Non-local binding in Slavic languages and restructuring

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Non-local binding of anaphors is one of the most discussed issues in the theory of anaphora. The classical analysis, starting with Pica (1987), connects the variation in the binding possibilities with the type of the anaphor that enters the binding relation. I argue that Czech and Russian exhibit non-local binding of a different origin. Non-local binding in these languages arises because of variation in the architecture of infinitival clauses. More concretely, it is argued that infinitival clauses may lack PRO, and the absence of PRO makes non-local binding possible. This account is compared to the analysis of restructuring elaborated in Wurmbrand (2001).

1. Introduction

In the study of anaphora, the question of why the size of the binding domain seems to vary across languages is a matter of constant debate.

For example, the domain in which an anaphor is bound in English is stated in Chomsky (1981) as follows:

(1)　　An anaphor α is bound in its binding category, which is the minimal category containing α and a SUBJECT accessible to α (SUBJECTS (for clauses): NP in Spec,IP (TP nowadays) or subject AGR)

[after Chomsky 1981:220]

This definition of the domain correctly excludes binding of the anaphor in English cases like the following (the square brackets in the examples mark the binding category as it is defined in (1)):

(2)　　a.　*Lucie thought that [Max talked to herself]
　　　　b.　*Max allowed Lucie [PRO to talk about himself]

However, in many languages anaphors may be bound by an antecedent outside the binding category, as for example in Chinese:

(3)   Zhangsan$_i$ renwei [Lisi$_j$ zhidao [Wangwu$_k$ xihuan ziji$_{i,j,k}$]]
         Zhangsan thinks [Lisi knows [Wangwu likes   self]]
         'Zhangsan thinks that Lisi knows that Wangwu likes himslef/him.'

[Chinese, from Cole et al. 1990]

Russian is another example. Here the anaphor *svoj* is bound outside the infinitival clause (compare this with the English example (2-b)).[1]

(4)   Professor$_i$ poprosil assistenta$_j$ [PRO čitat'   svoj$_{i,j}$ doklad]
         professor asked   assistant   [PRO read$_{inf}$ self's report]
         'The professor asked the assistant to read his (=professor's or assistant's) report.'

[Russian, from Rappaport 1986:104]

The data from Chinese, Russian and other languages present clear counterexamples to a universal application of the binding theory as proposed in Chomsky (1981). The question is whether the differences in the binding possibilities of anaphors are accidental (which would seriously undermine any universal approach to binding) or follow from some independent factors. Pica (1987) was the first to observe that anaphors which may be non-locally bound have a series of properties in common: they are monomorphemic, subject-oriented, they may be non-locally bound in special syntactic environments only (for instance, infinitival clauses in Russian, subjunctive and infinitival clauses in Icelandic). These observations have inspired elaborate theories of binding which may look superficially different but share the assumption that the reason for the variation in the binding possibilities of anaphors stems from the interplay between the type of clause and the type of anaphor.

For the sake of concreteness, let us take two examples of binding theories. The first is a movement approach to non-local binding. Under this analysis (starting with Pica 1987; see also Cole et al. 1990, Cole & Sung 1994 or Cole et al. 2001), it is assumed that an anaphor that is head-like may rise into a higher binding category by head movement.[2] The head movement of the anaphor takes place at LF, feeds binding,[3] and is optional (since non-local binding is possible, not obligatory).

Another example of a theory of binding is the Relativized SUBJECT approach set up by Progovac (Progovac 1992; 1993; 1994). Progovac makes use of Chomsky's binding theory (see (1) above) but relativizes the notion SUBJECT to the type of the anaphor involved, in the spirit of Rizzi's Relativized Minimality (Rizzi 1990). When the anaphor is a head, the SUBJECT of its binding category is AGR (i.e., a head), when the anaphor is an XP, the SUBJECT of its binding category is the NP in Spec, IP (i.e., an XP). Null AGR nodes (that is, the AGR nodes of infinitival predicates or the AGR nodes of finite predicates in languages like Chinese) must create a chain with a higher AGR node. When this chain is created, the binding category is

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[1]For reasons to consider the Chinese case in (3) as an example of a bound anaphor rather than a pronoun, see Cole et al. (2001), for Russian, see Rappaport (1986).

[2]The notions head and phrase in this system refer to the internal structure of the anaphor, not to its external distribution. In other words, monomorphemic anaphors are considered heads, whereas anaphors which consist of more than one morpheme (as him-self) are considered phrases.

[3]Binding itself may be captured by the binding theory of Chomsky (1981) without any modification.

effectively broadened and the anaphor may be bound non-locally, i.e. apparently outside the binding category, as defined in Chomsky (1981). Notice that this is only true of head-like anaphors since only in these cases does AGR serve as the SUBJECT of the binding category.

In sum, both the movement approach and the relativized SUBJECT approach are able to derive the correlation between non-local binding and monomorphemic anaphors.[4] As a bonus, the Relativized SUBJECT approach also derives the fact that non-local binding of monomorphemic anaphors appears only when AGR is null (as is assumed in some analyses for Chinese, which lacks an overt agreement, or for infinitival clauses) or 'impoverished enough' (as Progovac 1994 assumes to be the case in subjunctive clauses in Icelandic).

The main point of this article is that there are cases of non-local binding that do not fit in an explanation that relates monomorphemic anaphors and non-local binding. To be sure, the main point is not that the LF head-movement or the Relativized SUBJECT approach fails to capture these instances of non-local binding. Rather, the point is that the rationale behind the theory fails in some cases. In the rest of this article, I try to show that in Czech and Russian, non-local binding is possible not because the anaphor is monomorphemic but because of the properties of the infinitival clause in which the anaphor is contained. It is argued that in infinitival clauses in Czech and Russian, the element that closes off the binding category, that is, PRO, can be omitted. Consequently, an apparent case of non-local binding arises.

2. Non-local binding in Czech and Russian

In Czech, there are three types of reflexive anaphors: the clitic form *se*, the personal form *sebe* 'self' and the possessive form *svůj* 'self's'.

Reflexive anaphors must be bound inside a finite clause:[5]

(5) Pavlína$_i$ Honzovi$_j$ dovolila aby [*pro* se / sebe / svou$_{*i,j}$ dceru lépe
     Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ that$_{3sg}$ [pro self$_{cl}$ / self / self's daughter better
     poznal].
     recognized$_m$]
     'Pavlina allowed Honza to get to know himself/his daughter better.'

However, when a reflexive anaphor appears in an infinitival clause, it may be bound by the subject of the higher clause:[6]

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[4]It remains a question if this is a good result. Notice that under Progovac's approach any monomorphemic anaphor should be a possible candidate for non-local binding. But, as Cole et al. (2001) note, it seems that monomorphemicity is a necessary but not sufficient condition for non-local binding. For example, German *sich* does not appear to have an internal structure but still must be bound locally.

[5]Abbreviations: nom=nominative, dat=dative, instr=instrumental, sg=singular, pl=plural, m=masculine, f=feminine, inf=infinitive, pass=passive, recipr=reciprocal, cl=clitic, aux=auxiliary.

[6]This does not hold of the clitic anaphor. I will turn to binding of the clitic anaphor shortly.

(6)   a.   Pavlína$_i$ Honzovi$_j$ dovolila [mluvit o   sobě$_{i,j}$].
             Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ [talk$_{inf}$ about self]
             'Pavlina allowed Honza to talk about herself/himsself.'
       b.   Pavlína$_i$ Honzovi$_j$ dovolila [zpívat svou$_{i,j}$ písničku].
             Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ [sing$_{inf}$ self's   song]
             'Pavlina allowed Honza to sing her/his song.'

These cases in which the reflexive anaphor is bound by the subject of the higher clause represent apparent counterexamples to Chomsky's binding approach given in (1). Of course, these facts are accounted for in the Relativized SUBJECT approach or the movement approach to non-local binding. The reflexive anaphors are monomorphemic (if we abstract away from the case ending), therefore they are possible candidates for non-local binding. As the Relativized SUBJECT approach expects, non-local binding should take place only in infinitival clauses since these are assumed to lack AGR that could block it.[7]

Nevertheless there is reason to believe that Chomsky's version of the binding theory can derive the non-local binding of anaphors in cases like these as well. The key assumption that we have to make is that the NP in Spec, TP, i.e., PRO in infinitival clauses, may be absent in infinitival clauses in Czech. Notice that this assumption gives us the right binding facts since now we have two types of infinitival clause; one with a PRO and one without. Only the former defines a binding category.

The two variants of an infinitival clause are exemplified in (7-a) and (7-b):[8,9]

(7)   a.   Pavlína$_i$ Honzovi$_j$ dovolila [PRO$_j$ zpívat svou$_{*i,j}$ písničku].
             Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ [PRO sing$_{inf}$ self's   song]
             'Pavlina allowed Honza to sing his song.'
       b.   [Pavlína$_i$ Honzovi$_j$ dovolila zpívat svou$_{i,*j}$ písničku].
             [Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ sing$_{inf}$ self's   song]
             'Pavlina allowed honza to sing her song.'

Let us put aside for a while the question of how the infinitival subject is interpreted in the absence of PRO, and concentrate on evidence that supports this view. The analysis presented here makes the prediction that once PRO is present in an infinitival clause, a reflexive anaphor must be locally bound. And in fact, once we establish that PRO is present, we can see that non-local binding of the anaphor is not possible.

There are two cases in which we have to assume that there is a PRO subject. First, PRO must be present to serve as the antecedent of reflexive anaphors.

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[7]See, for example, Progovac (1994) for this analysis of non-local binding in Russian, which does not seem to differ from non-local binding in Czech in any relevant respect. See also below.

[8]The question of what happens to the AGR node remains. Either it is absent entirely in infinitival clauses (Chomsky 1981, Progovac 1994) or it is absent when PRO is missing since otherwise the features of AGR would remain unchecked.

[9]From now on, I include PRO in the examples which are unambiguous and in which according to my analysis PRO *must* be present. Apart from the illustrative examples (7-a) and (7-b) I do not write ambiguous sentences twice from now on (once with PRO and once without). However, the reader should keep in mind that exactly this ambiguity is assumed in these cases.

Reflexive anaphors are subject-oriented in Czech. In example (8-a), the antecedent of the reflexive anaphor can be only *Pavlína*, the external argument and the subject of the clause. When the verb is passivized the external argument is realized as a PP and the internal argument becomes the subject of the clause. In that case, the internal argument becomes the only possible antecedent for the anaphor (8-b).[10]

(8)   a.   Pavlína$_i$ Honzu$_j$ políbila až   na své$_{i,*j}$ svatbě
           Pavlina$_{nom,f}$ Honza$_{acc,m}$ kissed$_f$ until on self's wedding
           'Pavlina didn't kiss Honza until her wedding.'
      b.   Honza$_j$ byl   políben Pavlínou$_i$ až   na své$_{*i,j}$ svatbě
           Honza$_{nom,m}$ aux$_{pass,m}$ kissed$_m$ Pavlina$_{instr,f}$ until on self's wedding
           'Honza was not kissed by Pavlina until his wedding.'

However, a reflexive anaphor in an infinitival clause may also be bound by the argument that controls the subject of the infinitival clause. This happens even in cases in which the controller is not the subject of a higher clause, as in the example (9) where the controller *Honzovi* bears dative case:

(9)   Pavlína$_i$ Honzovi$_j$ zakázala zpívat svou$_{i,j}$ písničku.
           Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ sing$_{inf}$ self's   song
           'Pavlina forbade Honza to sing her/his song.'

The generalization that reflexive anaphors are subject-oriented can be maintained only if we assume that it is not the controller of the infinitival subject that binds the reflexive anaphor in the cases like (9) but the infinitival subject itself, that is, PRO.

Recall that our approach suggests that non-local binding is possible because PRO can be omitted in the infinitival clause. However, as we have just shown, PRO must be present in the infinitival clause to bind a reflexive anaphor. Thus, we get the clear prediction that in case a reflexive anaphor is bound by PRO, another reflexive anaphor in the same infinitival clause cannot be non-locally bound anymore.

In the example below, the phrase *cpát do sebe* 'to stuff oneself' contains a reflexive anaphor which must be bound locally otherwise its meaning ('to eat') would be lost (instead, the phrase would mean 'to feed'). And precisely in this case, another reflexive anaphor in the same infinitival clause cannot be bound by the higher subject, even though that interpretation would be perfectly reasonable.

(10)   Pavlína$_i$ Honzovi$_j$ zakázala [PRO$_j$ cpát   do sebe$_j$ svůj$_{*i,j}$ nejlepší oběd
           Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ [PRO stuff$_{inf}$ into self   self's   best   lunch
           tak rychle].
           so quickly]
           'Pavlina forbade Honza to gorge himself on his best lunch so quickly.'

Furthermore, the reflexive clitic has to be bound locally in every case. Thus, we get the prediction that when the reflexive clitic appears in an infinitival clause, another reflexive anaphor must

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[10]To save space, I present only data with the possessive reflexive anaphor.

be interpreted locally as well. This prediction is borne out, as the example (11) shows. Notice that this example differs from example (9) only in the presence of the reflexive clitic *si*.[11]

(11)   Pavlína$_i$ Honzovi$_j$ zakázala [PRO$_j$ zpívat si$_j$ svou$_{*i,j}$ písničku].
         Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ [PRO sing$_{inf}$ self$_{cl}$ self's   song]
         'Pavlina forbade Honza to sing his song.'

A second reason to assume the presence of PRO stems from the morphology of secondary predicates.

Secondary predicates agree in case, number and gender with the noun they modify:

(12)   a.   Honza   se   smál   Pavlíně   opilý.
               Honza$_{nom,m}$ self$_{cl}$ laughed Pavlína$_{dat,f}$ drunk$_{nom,sg,m}$
               'Honza laughed at Pavlina being drunk.'
        b.   Honza   se   smál   Pavlíně   (opilé   / *opilá).
               Honza$_{nom,m}$ self$_{cl}$ laughed Pavlína$_{dat,f}$ (drunk$_{dat,sg,f}$ / *drunk$_{nom,sg,f}$)
               'Honza laughed at Pavlina while she was drunk.'

In the infinitival clause in (13), the secondary predicate that modifies the infinitival subject appears in nominative, even though the controller of PRO *Honzovi* is in a different case (dative):

(13)   Pavlína   Honzovi   zakázala [PRO lézt   na střechu opilý].
         Pavlína$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ [PRO climb$_{inf}$ on roof   drunk$_{nom,m}$]
         'Pavlina forbade Honza to climb up on the roof while he would be drunk.'
         Not: 'While Honza was being drunk Pavlina forbade him to climb up on the roof.'

The correlation between the case that the secondary predicate bears and the fact that only the infinitival subject is modified suggests that there is a PRO, which can license secondary predicates in nominative in the embedded infinitival clause. This reasoning holds at least for cases when the overt argument controlling PRO bears a different case (as is the case in (13)).

The prediction for our approach is that a secondary predicate modifying the subject of an infinitival clause must rule out non-local binding of a reflexive anaphor since the infinitival clause contains PRO in this case. And, in fact, this prediction is borne out:[12]

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[11]Even though the reviewers share the same judgments as in (9)-(11) for Slovenian, they claim that there are examples in which anaphors may possibly be bound by two distinct subjects:

(i)   Modni kreator$_i$ mi$_j$ je svetoval dat nase$_{*i,j}$ svojo$_{i,j}$ najnovejšo umetnino.
         fashion designer$_{nom,m}$ me$_{dat}$ aux advised$_m$ put on-self self's   newest   creation
         'The fashion designer advised me to put his/my newest creation on.'

[Slovenian]

Possibly, *nase* 'on self' is not understood as an anaphor any longer in this case. This is suggested by the fact that (at least in Czech) when *se* 'self' is substituted by, for example, an object 'someone', the idiomatic reading 'to dress' is lost. Instead, in that case the verbal phrase means literally 'to cover someone with his/my newest creation'. However, I did not test whether the same is true for Slovenian.

[12]As the reviewers pointed out to me the acceptability of non-local binding may depend on the position of the

(14)   Pavlína$_i$ Honzovi$_j$ zakázala [PRO$_j$ zpívat svou$_{*i,j}$ písničku opilý].
       Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ [PRO sing$_{inf}$ self's   song   drunk$_{nom,m}$]
       'Pavlina forbade Honza [to sing his song drunk].'

Notice furthermore that when a secondary predicate is licensed by the argument that controls PRO and not by PRO itself, a reflexive anaphor in the infinitival clause retains its ambiguity. In the example below, *drunk* is licensed by the overt argument since it agrees with it in case. The reflexive anaphor can be non-locally bound.

(15)   Pavlína$_i$ mi$_j$ opilému   zakázala zpívat svou$_{i,j}$ písničku
       Pavlina$_{nom,f}$ me$_{dat,m}$ drunk$_{dat,m}$ forbade$_f$ sing$_{inf}$ self's   song
       'While I was drunk, Pavlina forbade me to sing her/my song.'

Similar, but probably more convincing cases are represented by constructions in which the accusative argument, instead of the dative argument, controls PRO. In these cases, a secondary predicate that modifies the infinitival subject can surface either as nominative or as accusative.

(16)   Marie   naučila Honzu   chodit domů střízlivý   / střízlivého
       Marie$_{nom,f}$ taught$_f$ Honza$_{dat,m}$ go$_{inf}$ home sober$_{nom,m}$ / sober$_{acc,m}$
       'Marie taught Honza to come home sober.'

[from Przepiórkowski & Rosen to appear]

Following Przepiórkowski & Rosen (to appear), I assume that accusative case on a secondary predicate is licensed by the matrix internal argument (i.e., the controller of the infinitival subject). On the other hand, nominative case on a secondary predicate is licensed by PRO. The clear prediction that we arrive at is that only a secondary predicate in nominative should block non-local binding, whereas a secondary predicate in accusative should not. This prediction is

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secondary predicate. They claim that in the Slovenian examples below non-local binding is marginally possible when the secondary predicate follows the anaphor (i-a). On the other hand, when the secondary predicate precedes the anaphor, non-local binding is "at least strongly disfavored" (i-b).

(i)   a.   Modna kreatorka$_i$ mi$_j$ je prepovedala [PRO$_j$ nosit   svojo$_{?i,j}$ najnovejšo umetnino
           fashion designer$_{nom,f}$ me$_{dat}$ aux forbade$_f$ [PRO wear$_{inf}$ self's   newest   creation
           bos]
           barefoot$_{nom,m}$]
      b.   Modna kreatorka$_i$ mi$_j$ je prepovedala [PRO$_j$ bos   nosit   svojo$_{??i,j}$
           fashion designer$_{nom,f}$ me$_{dat}$ aux forbade$_f$ [PRO barefoot$_{nom,m}$ wear$_{inf}$ self's
           najnovejšo umetnino]
           newest   creation]
           'The fashion designer forbade me to wear ??her/my newest creation barefoot.'

[Slovenian]

I have no other explanation than that processing may be involved in these examples. In example (i-a) there is nothing that precludes non-local binding by the time the anaphor appears. Thus, I assume, non-local binding may be computed at this moment. This interpretation may be "remembered" even after the moment when the presence of the secondary predicate tells us that PRO must be present in the infinitival clause.

   On the other hand, in example (i-b), by the time the anaphor appears there is a clear hint that PRO is present in the infinitival clause. Non-local binding should be strongly degraded in this case, which seems to be true.

borne out:

(17)   a. Marie$_i$ nutila Honzu$_j$ [PRO$_j$ chodit bosý   ve svém$_{*i,j}$
            Marie$_{nom,f}$ forced$_f$ Honza$_{acc,m}$ [PRO walk$_{inf}$ barefoot$_{nom,m}$ in self's
            bytě]
            appartment]
            'Marie forced Honza to walk in his appartment barefoot.'
        b. ?Marie$_i$ nutila Honzu$_j$ chodit bosého   ve svém$_{i,j}$ bytě
            Marie$_{nom,f}$ forced$_f$ Honza$_{acc,m}$ go$_{inf}$ barefoot$_{acc,m}$ in self's   appartment
            'Marie forced Honza to walk in his/her appartment barefoot.'

To conclude the discussion of the Czech data so far, there are two cases in which the presence of PRO in the syntax seems necessary. The first case is when a reflexive anaphor is bound by the subject of the same infinitival clause. The second case is when a secondary predicate modifying the subject of an infinitival clause bears the nominative case even though the overt argument controlling the subject bears a different case. And as we have seen, non-local binding of a reflexive anaphor is impossible in both of these cases.[13]

Let us turn briefly to some Russian data. As is the case in Czech, the personal reflexive anaphor *sebe* and the possessive reflexive anaphor *svoj* must be bound inside the clause if the clause is not infinitival; if it is, they may be bound outside of it (Rappaport 1986). However, as in Czech, non-local binding becomes impossible when PRO is arguably present.

First, as in Czech, the reflexive anaphor is subject-oriented in Russian (Rappaport 1986). When a reflexive anaphor is bound by the infinitival subject, another reflexive anaphor appearing in the same clause must be bound locally, too. In the example below, the phrase *svojej žene* 'self's wife' refers to *Ivan*. On the other hand, the phrase *svoim mužem* 'self's husband' most

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[13]The impossibility of non-local binding can be obviated by movement of an anaphor into a higher binding domain. The reviewers notice that the matrix subject can bind an anaphor when the anaphor is scrambled across PRO into the matrix clause, as in (i):

(i)   Modna kreatorka$_i$ mi$_j$ je svojo$_{i,j}$ najnovejšo umetnino prepovedala [PRO$_j$ nosit   bos]
        Fashion designer$_{nom,f}$ me$_{dat}$ aux self's   newest   creation forbade$_f$ [PRO$_j$ wear$_{inf}$ barefoot]

        'The fashion designer forbade me to wear my/her newest creation barefoot.'

        [Slovenian]

This is similar to other cases in which movement of an anaphor creates new binding possibilities. Compare (the marginally acceptable) wh-movement of an anaphor from a finite clause, which enables binding by the higher subject (ii-a) and an example in which the anaphor stays in the lower clause (ii-b):

(ii)   a. ?O   který svý$_{i,j}$ knížce *pro$_i$* chceš aby   [Marie$_j$ mluvila]?
            About which self's book   pro want$_{2sg}$ that$_{3sg}$ [Marie$_{nom,f}$ talked$_f$]
            'Which of your/her books do you want Mary to talk about?'
        b. *pro$_i$* chceš   aby   [Marie$_j$ mluvila o   svý$_{*i,j}$ knížce]?
            pro want$_{2sg}$ that$_{3sg}$ [Marie$_{nom,f}$ talked$_f$ about self's   book]
            'Do you want Mary to talk about her book?'

naturally refers to *Maša*, which becomes impossible and the sentence is pragmatically ruled out.

(18) *Maša sovetovala Ivanu [PRO govorit' o svojej ženě so svoim
      Maša$_{nom,f}$ recommended$_f$ Ivan$_{dat,m}$ [PRO talk$_{inf}$ about self's wife with self's
      mužem]
      man]
      'Maša recommended Ivan to talk to her husband about his wife.'

[Russian]

Second, as in Czech, another reason to assume PRO can be found in the morphology of secondary predicates. Secondary predicates can agree in case with the argument they modify. However, in some special instances they may appear in the non-agreeing instrumental form. The non-agreeing form is available *only* when the secondary predicate modifies an argument that bears structural case – nominative or accusative. When an argument bears dative, the non-agreeing form of its secondary predicate is ruled out:

(19) Boris$_i$ sovetoval Saše$_j$ golym$_{i,*j}$
      Boris$_{nom,m}$ recommended Sasha$_{dat,m}$ naked$_{instr,m}$
      'Boris advised Sasha nude.' (Boris=nude)

[Russian, from Bailyn 2001:13]

Now, notice that a secondary predicate that appears in an infinitival clause and modifies its subject may result in instrumental (in many cases, actually, it has to). This happens even if the overt argument in the higher clause appears in dative, which suggests that it is not the higher argument that licenses this instrumental case. An empty argument that bears structural case such as the infinitival subject is clearly needed in these cases.

What is important for our discussion is that when a non-agreeing secondary predicate is present in an infinitival clause, a reflexive anaphor in the clause must be bound locally.

(20) *Maša sovetovala Ivanu [PRO govorit' trjeznym so svoim
      Maša$_{nom,f}$ recommended$_f$ Ivan$_{dat,m}$ [PRO talk$_{inf}$ sober$_{instr,m}$ with self's
      mužem]
      man]
      'Maša recommended Ivan to talk to her husband sober.'

[Russian]

I take it that these examples suggest that in Czech and Russian binding cannot cross the boundaries of an infinitival clause that contains PRO. This interpretation of the data needs nothing beyond Chomsky (1981)'s theory of binding.

Notice that cases in which non-local binding is excluded because of the presence of PRO are unexpected and unaccounted for in theories that connect non-local binding to the type of the anaphor. In both the Relativized SUBJECT and movement approach, non-local binding of anaphors is parametrized with respect to the type of the anaphor. Since we have dealt with the same anaphor and yet it could be bound outside an infinitival clause in some cases, whereas

in other cases it could not, the parametrization with respect to the anaphor does not seem a possible way to explain the whole range of data. The only alternative way to go is to employ the assumption from the Relativized SUBJECT approach that non-local binding of monomorphemic anaphors is blocked when the AGR node does not create a chain with a higher AGR node. As Progovac (1994) assumes the blocking takes place only when agreement is overt.

The Relativized SUBJECT approach could explain why the presence of secondary predicates in an infinitival clause blocks non-local binding since secondary predicates express agreement. However, it remains unclear under this approach why non-local binding is excluded when another anaphor in the same clause is bound by PRO. I repeat the relevant example:

(21)   Pavlína$_i$ Honzovi$_j$ zakázala [PRO$_j$ zpívat si$_j$ svou$_{*i,j}$ písničku].
           Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ [PRO   sing$_{inf}$ self$_{cl}$ self's   song]
           'Pavlina forbade Honza to sing his song.'

To capture example (21), Progovac would have to assume that after all, agreement does not need to be expressed overtly for AGR to be present and close off the binding category of an anaphor. This would represent a serious blow for her theory. In Progovac (1994), it is assumed that overt agreement may in some special cases result in AGR which does not close off the binding category. To explain the Czech and Russian data, one would have to add that no agreement may result in AGR that does close off the binding category. In sum, any correlation between agreement on a predicate and the size of the binding category would be lost. I consider this an unwelcome result because this correlation has found quite rich cross-linguistic support (see Progovac 1994).

Thus, instead of going the way of further parameterizing the Relativized SUBJECT approach, I assume that Russian and Czech anaphors must be bound in the local bidning domain as it is defined in Chomsky (1981). The very fact of apparent non-local binding stems from variation in the architecture of the infinitival clause in Czech and Russian.

Variation in the architecture of infinitival clauses has been explored by Wurmbrand (2001) as a way to explain the phenomenon of restructuring in German. The notion restructuring refers to the fact that a clause can become transparent for some processes that are normally clause-bound. For example, an argument can A-move across the boundaries of its infinitival clause. This is the case in example (22). Here, the internal argument of the infinitival verb surfaces as the subject of the matrix clause when the matrix verb is passivized. Wurmbrand (2001) argues at length that this case of long A-movement can take place only when the infinitival clause is realized as VP (i.e., it lacks the functional categories vP, TP, CP and PRO).

(22)   Der   Lastwagen und der   Traktor wurden zu reparieren versucht
           The$_{nom}$ truck   and the$_{nom}$ tractor were   to repair   tried
           'One tried to repair the truck and the tractor.'

On the other hand, long A-movement is ungrammatical in English:

(23)   *The truck was tried to repair.

Wurmbrand stipulates that this is the case because English does not have VP infinitives. The same stipulation must be exploited in the case of non-local binding. Czech and Russian show

non-local binding because they have PRO-less infinitives. Consequently, an anaphor inside the PRO-less infinitival clause may be bound outside it, i.e. apparently non-locally. On the other hand, English does not have non-local binding since it lacks PRO-less infinitives.

Notice that Wurmbrand (2001) assumes that long A-movement is possible only when all functional categories above VP are missing. This is connected with the way restructuring is constrained. Wurmbrand assumes that a clause can be deprived of its functional categories only when the functional categories are peeled off from the top down. The German case of long A-movement gives empirical support for this analysis. As Wurmbrand shows, an infinitival clause from which long A-movement takes place cannot license temporal adverbs or negation (which, in her analysis, require the presence of a T node).

On the other hand I have assumed so far that infinitival clauses that enable non-local binding lack only PRO. There is empirical support for this view. As we can see, non-local binding does not disappear when the infinitival clause hosts a temporal adverb (24-a)[14] or negation (24-b).

(24)   a.   Pavlína$_i$ Honzovi$_j$ zakázala zpívat zítra   na večírku svou$_{i,j}$
             Pavlina$_{nom,f}$ Honza$_{dat,m}$ forbade$_f$ sing$_{inf}$ tomorrow on party   self's
             písničku.
             song   drunk$_{nom,m}$
             'Pavlina forbade Honza to sing her/his song at the tomorrow's party.'
       b.   Dramatik$_i$ přikázal divadlu$_j$ neměnit   žádnou ze svých$_{i,j}$ her.
             Playwright$_{nom,m}$ ordered$_m$ theatre$_{dat}$ not-change$_{inf}$ none   of self's   plays
             'The playwright ordered the theatre not to change any of his plays.'

If the analysis of non-local binding is on the right track, this has some implications for the theory of restructuring. Concretely, the way that a clause is deprived of its functional categories should not be restricted only to top-down peeling. Unpleasant as it may seem, this conclusion is probably inescapable. The absence of certain functional categories appears to violate the top-down restriction in other cases, too: clitic climbing in Czech is impossible from a clause that has PRO, but is not degraded if the clause hosts a temporal adverb (Lenertová 2002). Therefore, for clitic climbing to take place, the infinitival clause must be realizable with T node but without PRO. I showed that the same holds of long-distance agreement in Czech (Dotlačil 2004).[15]

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[14]Notice that the matrix verb is in past tense, which is incompatible with the adverb *zítra* 'tomorrow'. Therefore, the temporal adverb must be hosted by the infinitival clause.

[15]There is another surprising fact that concerns the clause structure of the infinitival clause in case of non-local binding. Even though PRO is missing it is possible to have an argument in accusative (písničku 'song$_{acc}$' in (24-a)). Not only is this problematic for Wurmbrand's top-down peeling approach, but it also goes against one implication of Burzio's generalization: ACC → External argument. However, it has been noted before that Slavic languages have constructions that represent counterexamples to this implication of Burzio's generalization (Lavine 2000 for Ukrainian, Markman 2003 for Russian). Furthermore, the Russian constructions that are problematic for Burzio's generalization do appear in Czech, too. Thus, we might follow Markman (2003) who suggests to disassociate the introduction of the external argument and the assigning/checking of accusative (for Russian, but this may be extended to other Slavic languages).

Alternatively, one could assume that accusative is assigned/checked in the matrix clause in case the infinitival clause lacks PRO. One potential problem could be the following example in which the matrix clause has an accusative argument.

3.   *The interpretation of the subject*

Notice that in case of non-local binding, which requires the absence of PRO, the interpretation of the infinitival subject does not seem to differ from the cases in which PRO may/must be present. For example, the infinitival subject in (25) must refer to the same entity as the internal argument of the higher clause no matter whether the anaphor is interpreted as bound locally or non-locally. In other words, the interpretation of the subject is the same no matter whether PRO is present or not.

(25)   Pavlína$_i$ Honzovi$_j$ dovolila zpívat svou$_{i,j}$ písničku.
          Pavlina$_{nom,f}$ Honza$_{dat,m}$ allowed$_f$ sing$_{inf}$ self's   song
          'Pavlina allowed Honza to sing her/his song.'
          Not: 'Pavlina allowed Honza that anyone could sing her/his song.'

Clearly, theories in which the interpretation of the infinitival subject is mediated by PRO (Manzini 1983, Chomsky 1981) or, under different assumptions, by the subject trace (Hornstein 1999), are inapplicable to these cases if we want to keep to the presented analysis of non-local binding. A different approach is needed.

To explain these facts, I follow Wurmbrand (2001) and Wurmbrand (2002)'s elaboration on Chierchia (1984).

Chierchia (1984) suggests that the interpretation of the infinitival subject is a lexical property of the predicate that selects the infinitival clause. To know the meaning of, for instance, the verb *force* means, among other things, to know that the subject of its infinitival clause must be co-referential with its internal argument. Technically, Chierchia achieves this result by loading the lexical meaning with appropriate meaning postulates. For example, the lexical meaning of the verb *force* includes the following meaning postulate (the capital letter Z represents a property variable, M_a stands for the modal frame that control predicates select; it specifies the type of the modal relation (in this case, necessity) and the conversational background to which the modal relation is relativized (in this case, deontic modality)):

(26)   [force'(Z, x, y) $\leftrightarrow$ M$_a$ Z(x)]
          (y forces x to do Z iff in all the situations compatible with what y imposes on x, x does Z).

By application of such meaning postulates we get the right interpretation for the subject of the embedded infinitival clause if its reference is exhausted by one of the arguments of the predicate that selects the infinitival clause. Exactly in these cases we expect that PRO may be missing and non-local binding may arise; the right interpretation of the infinival subject is determined

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(i)   a.   Marie$_i$ mě$_j$ nutila zpívat svou$_{i,j}$ písničku
                    Marie me$_{acc}$ forced sing$_{inf}$ self's   song$_{acc}$
                    'Marie forced me to sing her/my song.'

To licence the embedded accusative argument, the matrix clause would have to be able to check/assign accusative more than once, even in case the two accusative arguments have conflicting Φ-features (see Anagnostopoulou 2003 for arguments that more goals can agree with the same head only if the goals do not have conflicting Φ-features).

by the meaning postulate.[16] However, notice that PRO does not *need* to be missing. In fact, it must be present in many cases exactly because of the reasons discussed in section 2 (i.e., local binding of reflexive anaphors or the presence of secondary predicates in nominative (in Czech) or instrumental (in Russian)). This means that the meaning postulate allows the absence of PRO but does not require it, which is the result Wurmbrand arrives at in discussing VP infinitives in German. In other words there are cases in which both PRO and the meaning postulate guarantee a reference to the infinitival subject. As Wurmbrand suggests, we can imagine this as some kind of a checking mechanism: PRO, if present, bears a reference which must match the meaning postulate, otherwise a semantically anomalous sentence arises.

In addition to these cases, there are cases in which the meaning postulate cannot ensure the right interpretation of the infinitival subject. The infinitival subject can bring a reference of its own which is not exhausted by one of the arguments of the matrix predicate. In these cases PRO must be present. In our application that means that non-local binding should be ruled out. This is borne out, as we are about to see.

The first relevant case concerns partial control (27-a) and (27-b) - i.e., the infinitival subject denotes a superset of the reference set of the controller (see Landau (2000) for a thorough analysis). In examples (27-a) and (27-b), the superset denotation of the infinitival subject is controlled for by a collective predicate in the infinitival clause. Since collective predicates require more than one entity,[17] and the controller in both examples denotes one entity, the controllee (i.e., the infinitival subject) must be a superset of the reference set of the controller.

Another case is a split control (27-c) - i.e., the infinitival subject denotes the union of two arguments in the matrix clause.

(27) a. Já se   chci sejít   dneska odpoledne.
          I se_{recipr} want $meet_{inf}$ today   afternoon
          'I want to meet today in the afternoon.'
      b. Ředitel upřednostňuje sejít   se   ve škole.
          Director prefer $meet_{inf}$ se_{recipr} in school
          'The director prefers to meet today at school.'
      c. Pavlína$_i$ mi$_j$ navrhla [PRO$_{i+j}$ jít   do Prahy společně].
          Pavlina me suggested [PRO go_{inf} into Prague together]
          'Pavlina suggested to me to go to Prague together.'

In both cases non-local binding should be excluded. The data seem to point in this direction:

(28) a. ??Já$_i$ se   nechci   [PRO$_{i+}$ sejít   ve svém pokoji].
          I se_{recipr} not-want [PRO $meet_{inf}$ in self's room]
          'I do not want to meet in my room.' (intended)

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[16]Notice that this suggests that binding of anaphors takes place before the semantic representation. The same conclusion is arrived at in Reinhart & Reuland (1993) for English.

[17]In other words, this sentence is out:

(i)   *Petr se   sešel dneska odpoledne.
          Petr se_{recipr} met   today   afternoon
          '*Petr met today in the afternoon.'

b. ??Ředitel upřednostňuje sejít   se   ve své   pracovně.
   Director prefer   meet$_{inf}$ se$_{recipr}$ in self's office
   'The director prefers to meet in his office.' (intended)

c. Pavlína$_i$ mi$_j$ navrhla   [PRO$_{i+j}$ jít   společně do svého$_{*i,?i+j}$ pokoje].
   Pavlina me suggested [PRO   go$_{inf}$ together into self's   room]
   'Pavlina suggested to me to go together into (?our) room.'

Finally, in still other cases of control the interpretation of the infinitival subject cannot be included in the meaning postulate of the matrix predicate simply because the matrix predicate does not select either the controlling argument – i.e., arbitrary or long-distance control –, or it does not select the infinitival clause – i.e., adjunct control. Neither of these cases exists in Czech but arbitrary and adjunct control do exist in Russian. Both types disable non-local binding, as has been noted in the literature before. I present adjunct control only:

(29)   Ja poprosil ego absoljutno vse den'gi otdat'   prežde čem [PRO prodat' svoj
          I asked   him absolutely all money give$_{inf}$ before what [PRO sell$_{inf}$ self's
          dom]
          house]
          'I asked him to turn over asbolutely all the money before selling his/*my house.'

[Russian, from Rappaport 1986:110]

The loss of non-local binding in these cases is unexpected in the head movement approach or Relativized SUBJECT approach.

   Putting aside (28-a)-(28-c), one could suggest that the impossibility of non-local binding in example (29) follows in the movement approach from head movement constraint. The complementizer *prežde čem* 'before what' is quite likely realized in C^0 of the infinitival clause. The anaphor cannot skip C^0 on its way into the higher clause. Presumably, the complementizer cannot move into the higher clause along with the anaphor, either; therefore, the movement of the anaphor and consequently non-local binding is excluded in (29).

   Notice that this works only under the assumption that excorporation of heads is prohibited. However, the movement approach to non-local binding assumes that anaphors may excorporate. In fact, this assumption is clearly needed because non-local binding can normally skip heads like verbs or aspectual markers in Chinese and other languages (see, among others, examples in Cole & Sung 1994). In sum, the fact that the most embedded infinitival clause contains an overt complementizer does not help the movement approach explain why non-local binding is impossible in this clause.

   The Relativized SUBJECT approach can exclude non-local binding only in case agreement is present. As far as I can see, there is no reason to assume a different agreement for the adjunct infinitival clause and the complement infinitival clause to explain the absence of non-local binding in (29). Or, similarly, it is hard to see how an agreement could differ in the cases of exhaustive control and partial or split control ((28-a) and (28-c)).

   On the other hand, our analysis predicts these distinctions since in the cases (28-a) to (29)

the meaning postulate cannot replace PRO, hence PRO cannot be omitted and consequently, non-local binding is precluded.

4. Conclusion

It may be worth pointing out what this paper did not try to achieve, instead of what it did. It did not try to present a novel approach to non-local binding that is superior to the previous approaches. Something along the lines of the relativized SUBJECT approach or the movement approach to non-local binding is clearly needed to account for cases in which an anaphor may be bound outside of the clause that contains the overt subject, as, for instance, in this Chinese example repeated from above:

(30)   Zhangsan$_i$ renwei [Lisi$_j$ zhidao [Wangwu$_k$ xihuan ziji$_{i,j,k}$]]
         Zhangsan thinks [Lisi knows [Wangwu likes   self]]

I see no way to account for this case without any modification in Chomsky (1981)'s binding theory. In view of these data, some kind of parametrization of the binding theory is required.

In fact, there are reasons not to exclude a parametrization of anaphora in Czech either. Recall that reflexive clitics cannot be non-locally bound (see (11) above). This is unexpected if their binding category would be defined in the same way as the binding category of other reflexive anaphors. Clearly, another restriction on binding of reflexive clitics must be included.[18,19]

However, it seems to be the case that not all instances of apparent non-local binding can be explained by the parametrization of the binding theory itself. I have argued that Czech and Russian represent the cases in which non-local binding follows from the varying architecture of the infinitival clause rather than anything else. Once one bears this in mind, apparent non-local binding in Czech and Russian becomes local and therefore no longer represents an exception to Chomsky (1981)'s binding theory.

The main point is that there may be more variables in play that determine binding possibilities in languages. Whereas the parametrization of anaphors is well-studied, the parametrization of clauses in connection with the study of binding is quite unknown. However, even the latter parametrization may find empirical support, as I tried to show.

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[18]Notice, however, that the parametrization that connects non-local binding and monomorphemicity does not fare better in this case since reflexive clitics are clearly monomorphemic. Progovac (1993) suggests that the connection between monomorphemicity and non-local binding does explain why reciprocals in Russian, which are polymorphemic, must be bound locally. This is quite probably caused by the independent factor that reciprocals generally do not participate in non-local binding, which is more obvious when one considers Czech instead of Russian. In Czech, the anaphor *sebe* is ambiguous between a reflexive and reciprocal reading. Under non-local binding, the reciprocal reading disappears (see also Reinders-Machowska 1991 for the same facts in Polish).

[19]This parametrization cannot be stated in [+/-local] because all instances of binding are local in Slavic, as I tried to show. One possible way would be to implement Reinhart & Reuland (1993)'s theory in which syntactic and semantic predicates are distinguished for the purposes of binding. Unlike other reflexive anaphors, reflexive clitics would have to be bound locally in the *semantic* predicate.

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