Repair-driven object shift and case resolution in Lithuanian

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Abstract

In two types of infinitival clauses in the VO-language Lithuanian (purpose infinitives and infinitives embedded under motion verbs), the direct object exceptionally surfaces to the left of the verb and bears a non-canonical case value (dative and genitive, respectively). This exceptional object shift is not observed when the infinitive contains a lexical verb that assigns an inherent case to its object that is more oblique than the case associated with the respective infinitival type. Existing analyses (Franks and Lavine, 2006; Arkadiev, 2014) cannot explain this link between obliqueness level and obligatoriness vs. non-availability of object shift. We develop a new cyclic analysis of the phenomenon that incorporates the strengths of both previous approaches while avoiding their weaknesses. In this analysis, both the local verb and a higher C-head in the structure assign different case values to the object of the infinitive (multiple case assignment), with the subsequent linearization procedure at PF being sensitive to a case hierarchy, resulting in different outcomes depending on the specific case values the object happens to bear. In order to receive case from the higher head, the object undergoes repair-driven movement up to the edge of the infinitival vP (PIC-accessibility); however, the linearization procedure may render this displacement covert, depending on the particular case values of the object. We draw additional evidence for the cyclic approach from structures with stacked infinitives, which neither one of the previous analyses mentions.

1 Introduction

1.1 Transitive infinitives in Lithuanian

Lithuanian is, discourse-neutrally, a VO language with structural accusative objects in basic transitive clauses (Ambrazas, 2006; Dambriūnas et al., 1998; Ramonienė and Pribušauskaitė, 2008; Ramonienė et al., 2019). For information-structural purposes, extensive scrambling may take place, but the basic unmarked placement of a direct object is post-verbal:[1,2]

(1) Aldon-a piešia gėl-es.
PN-SG.NOM draw.PRS.3 flower-PL.ACC
'Aldona draws flowers.'

Accordingly, transitive infinitives in Lithuanian also typically appear with accusative objects in the discourse-neutral VO order (Ambrazas, 2006; Dambriūnas et al., 1998):

(2) a. Mokausi [piešti gėl-es].
learn.PRS.1SG draw.INF flower-PL.ACC

[1] Unless indicated otherwise, the examples in this paper come from the authors' work with L1 consultants. The consultants speak the capital variety of Vilnius (3 speakers) and several closely related West High Lithuanian (Bacevičiūtė et al., 2004; Zinkevičius, 1994) varieties from around the cities of Kaunas (1 speaker), Tauragė (2 speakers) and Marijampolė (2 speakers).

[2] We make use of the following abbreviations: 1 – first person, 3 – third person, ACC – accusative, DAT – dative, GEN – genitive, INF – infinitive, INS – instrumental, NOM – nominative, PF – phonological form, PL – plural, PN – personal name, POSS – possessive, PRS – present tense, PST – past tense, SG – singular

'I am learning to draw flowers.'

b. Mano brolis mėgsta [kirpti plauk-us].
1SG.POSS brother like.PRS.3 cut.INF hair-PL.ACC
'My brother likes to cut hair.'

If a transitive infinitival clause is embedded under a verb of motion, the word order in the embedded clause becomes OV and the case of the embedded object is obligatorily genitive, not accusative (Ambrazas, 2006; Dambriūnas et al., 1998). This behavior is illustrated in the example below (see section 1.3 on variation with respect to (3-b)).

(3) a. Senel-is eina [karv-ės/*-ę melžti].
grandfather-SG.NOM go.PRS cow-SG.GEN/-SG.ACC milk.INF
'Grandfather is going/walking to milk the cow.'

b. *?Senel-is eina [melžti karv-ę].
grandfather-SG.NOM go.PRS milk.INF cow-SG.ACC
'Grandfather is going/walking (there) to milk the cow.'

Note that, in (3), the genitive cannot be quantificational (partitive) because of the definite interpretation of the DP. In this article, we will be consistently using DPs with a definite reference in all examples with the genitive in order to distinguish it from quantificational genitive constructions often used with indefinites (Ambrazas, 2006; Ramonienė and Pribušauskaitė, 2008).

A similar pattern with a leftward object shift is observed in purpose infinitives, the only difference being that the case that shows up on the shifted object is now dative, not genitive:

(4) a. Šis prietais-as yra [karv-ei/*-ę melžti].
this.SG.NOM device-SG.NOM be.PRS.3 cow-SG.DAT/-SG.ACC milk.INF

b. *Šis prietais-as yra [melžti karv-ę].
this.SG.NOM device-SG.NOM be.PRS.3 milk.INF cow-SG.ACC
'This device is for milking a/the cow.'

To summarize, as the examples in (3) and (4) show, in both purpose infinitives and infinitives embedded under motion verbs, the object of the infinitive shifts to the left of the verb and shows up with a non-canonical case value. This object shift accompanied by non-standard case assignment constitutes the main focus of this article. While the application of the object shift does not depend on the semantics of the embedded verb, the pattern presented above is further complicated when the verb of the embedded infinitive is an inherent case assigner, as discussed in the following subsection.[3]

1.2 Infinitives with inherent case

With some transitive verbs in Lithuanian, the object surfaces with an inherent case value (often linked to the semantics of the verb). The oblique cases that may be assigned to a verb's object are genitive, dative and instrumental:

[3] We use the notion "inherent case" here merely to indicate that the case differs from the default ("structural") accusative typically showing up on transitive objects in Lithuanian. Further connotations that often accompany the notion "inherent", such as preservation under passivization, may be problematic for Lithuanian (see Anderson 2015; Sigurðsson et al. 2018; Šereikaitė 2020 for discussion) and do not play a role in the present article.

(5) a. Mokausi ši-o amat-o.
learn.PRS.1SG this-SG.GEN trade-SG.GEN
'I am studying this trade/profession.'
b. Tėv-ai man padeda.
parent-PL.NOM 1SG.DAT help.PRS.3
'(My) parents are helping me.'
c. Slaugytoj-a rūpinasi ligoni-u.
nurse-SG.NOM take.care.PRS.3 patient-SG.INS
'The nurse takes care of the patient.'

If an infinitive embedded after a motion verb or used in a purpose clause assigns one of these three cases to its object, the aforementioned object shift takes place only if the genitive or dative case specific for the respective infinitival type is more oblique than the inherent case assigned by the verb, adhering to the obliqueness hierarchy in (6) (cf. Marantz 1991; Blake 1992; Grosu 1994; Caha 2009).[4, 5]

(6) Nom < Acc < Gen < Dat < Ins

Thus, in constructions with motion verbs, if the embedded verb assigns inherent genitive, dative or instrumental case value to its object, then object shift does not take place, and the object shows the case assigned to it by the local verb. This is because only the accusative case is less oblique than the genitive associated with the construction. In the examples below, the checkmarks indicate sentences with a successful object shift, while the crosses refer to its absence.

(7) a. Einu [t-ų gėli-ų piešti] / *[piešti t-as gėl-es].
go.PRS.1SG that-PL.GEN flower-PL.GEN draw.INF draw.INF that-PL.ACC flower-PL.ACC
'I am going (somewhere) to draw those flowers.' ✔ [Gen > Acc]
b. Einu [mokytis matematik-os] / *[matematik-os mokytis].
go.PRS.1SG learn.INF math-SG.GEN math-SG.GEN learn.INF
'I am going (somewhere) to learn math.' ✘ [Gen = Gen]
c. Einu [padėti močiut-ei] / *[močiut-ės padėti].
go.PRS.1SG help.INF grandma-SG.DAT grandma-SG.GEN help.INF
'I am going (somewhere) to help (my) grandma.' ✘ [Gen < Dat]
d. Einu [rūpintis vaik-ais] / *[vaik-ų rūpintis]
go.PRS.1SG care.INF child-PL.INS child-PL.GEN care.INF
'I am going to take care of the children.' ✘ [Gen < Ins]

In purpose infinitives, regular accusative verbs and verbs with inherent genitive are subject to object shift because both of these cases are less oblique than the dative case associated with the construction:

(8) a. Štai teptukas [gėl-ėms piešti] / *[piešti gėl-es].
here brush flower-pl.dat draw.INF draw.INF flower-PL.ACC
'Here's a brush for painting flowers.' ✔ [Dat » Acc]

[4] The locative and vocative cases are excluded from this hierarchy because they are never assigned to objects of verbs.

[5] It should be noted that the dichotomy between inherent and structural case, insofar as it is relevant for the present work (see footnote 3), is orthogonal to the obliqueness hierarchy in (6). Thus, all that (6) is intended to express is that a case further to the right in (6) is more oblique than a case further to the left.

b. Čia prietaisas [metal-ui ieškoti] / *[ieškoti metal-o].
here device metal-SG.DAT seek.INF seek.INF metal-SG.GEN
'This is a device for searching for metal.' ✔ [Dat » Gen]

c. Įtaisė specialią sistemą [padėti akl-iesiems] / *[akl-iesiems padėti].
built.in special system help.INF blind-PL.DAT blind-PL.DAT help.INF
'They built in a special system to help the blind.' ✘ [Dat = Dat]

d. Stato ligoninę [rūpintis vaik-ais] / *[vaik-ams rūpintis].
build.PRS.3 hospital care.INF child-PL.INS children-PL.DAT care.INF
'They are building a hospital to care for children.' (Arkadiev, 2014) ✘ [Dat « Ins]

To sum up, the examples in (7) and (8) show that, if the case assigned by a given verb is the same or more oblique than the one appearing in either one of the two infinitival constructions, the object is not shifted across the verb and the case associated with the particular infinitival type does not surface.[6]

1.3 Variation in infinitives after motion verbs

In Standard Lithuanian, the judgement given for (3-b) is deprecated. However, for most speakers of contemporary casual Lithuanian, (3-b) is as grammatical as (3-a) (Ambrazas, 2006; Franks and Lavine, 2006; Arkadiev, 2014). Thus, it seems as if the relative ranking of the accusative and genitive cases along the case hierarchy were subject to fluctuation, even within the grammatical systems of individual speakers.

We will show in the analysis how this variation can be accounted for (see section 1.3). For now, note that dative is always ranked strictly higher than both genitive and accusative (which explains why there is no variation in purpose infinitives), and instrumental is always more oblique than dative.

1.4 Stacked infinitives

Interestingly, the possibility of having a shifted genitive object disappears entirely if another infinitive intervenes between a verb of motion and the most embedded infinitive. More precisely, the genitive case on the object is not possible, and the object may not shift to the left of either the first infinitive or both infinitives (in discourse-neutral non-emphatic utterances, i.e. utterances without scrambling performed for information-structural purposes):

(9) a. Einu [pamėginti [iškepti kepsn-į]].
go.PRS.1SG try.INF bake.INF roast-SG.ACC

b. *Einu [pamėginti [kepsni-o iškepti]].
go.PRS.1SG try.INF roast-SG.GEN bake.INF

c. *Einu [kepsni-o pamėginti [iškepti]].
go.PRS.1SG roast-SG.GEN try.INF bake.INF
'I am going (there) to try to bake the roast.'

[6] The judgements in Franks and Lavine (2006) and Arkadiev (2014) partially differ from the ones we elicited. One source for these differences might lie in the fact that the patterns (especially the construction after motion verbs) are currently rapidly evolving in the language, as mentioned by both descriptive grammars and the theoretical literature. We address these issues in more detail in sections 3.3 and 3.4.

It should be mentioned that Franks and Lavine (2006) also deal with object shift in the context of exceptional nominative assignment, which is only possible under a non-agreeing matrix verb. All of our consultants judged this construction as outdated, not belonging to the grammar of contemporary Lithuanian. Therefore, we are not going to address it in detail here (cf. also Arkadiev 2014, 50, 80, footnote 29). Suffice it to say that the construction with exceptional nominative could be incorporated into our analysis by assuming that a non-agreeing matrix verb may only select for an embedded infinitive entirely lacking the capacity to assign accusative case.

A similar pattern is observed in purpose infinitives. As the examples in (10) illustrate, the object cannot shift across either one or both verbs in neutral contexts and cannot surface in the dative case (in any context).

(10) a. Iššovė [pabandyti [išgąsdinti žmon-es]].
shoot.PST.3 try.INF scare.INF person-PL.ACC
b. *Iššovė [pabandyti [žmon-ėms išgąsdinti]].
shoot.PST.3 try.INF person-PL.DAT scare.INF
c. *Iššovė [žmon-ėms pabandyti [išgąsdinti]].
shoot.PST.3 person-PL.DAT try.INF scare.INF
'(S)he shot in order to try to scare the people.'

Thus, for both infinitival constructions, object shift and non-canonical case assignment to the embedded object of an infinitive are only possible when the infinitive is embedded immediately under a finite verb.

2 Previous analyses

2.1 Franks & Lavine (2006)

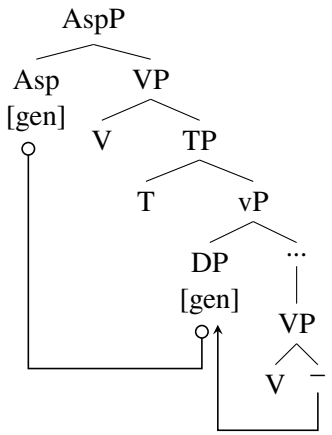
In Franks and Lavine (2006), the explanation of the exceptional object shift relies on the claim that the v-head of the embedded infinitive sometimes fails to assign accusative case to the object. Still, the object bears a case feature that requires to be valued. As a "last resort" (Franks and Lavine, 2006, 242-244), the object then moves to a specifier of vP to be able to receive a case value from a higher functional head that is yet to be introduced into the structure (see Bošković 2007; cf. also Heck and Müller 2000). It is this dislocation of the object that is directly responsible for its pre-verbal position linearly. Technically, object shift to Specv is a necessary precondition for case assignment to the object because vP is a phase in the sense of Chomsky (2000, 2001, 2008). If the object were to remain in it base position, within the domain of the phase head v, then, due to the Phase Impenetrability Condition, it could not be targeted by any syntactic operation that is related to a functional head outside vP.

(11) Phase Impenetrability Condition (PIC):
If Ψ is a phase with head H, then the complement of H (the "domain") is not accessible for operations involving a position outside Ψ. Only H and its specifiers (the "edge") are accessible for such operations.

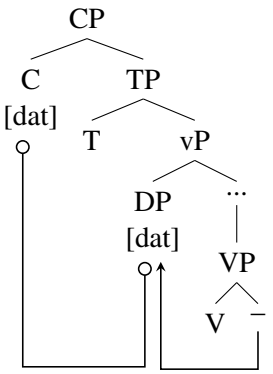
The object would then fall victim to the Case Filter (Vergnaud, 1977). Object shift avoids this by repairing the defect that otherwise would lead to a Case Filter violation.

According to Franks and Lavine's account, the two infinitival constructions differ structurally. In infinitives embedded under verbs of motion, the embedded structure is a TP (crucially, not a phase) and is selected for by the motion verb. Genitive case is assumed to be assigned to the object of the embedded verb that has undergone object shift to (an outer) Specv by an aspectual head in the matrix clause, as shown in (12). As for purpose infinitives, Franks and Lavine (2006) assume them to be CPs adjoined to the matrix vP, i.e. they have one more layer compared to infinitives embedded under motion verbs. Dative case is assigned by the C-head of the embedded clause itself, whose v-head, once again, does not assign accusative case to the object. This is illustrated in (13).

(12)



(13)



While we think that the general idea by Franks and Lavine (2006) that object shift is a last resort operation whose application is related to case assignment is an attractive one, there are nevertheless several aspects of the analysis that seem to us to be problematic (cf. also Arkadiev 2014, 60-61 for pertinent remarks).

First, since Franks and Lavine (2006) claim that the infinitival v-head optionally assigns accusative case to the object, the analysis predicts the $O_{GEN}V$ structure to always be in free variation with the regular VO_{ACC} pattern, depending on which flavor of the v-head is present in the numeration for a given derivation. If the v-head of the embedded verb does not assign accusative, object shift takes place and the object gets the case assigned by the Asp-head of the matrix clause. If the embedded v does assign accusative to the object, no object shift takes place and the Asp-head does not assign its case. Thus, the analysis does not account for the pattern in Standard Lithuanian (and the dialects it is based on), where object shift under motion verbs is obligatory (modulo the cases where the infinitival verb assigns inherent case that is more oblique than the genitive).

Second, the obligatoriness of the $O_{DAT}V$ pattern in purpose infinitives is accounted for by Franks and Lavine (2006) by assuming that the dative case on the C-head of the embedded clause is closely linked to the purpose semantics of the infinitive. As such, dative case needs to be realized overtly. For the dative to be successfully assigned, it is required that the derivation choose a v-head without accusative case, resulting in the object being forced to move to Specv. The analysis does not, however, present an explicit theory of the requirement that dative case in purpose infinitives must be realized. In this respect, their theory remains vague. In fact, there is reason to believe that no such requirement on the realization of dative case in purpose clauses exists in Lithuanian. Namely, intransitive verbs and verbs with inherent case other than dative are perfectly fine in purpose infinitives although no dative case shows up on the surface, see, for instance, (8-d).

Third, the idea of object shift being a "last resort" operation should be understood against the background assumption within the Minimalist Program that all movement must be feature-driven (Franks and Lavine 2006, 242-243), which is usually assumed to be enforced by a principle called Last Resort (Chomsky 1995):

(14) Last Resort (LR):
Movement must be licensed by feature checking.

As already mentioned above, object shift is not available in Lithuanian in discourse-neutral contexts other than purpose infinitives and infinitives embedded under motion verbs. This suggests that object shift, as it shows up in these infinitives, cannot be feature-driven (Franks and Lavine 2006, 265-266), or otherwise one would expect it to be generally possible. Thus, it can be assumed to violate Last Resort. Moreover, such a violation is possible, apparently, because object shift is a repair that exceptionally applies in reaction to a

situation that otherwise would lead to a Case Filter violation as the object would remain without a case value. While it seems to us that the gist of the analysis is interesting, it is clear that the concept of "last resort" is not formalized in Franks and Lavine (2006). Rather, the above mentioned properties of the repair analysis are simply left implicit. Below, we suggest that a precise and explicit execution of the idea is possible, and thus to be preferred. It requires violability and ranking of grammatical constraints. We return to this issue in section 3, where our proposal is presented.[7]

Fourth, for structures with intervening infinitives Franks and Lavine's analysis makes a prediction that is not borne out. Reconsider the examples in (9). If the v-head that is associated with the most deeply embedded infinitive in (9) does not assign accusative to its object, the latter will move to the edge of the vP-phase as a last-resort in order to be able to receive case later on. Since the intermediate verb *(pa)mėginti* 'try' does not select for a DP but for a vP, it is probably also not a case assigner. With the way the last-resort operation is conceptualized by Franks and Lavine (2006), there is nothing that prevents object shift from taking place once more, this time targeting Specv of the next higher infinitive. Finally, when the motion verb is merged, the object will receive genitive case from the matrix Asp-head, resulting in the unattested output (9-c), here repeated in (15), with a genitive object placed before both infinitives.

(15) *Einu [kepsni-o pamėginti [iškepti]].
go.PRS.1SG roast-SG.GEN try.INF bake.INF
'I am going (there) to try to bake the roast.'

Finally, Franks and Lavine (2006) do not address the variation seen with verbs that assign inherent case values to their objects, as discussed in section 1.2. As it stands, their analysis predicts that infinitives headed by such verbs should never involve object shift because the object always receives a case value within the vP. We have seen, however, that the picture is more complicated in that the presence versus absence of object shift depends on the relative obliqueness of the two case values assigned within and outside vP.

2.2 Arkadiev (2014)

In the analysis proposed by Arkadiev (2014), various functional heads along the clausal spine assign different cases to DPs within their respective c-command domains. Often, this results in DPs located lower in the structure having multiple case values. In contrast, the uppermost DP (the external argument) typically has only one case value.

To be more concrete, for instance, Arkadiev (2014) assumes that the infinitival T-head selected by motion verbs is a special flavor of T (called $T_{[SUP]}$, Arkadiev 2014, 86), bearing a genitive case feature. $T_{[SUP]}$ assigns genitive case to its vP-sister. From there, the genitive percolates down, ending up on any argument DP contained within vP. Crucially, in Arkadiev's analysis, the v-head of the embedded infinitive always assigns regular accusative case to the object (unlike what was the case in the proposal by Franks and Lavine 2006). In this way, the object of an infinitive embedded under a motion verb ends up with at least two case values: accusative case from the embedded v-head and genitive case coming from $T_{[SUP]}$. In a similar vein, the C-head of a purpose infinitive has the particular capacity to assign dative case ($C_{[PURP]}$). Since Lithuanian does not permit case stacking, its grammar incorporates, by assumption, a set of resolution rules for DPs with multiple case values, deciding which case will be realized morphologically. In contrast to our findings, the rules given in Arkadiev (2014) do not systematically reflect the case hierarchy in (6).[8]

[7] In fact, we will suggest in section 3.1 that it is actually not Last Resort that is violated by object shift but rather the Inclusiveness Condition (Chomsky 1995). This issue, however, is merely a technical one, and it does not change the fact that constraint violability as such is required.

[8] The observation noted in section 1.3 that there is some fluctuation between the genitive-accusative order along the hierarchy

To summarize, the theory of Arkadiev (2014) has certainly its merits: It offers a simple approach to syntactic case assignment (different flavors of v are not needed, multiple case assignment is possible) and also provides a set of resolution rules for morphological case realization.

A first shortcoming of Arkadiev's analysis is that the theory does not seem to allow to directly relate the patterns discussed in section 1.2 above, which emerged in our study, to the case hierarchy in (6). Rather, in Arkadiev (2014) the rules of case resolution are basically stated in an arbitrary way.

Second, it is, in our view, a more significant weakness of Arkadiev (2014) that non-canonical case assignment and object shift are decoupled in the analysis (as opposed to the analysis in Franks and Lavine 2006). In fact, Arkadiev (2014, 66, 82-83) explicitly argues against any connection between object shift and case assignment in the grammar of contemporary Lithuanian. Consequently, the analysis has nothing to say as to why the object often appears in a position to the left of the verb in the infinitives under discussion. While this move may be motivated by the fact that in some cases object shift does not apply (in contexts where the inherent case assigned by the infinitival verb is more oblique than the case assigned by the higher functional head, or for speakers that generally allow for VO-word order in the infinitives under discussion, see footnote 6), it appears to us that fully separating object shift from case assignment, i.e., for speakers of all varieties, means throwing the baby out with the bathwater. With respect to the patterns that we elicited from our consultants, what one would ideally like to have is a theory that maintains the connection between object shift and case while at the same time offering an explanation as to why overt object shift does not apply in each and every case.

Finally, note that Arkadiev does not incorporate any locality theory for case assignment that could possibly serve as a motivation for the application of object shift (see, in particular, Arkadiev 2014, 74, 82). A consequence of this is that the approach faces a substantial problem when it comes to constructions with multiple embedded infinitives, one stacked on the top of the other. Namely, the fact that case assignment by any functional head may apply all the way down directly leads to the consequence that this kind of uninhibited case assignment would easily transcend any intervening infinitival vP. All things equal, Arkadiev (2014) thus predicts that genitive and dative objects (shifted or not) should be possible in the two constructions in focus even if another infinitive intervenes, contrary to the empirically observed facts (recall the examples with the intervening infinitival verb 'try' in (9)).

3 The proposal

We now present our analysis of object shift and case assignment in Lithuanian. The proposal incorporates important insights from both Franks and Lavine (2006) and Arkadiev (2014). At the same time, it strives to avoid their shortcomings mentioned above. In particular, our proposal offers an explicit analysis of the last-resort nature of object shift in terms of repair-driven movement. And it solves the puzzle that object shift sometimes applies and sometimes not, depending on the position of the two competing cases on the case hierarchy in (6). The idea is that object shift always applies (if a higher case is to be assigned), but this is reflected only in some scenarios by overt movement. In other scenarios, object shift is covert (in the sense of Bobaljik 2002), which follows from a cyclic syntax-phonology mapping ("cyclic spell-out").

We start with a brief sketch of the core idea of the analysis in section 3.1. In sections 3.1.1 and 3.1.2, respectively, we introduce our assumptions about cyclic optimization and repair-driven object shift. Sections 3.1.3 and 3.1.4 then address some theoretical assumptions about case features, cyclic spell-out, and case

axis may cover some of the differences between the observations in Arkadiev (2014) and in the present paper. See section 3.3 below for some discussion.

resolution at PF. Finally, we present detailed derivations that illustrate the analysis of both types of infinitival constructions in a step-by-step fashion in sections 3.2–3.5.

3.1 Background assumptions and sketch of the proposal

Building on the object-raising account put forth in Franks and Lavine (2006) and juxtaposing it against the novel data set presented in Section 1.2, we propose the following generalization:

(16) Object raising asymmetry generalization:
In Lithuanian infinitival clauses, the object moves across the verb and displays the case value assigned to it by a higher functional head iff this case value is more oblique than the one assigned locally within the infinitival vP. Otherwise, the object is pronounced in its base position with the local case value.

In Section 2, we have seen that neither one of the existing two analyses provides a comprehensive explanation for why this generalization holds. It is thus our main objective to account for the pattern described in (16).

3.1.1 Cyclic optimization

We presuppose a derivational model of syntax (Chomsky, 1995) interleaved with optimization prodedures (Prince and Smolensky, 1993, 2004). This idea has already been employed in a spectrum of existing work (Müller 2000*a*,*b*; Fanselow and Ćavar 2001; Heck and Müller 2000; **?**, 2007; Fischer 2002, 2004; Assmann et al. 2015), under slightly different assumptions pertaining to the size of the domains that are subject to optimization. In the present work, we assume that the optimization procedures apply at the phase level (assuming that vP and CP are phases, Chomsky 2000, 2001).

Following standard assumptions in Optimality Theory, the generator component of the grammar takes lexical items from the numeration and performs the two basic syntactic operations, Merge (including Move) and Agree. Gen is not severely restricted and may take different paths while performing or not performing various operations. Whenever a set of output candidates instantiating a cyclic projection (vP or CP) has been generated, two crucial events take place in the following order. (a) The candidate set is subject to an optimization in narrow syntax which filters out the optimal output candidate. This optimal output candidate then serves as the basis of subsequent structure-building steps of the generator component, until the numeration is exhausted. (b) The complement of the cyclic head of each optimal output candidate is transferred to the interface to phonology (Epstein et al. 1998; Uriagereka 1999; Chomsky 2000, 2001). There, it serves as the input of another optimization procedure, which, again, involves generation and filtering, but this time with respect to another set of ranked constraints.

Our main focus on the syntactic side of optimization lies in the proper analysis of repair-driven object shift. In contrast, optimization at the phonological interface is concerned with chain reduction and case resolution.[9]

3.1.2 Object shift

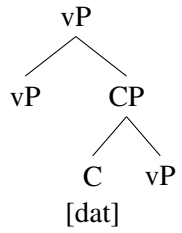
For the sake of argument, we assume that both infinitival types are CPs, with the C-head of a purpose infinitival clause bearing a dative case feature (17-a) and the C-head of an infinitival clause embedded under a motion verb bearing a genitive case feature (17-b).[10] This is largely in keeping with Arkadiev (2014), except

[9] Arkadiev (2014) already envisages an approach to case resolution in terms of optimization.

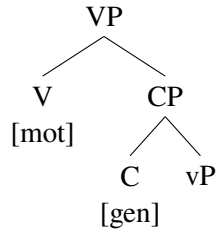
[10] See Arkadiev (2014, 60) for some criticism of Franks and Lavine's assumption that genitive case in infinitives after motion verbs is assigned by an aspectual head.

for the fact that the projections in this work are TPs. The CP of the C-head associated with a purpose infinitival may be adjoined to a variety of verbal projections, while the other type of infinitival CP is selected for specifically by motion verbs, as in Franks and Lavine (2006).

(17) a.



b.



Unlike Franks and Lavine (2006) (and following Arkadiev 2014), we assume that the embedded infinitive always assigns case normally to its object, be it a structural accusative (via *v*), and, in some cases, some oblique case (via V). Moreover, we adopt the insight of Franks and Lavine (2006) that object shift applies in order to make the object accessible to the case assigned by a higher functional head. Moreover, we assume (again following Franks and Lavine 2006) that such object shift is repair-driven, i.e., applies as a last-resort operation.

To this end, one may take the conclusion reached in section 2.1 at face value that repair-driven object shift violates Last Resort. A theory that embraces constraint violability is Optimality Theory (McCarthy and Prince 1993, Prince and Smolensky 1993, 2004, Smolensky and Legendre 2006). However, there is some reason to believe that object shift is feature-driven after all. Namely, in double object constructions, object shift of the direct object may not cross the indirect object (18-b). Rather, in such a scenario both objects have to shift (18-a):

(18) a. Važiuojame [Jonuk-ui pinigin-ės grąžinti].
go.PRS.1PL Jonuk-SG.DAT wallet-SG.GEN return.INF
'We are going to return the wallet to John.'

b. *?Važiuojame [pinigin-ės grąžinti Jonuk-ui].
go.PRS.1PL wallet-SG.GEN return.INF Jonuk-SG.DAT
'We are going to return the wallet to John.'

This situation is reminiscent of object shift in Scandinavian. As observed in Vikner (1989), shifting a lower pronominal object over a higher object in Danish is impossible (19-a). Instead, both objects must undergo object shift, which is only possible in Danish if both are weak pronouns (19-b).

(19) a. *Peter viste den jo Marie.
Peter showed it indeed Marie
'Peter indeed showed it to Marie.'

b. Peter viste hende den jo.
Peter showed her it indeed
'Peter indeed showed it to her.'

This makes sense if one assumes that movement of the lower object across the higher one is blocked by minimality (Ferguson 1993, 1996; Chomsky 1995; also Rizzi 1990; Fanselow 1991). In the probe-goal framework, minimality constrains relations between probe and goal, i.e., it involves feature-checking. Thus, if object shift in Lithuanian is subject to minimality, it should involve feature checking.

Yet, object shift in Lithuanian has the signature of a repair, i.e., it is an operation that does not apply in general (as it does in Danish with respect to weak object pronouns) but only exceptionally so as to avoid greater damage. It thus appears to incur certain costs, which block its application in a context where it is not enforced. These costs can be expressed in terms of constraint violation. We conclude from this that there must be a constraint that is violated by object shift, although this constraint is not Last Resort. We would like to propose that the constraint in question is one that militates against the presence of an EPP-probe on v, the probe being responsible for object shift in Lithuanian. Thus suppose that repair-driven object shift is triggered by a probe which, in Lithuanian, is not an inherent property of v but rather gets inserted on v in the course of the derivation as a repair (cf. Řezáč 2011). Such probe-insertion arguably violates the Inclusiveness Condition (Chomsky 1995), a version of which is given in (20).

(20) Inclusiveness Condition (IC):
Morpho-syntactic features must enter the derivation by Merge of a lexical item.

Now, even in Optimality Theory, violations of grammatical constraints by well-formed outputs do not come for free. Rather, they must be enforced by the need to avoid violations of higher ranked constraints. In contrast to Franks and Lavine (2006), we do not assume that the driving force behind object shift is the need to avoid a violation of the Case Filter.[11] Instead, we would like to suggest that the higher ranked constraint in question is a variant of the principle Phase Balance, proposed in Heck and Müller (2000); **?**. The version of Phase Balance relevant here, which is relativized to case-related object shift, is given in (21).[12]

(21) PhaseBalance (PB):
For every case-probe in the next lexical subarray, there must be a different accessible case-goal at the current phase.

(22) Accessibility:
A goal G is accessible at the current phase Ψ if a) or b) holds:
a. G is probed by an EPP-feature on the head of Ψ.
b. G is part of the next lexical subarray.

The notion of lexical subarray is adapted from Chomsky (2000). The idea is that a phase Ψ is associated with a collection of those lexical elemens that are needed to construct Ψ. This collection is called the lexical subbary of Ψ. Somewhat departing from Chomsky (2000), we assume that once a phase Ψ is under construction, its subarray has become part of the workspace of the derivation. If this happens, the subarray associated with the next higher phase is formed, and can be inspected by Phase Balance even though elements in this subarray cannot be used by structure-building operations yet.

Suppose that the current phase Ψ under construction is vP. This means that the lexical material needed for the construction of the next higher phase, presumably a CP, has been collected in the next subarry. If the C-head in this subarray carries a case-probe, then PB requires that there be an accessible case-goal within Ψ (= vP). If there is no case-goal as part of the subarray associated with CP (22-b), then accessibility can only be ensured (and thus PB be satisfied) if v bears an EPP-feature probing for a case-goal within v's VP-complement. Ultimately, such EPP-probing will lead to movement of an object within vP to Specv.[13] We

[11] This is hardly an option, given our assumption that the object will at least always receive structural accusative.

[12] In contrast, the definition of Phase Balance in Heck and Müller (2000); **?** is tailored to fit the needs of a repair-driven analysis of long distance Ā-movement. An interesting question is in what way the differences between the two definitions of Phase Balance may be derivable from independent differences between A- and Ā-movement. We have to leave this for future research.

[13] We assume that the bare EPP-probe inserted in Lithuanian has the capacity to attract all the case-goals in its search space (cf.

follow the usual assumption that the EPP-probe on v requires movement in order to be satisfied. Probe satisfaction is ensured by the constraint in (23) (Chomsky 1995):

(23) Feature Condition (FC):
Probes that find a goal to enter into Agree with must be satisfied.

If v does not bear an EPP-probe as a lexical property, as we assume to be the case in Lithuanian, then such a probe must be inserted on v in order to be able to satisfy PB. Such probe-insertion violates the IC, but assuming that the IC is a violable constraint and that PB is ranked higher than the IC, this violation is enforced and not fatal.

3.1.3 Case features and case assignment

We assume that case assignment is the consequence of a probe-goal interaction in the sense of Chomsky (2000, 2001).[14] The operation in question here is Agree. Agree applies between probe and goal if and only if the probe c-commands the goal. As for case assignment, the case probe is valued and the case goal is unvalued. Application of Agree between probe and goal results in valuation of the goal (if possible).

Following Arkadiev (2014), we take it that a transitive v always bears a case probe that is capable of valuing a yet unvalued case goal as accusative. Furthermore (again, in line with Arkadiev 2014), we assume that one and the same argument can serve as a goal for multiple case probes (multiple case assignment, McCreight 1988; Béjar and Massam 1999; Merchant 2006; Richards 2013). We implement this idea in the following manner.

First, we assume that the cases of Lithuanian (structural and oblique) in (24) are decomposed into abstract features as follows:[15]

(24)

	Nominative	$+\alpha$	$-\beta$	$-\gamma$	$-\delta$	$-\epsilon$
	Accusative	$+\alpha$	$+\beta$	$-\gamma$	$-\delta$	$-\epsilon$
	Genitive	$+\alpha$	$+\beta$	$+\gamma$	$-\delta$	$-\epsilon$
	Dative	$+\alpha$	$+\beta$	$+\gamma$	$+\delta$	$-\epsilon$
	Instrumental	$+\alpha$	$+\beta$	$+\gamma$	$+\delta$	$+\epsilon$

Note that the values of the case features in (24) are not freely distributed. A positively valued feature entails positive values on all the features to its left. For instance, $[+\gamma]$ is not a licit value without $[+\alpha, +\beta]$. Thus, in terms of the positive values of the above features, the cases in (24) represent a cascade of subset-superset relations. The set of positively valued features of a more oblique case always forms a superset of the set of positively valued case features of a less oblique case. This allows to encode the case hierarchy in (6) directly

the notion of an "unsatiable" probe in Deal 2015, 2024), thus accounting for cases of multiple object shift such as in (18-a).

[14] Without further discussion, we will not be pursuing the idea of configurational case assignment (Marantz, 1991; Stiebels, 2002; McFadden, 2004; Baker and Vinokurova, 2010; Baker, 2015).

[15] Two alternative ways of expressing multiple case assignment would involve a) the existence of multiple case features on one argument, or b) case overwriting. A thourough discussion of these alternatives is beyond the scope of this article. We would like to make the following brief remarks here. Option a) complicates the theory as one must deal with two different case resolution scenarios: one between case values on different copies of the same argument, and one between different case values on one and the same copy of an argument. Option b) encounters the problem that it is possible that information about a more oblique case may get lost in the course of the derivation, i.e., hierarchy effects can hardly be modeled. Empirically, however, it appears that less oblique (typically structural) cases cannot overwrite more oblique ones (e.g., Fanselow 2000; Woolford 2001).

into the case features themselves (see Caha 2009, 2013, 2024; Georgi and Salzmann 2017; Himmelreich 2017; McFadden 2018; Smith et al. 2019; Zompì 2019; Christopoulos and Zompì 2022).

We further assume that any case goal on a D-head comes from the lexicon with all its features negatively valued. Case assigment by feature valuation then means to provide the features of the case goal with one or more positive values, depending on the number of positively valued case features on the probe. Thus, a case-assigning probe has at least one positively valued feature (i.e. $[+\alpha]$ in the case of a nominative assigning head), and it will provide as many features of the goal with a positive value as it can. In contrast, negative values on the probe do not have any effect. If the set of positively valued features on a probe forms a (improper) subset of the positively valued features of a goal, then the probe will ignore the goal (i.e., Agree is not established) and search for the next goal within its c-command domain.[16] As we will se later, this asumption allows us to avoid certain cases of apparent minimality violations.

To illustrate, suppose that an object has been assigned accusative by v ($[+\alpha, +\beta]$). At a later point, it enters into Agree with a higher functional head that bears a genitive case probe ($[+\alpha, +\beta, +\gamma]$). As a consequence, the feature $[-\gamma]$ on the goal will be valued $[+\gamma]$, thus becoming genitive. Alternatively, suppose that an object has already been assigned inherent dative case ($[+\alpha, +\beta, +\gamma, +\delta]$). When v is merged, it will search for an appropriate goal within its c-command domain. Since the set of the object's positively valued case features forms a superset of the set of v's positively valued case features ($[+\alpha, +\beta]$), the probe ignores the goal.[17]

3.1.4 Case resolution and chain reduction

We now present our assumptions about the mechanics of the interface to phonology. Two further background assumptions are important here: a) the copy-theory of movement (Chomsky 1995), and b) the idea that the interaction between syntax and phonology/morphology is organized cyclically (e.g., Bresnan 1971, 1972; Epstein et al. 1998; Uriagereka 1999; Simpson and Wu 2002; D'Alessandro and Scheer 2015). The main aspects relevant here are the following.

First, we follow the hypothesis that movement leaves behind a copy of the moved item (Perlmutter 1972; Chomsky 1995; Corver and Nunes 2007). Typically, a movement chain involves only one copy that is phonetically realized. We assume that the following high-ranked constraint is responsible for this phenomenon of "chain reduction" (Nunes 1995). The constraint applies at the interface to phonology (see below for details) to the effect that only one of the multiple copies of any movement chain ends up being realized phonetically.[18]

(25) Chain Reduction (CR):
Let $\langle c_1, \ldots, c_n \rangle$ be a movement chain with n copies. Then only one of the copies in $\langle c_1, \ldots, c_n \rangle$ is marked for realization.

Second, we assume that the mapping from syntax to phonology is a cyclic two-step procedure (see Fowlie 2013). Every phase is a cyclic domain. Once a phase has been completed, the complement of the current phase head is first mapped onto a representation of phonological form (PF) by a process called Transfer (Chomsky 2000, 2001). This renders the internals of the complement inaccessible for the syntax. By assumption, PF is a hierarchically organized representation that is the result of mapping syntactic structure

[16] Note that the definition of the FC in (23) implies that there is no Inverse Case Filter (Bošković, 2002; Řezáč, 2004). In other words, if a case probe fails to enter Agree with any goal, the FC is not violated (cf. Béjar 2003; Preminger 2014).

[17] The same logic allows the direct object in (18-a) to enter into case-agreement with the higher genitive case probe across the dative-marked indirect object.

[18] Nunes (1995) proposes to derive chain reduction from properties of feature checking. Here, we treat Chain Reduction as a primitive of the theory.

onto prosodic categories (Selkirk 2006, 2011).[19] At PF, the linearization algorithm marks the copies of a movement chain that will ultimately be phonetically realized when the PF-representation is later given to the phonology by a process called Spell-Out. Copies that remain unmarked for realization (due to CHAIN REDUCTION) will not receive an interpretation in the phonology.

To illustrate this procedure, suppose the derivation has constructed a transitive infinitival vP, and the object has undergone object shift in the syntax. Thus, there is an upper copy of the object in Specv and a lower copy within VP. Both copies bear the case value α that the object has received in its base position.[20] Since vP is complete, the complement of v, i.e. VP, is tranferred to PF, rendering the internal structure of VP opaque (26-a).[21]

(26) a. Syntax: [$_{vP}$ DP$_{[case:\alpha]}$ V-v *VP*]
b. PF: [$_{VP}$ V $\underline{\text{DP}_{[case:\alpha]}}$]

The structure transferred to PF only comprises the lower copy of the object. PF must now decide whether the lower copy should be marked for realization in the phonology. Since there is only one copy available, there is no choice. The lower copy is marked for realization by default, see (26-b).[22]

The derivation continues in narrow syntax. Suppose that the higher copy of the object receives a second case value β from a higher functional head, say C. At some point, the complement of C (say a TP) is transferred to PF. When this happens, the PF-representations of VP and TP are put together. The resulting PF-representation now contains both copies of the object, with only the lower one being marked for realization so far, see (27-b).[23]

(27) a. Syntax: [$_{CP}$ C *TP*]
b. PF: [$_{TP}$ T [$_{vP}$ DP$_{[case:\ \beta]}$ V-v [$_{VP}$ V $\underline{\text{DP}_{[case:\ \alpha]}}$]]]

Since there are two copies available in the representation at hand, it has to be decided which one will be realized on the surface. To this end, the PF-derivation compares the case features of the two copies of the object. By assumption, there is a (family of) PF-constraint(s), each of which demanding that a particular positive value of a case feature matrix ω must receive an overt reflex (cf. Fanselow 2000; Woolford 2001).[24, 25]

(28) REALIZE CASE([+ω]) (RC([+ω])):
A case feature [+ω] on a DP must be marked for realization.

Suppose that the case value β on the higher DP-copy is more oblique than the case value α on the lower DP-copy. All things equal, it now follows from the set-up of the case-feature decomposition in (24) and from

[19] For reasons of simplicity, we retain syntactic categories as labels of PF-representations. And in fact, our proposal requires that at least some morpho-syntactic information, in particular case values, be accessible at PF.

[20] The value α may either be structural accusative or some inherent case.

[21] In what follows, transferred categories will be indicated by slanted printing.

[22] Categories marked for realization appear underlined.

[23] The assumption that cyclic domains that are transferred separately must be put back together later is not a property holding specifically for the present approach. Rather, it is a logical necessity resulting from the interaction of cyclic Transfer and chain reduction (cf. Fujii 2007).

[24] We assume that the constraint (family) in (28) requires realization of a DP with case. This is a slight simplification. In fact, (28) merely requires realization of a case feature and may therefore be satisfied by an overt case affix. However, assuming that such an affix is contingent on an overt host, (28) de facto implies realization of the whole DP.

[25] Importantly, every copy of a DP-chain is assumed to be subject to (28).

(28) that β will prevail over α, no matter the ranking of the different instantiations of RC($+\omega$) involved. To see this, consider the following scenario. Let there be a chain involving two copies $\langle c_1, c_2 \rangle$, where the case of the lower copy c_1 is $[+\alpha, +\beta]$ (accusative) and the case of the higher copy c_2 is $[+\alpha, +\beta, +\gamma]$ (genitive). Since the former case is a proper subset of the latter, it follows that the set of RC-constraints violated by a PF-output candidate that fails to realize the copy bearing genitive is a superset of the set of RC-constraints violated by a PF-output candidate that fails to realize the copy bearing accusative. In other words, no matter the relative ranking of RC([$+\alpha$], RC([$+\beta$]), and RC([$+\gamma$]), the PF-output candidate that marks the more oblique case for realization harmonically bounds the PF-output candidate that marks the less oblique case for realization. This is shown in the following tableau, where PF_1 harmonically bounds PF_2 (and PF_4):[26, 27]

(29)

input: $DP_{[+\alpha,+\beta,+\gamma]} \ldots \underline{DP_{[+\alpha,+\beta]}}$	CR	RC([$+\alpha$])	RC([$+\beta$])	RC([$+\gamma$]))
☞ PF_1: $\underline{DP_{[+\alpha,+\beta,+\gamma]}} \ldots DP_{[+\alpha,+\beta]}$		*	*	
PF_2: $DP_{[+\alpha,+\beta,+\gamma]} \ldots \underline{DP_{[+\alpha,+\beta]}}$		*	*	*!
PF_3: $\underline{DP_{[+\alpha,+\beta,+\gamma]}} \ldots \underline{DP_{[+\alpha,+\beta]}}$	*!			
PF_4: $DP_{[+\alpha,+\beta,+\gamma]} \ldots DP_{[+\alpha,+\beta]}$		**(!)	**(!)	*(!)

Obviously, PF-output candidate PF_3, which does not violate any RC-constraint as it realizes both copies violates the high-ranked constraint CR.

Before we continue, we would like to introduce a convention that allows for a more compact display of case representations. From now on, we will abbreviate a case feature matrix $M = [+\omega_1, \ldots, +\omega_n]$ as $[+\omega_n]$.[28] Recall that due to the case decomposition in (24) the presence of $[+\omega_n]$ in M implies the presence of $[+\omega_1, \ldots, +\omega_{n-1}]$ in M. Therefore, the abbreviated notation does not suffer from any loss of informativity as compared to the more elaborate notation.

Returning to the discussion, note that a scenario where the lower copy bears a more oblique case (say $[+\alpha, +\beta, +\gamma, +\delta]$) and the higher copy bears a less oblique case (say $[+\alpha, +\beta, +\gamma]$) cannot arise. This is because multiple case assignment does not involve literal overwriting under the present assumptions. Rather, it merely involves turning negative feature values into positive ones (but not the other way round). As a consequence, the higher copy of a shifted object will always have at least as many positive feature values as (i.e., is at least as oblique as) the lower copy. In particular, if the case assigned by a functional head in a lower case domain is more oblique than the case assigned by a functional head in a higher case domain, then both copies of an object moving from the lower case domain to the higher one will bear the same case, namely the one assigned in the lower domain. This leads to the question as to how the issue of chain reduction is resolved in such a scenario.

According to the generalization in (16), it is the lower copy that is realized under these conditions in Lithuanian. As for the theoretic interpretation, we would like to claim that here the cyclic nature of the approach becomes important.[29] Since it was decided at an earlier cycle to mark the lower copy for realization (recall (26-b)), deciding at the current cycle that the higher copy is to be realized entails a revision of the previous decision: Only one copy may be realized. Again, we assume that such a revision incurs certain costs for the

[26] In what follows, "*!" stands for a fatal violation, "*(!)" for a violation that is fatal provided a particular ranking.

[27] Depending on further details, it may be the case that PF-output candidate PF_4 is also banned for reasons of recoverability.

[28] For instance, accusative case on a DP is now abbreviated as [$+\beta$], genitive case as [$+\gamma$], etc.

[29] According to the Cyclic Principle (Chomsky 1965), rules of grammar must apply in more inclusive domains before they apply in less inclusive ones. In the present context, the relevant rule is the process that marks categories for PF-realization.

derivation. Concretely, these costs are interpreted as a violation of a constraint called *Revise as defined in (30).

(30) *Revise (*Rev):
PF-marking for realization must not be undone.

Since in the above scenario both copies bear the same set of positively valued case features, they exhibit the same constraint profile with respect to the RC-family. Thus, under these conditions it is up to *Rev to decide which PF-output candidate is optimal.[30] All things equal, the PF-output candidate that revises the decision made at an earlier cycle is harmonically bounded by the PF-output candidate that retains this decision, leading to realization of the lower copy.[31] This is illustrated by tableau (31), where PF_1 is harmonically bounded by PF_2, assuming that the lexical verb assigns inherent dative case to the object (i.e., $[+\alpha, +\beta, +\gamma, +\delta]$, now abbreviated as $[+\delta]$).

(31)

input: $DP_{[+\delta]} \ldots \underline{DP_{[+\delta]}}$	CR	RC($[+\alpha]$)	RC($[+\beta]$)	RC($[+\gamma]$)	RC($[+\delta]$)	*Rev
PF_1: $\underline{DP_{[+\delta]}} \ldots DP_{[+\delta]}$		*	*	*	*	*!
☞ PF_2: $DP_{[+\delta]} \ldots \underline{DP_{[+\delta]}}$		*	*	*	*	
PF_3: $\underline{DP_{[+\delta]}} \ldots \underline{DP_{[+\delta]}}$	*!					
PF_4: $DP_{[+\delta]} \ldots DP_{[+\delta]}$		**(!)	**(!)	**(!)	**(!)	

Returning to the first scenario discussed above, where the higher copy bears a more oblique case than the lower copy, it is clear that *Rev must be ranked below at least one RC-constraint that requires realization of a feature that is part of the more oblique case but not part of the less oblique case. This is necessary in order to have the intended effect that the higher copy with the more oblique case is realized. Tableau (32), which is a modified version of tableau (29), illustrates:

(32)

input: $DP_{[+\gamma]} \ldots \underline{DP_{[+\beta]}}$	CR	RC($[+\alpha]$)	RC($[+\beta]$)	RC($[+\gamma]$)	*Rev
☞ PF_1: $\underline{DP_{[+\gamma]}} \ldots DP_{[+\beta]}$		*	*		*
PF_2: $DP_{[+\gamma]} \ldots \underline{DP_{[+\beta]}}$		*	*	*!	
PF_3: $\underline{DP_{[+\gamma]}} \ldots \underline{DP_{[+\beta]}}$	*!				
PF_4: $DP_{[+\gamma]} \ldots DP_{[+\beta]}$		**(!)	**(!)	*(!)	*

In the remainder of this section, we provide a formal step-by-step account of how infinitival clauses with (overt or covert) object shift and non-canonical case assignment in Lithuanian are derived.

[30] This is an instance of what McCarthy and Prince (1994) call "emergence of the unmarked."

[31] Looking at movement chains more generally, it is clear that more than often it is not the lower of two copies that is overtly realized but the higher one (see Nunes 1995), even in Lithuanian. Therefore, there must be constraints outranking *Rev, which favor the realization of the higher copy. Identifying these constraints is a task that goes beyond the scope of this article. One can speculate, however, that such constraints would make reference to a probe (e.g., [wh], [D], or [ϕ]) that is associated with the EPP-feature that triggers the movement in question. Given that in the case of repair-driven object shift we are dealing with a bare EPP-feature (not accompanied by any such probe), it would follow that constraints favoring the higher copy are satisfied vacuously and therefore do not interact with *Rev.

3.2 The derivation of purpose infinitives

We begin with purpose infinitives. As for the syntax, suppose the derivation has already constructed an (infinitival) vP, the object of which receives either structural or inherent case (by v or V, respectively). Since the infinitive at hand is a purpose infinitive, the subarray containing the material for the next higher phase, the CP, comprises a C-head bearing a case probe $[+\delta]$ (dative). Since the subarray does not also contain a case goal, PB can only be satisfied by making the vP-internal object accessible via EPP-probing. This requires the insertion of an EPP-probe on v, which, in turn, violates the IC. Under the ranking PB $\gg$ IC, it follows that output candidate O_1 in tableau (33), which applies object shift, prevails over output candidate O_3, which fails to shift the object (thereby dispensing with a violation of the IC at the fatal cost of violating PB). (33) presupposes that the object has been assigned structural accusative by v.[32]

(33)

input: $[_{vP}$ ... $DP_{[+\beta]}$] subarray: $\{C_{[+\delta]}$, ...$\}$	PB	FC	LR	IC
☞ O_1: $[_{vP}$ $DP_{[+\beta]}$ $v_{[EPP]}$ ... $DP_{[+\beta]}$]				*
O_2: $[_{vP}$ $DP_{[+\beta]}$ v ... $DP_{[+\beta]}$]	*(!)		*(!)	
O_3: $[_{vP}$ v ... $DP_{[+\beta]}$]	*!			
O_4: $[_{vP}$ $v_{[EPP]}$ ... $DP_{[+\beta]}$]	*(!)	*(!)		

O_2 and O_4 in tableau (33) may or may not be unequivocally ruled out by PB, depending on the relative ranking of FC and LR on the one hand, and the IC on the other.[33]

Suppose instead the object had been assigned inherent case within vP instead of structural accusative. Obviously, this does not lead to any substantial changes. For instance, as tableau (34) illustrates, under the assumption that the object gets assigned inherent genitive, the output candidate O'_1, which applies object shift, is optimal, again:

[32] If the object receives inherent case by V, the set of its case features that are valued positively will exceed the set of positive valued case features on the structural case probe. In this situation, the case probe on v does enter into case-Agree with the object.

[33] Here and in what follows, the discussion ignores the PRO-subject of the infinitive. This is unproblematic for two reasons. First, the subject is not merged into Specv via an EPP-probe on v. By definition, probing requires c-command, and the subject, not being part of vP yet, cannot be c-commanded by v. Therefore, the subject in Specv cannot satisfy PB and thus does not preempt object shift. Second, by assumption, object shift targets an outer Specv-position. As the set of the object's positively valued case features (at least $[+\beta]$) is a superset of the set of the positively valued features of the nominative case probe on T ($[+\alpha]$), it will be ignored by the case probe on T, which can thus case-agree with PRO.

(34)

input: $[_{vP}$ ... $DP_{[+\gamma]}$] subarray: {$C_{[+\delta]}$, ...}	PB	FC	LR	IC
☞ O'_1: $[_{vP}$ $DP_{[+\gamma]}$ $v_{[EPP]}$ ... $DP_{[+\gamma]}$]				*
O'_2: $[_{vP}$ $DP_{[+\gamma]}$ v ... $DP_{[+\gamma]}$]	*(!)		*(!)	
O'_3: $[_{vP}$ v ... $DP_{[+\gamma]}$]	*!			
O'_4: $[_{vP}$ $v_{[EPP]}$ ... $DP_{[+\gamma]}$]	*(!)	*(!)		

Tableaux (33) and (34) above thus illustrate that object shift applies (generating two copies of the object) regardless of the type of case assigned within vP.

Let us now turn to the PF-branch of the derivation. It begins by Transfer of the complement of the phase head v. As already informally noted in section 3.1.4 above, since the resulting PF-representation only contains one copy of the object (the lower one), this copy is unavoidably marked for realization. Tableau (35) shows this under the assumption that the object has been assigned accusative case.[34]

(35)

input: $[_{VP}$ V $DP_{[+\beta]}$]	CR	RC([+α])	RC([+β])	*Rev
☞ PF_1: $[_{VP}$ V $\underline{DP_{[+\beta]}}$]				
PF_2: $[_{VP}$ V $DP_{[+\beta]}$]		*(!)	*(!)	

The syntactic derivation continues with a VP-node whose internals are no longer accessible for the syntax. The next higher phase, which is headed by the purposive C-head, is constructed on the basis of the optimal output candidate O_1 from (33). The purposive C-head bears a case probe [+δ]. Since the set of positively valued features of this case probe ([+α, +β, +γ, +δ]) forms a superset of the set of positively valued case features of the (higher copy of the) object ([+α, +β]), Agree is established, leading to valuation of the case matrix of the goal with respect to [+γ, +δ]. This is illustrated by tableau (36).[35, 36]

(36)

input: $[_{CP}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\beta]}$ ...]] subarray: {...}	PB	FC	LR	IC
☞ O_{11}: $[_{CP}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\delta]}$ ...]]				
O_{12}: $[_{CP}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\beta]}$ ...]]		*!		

When the complement of C, i.e. TP, is transferred, it joins the previously phonologized VP at PF. Since there

[34] Recall that [+β] is a shorthand for [+α, +β].

[35] Note that the next subarray does not contain any case probe unmatched by a case goal in the array. Therefore PB is vacuously satisfied by all output candidates in tableau (36).

[36] As the output candidates in tableau (36) are based on the optimal output O_1 from tableau (33), they are indexed as O_{11}, O_{12}, etc.

are two copies of the object in the resulting PF-representation, it has to be decided which one of them is to be marked for realization. All PF-output candidates of the relevant competition are based on the optimal output PF_1 from tableau (35).[37] Thus, they all contain a lower copy of the object that has already been marked for realization. Undoing this marking incurs a violation of *Rev. However, the upper copy of the object now bears the case feature $[+\delta]$, whose realization, in contrast to case on the lower copy, is demanded by RC($[+\gamma]$) and RC($[+\delta]$). As already shown in section 3.1.4 (recall tableau (32)), the fact that the more oblique case is realized requires that at least one of RC($[+\gamma]$) and RC($[+\delta]$) be ranked higher than *Rev. Tableau (37) gives the relevant competition.[38]

(37)

input: $[_{TP}$ T $[_{vP}$ $DP_{[+\delta]}$ … $\underline{DP_{[+\beta]}}$]]	CR	RC($[+\gamma]$)	RC($[+\delta]$)	*Rev
☞ PF_{11}: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $DP_{[+\beta]}$]				*
PF_{12}: $[_{TP}$ … $DP_{[+\delta]}$ … $\underline{DP_{[+\beta]}}$]		*(!)	*(!)	
PF_{13}: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $\underline{DP_{[+\beta]}}$]	*!			
PF_{14}: $[_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\beta]}$]		*(!)	*(!)	*

As a result, dative case assigned by the C-head associated with purpose infinitivals prevails over structural accusative case assigned by v.

If the object is assigned inherent genitive case by the lexical verb of the infinitival clause, nothing substantial changes. First, an optimal PF'_1 output candidate is generated on the basis of the optimal output candidate O'_1 from tableau (34). PF'_1 is identical to PF_1 in tableau (35), except that it is specified as $[+\gamma]$ instead of $[+\beta]$. After a CP has been built on the basis of the winning output candidate O'_1 from (34), the case goal on the higher copy of the object (valued as $[+\gamma]$, i.e., genitive, in the input), becomes $[+\delta]$. This competition mirrors the one in tableau (36), except that $[+\beta]$ is to be replaced by $[+\gamma]$. Next, TP is transferred to PF. A new set of PF-output candidates is created, based on the winner of the previous PF-optimization, PF'_1. The difference with respect to the previous PF-competition is that now both PF-output candidates that mark only one of the copies for realization (see PF'_{11} and PF'_{12} in tableau (38)) violate RC($[+\gamma]$), the constraint that requires realization of the genitive. Crucially, however, the PF-output candidate that only marks the lower copy for realization (namely PF'_{12} in tableau (38)) still incurs an additional violation of RC($[+\delta]$). The result is that the dative case associated with a purpose infinitival prevails over an inherent genitive case assigned within vP of the infinitival clause, leading to realization of the higher copy:

(38)

input: $[_{TP}$ T $[_{vP}$ $DP_{[+\delta]}$ … $\underline{DP_{[+\gamma]}}$]]	CR	RC($[+\gamma]$)	RC($[+\delta]$)	*Rev
☞ PF'_{11}: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $DP_{[+\gamma]}$]		*		*
PF'_{12}: $[_{TP}$ … $DP_{[+\delta]}$ … $\underline{DP_{[+\gamma]}}$]		*	*!	
PF'_{13}: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $\underline{DP_{[+\gamma]}}$]	*!			
PF'_{14}: $[_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\gamma]}$]		**(!)	*(!)	*

[37] Therefore, again, they are indexed as PF_{11}, PF_{12}, etc.

[38] For reasons of space, RC($[+\alpha]$) and RC($[+\beta]$) have been omitted from tableau in (37). This is without consequences, as they do not distinguish between PF_{11} and PF_{12}, and PF_{14} is also ruled out by RC($[+\gamma]$) and RC($[+\delta]$). Analogue considerations apply to tableau (38).

In a scenario where the embedded infinitival verb assigns a case to its object that is higher on the case hierarchy (6) than the dative case assigned by the infinitival purpose C-head, namely instrumental, then the latter does not have any positively valued case features that could enter into Agree with a negatively valued case feature on the object. Therefore, in the syntax both copies of the object bear the feature matrix $[+\epsilon]$ (instrumental case).

At PF, the failure to mark any of the two copies for realization incurs a violation of RC($[+\epsilon]$), and likewise of all other members of the RC-family. Therefore, the decision between PF-output candidates PF''_{11} and PF''_{12} in tableau (39) is relegated to *Rev, which retains the decision made in an earlier cycle to realize the lower copy. (Of course, marking both copies for realization would spare a violation of RC($[+\epsilon]$) but it incurs a fatal violation of the higher ranked CR, see PF''_{13}). In other words, instrumental prevails over dative and is realized on the lower copy:[39]

(39)

input: $[_{TP}$ T $[_{vP}$ $DP_{[+\epsilon]}$ ... $\underline{DP_{[+\epsilon]}}$]]	CR	RC($[+\omega]$)	*Rev
PF''_{11}: $[_{TP}$ ... $\underline{DP_{[+\epsilon]}}$ ... $DP_{[+\epsilon]}$]		*****	*!
☞ PF''_{12}: $[_{TP}$ ... $DP_{[+\epsilon]}$ ... $\underline{DP_{[+\epsilon]}}$]		*****	
PF''_{13}: $[_{TP}$ ... $\underline{DP_{[+\epsilon]}}$ ... $\underline{DP_{[+\epsilon]}}$]	*!		
PF''_{14}: $[_{TP}$ ... $DP_{[+\epsilon]}$ ... $DP_{[+\epsilon]}$]		***** *!****	*

The same state of affairs holds if the lexical verb of the infinitival clause assigns inherent dative to the object. Again, no Agree-relation can be established in the syntax between the case goal on the C-head associated with the purpose infinitive and the higher copy of the shifted object because the case feature matrices of the case assigning head an the higher copy are identical (namely $[+\delta]$). Accordingly, at PF, any output candidates that chose to mark only one of the two copies for realization will violate RC($[+\alpha]$), RC($[+\beta]$), RC($[+\gamma]$), and RC($[+\delta]$). All things equal, it is then, again, the lower ranked *Rev, which favors realization of the lower copy (this time with dative case).

Finally, it is worth noting that the last two scenarios, i.e., those where the case assigned by the lexical verb to the object is of higher or equal rank on the case hierarchy (6) as compared to the case assigned by the C-head associated with the infinitive, are particulary important (as already alluded to in section 3.1.4) because they provide an argument that PF-optimization must apply cyclically. To illustrate, suppose that the lexical verb of a purpose infinitive assigns instrumental case. Suppose further, in contrast to what we assumed so far, that Transfer applies only once, namely after the complete syntactic structure has been generated. Global PF-optimization under this scenario is given by tableau (40), where CP_1 is the matrix clause and CP_2 the embedded infinitival clause.

(40)

input: $[_{CP_1}$ ... $[_{CP_2}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\epsilon]}$ ... $DP_{[+\epsilon]}$]]]	CR	RC($[+\omega]$)	*Rev
☞ PF_1: $[_{CP_1}$ ... $[_{CP_2}$ $C_{[+\delta]}$ ... $[_{vP}$ $\underline{DP_{[+\epsilon]}}$ ... $DP_{[+\epsilon]}$]]]		*****	
☞ PF_2: $[_{CP_1}$ ... $[_{CP_2}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\epsilon]}$ ... $\underline{DP_{[+\epsilon]}}$]]]		*****	
PF_3: $[_{CP_1}$ ... $[_{CP_2}$ $C_{[+\delta]}$ ... $[_{vP}$ $\underline{DP_{[+\epsilon]}}$ ... $\underline{DP_{[+\epsilon]}}$]]]	*!		
PF_4: $[_{CP_1}$ ... $[_{CP_2}$ $C_{[+\delta]}$ ... $[_{vP}$ $DP_{[+\epsilon]}$ ... $DP_{[+\epsilon]}$]]]		***** *!****	

[39] In tableau (39) and elsewhere, RC($[+\omega]$) is a shorthand for all members of the RC-family, i.e., RC($[+\epsilon]$), RC($[+\delta]$), etc.

Since none of the copies of the movement chain in the input has been marked for realization (because there is no earlier PF-cycle), *Rev is vacuously satisfied by all PF-output candidates. Moreover, since the case goals of both copies of the movement chain in the input are valued [+ϵ], PF-output candidates PF_1 and PF_2, which realize one of the two copies each, violate every constraint of the RC-family exactly once. PF_3 is suboptimal as it marks both copies for realization, and PF_4 violates each member of the RC-family twice as it does not mark either copy for realization. Moreover, under current assumptions neither PF_1 nor PF_2 violate any other constraint. Consequently, they exhibit the same constraint profile. All things equal, global optimization therefore predicts optionality with respect to whether the lower or the higher copy is realized in such a scenario, contrary to fact.

To conclude global optimization overgenerates, thus offering an argument in favor of cyclic optimization.

3.3 The derivation of infinitives under motion verbs

Turning to infinitival clauses embedded under motion verbs, by and large the same analysis is applicable, concentrating on the grammar of conservative speakers. As mentioned in section 1.3, for those consultants, object shift and realization of the genitive is obligatory (modulo scenarios where the lexical verb assigns a case that is more oblique than the genitive).

However, as will become clear, the facts are somewhat more complicated than what we have seen with purpose infinitives, due to variation. Namely, while object shift in purpose infinitives is obligatory for all of our consultants, this is not the case when it comes to infinitives after motion verbs. In fact, consultants who are speakers of modern urban varieties report that $O_{GEN}V$ and VO_{ACC} are in free variation for them. The examples in (3), which had grammaticality judgements coming from older speakers of conservative dialects, are repeated in (41), now with judgements coming from younger urban speakers. There are no information-structural or other semantic differences between the two sentences, and both are deemed equally grammatical.

(41) a. Senel-is eina [karv-ės melžti].
grandfather-SG.NOM go.PRS cow-SG.GEN milk.INF
b. Senel-is eina [melžti karv-ę].
grandfather-SG.NOM go.PRS milk.INF cow-SG.ACC
'Grandfather is going (there) to milk the cow.'

We propose that the variation can be accounted for by assuming a re-ranking of *Rev with respect to one of the constraints of the RC-family, namely RC([+γ]). In other words, we assume that while for all speakers the constraints that specifically require overt realization of dative and instrumental (RC([+δ]) and RC([+ϵ])) strictly dominate *Rev, this is not the case for the constraint that specifically requires realization of the genitive. For conservative speakers, only the ranking in (42-a) is active, where the necessity to realize the genitive is more important than keeping the PF-marking for realization from an earlier cycle intact. In contrast, younger speakers seem to entertain both rankings in (42-a,b).

(42) a. RC([+ϵ]), RC([+δ]), RC([+γ]) $\gg$ *Rev
b. RC([+ϵ]), RC([+δ]) $\gg$ *Rev $\gg$ RC([+γ])

In what follows, we briefly discuss the derivations that involve the two rankings in (42-a,b), respectively.

To begin with, as far as object shift is concerned, the syntax remains (almost) exactly the same as the one

discussed in the context of purpose infinitivals, see section 3.2 above. At the vP-cycle, there is a case probe in the next subarray, which is located on the C-head of the infinitival clause.[40] This case probe is not matched by any case goal in the same subarray. Therefore, satisfaction of PB requires insertion of an EPP-feature on v (incuring a non-fatal violation of the IC), ultimately triggering object shift in the optimal output candidate of the vP-cycle (cf. tableau (33), section 3.2). At the PF-side, there is only one copy available after Transfer of the VP, which is therefore marked for realization (cf. tableau (35), section 3.2).

At the CP-cycle, the case probe matrix $[+\gamma]$ on C may only enter into case-Agree with an object if the latter has been assigned a case that is lower on the case hierarchy (6) than genitive, i.e., accusative case. Assuming this scenario, the $[-\gamma]$-value on the higher copy of the shifted object is valued by the case probe on C as $[+\gamma]$. Turning to the PF-cycle, let us first assume the more conservative ranking in (42-a). As always, realization of the lower copy is independently favored by *Rev. However, due to the partial ranking RC($[+\gamma]$) $\gg$ *Rev, PF-output candidate PF_1 in tableau (43), which involves overt realization of genitive case on the higher copy, wins out against PF-output candidate PF_2 (cf. tableau (37), section 3.2):

(43)

input: $[_{TP}$ T $[_{vP}$ $DP_{[+\gamma]}$ … $\underline{DP_{[+\beta]}}$]]	CR	RC($[+\alpha]$)	RC($[+\beta]$)	RC($[+\gamma]$)	*Rev
☞ PF_1: $[_{TP}$ … $\underline{DP_{[+\gamma]}}$ … $DP_{[+\beta]}$]		*	*		*
PF_2: $[_{TP}$ … $DP_{[+\gamma]}$ … $\underline{DP_{[+\beta]}}$]		*	*	*!	
PF_3: $[_{TP}$ … $\underline{DP_{[+\gamma]}}$ … $\underline{DP_{[+\beta]}}$]	*!				
PF_4: $[_{TP}$ … $DP_{[+\gamma]}$ … $DP_{[+\beta]}$]		**(!)	**(!)	*(!)	*

Suppose now that the object had been assigned an inherent case by the lexical verb of the infinitive, and that this inherent case is at least as oblique (with respect to the case hierarchy (6)) as the genitive. Then the object's case will be too specific to be altered by the genitive case probe on C, so both copies retain their case value in the syntax (which will be either genitive, dative, or instrumental, depending on which case had been assigned within vP). As before, at PF the decision which copy is to be marked for realization is relegated to the low ranked constraint *Rev, which favors realization of the lower copy. Tableau (44) illustrates the scenario where inherent dative case is assigned to the object within vP (cf. tableau (39) from section 3.2).[41]

(44)

input: $[_{TP}$ T $[_{vP}$ $DP_{[+\delta]}$ … $\underline{DP_{[+\delta]}}$]]	CR	RC($[+\delta]$)	*Rev
PF'_1: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $DP_{[+\delta]}$]		*	*!
☞ PF'_2: $[_{TP}$ … $DP_{[+\delta]}$ … $\underline{DP_{[+\delta]}}$]		*	
PF'_3: $[_{TP}$ … $\underline{DP_{[+\delta]}}$ … $\underline{DP_{[+\delta]}}$]	*!		
PF'_4: $[_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\delta]}$]		*!*	*

Assume now the more progressive ranking in (42-b) in a scenario where the object is assigned structural accusative case within vP (and no inherent case). After TP has been transferred, the PF-representation contains two copies, a higher one with case value $[+\gamma]$ (= genitive), and a lower one with case value $[+\beta]$ (=

[40] The only difference with respect to purpose infinitives is that this case probe is $[+\gamma]$ in infintives embedded under motion verbs, and not $[+\delta]$ as in purpose infinitives.

[41] Again, for reasons of space, RC($[+\alpha]$), RC($[+\beta]$), and RC($[+\gamma]$) are ignored in tableau (44), and RC($[+\alpha]$) is ignored in tableau (45).

accusative). Given the ranking *Rev ≫ RC([+γ]), which is part of (42-b), it is now the lower copy, bearing accusative case, whose realization is favored by the constraints, see PF-output candidate PF''_2 in tableau (45) (cf. tableau (37) from section 3.2).

(45)

input: [TP T [vP $DP_{[+\gamma]}$ … $\underline{DP_{[+\beta]}}$]]	CR	RC([+β])	*Rev	RC([+γ])
PF''_1: [TP … $\underline{DP_{[+\gamma]}}$ … $DP_{[+\beta]}$]		*	*!	
☞ PF''_2: [TP … $DP_{[+\gamma]}$ … $\underline{DP_{[+\beta]}}$]		*		*
PF''_3: [TP … $\underline{DP_{[+\gamma]}}$ … $\underline{DP_{[+\beta]}}$]	*!			
PF''_4: [TP … $DP_{[+\gamma]}$ … $DP_{[+\beta]}$]		**!	*	*

Thus, re-ranking *Rev and RC([+γ]) allows to model the variation with respect to case resolution and the overtness of object shift between speakers of a more conservative vs. a more progressive variety of Lithuanian.

3.4 Further variation

Before we turn to a discussion of stacked infinitives in section 3.5, we would like to briefly address the question how some of the empirical findings on case resolution in Lithuanian reported in the literature that diverge from ours may be integrated into the present theory.

To begin with, Arkadiev (2014), like the present study, reports instances of overwriting of inherent case (in contrast to Franks and Lavine 2006, see below). However, he notes that only some of his consultants demand that inherent genitive case be overridden by dative case in purpose infinitives (Arkadiev 2014, 61-62). For others, genitive may survive. One may approach this difference in the same manner as the variation in infinitives embedded under motion verbs, suggested at the end of section 3.3. Concretely, one may assume that the grammars of the speakers that allow for realization of the genitive in purpose infinitives exhibit the ranking *Rev ≫ RC([+δ]). The relevant PF-competition is given in tableau (46). It mirrors the one in tableau (45), section 3.3, with [+δ] replacing [+γ] and [+γ] replacing [+β].[42]

(46)

input: [TP T [vP $DP_{[+\delta]}$ … $\underline{DP_{[+\gamma]}}$]]	CR	RC([+γ])	*Rev	RC([+δ])
PF_1: [TP … $\underline{DP_{[+\delta]}}$ … $DP_{[+\gamma]}$]		*	*!	
☞ PF_2: [TP … $DP_{[+\delta]}$ … $\underline{DP_{[+\gamma]}}$]		*		*
PF_3: [TP … $\underline{DP_{[+\delta]}}$ … $\underline{DP_{[+\gamma]}}$]	*!			
PF_4: [TP … $DP_{[+\delta]}$ … $DP_{[+\gamma]}$]		**!	*	*

Note that the analysis does not imply that the grammar of the same speakers also allows accusative case to survive in purpose infinitives.[43] The reason for this is that, due to the feature decomposition in (24), dative

[42] The analysis implies VO_{GEN} word order for this scenario. The presentation in Arkadiev (2014, 61) seems to suggest that this is correct.

[43] By and large, this appears to be correct. Arkadiev (2014, 63, 69) notes that "as a marginal option" some speakers also allow for accusative case to survive in purpose infinitives. We have nothing to say about this here except that we feel that the marginality of the phenomenon suggests that its explanation should not be at the core of the theory for this construction.

case has a property (besides the feature [+δ]) that accusative case lacks, namely [+γ]. Given that RC([+γ]) is ranked higher than *Rev, dative still prevails over accusative in purpose infinitivals. This is illustrated in tableau (47):

(47)

input: [$_{TP}$ T [$_{vP}$ $DP_{[+\delta]}$ … $DP_{[+\beta]}$]]	CR	RC([+β])	RC([+γ])	*Rev	RC([+δ])
☞ PF_1: [$_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\beta]}$]		*		*	
PF_2: [$_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\beta]}$]		*	*!		*
PF_3: [$_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\beta]}$]	*!				
PF_4: [$_{TP}$ … $DP_{[+\delta]}$ … $DP_{[+\beta]}$]		**(!)	*(!)	*	*

Second, Arkadiev (2014) also reports that, in Modern Lithuanian, the neutral word order within an infinitival clause embedded under a motion verb is VO_{GEN}. At least some of our consultants confirmed this.[44] Since different authors seem to agree that object shift coupled with genitive assignment is in the process of slowly disappearing from the urban dialects of Modern Lithuanian (Ambrazas, 2006; Franks and Lavine, 2006; Arkadiev, 2014) and because object shift in purpose infinitives is stable across different varieties of Lithuanian, we suggest (following Arkadiev 2014) that those speakers for whom all three patterns – VO_{ACC}, VO_{GEN} and $O_{GEN}V$ – are neutral must have an (additional) mechanism of genitive assignment in infinitives embedded after verbs of motion, different from the one discussed in this paper.[45]

Finally, Franks and Lavine (2006, 250, 255) claim that, irrespective of any considerations pertaining to the case hierarchy in (6), an inherent case that is assigned by the lexical verb of an infinitive always prevails over the genitive or the dative assigned under motion verbs or in the context of purpose infinitives, respectively. In addition, they claim that object shift is generally suppressed in the context of inherent case assignment within the infinitive. Assuming that this is a real pattern, the most straightforward approach would seem to involve the assumption that the family of constraints that require overt realization of a particular case must be enriched by a distinction between inherent ([+inh]) and structural ([−inh]) cases. The partial ranking able to produce the pattern reported by Franks and Lavine (2006) would then be RC([+inh,+ω]) $\gg$ *Rev $\gg$ RC([−inh,+δ]), RC([−inh,+γ]), which would still allow for structural accusative case to be overwritten by dative and genitive case associated with purpose infinitives and infinitives embedded under motion verbs, respectively.[46]

3.5 Stacked infinitives

We have seen in (9), here repeated as (48) for convenience, that, if another infinitive intervenes between the embedded infinitive and, for instance, a verb of motion, then object shift may no longer apply.

(48) a. Einu [pamėginti [iškepti kepsn-į]].
go.prs.1sg try.inf bake.inf roast-sg.acc

b. *Einu [pamėginti [kepsni-o iškepti]].
go.prs.1sg try.inf roast-sg.gen bake.inf

[44] More precisely: For these consultants, both VO_{GEN} and $O_{GEN}V$ are neutral.

[45] We do not have much to say about the precise nature of this mechanism. It is conceivable that the grammar of these speakers provides a vP-internal source of the genitive, probably related to the motion verb by (indirect) selection. Note that examples given by Arkadiev (2014, 61-62) suggest that, for some speakers, a similar mechanism might also be available in purpose infinitives.

[46] Where RC([+inh,+ω]) stands for a family of RC-constraints, with ω ranging over elements in $\{\alpha, \beta, \gamma, \delta, \epsilon\}$.

c. *Einu [kepsni-o pamėginti [iškepti]].
go.PRS.1SG roast-SG.GEN try.INF bake.INF
'I am going (there) to try to bake the roast.'

Following Franks and Lavine (2006), the object of the most deeply embedded infinitive should shift at least as far as to the edge of its vP. Moreover, assuming that the v-head associated with the head of the next higher infinitive, *pamėginti* 'try', does not assign accusative case, which is plausible, as it does not select for a DP, then the object should shift one more time, to the edge of the next higher vP. In this position, it would be accessible for the matrix Asp-head and could thus recieve genitive case. This output, however, is ungrammatical according to all of our consultants, see (48-c).[47]

It is not obvious how to revise the analysis in Franks and Lavine (2006) in such a way that this false prediction is avoided. Of course, part of the problem is that Franks and Lavine (2006) assume that the driving force behind repair-driven object shift is the unvalued case feature on the object. This case feature, however, will remain unvalued until the object has shifted to a position where it is accessible to a higher case assigning functional head.

In our analysis, the lack of movement to the edge of either the first or the second vP falls out of the nature of the constraint PB. When the lowest vP is optimized, the grammar has, as layed out in section 3.1.2, access to the following information: (a) the elements in the current vP, unlimited; (b) the elements present in the subarray for the next phase, only for inspective purposes. In the case with an intervening infinitive in (48), the subarray for the next phase contains the lexical verb 'try' and its v-head, neither of which, by assumption, bears a case probe.[48] Therefore, PB is satisfied vacuously, and an output candidate that involves object shift is filtered out due to an unmotivated violation of the IC, reflecting the nature of object shift as a costly last-resort operation. This is illustrated in tableau (49), where output candidate O_1, which applies object shift, loses against output candidate O_3, which leaves the object in-situ.

(49)

input: $[_{vP}$ ... $DP_{[+\beta]}$] subarray: {v, V, ...}	PB	FC	LR	IC
O_1: $[_{vP}$ $DP_{[+\beta]}$ $v_{[EPP]}$ ... $DP_{[+\beta]}$]				*!
O_2: $[_{vP}$ $DP_{[+\beta]}$ v ... $DP_{[+\beta]}$]			*!	
☞ O_3: $[_{vP}$ v ... $DP_{[+\beta]}$]				
O_4: $[_{vP}$ $v_{[EPP]}$ ... $DP_{[+\beta]}$]		*!		*

With the object remaining low in structure, any case probe (be it genitive or dative) on an infinitival C-head merged above the intermediate *try*-infinitive will not be able to reach the object due to the PIC. Because our

[47] Assuming instead that the v-head associated with *pamėginti* 'try' does assign accusative case does not really help, given the analysis in Franks and Lavine (2006). Under this assumption, a structure is generated where the object shifts to the edge of the most deeply embedded infinitive, receiving structural accusative case there from the next higher v-head. According to our consultants, this is equally ungrammatical.

[48] We have been assuming here that the most deeply embedded infinitive is a bare vP. Nothing changes if one assumes it to be a TP or a CP, though. If T bears a nominative case probe, then it is sufficient to assume that PRO has a case goal that satisfies PB, thereby voiding object shift. If T does not bear a case probe, then no issue arises to begin with. Moreover, there is no reason whatsoever to assume that the C-head that is associated with a *try*-infinitive may bear a case probe.

analysis does not include an obligatory Inverse Case Filter, the derivation will not crash if the case probe on C fails to find a goal. The derivation then continues on the basis of output candidate O_3 from tableau (49). Since object shift has not applied, there is no higher copy of the object. This means that in the finalized PF-representation, the object is pronounced in-situ with the case value assigned to it by the local verb, which is exactly what is attested empirically.

Finally note that, all things equal, it is indispensable that optimization apply cyclically at the phase level (assuming that vP and CP are phases) in order for the analysis to work. To illustrate this, suppose, giving up this assumption, that optimization applies globally, i.e., at the point of the derivation where all material from the numeration (including any subarray) has been used up. Tableau (50) illustrates.[49] The optimal output candidate is O_2, which applies object shift twice and has the case goal on the shifted object be valued by the case probe on the C-head of the highest infinitive.[50] While applying object shift incurs two violations of the IC, this is acceptable considering the alternatives. O_3 applies object shift without EPP-feature insertion, which results in a fatal violation of LR. O_1 applies object shift and then fails to value the case goal, which fatally violates the FC. O_5 leaves the object in-situ and establishes long-distance case-Agree between probe and goal. This fatally violates the PIC.

(50)

input: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ v \ldots [_{vP}\ v \ldots DP_{[+\beta]}\ ]]]$ subarray: { }	PIC	PB	FC	LR	IC
O_1: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ DP_{[+\beta]}\ v_{[EPP]} \ldots [_{vP}\ \_\ v_{[EPP]} \ldots \_\ ]]]$			*!		**
☞ O_2: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ DP_{[+\gamma]}\ v_{[EPP]} \ldots [_{vP}\ \_\ v_{[EPP]} \ldots \_\ ]]]$					**
O_3: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ DP_{[+\gamma]}\ v \ldots [_{vP}\ \_\ v \ldots \_\ ]]]$				*!*	
O_4: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ v \ldots [_{vP}\ v \ldots DP_{[+\beta]}\ ]]]$		*!			
O_5: $[_{CP}\ C_{[+\gamma]} \ldots [_{vP}\ v \ldots [_{vP}\ v \ldots DP_{[+\gamma]}\ ]]]$	*!				

The most dangerous competitor for O_2 in tableau (50) is O_4. O_4 does not apply object shift and leaves case on the object unvalued. This is exactly the empirically attested output. In (50), O_4 is filtered out due to a violation of PB (there are no copies of the object at any phase edge). Thus, one might wonder whether an approach based on global optimization might not simply dispense with PB, thus deriving the correct result for stacked infinitives after all. This, however, is not an option because even a global approach must account for repair-driven object shift in the context of a simply embedded (i.e. non-stacked) infinitive, which requires a constraint that favors object shift and outranks the IC, viz. PB.

To conclude, global optimization, as opposed to cyclic optimization, produces the wrong output candidate (i.e., it overgenerates and undergenerates). Therefore, the present analysis also provides argument for cyclic optimization in the syntax (alongside the argument for a cyclic PF-computation, see section 3.2).

4 Concluding remarks

This article discussed object shift in two types of infinitival constructions in Lithuanian. We briefly discussed two previous analyses. It was noted that the first one (Franks and Lavine, 2006) a) cannot account for our findings with respect to the behavior of non-finite verbs assigning inherent case and b) does not offer an explicit

[49] For reasons of space, the matrix clause is left out in the representations in tableau (50).

[50] Tableau (50) involves an infinitive embedded under a motion verb. Of course, the same result obtains with a purpose infinitive.

analysis of the notion of repair-driven movement, which the analysis invokes. The second one (Arkadiev, 2014) does not maintain the connection between object shift and exceptional case assignment that, at least in some contexts, can be observed. Additionally, it was noted that neither one of the two existing analyses makes (correct) predictions regarding structures with stacked infinitives.

In order to account for the link between the exceptional availability of object shift on the one hand and the specific case values assigned to the object in different positions, we made a proposal that attempts to combine important insights from both Franks and Lavine (2006) and Arkadiev (2014) (namely, repair-driven object shift and multiple case assignment combined with a mechanism of case resolution, respectively) while at the same time making up for their shortcomings. The result is an analysis in terms of phase-based optimization applying cyclically in both syntax and at the syntax-phonology interface. The main traits of the analysis were the following.

The object of the infinitival verb undergoes repair-driven movement, interpreted in terms of optimization, to the edge of the vP-phase in order to be able to match up with a case probe in the C-domain. The lower copy created by object shift is spelled out with its local case value when VP is transferred to the syntax-phonology interface. The case value on the higher copy of the object is changed if the C-head of the infinitive assigns a more oblique case than the one assigned to the object locally. If the higher copy does receive a more oblique case value, it will be favored by the PF-optimization procedure that applies at the second spell-out cycle. Thus, the higher copy will be pronounced, the lower not (overt object shift). Otherwise, if the object's case value remains unchanged, the lower copy, favored by PF-optimization during an earlier PF-cycle, will be retained (covert object shift).

Next, we argued that the fact that both repair-driven object shift and exceptional case assignment fail to apply in contexts with stacked infinitives not only provides an additional argument in favor of the assumption that the two are connected but also recieves an explanation in terms of cyclic (i.e., local, as opposed to global) optimization.

Furthermore, we proposed that some of the variation between speakers with respect to the genitive case assigned in infinitives embedded after motion verbs can be attributed to a vacillating relative ranking of a constraint that militates against revising PF-decisions made on an earlier cycle and a constraint demanding the realization of genitive case. For speakers who have an even more permissive pattern, we suggested that they might have divorced the two infinitival constructions in question in their mental grammar. Whatever mechanism is responsible in their grammar for the realization of genitive case after motion verbs, it must be different from what happens in purpose infinitives because the latter remain stable and unchanged throughout a large part of the Lithuanian-speaking region.

As a last point, it is perhaps worth mentioning that the present proposal, to the extent that it is successful, provides two (indirect) arguments for the phase status of vP. This is interesting in so far as it is sometimes contested in the literature that vP is a phase (Keine 2016; Keine and Zeijlstra 2025). The first argument is that, for reasons of locality, the object shifts out of a domain undergoing cyclic Transfer: VP. The second argument is that the lower copy of the shifted object may be favored at PF only because it undergoes cyclic Transfer as part of VP. Assuming that cyclic Transfer only applies to complements of phase heads, it follows that vP must be a phase.

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