

Concealed Pied-Piping in Russian: Evidence from Parasitic Gaps, Late Merge, and ATB Configurations¹

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Abstract: We examine the nature of left branch extraction from nominal phrases in Russian. Our primary diagnostic is parasitic gap licensing, which becomes evident in Russian once certain confounds are removed. We observe that the interpretation for a parasitic gap in a context with left branch extraction is identical to the interpretation assigned when the containing nominal phrase is pied-piped, rather than extracted from. From this, we argue that Russian left branch extraction in fact involves concealed pied-piping of the entire nominal phrase that the supposedly extracted constituent originates in. We go on to show that this hypothesis accurately predicts certain interactions of left branch extraction with principle C effects in ‘late merge’ configurations, and with ATB movement from coordinate structures. We conclude with implications for the structure of the Russian nominal and theories of discontinuous noun phrases.

1 Introduction

In this paper, we examine left branch extraction (LBE) in Russian, which we argue involves a different syntactic derivation than its appearance suggests. As (1) below shows, LBE involves A'-extraction of an element originating at the left edge of a nominal phrase. LBE is productive for many languages in the Slavic family, and beyond (Ross, 1967; Corver, 1990, 2007, a.o.). In Russian, LBE is available for adjectives, quantifiers, possessors, demonstratives, and so on:

(1) *LBE in Russian*

[**Kakuju** / ètu / miluju]_k ty uvidel [_{NP} *t_k* košku]
what / this / cute you saw cat

‘What cat did you see? / I saw this cat / I saw a cute cat.’

The fact that some languages permit LBE is a puzzle, given that many other languages like English do not, as (2) below shows. For English, the only possibility is to pied-pipe the entire DP dominating the relevant element targeted for A'-movement, rather than sub-extracting from it:

(2) *No LBE in English: Pied-piping of containing DP required*

- a. * **Which**_k did you see [*t_k* cats]?
- b. ✓ [**Which cats**]_k did you see *t_k*?
- c. * **Those** / **cute**_k I saw [*t_k* cats]
- d. ✓ [**Those cats** / **cute cats**]_k I saw *t_k*

¹Authors listed alphabetically. Thanks to comments from Željko Bošković, Kenyon Branan, Miloje Despić, Danny Fox, Naomi Francis, Vera Gribova, Natasha Ivlieva, Ivona Kučerová, Anton Kukhto, Jason Overfelt, David Pesetsky, Phillip Shushurin, Mitya Privozov, Norvin Richards, Bartosz Wiland, and audiences at MIT, FASL 27, NELS 49, and the 93rd annual LSA meeting, as well as to our Russian informants. Glossing conventions: ACC = accusative, CNV = converb, GEN = genitive, SG = singular, SUBJ = subjunctive.

Among the first to consider the distribution of LBE was Ross (1967), who hypothesized that a syntactic constraint, the Left Branch Condition, is responsible for banning LBE in some languages. Many subsequent works have explored how the presence or absence of LBE might be derived from the independent syntactic properties of a given language (Szabolcsi, 1984; Corver, 1990, 1992; Rappaport, 2001; Bošković, 2005, a.o.) In this paper, we argue that the difference between Russian and languages without LBE does not stem from a syntactic difference, but rather from a difference in how the relevant structures are pronounced. That is, we argue that LBE in Russian actually involves concealed pied-piping of the entire nominal phrase that LBE has appeared to exit, rather than extraction from it. If this conclusion is correct, the structure of Russian examples like (1) above is fundamentally the same as that of the English (2b/d) above, where as the surface string shows, pied-piping applies.

Our central diagnostic for the nature of LBE is the licensing of parasitic gaps (PGs; Engdahl, 1983; Nissenbaum, 2000, a.o.). PGs are gaps inside of islands which take on the interpretation of an A'-moved phrase outside of that island. Though identifying PGs in Russian requires some work, they become evident when conditions are right, as we'll see in the next section. Our key observation is that LBE and pied-piping A'-movement in Russian have the same result for PG interpretation. This is previewed in (3) below. The interpretation for the PG here is the same whether the entire direct object undergoes pied-piping *wh*-movement, or whether LBE from that object occurs, moving only the *wh*-determiner: in either case, the PG is interpreted as if the entire object moved.²

(3) *LBE and pied-piping movement license a PG with the same interpretation*

[**Kakoj** **⟨podarok⟩**]_k Vasja voznenavidel [_{t_j} **⟨podarok⟩**]_k, [ne obnaruživ ____k pod
 what present Vasja came.to.hate present not discover.CNV under
 ělkoj]?
 pine.tree

‘What present did V. come to hate, not finding (it) under the New Year tree?’

Hence we argue that when LBE occurs, the apparently stranded nominal is in fact pied-piped with that movement, despite the fact that part of it continues to be pronounced in its base position on the surface. This result can be derived via mechanism applying at Phonological Form (PF) like *distributed deletion* (Fanselow and Ćavar, 2002), which independent research has argued to be implicated in the formation of (seemingly) discontinuous nominal phrases in Russian (Pereltsvaig, 2008; Fanselow and Féry, 2013). We argue that this hypothesis of concealed pied-piping extends to accurate predictions about the interaction of (apparent) LBE with principle C and ‘late merge’ effects (Lebeaux, 1991, a.o.), about ATB LBE from coordinate structures, and about the failure of extracted possessor phrases to license PGs in Russian.

1.1 Roadmap

In section 2, we establish the existence of PGs in Russian. In section 3, we describe the syntax/semantics for PG licensing that we adopt, and discuss the predictions it makes about the

²Throughout this paper we mark basic gaps with ‘*t*’ and parasitic gaps with ‘___’.

interaction of LBE and PGs. In section 4, we demonstrate how LBE interacts with PG licensing, yielding our initial evidence for concealed pied-piping. In section 5, we report convergent results from the interaction of LBE with late merge effects relating to principle C. Section 6 further argues that concealed pied-piping under LBE not only can apply, but in fact must, based on interactions of LBE with ATB movement, and the failure of possessor LBE to license PGs. Section 7 discusses some general consequences of these findings. Section 8 concludes, and is followed by the appendices.

2 Establishing PGs in Russian

A defining property of PGs is that they are gaps inside of islands which are licensed by A'-movement that crosses over the structural position of the island, as exemplified in (4):

- (4) *PG in an adjunct island in English*
 [Which person]_k did you [forget about *t_k* [after talking to ___k]]?

The gap in the adjunct clause here cannot obviously have been created by movement from the adjunct, because such adjuncts are generally islands:

- (5) *Adjunct island in English*
 * [Which person]_k did you forget about the cakes [after talking to *t_k*?]

Thus the relevant gap in (4) must be truly ‘parasitic’ on the movement chain in the matrix clause. PGs can be easily identified in a language like English by using gaps in VPs that are obligatorily transitive, such as *talk to* in (4) above. However, Russian does permit object drop in some circumstances, as (6) below shows. Thus it is necessary to establish when object drop is illicit, in order to establish whether a given gap is truly ‘parasitic’.

- (6) *Russian object drop*
 a. A: Ty kupila tort?
 you bought cake
 ‘Did you buy cake?’
 b. B: Da, ja kupila (**tort**).
 yes I bought (**cake**)
 ‘Yes, I bought (cake).’

There are a few factors that allow us to be certain that a given gap is not the result of object drop. Ivlieva (2007), the first work to our knowledge to discuss Russian PGs, shows that perfective aspect makes object drop more difficult in this language. We observe that negation strengthens this effect, as does using a right-adjoined adjunct.³ Furthermore, some Russian verbs also resist

³That is, an otherwise illicit gap is less degraded when in an adjunct adjoined left of the VP:

- i. Vasja [ne obnaruživ ___k pod jolkoi] voznenavidel [etot podarok]_k,
 Vasja not discover.CNV under pine.tree came.to.hate this present

object drop, like *obnaružit* ('discover') in (7) below. Here we combine all these factors to create an adjunct clause whose object cannot be dropped:

(7) *Adjunct clause with undroppable object in Russian*

Vasja voznenavidel [ètot podarok]_k, [ne obnaruživ **ego_k/*** _k pod ëlkoj]
 Vasja came.to.hate this present, not discover.CNV him under pine.tree
 'V. came to hate this present, not finding it under the New Year tree.'

With an obligatorily transitive environment identified, we are now in the right position to find PGs in Russian.

Example (8) below shows that A'-movement in the matrix clause licenses the otherwise bad gap identified in (7), thus presenting a PG. In (8) the 'true' gap and the PG are co-referent, both taking the moved phrase *kakoj podarok* ('what present') as their antecedent:

(8) *Potentially illicit gap in the adjunct rescued by matrix A'-movement*

[Kakoj podarok]_k Vasja voznenavidel *t_k*, [ne obnaruživ _k pod ëlkoj]?
 what present Vasja came.to.hate not discover.CNV under pine.tree
 'What present did V. come to hate, not finding (it) under the New Year tree?'

This example shows PG licensing by interrogative *wh*-movement. As we expect, PG licensing in Russian is not exclusive to this sort of movement, but is a property of A'-movement in general. For instance, in (9) and (10) below we see a PG licensed respectively by *wh*-movement in a relative clause, and by scrambling:

(9) *PG licensed by wh-movement in relative clause*

Vasja našël podarok, [kotoryj_k ja voznenavidel *t_k*, [ne obnaruživ _k pod ëlkoj]]
 Vasja found present, which I came.to.hate not discover.CNV under pine.tree
 'Vasja found the present that I came to hate, not having found (it) under the New Year tree.'

(10) *PG licensed by scrambling*

[Ètot podarok]_k Vasja voznenavidel *t_k*, [ne obnaruživ _k pod ëlkoj]
 this present Vasja came.to.hate not discover.CNV under pine.tree
 'Vasja came to hate this present, not having found (it) under the New Year tree.'

We can see that the gap in the adjunct of the previous three examples really is 'parasitic', and cannot have been formed by movement from the adjunct, since the adjunct used in these examples is an island in Russian:

'Vasja came to hate this present, not having found it under the New Year tree.'

Since our goal today is to determine empirically when object drop is impossible in order to establish the existence of PGs, we leave this puzzle aside.

(11) *Adjunct island in Russian*

* [Kakoj podarok]_k Vasja voznenavidel Mašu, [ne obnaruživ *t_k* pod ėlkoj]?
 what present_k Vasja came.to.hate Masha, not discover.CNV under pine.tree

‘What present did V. came to hate M., not finding (it) under the New Year tree?’

To sum up, by controlling for the presence of object drop, we have found that Russian does indeed allow PGs. In the next section we go on to discuss our approach to the syntax and semantics of PGs, and the predictions for the interaction of PGs and LBE.

3 A Theory of PGs and its Predictions for LBE

We’ve seen that a PG takes on the interpretation of an A’-moved phrase outside of the containing island. We follow works arguing that this interpretive result is derived by movement of a null operator within the island (Chomsky, 1986; Browning, 1987; Nissenbaum, 2000, a.o.). For this approach, a PG is thus fundamentally the trace of an operator’s movement.

Following Nissenbaum, the operator moves to the edge of the containing island, and this movement triggers the rule of λ -abstraction (Heim and Kratzer, 1998), which changes the semantic type of that island.⁴ Thus a clausal adjunct containing a PG becomes a derived predicate of type $\langle e, t \rangle$, as shown in (12) below:⁵

⁴That PGs are indeed traces of moved operators is indicated by the fact that placing an island inside of a constituent containing a PG causes ungrammaticality (Chomsky, 1986; Kayne, 1993, a.o.). We show this below with a relative clause island in English, which the operator required for a PG configuration cannot cross:

- ii. * Who_k did John visit *t_k* [OP_k without consulting the person [_{RC} who’d talked to *____k*?]] (Nissenbaum 2000, pg. 24)

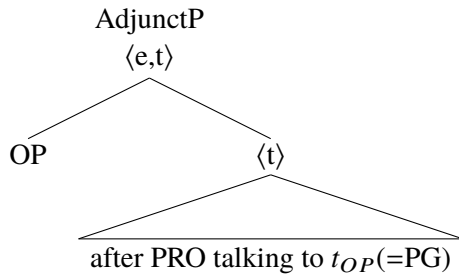
The following example shows that the same holds for Russian, indicating that in this language as well, PGs are formed by operator movement:

- iii. * Kogo_k Vasja uznał *t_k* [OP_k ne smotrev reportaž, [_{RC} v kotorom Maša obvinjaet *____k* v kraže kartiny]]?
 who.ACC Vasja recognized not watch.CNV report in which Masha accuses *____k* in
 stealing picture

‘Who is x s.t. Vasja recognized x, without having watched the report in which Masha accuses x of stealing a picture?’

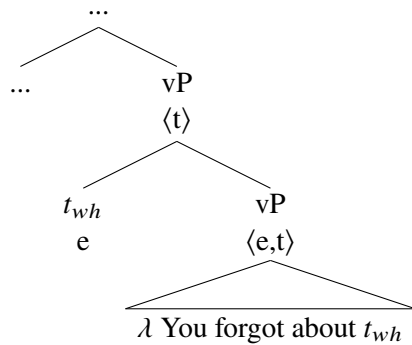
⁵PGs are possible in other islands, such as relative clauses and subjects, but we focus on adjunct islands in this paper. PGs in adjunct islands are the easiest to construct and interpret, and therefore are the safest PGs for us to examine, since the factors required to ensure the presence of a PG in Russian make the crucial sentences quite complex in the first place.

- (12) *Null operator movement inside adjunct forms a derived predicate*



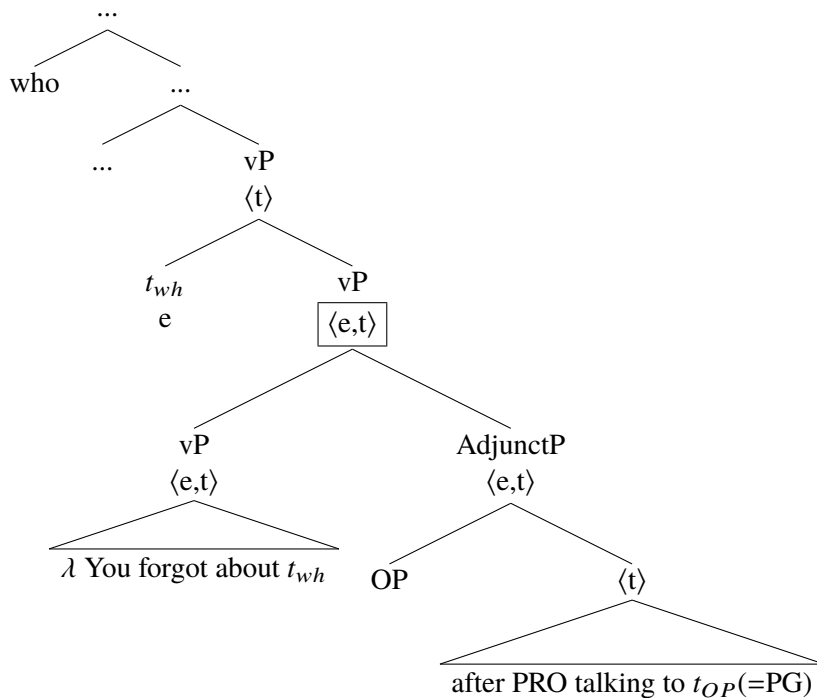
Recall that a PG must be licensed by A'-movement that occurs external to the relevant island. Nissenbaum argues that this is so because such A'-movement creates a position to which the PG-containing island must adjoin in order to be successfully interpreted. In particular, Nissenbaum follows Chomsky (2000, 2001) in positing that A'-movement must successive-cyclically pause in the edge of vP, since vP is a phase. This intermediate step of A'-movement through the vP edge triggers an application of λ -abstraction there as well, creating an $\langle e, t \rangle$ node in the vP edge, as we see in the partial structure in (13) below:

- (13) *Successive-cyclic A'-movement creates an $\langle e, t \rangle$ node in vP*



The PG-containing adjunct island in (12) above is a constituent of type $\langle e, t \rangle$, and as we've just seen, a node of the same type exists in the vP edge after successive-cyclic A'-movement through it. Thus this adjunct can be externally merged as the sister of the $\langle e, t \rangle$ position in the vP in (13), and the resulting structure will be successfully interpreted via Predicate Modification (Heim and Kratzer, 1998), as we see in (14) below. The tree in (14) models the initial English PG sentence introduced in (4) above. In this structure, the (boxed) intermediate vP node created by merge of the adjunct to the site of successive-cyclic movement denotes a function of type $\langle e, t \rangle$, which is true of individuals that the addressee both talked to and forgot about. The intermediate type e trace of the A'-moved nominal phrase will saturate the individual argument of this function, 'filling in' both the variable that corresponds to its trace in VP, and the trace of the null operator in the adjunct:

(14) *Predicate Modification of vP and adjunct island allows a PG to be interpreted*



[= Who did you forget about after talking to?]

With a syntax/semantics for PG licensing now made explicit, next we consider the predictions for the interaction of PGs and LBE. Considering the semantic behavior of LBE will raise several issues that must be clarified, but in short, our conclusion will be that we do not generally expect argument PGs to be licensed by LBE. The fact that in reality they are licensed by LBE, in the way previewed in (3) above, is our first piece of evidence that LBE actually involves pied-piping, despite its surface appearance.

3.1 Predictions for the Interaction of LBE and PGs

Our investigation focuses on LBE in the context of object PGs, since there are two straightforward possibilities to consider in this situation. Examining which of the two holds in reality will help us understand whether concealed pied-piping is applying.

We've already seen in (8-10) above that movement of a nominal phrase can license an object PG in Russian. If LBE in fact involves concealed pied-piping of the containing nominal phrase that appears to have been exited by extraction, then such movement should license an object PG in precisely the same way as completely overt movement of a nominal phrase: in both cases, the moved phrase can bind the variable corresponding to its original trace, and at the same time, the trace of the PG-forming null operator's movement from object position within the adjunct.

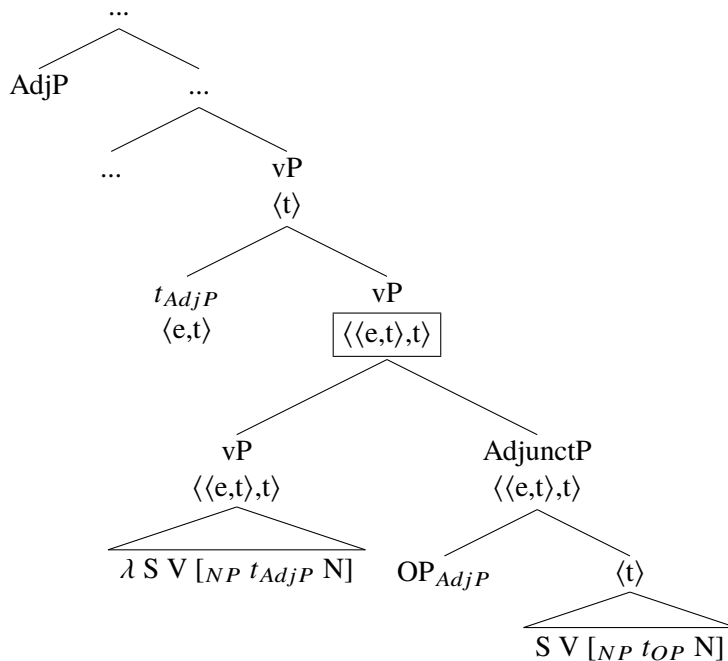
Alternatively, if LBE involves true extraction from a nominal phrase, our expectations differ. If traces must be of type *e* (Fox, 1999 fn. 37, Poole, 2017, a.o.)⁶ then LBE of an adjective, demonstrative, quantifier, and semantically comparable elements, should generally cause a type

⁶A similar proposal with the same effect comes from Beck (1996), who suggests that the type of a trace will be as low as it can be, while still being interpretable in the context it inhabits.

mismatch: as Heim & Kratzer (1998: 212) show, a type e trace left behind by LBE will combine with the $\langle e, t \rangle$ denotation of NP, yielding the type t for that NP, which thus cannot be interpreted with the verb (or with a determiner/demonstrative, if present). This semantic problem is avoided if the extracted element undergoes syntactic reconstruction to its base position and is treated by LF as if it had not moved. But in this case, it shouldn't be able to license a PG.

If LBE could leave a trace of an appropriately high type ($\langle e, t \rangle$ for adjectives, $\langle \langle e, t \rangle, e \rangle$ for demonstratives, and $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$ for quantifiers, etc.), then this semantic problem is avoided. In this case, LBE could in principle license PGs of the right sort: for instance, adjective movement could license an adjective PG in this situation. In such a scenario where high type traces are permitted, successive-cyclic movement of the extracted element through vP , and the co-occurring λ -abstraction that this movement triggers, must create a vP node that in the basic case would need to be of type $\langle \tau, t \rangle$, where τ matches the denotation of (the trace of) the extracting element in question. For instance, adjective extraction would need to create a vP node of type $\langle \langle e, t \rangle, t \rangle$, as we see in the tree in (15) below. Here we also see corresponding movement of an operator from adjective position inside the adjunct, changing the adjunct's type to $\langle \langle e, t \rangle, t \rangle$ as well. Provided that we grant Predicate Modification the ability to combine not only $\langle e, t \rangle$ constituents, but instead two constituents of the same type more generally, this hypothetical structure can be successfully interpreted, since here the two $\langle \langle e, t \rangle, t \rangle$ nodes can be combined:

(15) *Interpretation of adjective LBE and an adjective PG assuming high-type traces*



Derivations of this sort allow interpretation of PGs not only by adjective extraction, but also by extraction of elements like quantifiers and demonstratives, though in these cases Predicate Modification will apply respectively to two nodes of type $\langle \langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle, t \rangle$ for the former, and $\langle \langle \langle e, t \rangle, e \rangle, t \rangle$ for the latter. Importantly, if high type traces (and corresponding λ -abstraction) are implicated in the interpretation of LBE, then we do not expect LBE to be able to license argument PGs: the higher type of the vP formed when LBE occurs cannot undergo Predicate Modification

with an adjunct island containing an object PG, for instance, since this adjunct will be type $\langle e, t \rangle$ as we saw in (13-14) above.⁷ For this reason, if we find that a PG in object position can be licensed by LBE, we will have reason to suspect that such a derivation does not actually involve syntactic sub-extraction, despite appearances.

In short, if LBE is true extraction from a nominal phrase, there are several semantic reasons that we do not expect such movement to successfully license an object PG. As we'll see in the next section, however, LBE does successfully license such PGs, in a way that we argue indicates that LBE does not actually involve sub-extraction, as previewed.

4 LBE Licenses PGs like Movement of a Full Nominal Phrase

Consider (16) below, repeating (8) above, which shows that full pied-piping movement of a direct object in Russian can license a PG in object position. Here the moved object *kakoj podarok* serves as the antecedent for both the real gap, and the 'parasitic' one in the adjunct:

(16) *A'-bar movement of a direct object licenses an object PG*

[Kakoj podarok]_k Vasja voznenavidel *t_k*, [ne obnaruživ ____k pod ėlkoj]?
 what present Vasja came.to.hate not discover.CNV under pine.tree

'What present did V. come to hate, not finding (it) under the New Year tree?'

Example (17) below is the same as (16), except that (17) left-branch extracts the minimal *wh*-element *kakoj* rather than moving the entire nominal phrase that dominates it. Here we see that the interpretation of the PG is the same as in (16), where the entire direct object moves instead. The only interpretive difference between (16) and (17) is a change in information structure: LBE in Russian signals focus on the element to which it applies. However, there is no truth conditional difference between these two examples.

(17) *LBE from an object licenses a PG like full object movement*

Kakoj_k Vasja voznenavidel [*t_k podarok*]_j, [ne obnaruživ ____j pod jolkoj]?
 what Vasja came.to.hate [present], not discover.CNV under pine.tree

'What present did V. come to hate, not finding (it) under the New Year tree?'

We find the same result for LBE of other elements, as (18-22) below show. While some of the examples in this set are more marked than others, we believe that this is attributable to the fact that not all elements undergo LBE with equivalent ease for all speakers.⁸ Some speakers apply LBE quite freely, while some allow it for only a few elements, demonstrative and quantifier LBE

⁷While Predicate Modification would be inapplicable in such circumstances, basic Functional Application could actually apply in the case of adjective LBE with an argument PG. In this case we would have a vP segment of type $\langle \langle et \rangle, t \rangle$, which could be saturated by the type $\langle e, t \rangle$ adjunct containing the argument PG. However, if this occurs, the resulting node of type *t* cannot be combined with the $\langle e, t \rangle$ trace left behind by successive-cyclic movement of the adjective. Thus adjective extraction licensing an argument PG is still not possible in this case, though the reason for this failure is somewhat more complicated than for other instances of LBE.

⁸If LBE is generally available in Russian syntax, then this variability is puzzling. As previewed in the introduction, we argue that Russian LBE is derived in PF by a mechanism like distributed deletion, rather than by true sub-extraction.

generally being regarded as the most difficult. Overall, our research has found that speakers who do not allow a particular example from this set do not generally permit LBE of the relevant element in the basic case.

(18) *Object PG with adjective LBE*

Doroguščij_k Vasja voznenavidel [*t_k* **podarok**]_j, [ne obnaruživ ____j pod ělkoj]
 very.expensive Vasja came.to.hate [present], not discover.CNV under pine.tree
 ‘V. came to hate the EXPENSIVE present, not finding (it) under the New Year tree.’

(19) *Object PG with possessor LBE*

Čej_k Vasja voznenavidel [*t_k* podarok]_j, [ne obnaruživ ____j pod ělkoj]?
 whose Vasja came.to.hate [present], not discover.CNV under pine.tree
 ‘Whose present did V. come to hate, not finding (it) under the New Year tree?’

(20) *Object PG with skol’ko (‘how many’) LBE*

Skol’ko_k Vasja voznenavidel [*t_k* podarkov]_j, [ne obnaruživ ____j pod ělkoj]?
 how.many Vasja came.to.hate [presents], not discover.CNV under pine.tree
 ‘How many presents did V. come to hate, not finding (them) under the New Year tree?’

(21) *Object PG with quantifier LBE*

? **Každyj_k** Vasja voznenavidel [*t_k* podarok]_j, [ne obnaruživ ____j pod ělkoj]
 each Vasja came.to.hate [present], not discover.CNV under pine.tree
 ‘V. came to hate EVERY present, not finding (it) under the New Year tree.’

(22) *Object PG with demonstrative LBE*

? **Ėtot_k** Vasja voznenavidel [*t_k* podarok]_j, [ne obnaruživ ____j pod ělkoj]
 this Vasja came.to.hate [present], not discover.CNV under pine.tree
 ‘V. came to hate THIS present, not finding (it) under the New Year tree.’

The PG in all these LBE contexts is interpreted as if the entire object moved. From this we conclude that this is precisely what has happened in the syntax of these configurations, despite surface appearances. This result suggests that Russian LBE is only apparent: targeting a left branch of a nominal phrase for movement actually results in the entire nominal phrase undergoing pied-piping, as is evident in the overt word order possibilities for languages like English. What differentiates Russian is thus presumably an operation like distributed deletion (Fanselow and Ćavar, 2002), which allows part of the moved phrase to be pronounced in the tail (= lower copy) of the movement chain:

If this conclusion is right, then inter-speaker variation in LBE can be understood as stemming from idiosyncrasy at the PF interface, rather than from variability in basic syntactic operations.

(23) *LBE as pied-piping movement + distributed deletion*

[**Kakoj podarok**]_j Vasja voznenavidel [**kakoj podarok**]_j?
 what present Vasja came.to.hate what present

We've just seen that (apparent) displacement of various elements from the nominal phrase can license PGs, including adjectives and demonstratives, which are presumably adjuncts. Since adjuncts cannot license PGs under normal circumstances, as (24-25) below show, this result is potentially unexpected.⁹ However, PG licensing by adjunct LBE in the above examples is unsurprising if such configurations involve not sub-extraction, but pied-piping movement of the containing argument noun phrase, as we argue.

(24) *Adjuncts cannot license PGs: English* (Browning 1987, p. 252)

- a. * How_k did you fix the car t_k [after repairing the bicycle ___k]?
 Intended: 'What is the way x such that you fixed the car in way x, after repairing the bike in way x?'
- b. * When_k did you leave Boston t_k [in order to visit Mary ___k]?
 Intended: 'What is the time x such that you left Boston at time x, in order to visit Mary at time x?'

(25) *Adjuncts cannot license PGs: Russian*

- a. * Kak_k Vasja t_k počinil mašinu, [___k ne otremonirovav velosiped?]
 how Vasja fixed car not repair.CNV bicycle
 Intended: 'What is the way x such that Vasja fixed the car in way x, not having fixed the bike in way x?'
- b. * [V kakom mesjace]_k on priexal v Moskvu t_k, [ne najdja rabotu v Omske ___k]?
 in what month he came to Moscow not find.CNV job in Omsk
 Intended: 'What month x is such that he came to Moscow in x, not having found job in Omsk in x?'

4.1 Alternative Hypothesis: PG Licensing by Remnant Movement

It is conceivable that in the examples we've argued involve PG licensing by concealed pied-piping, there actually is no pied-piping, but instead the PG is licensed by the post-extraction remnant of the nominal phrase undergoing either covert movement, or a step of string-vacuous overt movement. We showed in section 2 that it is possible to construct Russian sentences with an illicit gap in an adjunct, as repeated in (26) below, which were our basis for diagnosing the existence of PGs in this language. If some covert or otherwise string-vacuous movement is generally available to license PGs, it is not obvious why such movement cannot license the PG in examples of this sort:

⁹Note that examples (24) and (25) are grammatical under the interpretation where there is no manner/temporal adjunct modifier in the adjunct clause. It is conceivable that adjuncts are typically unable to license PGs because of a type mismatch, for reasons discussed in the previous section, but we will not dwell on this topic in the present paper.

(26) *Adjunct clause with undroppable object in Russian*

Vasja voznenavidel [ètot podarok]_k, [ne obnaruživ **ego**_k/*___k pod ëlkoj]
 Vasja came.to.hate this present, not discover.CNV him under pine.tree

‘V. came to hate this present, not finding it under the New Year tree.’

That a short string-vacuous movement is not responsible for PG licensing in our crucial examples is clear in cases where (apparent) LBE strands a nominal phrase in an embedded clause, but licenses a PG interpreted in a higher clause, as in (27-28). Here the (a) examples show an unlicensed gap, which in the (b) examples is licensed by long distance LBE:

(27) (Scenario: Vasja thinks that Masha took the present that was supposed to be under the New Year tree)

- a. * Vasja [xotel, [ne obnaruživ ___j pod ëlkoj], [čtoby Maša vernula [ètot podarok]_j]].
 Vasja wanted not discover.CNV under pine.tree that.SUBJ Masha returned this present

‘Vasja wanted that Masha would return this present, not having found (it) under the New Year tree.’

- b. **Kakoj**_k Vasja [xotel, [ne obnaruživ ___j pod ëlkoj], [čtoby Maša vernula [t_k **podarok**]_j]]?
 what Vasja wanted not discover.CNV under pine.tree that.SUBJ Masha returned present

‘What present did Vasja want that Masha would return, not having found (it) under the New Year tree?’

(28) (Scenario: Vasja thinks that Masha took someone’s present that was supposed to be under the New Year tree)

- a. * Vasja [xotel, [ne obnaruživ ___j pod ëlkoj], [čtoby Maša vernula [Petin podarok]_j]].
 Vasja wanted not discover.CNV under pine.tree that.SUBJ Masha returned Petya’s present

‘Vasja wanted that Masha would return Petya’s present, not having found (it) under the New Year tree.’

- b. **Čej**_k Vasja [xotel, [ne obnaruživ ___j pod ëlkoj], [čtoby Maša vernula [t_k **podarok**]_j]]?
 whose Vasja wanted not discover.CNV under pine.tree that.SUBJ Masha returned present

‘Whose present did Vasja want that Masha would return, not having found (it) under the New Year tree?’

This concludes our investigation of PGs as a diagnostic for the nature of Russian LBE, which we have argued reveals that such movement involves not true sub-extraction, but rather concealed pied-piping of the phrase that the seemingly extracted constituent originates in. In the next two sections, we provide several corroborating lines of evidence for this result.

5 Concealed Pied-Piping Feeds Late Merge

In this section, we provide independent support for concealed pied-piping with evidence from late merge (Lebeaux, 1991; Takahashi and Hulsey, 2009; Stanton, 2016, a.o.) and its interaction with principle C in LBE configurations. Here we will see once again a way in which LBE behaves like full pied-piping movement of a nominal phrase, indicating that the former is reducible to the latter.

The works cited above argue that merge can be late in the sense that a given element may sometimes be externally merged within a constituent, after that constituent has already been constructed. Many works argue that the possibility of late merge becomes evident in configurations with A'-movement, where external merge to a given phrase applies after it moves. Lebeaux (1991) in particular argued that such post-movement late merge is applicable primarily to adjuncts. Lebeaux's evidence for this conclusion comes from the interaction of A'-movement movement and principle C of binding theory, for which contrasts like that shown in (29) below hold. Notice that in the ungrammatical (29a), the *wh*-moved phrase contains a complement CP, which in turn contains an R-expression that is co-referential with the matrix subject. However, as (29b) shows, a comparable sentence where the relevant R-expression is in a relative clause of the moved *wh*-phrase is grammatical:

- (29) *Principle C in complement versus adjunct of A'-moved phrase*
- a. *Principle C applies in complement of moved phrase*
 */?? [Which rumor [that John₂ ate all the cakes]]₁ did he₂ deny *t*₁?
 - b. *No principle C in adjunct of moved phrase*
 ✓ [Which cakes [that John₂ ate]]₁ did he₂ find *t*₁ very tasty?

Lebeaux argues that such contrasts emerge because complements / arguments must be merged as early as possible, while adjuncts can be merged late, post-movement. Thus in (29a), the complement of N is merged before the containing DP moves, meaning that there is a stage of the derivation where this complement is c-commanded by the matrix subject. Since the matrix subject is co-referential with the subject of the complement CP here, a principle C violation is incurred. In contrast, because relative clauses are adjuncts, the relative clause in (29b) need not be externally merged until after its host DP moves over the subject. Thus there is no level of the derivation at which the R-expression in the relative clause was c-commanded by the co-referential subject, and therefore no principle C violation.

- (30) *How to avoid principle C*
- a. *Step 1: Move*
 [Which cakes]₁ did he₂ find *t*₁ very tasty?
 - b. *Step 2: Merge adjunct to moved phrase*
 [Which cakes [that John₂ ate]]₁ did he₂ find *t*₁ very tasty?

The same pattern holds within Russian. For instance, in (31) below, we see that the complement *Vasja*.GEN of the moved nominal phrase *picture* fails to avoid a principle C violation caused by the co-indexed subject:

(31) *No principle C avoidance for complement of A'-moved phrase in Russian*

* [Kotoruju fotografiju **Vasi**_k]_j **on**_k kupil t_j ?
 which photo.ACC Vasja.GEN he bought

‘Which photo [of Vasja_k] did he_k buy?’

In contrast, an R-expression in a relative clause of the moved phrase doesn’t violate principle C, as we see in (32) below. Here the R-expression which is the subject of the relative clause is co-referential with the matrix subject, and yet, there is no violation in this sentence. This indicates that in Russian too, adjuncts can merge late:

(32) *Principle C avoided by relative clause of A'-moved phrase in Russian*

[[Čju kartinu] [kotoruju **Vasja**_k kupil]]_j **on**_k voznenavidel t_j
 Whose picture that Vasja bought he came.to.hate

‘Whose picture [that Vasja_k bought] did he_k come to hate?’

This pattern of principle C avoidance depends on internal merge creating a high position to which later external merge of an adjunct can apply: if a given sort of movement does involve a nominal phrase which late merge of a relative clause can target, then such patterns should not be possible. It turns out that such patterns are indeed possible in LBE configurations. As we see in (33) below, LBE facilitates the merge of a relative clause containing a noun phrase co-indexed with the matrix subject, for which no principle C violation occurs:

(33) *LBE with principle C avoiding relative clause in Russian*

a. *Adjective LBE*

Doroguščuju_j [kotoruju **Vasja**_k kupil] **on**_k voznenavidel t_j kartinu
 very.expensive that Vasja bought he came.to.hate picture
 ‘The VERY EXPENSIVE picture, that Vasja_k bought, he_k came to hate.’

b. *Demonstrative LBE*

Ètu_j [kotoruju **Vasja**_k kupil] **on**_k voznenavidel t_j kartinu
 this that Vasja bought he came.to.hate picture
 ‘THIS picture, that Vasja_k bought, he_k came to hate.’

c. *Possessor LBE*

Čju_j [kotoruju **Vasja**_k kupil] **on**_k voznenavidel t_j kartinu?
 Whose that Vasja bought he came.to.hate picture
 ‘Whose picture [that Vasja_k bought] did he_k come to hate?’

The fact that overt pied-piping (32) and LBE (33) pattern together in allowing late merge of a relative clause is predicted, given our argument that the syntax of these two scenarios is the same. The only difference is that the moved nominal phrase is fully overt in (32), but partially covert in

(33). The fact that the moved nominal phrase in (33) is covert does not change the fact that late merge can target it.¹⁰

Note that we do not expect the same pattern of judgments to emerge from literal sub-extraction of a left branch, and subsequent extraction of a relative clause from within the same nominal phrase: if the relative clauses in these examples reached the high position they inhabit by simply moving there, they should be subject to principle C. For principle C to be avoided, it is vital that the relative clauses be externally merged to a position above the matrix subject. Late external merge would be impossible here if there were not a nominal phrase there to merge to.¹¹

6 On the Obligatoriness of Concealed Pied-Piping: Evidence from ATB Movement and Possessor LBE

The evidence for concealed pied-piping that we have shown is consistent with such pied-piping being optional, but forced in the configurations discussed so far in order to permit PG licensing, and principle C avoidance via late merge. Thus while we have shown that LBE can involve concealed pied-piping, we have not yet shown that it must.¹² In this section, we discuss two configurations which we argue reveal that concealed pied-piping is in fact obligatory. The first of these involves the interaction of LBE with ATB movement from coordinations, and the second involves the licensing of PGs by possessor LBE.

6.1 ATB LBE

Across-The-Board (ATB) movement (Ross, 1967, a.o.) involves movement of a phrase from a coordinate structure, in which that phrase corresponds to a gap position in each conjunct:

- (34) *ATB movement*
Who_k does [[Mary like t_k] and [Sarah dislike t_k]]?

ATB movement is possible in Russian, as (35) and (36) respectively show with TP coordination and VP coordination:

- (35) *Russian ATB movement from TP coordination*
Čto_k [[Maša ljubit t_k], a [Vasja ненавиdit t_k]]?
what.ACC Masha.NOM loves & Vasja.NOM hates
‘What does Masha like and Vasja hate?’

¹⁰In these LBE + late merge configurations, PGs can be licensed as expected.

¹¹Given that the relative clauses in (33) must not have undergone movement, it would also be unclear how these examples could be interpreted if the relative clause were not late merging to a nominal phrase. This is because relative clauses are adjuncts interpreted by Predicate Modification with NP (both being of type $\langle e, t \rangle$), but this interpretive rule could not apply if the relative clauses in (33) were not in fact attached to an NP.

¹²Kotek and Erlewine (2016) argue that covert movement pied-pipes as much as possible. They analyze movement that is entirely covert, while we are concerned with covert pied-piping that is driven by overt movement. Kotek & Erlewine’s claim could conceivably apply to this sort of movement also, given that we will argue that concealed pied-piping is obligatory.

(36) *Russian ATB movement from VP coordination*

Čto_k Maša [[ljubit *t_k*] i [večno xvalit *t_k*]]?
 what.ACC Masha.NOM loves & constantly praises

‘What does Masha like and constantly praise?’

Such sentences serve as the basis for our examination of LBE in contexts of ATB movement.

Among other constraints that are not relevant for the purposes of this paper, ATB movement is usually subject to an identity requirement, forcing the same element to be extracted from each conjunct (and subsequently united in a single higher position). The elements capable of LBE in Russian generally undergo concord for case/gender/number, matching the features of the containing nominal phrase. Provided that the direct objects of two conjuncts are the same in case/gender/number, ATB LBE from those objects should be possible: provided that the same element is extracted from each object, in this situation the features that the extracted element would bear in both gap positions will be identical as required. It turns out that such ATB LBE is unacceptable, as (37-41) below show for ATB LBE from TP coordinations:

(37) *TP Coordination: LBE of ‘what kind’ / ‘which’ / ‘whose’*

* Kako_{j_k} / kotory_{j_k} / čej_k Maša ljubit
 what.kind.MASC.SG.ACC which.MASC.SG.ACC whose.MASC.SG.ACC Masha.NOM loves
 [*t_k* čaj], a Vasja nenavidit [*t_k* kofe]?
 tea.MASC.SG.ACC & Vasja.NOM hates coffee.MASC.SG.ACC

‘What kind_k / which_k / whose_k does Masha like *t_k* tea and Vasja hate *t_k* coffee?’

(38) *TP Coordination: Adjective LBE*

* Čjorny_{j_k} Maša ljubit [*t_k* čaj], a Vasja nenavidit [*t_k*
 black.MASC.SG.ACC Masha.NOM loves tea.MASC.SG.ACC & Vasja.NOM hates
 kofe]
 coffee.MASC.SG.ACC

‘Masha likes black tea and Vasja hates black coffee.’

(39) *TP Coordination: Demonstrative LBE*

* Ètot_k Maša ljubit [*t_k* čaj], a Vasja nenavidit [*t_k*
 this.MASC.SG.ACC Masha.NOM loves tea.MASC.SG.ACC & Vasja.NOM hates
 kofe]
 coffee.MASC.SG.ACC

‘Masha likes this tea and Vasja hates this coffee.’

(40) *TP Coordination: Quantifier LBE*

* Každuju_k Maša ljubit [_k p'esu Šekspira], a
 every.FEM.SG.ACC Masha.NOM loves play.FEM.SG.ACC Shakespeare.GEN &
 Vasja nenavidit [_k simfoniju Baxa]
 Vasja.NOM hates symphony.FEM.SG.ACC Bach.GEN

‘Masha likes every play of Shakespeare and Vasja hates every symphony of Bach.’

(41) *TP Coordination: Numeral LBE*¹³

* Tri_k Maša ljubit [_k p'esy Šekspira], a Vasja
 three.ACC Masha.NOM loves play.FEM.SG.GEN Shakespeare.GEN & Vasja.NOM
 nenavidit [_k simfoniji Baxa]
 hates symphony.FEM.SG.GEN Bach.GEN

‘Masha likes three plays of Shakespeare and Vasja hates three symphonies of Bach.’

Examples (42-46) below show that the same unacceptability holds for ATB LBE from VP coordinations:

(42) *VP Coordination: LBE of ‘what kind’ / ‘which’ / ‘whose’*

* Kako_{j_k} / kotory_{j_k} / čej_k Maša ljubit
 what.kind.MASC.SG.ACC which.MASC.SG.ACC whose.MASC.SG.ACC Masha.NOM loves
 [_k čaj], i/no nenavidit [_k kofe]?
 tea.MASC.SG.ACC & hates coffee.MASC.SG.ACC

‘What kind_k / which_k / whose_k does Masha like _k tea and hate _k coffee?’

(43) *VP Coordination: Adjective LBE*

* Čjorny_{j_k} Maša ljubit [_k čaj], i/no nenavidit [_k
 black.MASC.SG.ACC Masha.NOM loves tea.MASC.SG.ACC & hates
 kofe]
 coffee.MASC.SG.ACC

‘Masha likes black tea and hates black coffee.’

(44) *VP Coordination: Demonstrative LBE*

* Ètot_k Maša ljubit [_k čaj], i/no nenavidit [_k
 this.MASC.SG.ACC Masha.NOM loves tea.MASC.SG.ACC & hates
 kofe]
 coffee.MASC.SG.ACC

‘Masha likes this tea and hates this coffee.’

¹³Numerals like ‘three’ do not agree with their noun in gender, number and case: within a direct object, ‘three’ receives accusative case marking, but assigns N genitive singular marking, as we see in (41). This attempted ATB LBE example thus preserves the morphology expected for such a configuration. These concerns also apply to numeral extraction in example (46) below.

(45) *VP Coordination: Quantifier LBE*

* *Každuj_k* *Maša* *ljubit* [*t_k* *p'esu* *Šekspira*], *i/no*
 every.FEM.SG.ACC Masha.NOM loves play.FEM.SG.ACC Shakespeare.GEN &
nenavidit [*t_k* *simfoniju* *Baxa*]
 hates symphony.FEM.SG.ACC Bach.GEN

‘Masha likes every play of Shakespeare and hates every symphony of Bach.’

(46) *VP Coordination: Numeral LBE*

* *Tri_k* *Maša* *ljubit* [*t_k* *p'esy* *Šekspira*], *i/no* *nenavidit* [*t_k*
 three.ACC Masha.NOM loves play.FEM.SG.GEN Shakespeare.GEN & hates
simfoniji *Baxa*]
 symphony.FEM.SG.GEN Bach.GEN

‘Masha likes three plays of Shakespeare and hates three symphonies of Bach.’

If LBE as literal sub-extraction of a left branch element from a nominal phrase were available in Russian syntax, there is no reason for the above examples to be ungrammatical. If LBE actually involves obligatory pied-piping in syntax of the nominal phrase in which the apparently extracted constituent originates, then the unacceptability of these examples is predicted. Recall that ATB movement requires the elements moving from each conjunct to be identical. In all the above examples attempting ATB LBE, while the elements being targeted for LBE from each direct object are identical, the rest of the direct object in each conjunct is distinct. Because attempted ATB LBE obligatorily triggers pied-piping movement of the entire direct object from each conjunct, the resulting configuration is unacceptable, since ATB movement of non-identical constituents would need to occur.

6.1.1 ATB LBE with Identical Remnants and the Nature of *skol'ko*

The above discussion might lead us to predict that some form of ATB LBE might be permitted provided that the remnants of that movement are identical in each conjunct. Such examples are also ungrammatical, however, as (47) shows:

(47) *No ATB LBE from identical direct objects*

* *Kakoj_k* / *kotoryj_k* / *čej_k* /
 what.kind.MASC.SG.ACC which.MASC.SG.ACC whose.MASC.SG.ACC
čjornyj_k / *‘etot_k* *Maša* *ljubit* [*t_k* *čaj*], *a*
 black.MASC.SG.ACC this.MASC.SG.ACC Masha.NOM loves tea.MASC.SG.ACC &
Vasja *nenavidit* [*t_k* *čaj*]
 Vasja.NOM hates tea.MASC.SG.ACC

‘What kind_k / which_k / whose_k does Masha like *t_k* tea and Vasja hate *t_k* tea?’, ‘Masha likes black / this tea and Vasja hates this / black tea.’

Citko (2006) observes that this judgment holds for several Slavic languages, and proposes a solution in terms of the interaction between linearization and multi-dominant syntax. While Citko’s

arguments to this effect are not in conflict with the essentials of the present paper, Citko does differ on one important matter: she reports that in Russian (among other Slavic languages) ATB LBE is possible if and only if the remnants of that movement are distinct. While we cannot comment on the nature of LBE in other Slavic languages within this paper, for Russian, this is precisely what this section has reported to be unacceptable in (37-46) above. However, Citko reports only one example of grammatical ATB LBE in Russian, involving the element *skol'ko* ('how many'):

(48) *ATB LBE of skol'ko*

Skol'ko_i Meri napisala [*t_i* knig] a Ivan procital [*t_i* stat'ej]?
 how-many Mary write books and Ivan read articles

'How many books did Mary write and Ivan read?' [Citko 2006, ex. 9b]

As far as we can tell, ATB LBE of *skol'ko* is indeed relatively acceptable, though still imperfect. Nevertheless, this example is perceptibly more acceptable than similar examples reported in this section. On this note it is also relevant to mention Pesetsky (1982), who shows examples that possibly instantiate licensing of a nominal-internal PG by LBE of *skol'ko* in a manner suggestive of true extraction.¹⁴ These observations from the literature may indicate that *skol'ko* is structurally different from the other elements capable of LBE in Russian, in that it is capable of true syntactic extraction, without concealed pied-piping. The potentially exceptional status of *skol'ko* is interesting in light of the fact that in French, as is widely known, *combien* ('how many') is the only element capable of undergoing LBE:

(49) *'How many' extraction in French*

Combien_k a-t-il vendu [*t_k* de livres]?
 how-many has-he sold of books

'How many books did he sell?' [French, Corver (2007), ex. 16a]

Comparable sentences appear to be possible in English under certain circumstances, despite English not typically permitting LBE:

(50) *'How many' extraction in English*

? [How many]_k did you eat [*t_k* of the cookies]?

Thus we hypothesize that the structure of 'how many' may cross-linguistically differ from other left branches in such a way that it truly can extract from the nominal phrase, even when no other elements can do so. Since this appears to be a topic that extends beyond the analysis of Russian, we leave this for future work.

¹⁴In appendix A below we investigate licensing of a numeral PG by numeral LBE, which contains an attempt to license a nominal-internal PG with LBE of *skol'ko*. This example (60 below) is not acceptable, however. The configurations with *skol'ko* examined by Pesetsky are rather different than the scenarios that this paper examines. As mentioned above, since 'how many' may be cross-linguistically exceptional, we wish to leave this subject aside for now.

6.2 Failure of PG Licensing by Possessor LBE

In section 3.1 above, we discussed some semantic reasons why a PG in object position should not be able to be licensed by most of the elements that can undergo LBE (adjectives, demonstratives, and so on). However, as shown in (19) above, LBE can also displace pre-nominal possessors. If possessors are straightforward nominal phrases (and thus presumably denote individuals), it is plausible that possessors are not constrained by the semantic complications of other sorts of LBE, and thus, might be able to license an argument PG, if concealed pied-piping does not apply. If concealed pied-piping must apply, however, then a possessor will never be able to license a PG, since it cannot actually sub-extract and move independently.¹⁵

However, it is not immediately obvious whether the relevant Russian pre-nominal possessors are normal nominal phrases or not. Most of them bear agreement morphology that looks just like that of adjectives, and if they are indeed adjectives or at least adjuncts, as Lyutikova (2012) argues, then we don't expect them to be able to license an argument PG in any case. Some relevant argumentation on this topic comes from Rappaport (To appear), who provides a few pieces of evidence that pre-nominal possessors in Russian are referential nominal phrases bearing genitive case, unlike similar looking de-nominal adjectives. Rappaport shows, for instance, that such possessors participate in binding relations just as typical noun phrases do, as we see in (51) below. Here the first person possessor in (51a) is able to bind an anaphor, whereas the same is not possible for the de-nominal adjective of 'author' shown in (51b):

(51) *Unlike de-nominal adjectives, pre-nominal possessors can bind anaphors*

- a. ✓ On cital **moju**₁ stat'ju pro **sebja**₁
 he read my article about self.ACC
 'He read my₁ article about myself₁'
- b. * On₁ kupil **avtorskij**₂ ekzempljar u **sebja**_{1/*2}
 he bought author.ADJ copy from self.ACC
 'He₁ bought an author₂'s copy at his_{1/*2} own place

Rappaport also argues that such possessors bear genitive case, which is expected for a possessor nominal, though not for an adjective. One indirect piece of evidence he provides is that such possessors can be coordinated with straightforwardly genitive lexical possessors. A potentially more informative piece of evidence comes from expressions introducing a nominal with *kak* ('like, as'), which require that nominal to match the case of the standard of comparison. We see this in (52a) in an accusative context, and in (52b) we see the same in a genitive context, where the nominal *Evropejcev* introduced by *kak* bears genitive case due to its standard of comparison being a possessor:

¹⁵Davis (To appear) has recently argued that when certain PF requirements are met, colloquial English permits extraction of possessors for some speakers. Davis further shows that such movement can apparently license parasitic gaps, as shown in (iv.) below. If concealed pied-piping is not obligatory in Russian, we expect such examples to be possible for Russian also. We will see, however, that they are not.

iv. *Parasitic gap licensed by extracted possessor in colloquial English*

- a. This is the guy [who_k I said [_{t_k}'s shoes] I liked [after talking to _____k today]]
- b. Who_k do you think [_{t_k}'s research] is good, [despite not thinking _____k's paintings are nice]?

(52) *Case matching in kak-comparisons*

- a. On **menja** ub”jot kak **muxu**
 He **me.ACC** will.kill like **fly.ACC**
 ‘He will kill me like a fly’
- b. **Vaša** pervaja zadaca, kak **Evropejcev**, budet...
 you.GEN.PL.NOM.FEM.SG first task.NOM.FEM.SG as European.GEN.PL will.be...
 ‘Your first task, as Europeans, will be...’

If we accept Rappaport’s argument that Russian pre-nominal possessors are typical referential case-assigned nominal phrases, then we expect extraction of such elements to potentially license PGs. In what follows, we’ll show that this is in fact not possible, consistent with concealed pied-piping being obligatory.

Before moving on to the relevant tests, we must note that Russian PGs have a case matching requirement, which we demonstrate in appendix B: the case of the phrase that licenses a given PG must match the case that is normally assigned in the position where the PG is interpreted. If possessors bear genitive case, as Rappaport argues, then we must ensure that a PG potentially licensed by LBE of a possessor is in a position for genitive case assignment. We can guarantee that this is so by including negation with the verb whose object is the PG, since negation can trigger genitive marking on objects in Russian.

In (53) below we demonstrate that movement of a genitive direct object can indeed license a PG in the object position of a negated verb. The verb in the adjunct here is appropriately negated, and the object moved in the matrix clause bears genitive case, assigned by the verb ‘be.afraid.of’:

(53) *Genitive object licenses PG in a genitive position*

[Č’ego zvuka]_k Lena ispugalas’ t_k, [ne raspoznav ___k sproson’a]?
 whose.GEN.SG sound.GEN.SG Lena was.afraid.of not recognize.CNV after.waking

‘Whose sound was Lena afraid of, not having recognized (it) after waking up?’

Notice that the moved genitive object that licenses the PG in (53) contains a possessor. Here that possessor simply remains inside of the genitive object where it originates, but we can modify (53) to extract just the possessor, and see if the interpretation of the PG changes. This test is performed in (54) below, where the possessor undergoes LBE from the genitive object. The interpretation for the PG doesn’t change here: this sentence has the same reading as (53) above, where the overtly moved object licenses the PG. This result suggests that possessor LBE in fact fails to license PGs, consistent with concealed pied-piping of the entire possessum obligatorily occurring.

(54) *Object PG with possessor LBE is interpreted as if the entire possessum moves*

Č’ego_j Lena ispugalas’ [t_j zvuka]_k, [ne raspoznav ___k sprosonja]?
 whose.GEN.SG Lena was.afraid.of sound.GEN.SG not recognize after.waking

‘Whose sound was Lena afraid of, not having recognized (it) after waking up?’

In (55) below we make another attempt using the pronoun *eë* ‘she’, which is ambiguous between accusative and genitive case. This pronoun is independently licit as the object of a negated verb, or

as a possessor. In (55) we extract a possessor *eë* in a configuration with a PG in the object position of a negated verb, but the only reading for the PG here is the one we would expect if the entire possessum had moved:

(55) *‘eë’ as a possessor does not license an object PG by LBE*

Eë_k Lena voznenavidela [*t_k* otkrytku]_j, [ne obnaruživ ____{j/*k} v komnate]
 her Lena came.to.hate card.FEM.ACC not find.CNV in room

a. Lit: ‘Hers Lena came to hate card, not having found (it) in the room’

b. Lit: *‘Hers Lena came to hate card, not having found (her) in the room.’

To sum up, these examples show that an extracted possessor cannot license a PG on its own: the reading we receive when we attempt this is indicative of concealed pied-piping of the containing nominal phrase.¹⁶ If Rappaport’s argumentation serves as reasonable grounds for expecting pre-nominal possessors to have been potential candidates for PG licensing, then these facts provide further evidence that concealed pied-piping is in fact obligatory.

7 Consequences

7.1 The Structure of the Russian Nominal and Constraints on Sub-Extraction

We have argued that LBE in Russian in fact involves concealed pied-piping of the entire nominal phrase that LBE appears to exit, and furthermore argued that this pied-piping is obligatory. If correct, this indicates that in Russian, something like the Left Branch Condition holds in the underlying syntax. While in languages like English the influence of the Left Branch Condition is evident in the surface word orders that can be created by movement, this is not so in Russian, which is why more intricate diagnostics have been required to detect the presence of this constraint.

The Left Branch Condition is in essence a descriptive generalization, rather than an explanation, of the fact that some languages do not (generally) permit LBE. This generalization should, ideally, be reducible to independent mechanisms of syntax. This expectation is explored by numerous works (Szabolcsi, 1984; Corver, 1990, 1992; Rappaport, 2001; Bošković, 2005, a.o.). Bošković (2005, 2016), for instance, argues that LBE is limited by the presence of D, in languages where

¹⁶We have shown examples attempting to license an object PG with possessor LBE, but what we have not shown are similar examples attempting to license a possessor PG. Such an example is shown in (v.) below. While we think the judgments for such examples are consistent with concealed pied-piping, such examples are confounded by the fact that there is no decisive evidence for there actually being a possessor gap here. This is because possessed NPs in Russian receive no marking that indicates whether they are possessed. Thus any judgments for these examples cannot be regarded as conclusive evidence.

v. *Ejo₁ Lena voznenavidela [*t₁* sestru]₂, ne obnaruživ [___₁ otkrytku] v komnate.
 her Lena came.to.hate sister.FEM.ACC NEG find.CNV card in room

Lit: ‘Hers Lena came to hate sister, not having found a/*her card in the room.’

The morphology involved in certain constructions with numerals makes diagnosing the presence of the relevant sort of nominal-internal PG much easier to establish. In appendix A below, we show that even in such contexts the licensing of such a gap by LBE fails, consistent with the hypothesis of obligatory concealed pied-piping.

it is present. Bošković argues that this is so because D introduces a phase boundary, and that therefore any extraction from the nominal phrase must successive-cyclically pass through spec-DP. While such movement through spec-DP is possible in principle for complements of N, Bošković argues that the necessary movement to spec-DP is impossible for adjuncts / specifiers of NP. This is because such movement would be too short and thus in violation of anti-locality (Bošković, 1997; Ishii, 1999; Grohmann, 2003; Abels, 2003, a.o.).

- (56) *Anti-local LBE from adjunct / specifier of NP through spec-DP*
- $$[_{CP} \dots [_{DP} * D [_{NP} XP N \dots]]]$$
-

If a theory along these lines is correct, then the present paper's conclusion that Russian lacks LBE can be attributable to the presence of D in this language, a conclusion that has some independent support (see Pereltsvaig, 2006, 2007; Pesetsky, 2013, a.o.).¹⁷ The hypothesis would thus be that in Russian, the elements that undergo (apparent) LBE are in fact base-generated as adjuncts / specifiers of NP, and thus below D.¹⁸ From this position, their movement through spec-DP is impossible, and they cannot in fact move from DP. Thus when such constituents are targeted for A'-movement, pied-piping of the entire containing nominal phrase must apply. It is only an idiosyncratic fact about Russian PF that such movement can be pronounced in such a way that it appears that sub-extraction has occurred.

7.2 The Reality of Distributed Deletion

If this paper's results are correct, they suggest that discontinuous phrases can be created not only by syntactic sub-extraction, but also by PF mechanisms that linearize a chain in such a way that a moving constituent appears to be discontinuous. The conclusion that such distributed deletion is possible in Russian (but presumably not in languages where the Left Branch Condition is surface-evident) is supported by the fact that LBE in Russian can displace elements that are not syntactic constituents. Pereltsvaig (2008),¹⁹ who also argues that discontinuous nominal phrases in Russian

¹⁷The fact that Russian has no surface-apparent evidence for D raises the question of how learners come to know that it is present. One possible answer to this question would be that DP is universal, and hence automatically posited without input. This conclusion challenges the account in Bošković (2005), in which it is argued that languages that appear to lack D and allow LBE truly do lack D, and hence allow greater possibilities for sub-extraction. If DP is universal, then such an account cannot be correct. Indeed, it has known exceptions: Fanselow and Féry (2013) report adjectival LBE in Bulgarian and Macedonian, which do have determiners. Pankau (2019) reports the same for Lower Sorbian. Thus the account in Bošković (2005) may be too strong in any case. However, Bošković's insight that differing structures for nominal phrases should correlate with differing extraction possibilities remains valuable, and could likely be refined toward an understanding of how LBE might occur even in the presence of DP in some situations. We leave the details of such an investigation to future work.

¹⁸Since the English possessor is standardly assumed to be generated in spec-DP, the possibility of this phrase being able to undergo true LBE is predicted, as the facts from colloquial English reported in footnote 15 above suggest. A language with a similar extraction profile is Hungarian, which as Bošković (2005) points out, allows possessor LBE via spec-DP but not adjective LBE. In contrast, the Russian facts reported here would, in the context of this perspective on LBE, suggest that the Russian possessor originates below D and thus cannot undergo LBE. If Russian pre-nominal possessors are fundamentally adjuncts (Lyutikova, 2012) of NP, this is what we expect.

¹⁹Pereltsvaig (2008) argues that in addition to LBE, inverted splits in Russian, which displace NP while stranding its adjuncts / specifiers, are also derived by distributed deletion. If this is so, we expect this construction to show a PG licensing pattern identical to that reported for LBE in section 4 above. We leave this subject aside for the meantime.

are derived by distributed deletion, shows among other relevant facts that LBE of a preposition and an adjective is possible, as we see in (57) below. There is no obvious constituent dominating exclusively those elements that we can posit being targeted for syntactic movement here. However, if LBE in Russian is a matter of splitting DPs apart at PF, for which operations defined in purely linear rather than structural terms are possible, then the availability of such examples is expected.²⁰

(57) *Non-constituent LBE of P + Adj* (Pereltsvaig 2008)

- a. **Na sledujuščij** ostan'tes' **trolleybus!**
for next stay trolleybus
'Stay for the NEXT trolleybus!' (Ex. 2c)
- b. **Protiv sovetskoj** on vystupal **vlasti**
against Soviet he demonstrated regime
'It is against the soviet regime that he demonstrated' (Ex. 4a)

Fanselow and Féry (2013) provide a separate argument for the same conclusion, based on a study of intervention effects and the prosody of LBE in Slavic languages. Intervention effects involve extraction being blocked by negation, a quantifier, or some other focus-sensitive element. Fanselow and Féry observe that such intervention applies to LBE in some Slavic languages (Slovenian, Sorbian, Bulgarian) but not others (Russian, Ukrainian, Polish, Czech, Macedonian). They argue that LBE is actual sub-extraction in the first set, and thus intervention applies. In contrast, they argue that intervention effects disappear in the second set of languages because for them, LBE is actually movement of a full noun phrase followed by distributed deletion, rather than true sub-extraction.²¹ In support of this argument, Fanselow and Féry also show that LBE in the intervention-avoiding set of languages can have a prosodic contour characteristic of full phrasal movement.

While the evidence for distributed deletion appears to be strong for Russian, the existence of such a PF mechanism raises a question: if distributed deletion is freely available, it should be able to derive sentences in which islands appear to be violated by simply moving the island, and linearizing that movement in a distributed fashion. While this would be an undesirable result, to a limited extent, this is actually what distributed deletion can indeed sometimes do: Pereltsvaig (2008) and Fanselow and Féry (2013) show several circumstances where LBE appears to circumvent expected constraints on sub-extraction from nominal environments. Analogously, van Urk (2019) has recently argued that the character of VP fronting in the Polynesian language Imere is best captured by distributed deletion, since standard syntactic movement possibilities do not properly predict what material that movement can strand. Thus while we acknowledge that distributed deletion must not be given free reign to render any constituent superficially discontinuous, the possibility for such an operation to separate elements that syntactic movement cannot appear necessary.

²⁰Pereltsvaig also reports that examples consisting of LBE of P alone are taken by some speakers to be acceptable, provided that they are sensitive enough to the possibilities of colloquial speech. As this would be displacement of only a head, such examples further challenge the analysis of Russian LBE as actual extraction, given that head movement tends to be highly local, unlike phrasal movement (Travis, 1984).

²¹We expect the intervention-avoiding set of languages identified by Fanselow and Féry to all allow PG licensing by LBE as we have shown here for Russian. Among these languages is Polish, which Bartosz Wiland (p.c.) tells us does not appear to have PGs, making this diagnostic for concealed pied-piping unavailable in this language. The other lines of evidence for concealed pied-piping shown in this paper ought to be applicable to Polish and other Slavic languages, however. We leave this for future work.

8 Conclusion

In this paper, we have argued that LBE from nominal phrases in Russian is only apparent: when such extraction appears to have occurred, in reality, the entire nominal phrase in which the seemingly extracted constituent originated undergoes concealed pied-piping. Our evidence for this conclusion came from the interaction of LBE with PG licensing, ‘late merge’ effects with principle C, and ATB configurations. This finding unites Russian with languages where the Left Branch Condition is surface-evidently operative, indicating that the difference between Russian and such languages is the availability of distributed pronunciation of movement chains in the former. If a theory like that of Bošković (2005) and related works is correct that the presence of D constrains LBE, these findings can also be taken as novel evidence that the Russian nominal phrase indeed includes the DP layer, despite appearances.

9 Appendix A: PGs and numeral LBE

In sub-section 6.2, we attempted to use possessor LBE as a test for determining whether concealed pied-piping must apply, or is simply optional. The facts we observed for the interaction of possessor LBE and PG licensing in object position are consistent with concealed pied-piping applying obligatorily. As footnote 16 mentions, while similar examples can be constructed that attempt licensing of a possessor PG, such configurations are inconclusive since there is no direct evidence that they definitely contain a PG in possessor position. Clearer examples of this sort can be constructed with certain numerals that assign idiosyncratic case. For instance, the numeral ‘three’ assigns genitive case to its host NP. In (58) below we see an example of extraction of ‘three’, where the NP ‘girl’ it originated in bears genitive morphology as expected. This example also contains an object PG, which is licensed in a manner indicative of concealed pied-piping, as we’ve seen earlier in this paper:

(58) *PG with LBE of ‘three’*

? Tri_k ja uvidel [t_k devočki]_j v restorane, [ne obnaruživ ____j v kafe]
 three.ACC.SG I saw girl.GEN.SG in restaurant NEG discover.CNV in cafe

‘I saw three girls in the restaurant, (after) not having found (them) in the cafe.’

The next example attempts to license a numeral PG by numeral LBE of ‘three’. For the morphological reasons mentioned above, the presence of the intended numeral PG is clear here. Nevertheless, LBE of ‘three’ does not appear to license this gap:

(59) *LBE of ‘three’ can’t license a numeral PG*

* Tri_k ja uvidel [t_k devočki] v restorane, [obnaruživ [____k
 three.ACC.SG I saw girl.GEN.SG in restaurant discover.CNV
 babuški] v kafe].
 grandmother.GEN.SG in cafe

‘I saw three girls in the restaurant, having found (three) grandmothers in the cafe.’

An element with similar behavior is *skol'ko*, ('how many'), which assigns genitive plural morphology to NP. LBE of *skol'ko* seems unable to license a nominal-internal PG either, despite the intended gap being morphologically indicated:

(60) *LBE of 'how many' cannot license a nominal-internal PG*

* Skol'ko_k Sabina zagruzila [_{t_k} fajlov], [obnaruž [_{___k} statej] pro
 how.many Sabine uploaded file.GEN.PL find.CNV article.GEN.PL about
 svjazyvanije]?
 binding

'What number x did Sabine upload x files, having found x articles about binding?'

Overall, these facts indicate that LBE cannot license nominal-internal PGs. This could be because LBE obligatorily triggers concealed pied-piping, or alternatively, this could be due to a ban the high-type traces that would be necessary for the interpretation of the relevant structures, as discussed in section 3.1 above.

10 Appendix B: Case Matching

As discussed in sub-section 6.2, Russian PGs are subject to a case matching requirement: a given element can only license a PG if its case matches the case that would be assigned in the position where the PG is interpreted. Section 6.1 showed some representative examples of this effect with genitive case, and here we'll demonstrate further with other cases.

In (61a) below, we see a verb that assigns dative case to its object, and in (61b), a verb that assigns accusative:

- (61) a. Ty pozvonil etomu studentu.
 you called this.DAT student.DAT
 'You called this student.'
 b. Ty obnaružil etogo studenta.
 you found this.ACC student.ACC
 'You found this student.'

In (62), we see that movement of a dative phrase, and LBE from a dative phrase, cannot license a PG in an accusative position:

(62) *Movement of /from a dative phrase doesn't license a PG in an accusative position*

- a. * Kakomu_k ty pozvonil [_{t_k} studentu], [ne obnaruživ _{___k} na seminare]?
 what.DAT you called student.DAT NEG find.CNV on seminar
 'What student did you call, not having found (that student) at the seminar?'
 b. * [Kakomu studentu]_k ty pozvonil _{t_k}, [ne obnaruživ _{___k} na seminare]?
 what.DAT student.DAT you called NEG find.CNV on seminar
 'What student did you call, not having found (that student) at the seminar?'

But pied-piping movement of an accusative phrase, or LBE from an accusative phrase, can license such a PG successfully:

(63) *Movement of /from an accusative phrase licenses a PG in an accusative position*

- a. [Kakogo studenta]_k ty otrugal *t_k*, [ne obnaruživ ____k na seminare]?
 what.ACC student.ACC you scolded NEG find.CNV on seminar
 ‘What student did you scold, not having found (that student) at the seminar?’
- b. Kakogo_k ty otrugal [*t_k* studenta], [ne obnaruživ ____k na seminare]?
 what.ACC you scolded student.ACC NEG find.CNV on seminar
 ‘What student did you scold, not having found (that student) at the seminar?’

11 Appendix C: Scope and LBE

Previous work on LBE in some other Slavic languages (Stjepanović, 2011; Despić, 2015, a.o.) has argued against an analysis of LBE as full movement of a noun phrase plus distributed deletion. One such argument comes from scope. For example, Despić observes that in Serbo-Croatian, a quantifier that has undergone LBE has the same scope (narrow) as a QP that has not moved. In contrast, overt scrambling of QP results in wide scope.

While the facts for Russian are complex, we observe that there are cases in Russian where the scope of a quantifier that has undergone LBE patterns with that of a moved QP. Examples (64-66) below illustrate this with the relative scope of negation and a QP. This is what we expect to occur, if LBE of a quantifier is really movement of the entire QP:

(64) *No movement*

Maša ne ljubit dvux kommentatorov.
 Masha NEG loves two commentators

OK: *two commentators* > ¬: There are two commentators that Masha doesn’t like. ?: ¬ > *two commentators*: It’s not the case that Masha likes two commentators (for example, when she watches the show she actually prefers that there would be only one commentator).

(65) *QP scrambling over negation*

[Dvux kommentatorov]_k Maša ne ljubit *t_k*
 two commentators Masha NEG loves

OK: *two commentators* > ¬: There are two commentators that Masha doesn’t like. OK: ¬ > *two commentators*: It’s not the case that Masha likes two commentators (for example, when she watches the show she actually prefers that there would be only one commentator).

(66) *LBE of quantifier over negation*

Dvux_k Maša ne ljubit [*t_k* kommentatorov].
 two Masha NEG loves commentators

OK: *two commentators* > \neg : There are two commentators that Masha doesn't like. OK: \neg > *two commentators*: It's not the case that Masha likes two commentators (for example, when she watches the show she actually prefers that there would be only one commentator).

However, further facts of this sort prove to be quite complex. For instance, as (67-69) below show, in scenarios with two QPs quantifier LBE results in narrow scope. However, both scrambling and a lack of movement result in scope ambiguity:

(67) *No movement*

Dva mal'čika uvideli každyj podarok
two boys saw every gift

OK: *two boys* > *every gift*: There are two boys who saw every gift. OK: *every gift* > *two boys*: For every gift, two boys saw it.

(68) *Lower QP scrambled over higher QP*

[Dva podarka]_k každyj mal'čik uvidel *t_k*
two gifts every boy saw

OK: *two gift* > *every boy*: There are two gifts that were seen by every boy OK: *every boy* > *two gifts*: For every boy, there were two gifts that he saw.

(69) *Q scrambled over higher QP*

Dva_k každyj mal'čik uvidel [*t_k* podarka]
two every boy saw gifts

*: *two gift* > *every boy*: There are two gifts that were seen by every boy OK: *every boy* > *two gifts*: For every boy, there were two gifts that he saw.

So while LBE can restrict possibilities for scope, it doesn't clearly pattern with scenarios without movement. More work on the semantics of Russian LBE is needed to understand these effects.

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