers sing yesterday?'
*'How many singers sang ten songs?'

Even though both Ns *pjevača* and *pjesama* are, in principle, compatible with both QPs *koliko* and *deset*, (27) is not ambiguous. The only meaning available is one where the paths of *koliko* and *deset* nest. The reason for this should be familiar. This is the only way the features on QPs *koliko* and *deset* that they have to share with Fs do not run into intervention effects when probing down. This example confirms the claim I made above that a dependency does need to be established between an LBE-ed QP and its original FP.

To sum up, in this section we have accounted for the generalizations about multiple source LBE observed in (10) and (12). We have seen that both follow from the same assumptions in a system that is based on Bošković (2007, 2020, 2021).

Finally, I would like to point out that the data discussed here favor the direct approach to LBE (Bowers 1987, Corver 1990, 1992, Bošković 2005, Despić 2015, Talić 2017, 2019), rather than the remnant movement (Franks & Progovac 1994) and scattered deletion approaches (Fanselow & Ćavar 2002; for an overview of different approaches to discontinuity, see Franks 2007). This is because it is not clear how the latter two types of approaches would explain the contrast between examples like (1) and (2). In fact, they predict that both types of examples should be grammatical, on a par with examples that involve no LBE, given that in both types of approaches LBE involves moving full NPs. In the remnant movement approach, the noun first moves out and then the remnant NP with an AdjP in it undergoes movement, giving an appearance of left branch extraction. Given that a feature-sharing relation between the AdjP and N in this approach can be established within the moved NP, it is not clear why examples like (2) would be unacceptable. In the scattered deletion approach, it is a full NP that undergoes movement to the surface position of the AdjP, and then scattered deletion applies, deleting the higher copy of the noun and the lower copy of AdjP. To account for the contrast between (1) and (2) in this approach, agreement between an 'LBE-ed' Adj and the N it modifies would have to occur after copy deletion applies at PF, but it is difficult to see exactly how an account of all the data could be achieved.

## 5 CONCLUSIONS

In this paper I have shown that multiple source LBE in BCS is possible, but restricted. Crucial to the account of the restriction was a discovery that LBE-ed elements in BCS agree with the nouns they modify after they undergo LBE.

I have shown that this fact follows from assumptions that combine Bošković's (2007) system, in which movement is driven by the presence of an uninterpretable/unvalued *u*K feature on the moved element, with Bošković's (2020, 2021) suggestion that the presence of a *u*K feature disrupts labeling via feature-sharing in [$_{XP}$ YP] configurations. In a nutshell, merging the LB element and NP in the base position results in an [$_{XP}$ YP] object. If the LB element has no *u*K feature, it will share features with NP in the base position, and the resulting object will be labeled. However, if the LB element has a *u*K feature, feature-sharing is disrupted and the resulting [$_{XP}$ YP] object is unlabeled. After the LB element undergoes movement, *u*K and all other uninterpretable/unvalued features on the LB element start probing down in search of their goals. They will find the goals successfully, as long as there is no other unlabeled [$_{XP}$ YP] object on the way in which either XP or YP (or both) have matching features. Such objects act as defective intervenors. Thus, the unacceptable cases of msLBE are a result of defective intervention effects.

Finally, while the data discussed above can be straightforwardly accounted for under the direct approach to LBE, the remnant movement and scattered deletion approaches to this phenomenon face difficulties in explaining the data at best.

## ABBREVIATIONS

| | | | |
|---|---|---|---|
| Adj | Adjective | LBE | left branch extraction |
| BCS | Bosnian-Croatian-Serbian | msLBE | multiple source LBE |
| LB | left branch | PIC | Phase impenetrability Condition |

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## REFERENCES

Bjorkman, Bronwyn M. & Hedde Zeijlstra. 2019. Checking up on Phi-Agree. *Linguistic inquiry* 50(3). 527–569.

Bošković, Željko. 2002. On multiple wh-fronting. *Linguistic inquiry* 33(3). 351–383.

Bošković, Željko. 2005. On the locality of left branch extraction and the structure of NP. *Studia linguistica* 59(1). 1–45.

Bošković, Željko. 2006. Case and agreement with genitive of quantification in Russian. In Cedric Boeckx (ed.), *Agreement systems*, 99–120. Amsterdam: John Benjamins Publishing Company.

Bošković, Željko. 2007. On the locality and motivation of Move and Agree: An even more minimal theory. *Linguistic inquiry* 38(4). 589–644.

Bošković, Željko. 2008. On successive-cyclic movement and the freezing effect of feature checking. In Jutta Hartmann, Veronika Hegedűs & Henk van Riemsdijk (eds.), *Sounds of silence: Empty elements in syntax and phonology*, 195–233. Amsterdam: Elsevier.

Bošković, Željko. 2009. On Leo Tolstoy, its structure, case, left branch extraction, and prosodic inversion. In Steven Franks, Vrinda Chidambaram & Brian Joseph (eds.), *A linguist's linguist: Studies in South Slavic linguistics in honor of E. Wayles Browne*, 99–122. Bloomington: Slavica.

Bošković, Željko. 2016. Getting really edgy: On the edge of the edge. *Linguistic inquiry* 47(1). 1–33.

Bošković, Željko. 2020. On the coordinate structure constraint, across-the-board movement, phases, and labeling. In Jeroen Craenenbroeck, Cora Pots & Tanja Temmerman (eds.), *Recent developments in phase theory*, 133–182. Berlin: Mouton de Gruyter.

Bošković, Željko. 2021. Merge, Move, and contextuality of syntax: The role of labeling, successive-cyclicity, and EPP effects. Manuscript, University of Connecticut.

Bowers, John. 1987. Extended X-bar theory, the ECP, and the left branch condition. In *Proceedings of the West Coast Conference on Formal Linguistics*, vol. 6, 47–62.

Browne, Wayles. 1974. On the problem of enclitic placement in Serbo-Croatian. In Richard D. Brecht & Catherine V. Chvany (eds.), *Slavic transformational syntax, Michigan Slavic Materials 10*, 36–52. Ann Arbor: Department of Slavic Languages and Literatures, University of Michigan.

Browne, Wayles. 1975. Serbo-Croatian enclitics for English speaking learners. In Rudolf Filipović (ed.), *The Zagreb English-Serbo-Croatian project. Contrastive analysis of English and Serbo-Croatian I*, 105–134. Zagreb: Institute of Linguistics. [Reprinted in Journal of Slavic Linguistics 12 (1-2), 255-289].

Chomsky, Noam. 1973. Conditions on transformations. In Stephen R. Anderson & Paul Kiparsky (eds.), *A festschrift for Morris Halle*, 232–286. New York: Holt, Rinehart and Winston.

Chomsky, Noam. 2000. Minimalist inquiries. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A life in language*, 1–52. Cambridge, Mass: MIT Press.

Chomsky, Noam. 2013. Problems of projection. *Lingua* 130. 33–49.

Corver, Norbert. 1990. *The syntax of left branch extractions*: University of Tilburg dissertation.

Corver, Norbert. 1992. Left branch extraction. In *Proceedings of North East Linguistics Society*, vol. 22, 67–84.

Dadan, Marcin. 2020. Case sharing: Evidence from Slavic and beyond. In Tania Ionin & Jonathan E. McDonald (eds.), *Formal Approaches to Slavic Linguistics 26: The Urbana-Champaign Meeting*, 57–74. Ann Arbor, Michigan: Michigan Slavic Publications.

Despić, Miloje. 2013. Binding and the structure of NP in Serbo-Croatian. *Linguistic inquiry* 44(2). 239–270.

Despić, Miloje. 2015. Some issues in the theory of nominal domain: Reflexive possessives, left branch extraction and quantifier raising. Presented at Mie University, Japan.

Epstein, Samuel David & Daniel Seely. 1999. *Spec(ifying) the GF subject*. Ms., University of Michigan and Eastern Michigan University.

Fanselow, Gisbert & Damir Ćavar. 2002. Distributed deletion. In Artemis Alexiadou (ed.), *Theoretical approaches to universals*, 65–107. Amsterdam: John Benjamins.

Fernández-Salgueiro, Gerardo. 2006. On the incompatibility of multiple wh-movement with left-branch extraction in Serbo-Croatian. In James E. Lavine, Steven Franks, Mila Tasseva-Kurktchieva & Hana Filip (eds.), *Formal Approaches to Slavic Linguistics 14: The Princeton Meeting 2005*, 151–171. Ann Arbor, MI: Michigan Slavic Publications.

Franks, Steven. 2007. Deriving discontinuity. In Franc Marušić & Rok Žaucer (eds.), *Studies in formal Slavic linguistics*, 103–120. Frankfurt: Peter Lang.

Franks, Steven & Ljiljana Progovac. 1994. On the placement of Serbo-Croatian clitics. In *Indiana Linguistic Studies 7, Proceedings of the 9th biennial conference on Balkan and South Slavic linguistics, literature, and folklore*, 69–78. Bloomington: Indiana University Linguistic Club.

Grebenyova, Lydia. 2012. *Syntax, semantics and acquisition of multiple interrogatives: Who wants what?* Amsterdam: John Benjamins.

Richards, Norvin. 2001. *Movement in language: Interactions and architectures*. Oxford: Oxford University Press.

Rizzi, Luigi. 1990. *Relativized minimality*. Cambridge, Mass: MIT Press.

Ross, J.R. 1967/1986. *Infinite syntax*. Norwood: Ablex Publishing.

Rudin, Catherine. 1988. On multiple questions and multiple wh-fronting. *Natural language and linguistic theory* 6. 445–501.

Stjepanović, Sandra. 1998. Extraction of adjuncts out of NPs. Presented at Comparative Slavic Morphosyntax Workshop, Spencer, IN.

Stjepanović, Sandra. 2010. Left branch extraction in multiple wh-questions: A surprise for question interpretation. In *Formal Approaches to Slavic Linguistics 18: The Second Cornell Meeting meeting*, 502–517. Ann Arbor, Michigan: Michigan Slavic Publications.

Stjepanović, Sandra. 2012. Differential object marking in Serbo-Croatian: Evidence from left branch extraction in negative concord construction. In John Frederick Bailyn, Ewan Dunbar, Yakov Kronrod & Chris LaTerza (eds.), *Formal Approaches to Slavic Linguistics 19: The Stony Brook Meeting*, 99–115. Ann Arbor, MI: Michigan Slavic Publications.

Stjepanović, Sandra. 2018. Deriving multiple left branch extraction. In Wayles Browne, Miloje Despić, Naomi Enzinna, Simone Harmath de Lemos, Robin Karlin & Draga Zec (eds.), *Formal Approaches to Slavic Linguistics 25: The Third Cornell Meeting*, 277–297. Ann Arbor, MI: Michigan Slavic Publications.

Stjepanović, Sandra. 2020. Extraction out of coordinate structure conjuncts. In Tania Ionin & Jonathan E. McDonald (eds.), *Formal Approaches to Slavic Linguistics 26: The Urbana-Champaign Meeting*, 380–397. Ann Arbor, MI: Michigan Slavic Publications.

Talić, Aida. 2017. *From A to N and back: Functional and bare projections in the domain of N and A*. Storrs, CT: University of Connecticu dissertation.

Talić, Aida. 2019. Upward P-cliticization, accent shift, and extraction out of PP. *Natural language and linguistic theory* 39(3). 1103–1143.

Zeijlstra, Hedde. 2012. There is only one way to agree. *The Linguistic Review* 29(3). 491–539.

Zlatić, Larisa. 1997. *The structure of the Serbian noun phrase*: University of Texas at Austin dissertation.