Lithuanian Phrasal Comparatives without Covert Syntactic Structures

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Abstract. Phrasal comparatives can be analyzed as either involving covert structures or as being directly licensed depending on whether they exhibit clausal properties. In this paper, I show on the basis of Lithuanian phrasal comparatives that clausal-like effects can be enforced without invoking covert structures. I provide an empirically motivated analysis of Lithuanian phrasal comparatives in Hybrid Type-Logical Categorial Grammar. Under this analysis, the clausal-like properties of Lithuanian phrasal comparatives emerge as simple effects of phrasal comparative operators.

Keywords: comparatives · covert structure· phrasal comparatives· HTLCG

1 Introduction

This paper explores whether it is possible to provide an analysis of a syntactic construction if it has propositional semantics and clausal-like properties without invoking covert syntactic structures. The question is addressed on the basis of phrasal comparative constructions in Lithuanian (a Balto-Slavic language). Phrasal comparatives in Lithuanian are signaled by the morpheme of *už* 'than'. In (1), the comparison is drawn between the nominative subject *Jonas* 'John', the associate, and the accusative case-marked *Tomą* 'Tom', the standard of comparison. The complement of *už* 'than' must be a single accusative case-marked nominal phrase.

(1)   Jonas   bėga   greičiau už   Tomą   (*bėga).
        John.nom run.prst.3 faster   than Tom.acc run.prst.3

        'John runs faster than Tom (*runs).'

From a generative perspective, phrasal comparatives can be derived via two routes. Phrasal comparatives can be derived from clausal sources through some reduction operation of the relevant part of the sentence (e.g. Bresnan 1973, Lechner 2001, 2004, Merchant 2009). The underlying sentential structure of the sentence in (1) under such an approach is shown in (2a). Alternatively, direct approaches assume that phrasal comparatives are base-generated PPs (e.g. Hankamer 1973, Heim 1985, Merchant 2012), i.e. no unpronounced syntactic structures are posited as shown in (2b).

(2)   a. Jonas bėga greičiau už [$_{CP}$ Tomą ~~(bėga)~~.]
      b. Jonas bėga greičiau už [$_{NP}$ Tomą.]

The goal of this paper is to give an empirically adequate treatment of Lithuanian phrasal comparatives that is explicit about the syntax and semantics of Lithuanian phrasal comparatives, as well as word order. Previously, Lithuanian phrasal comparatives have been argued to be underlyingly clausal (Grinsell 2012) based on claims of apparent island sensitivity. Grinsell suggests that Merchant's 2009 clausal analysis of phrasal comparatives in Modern Greek can be extended to Lithuanian. I argue against an ellipsis-based analysis of Lithuanian phrasal comparatives as the analysis does not capture the relevant empirical generalizations. I offer a direct analysis of Lithuanian phrasal comparatives that I choose to implement in categorial grammar in the form of Hybrid Type-Logical Categorial Grammar (HTLCG, Kubota 2010, 2015, Kubota and Levine 2016), though a direct analysis can also be implemented in the Minimalist Program (Vaikšnoraitė 2017). I argue that it is possible to account for clausal-like properties of phrasal comparatives without appealing to covert structure. The analysis proposed in this paper shows that i) direct licensing of phrasal comparatives straightforwardly captures all empirical generalizations about Lithuanian phrasal comparatives; ii) the empirical generalizations and clausal-like properties of phrasal comparatives emerge as simple effects of lexical specifications of comparative operators.

2   The Empirical Domain: Lithuanian Phrasal Comparatives

This section reviews three empirical generalizations about phrasal comparatives in Lithuanian that have been previously discussed in the literature (e.g. Ambrazas 2016, Grinsell 2012) and introduces a novel empirical generalization. Lithuanian has several comparative morphemes that combine with different lexical categories to produce comparative meanings. These comparative morphemes are compatible with phrasal comparatives as the examples in (3) show. In (3a), the suffix -*esn*- '-er' attaches to the adjective *greitas* 'fast'. In (3b), the suffix -*iau* '-er' is attached to the adverb *greitai* 'fast'. Nominal comparatives are formed by adding *daugiau* 'more' in front of the nominal *knygų* 'books' as shown in (3c) (for more information about the morphology of comparatives, see Ambrazas 2016):

(3)   a. Jonas   greit-**esn**-is   už   Tomą.
          John.nom fast-er-m.sg.nom than Tom.acc

          'John is faster than Tom.' (Adjectival comparative)

      b. Jonas   bėga   greič-**iau** už   Tomą.
          John.nom run.prs.3 fast-er   than Tom.acc

          'John runs faster than Tom.' (Adverbial comparative)

      c. Jonas perskaitė **daugiau** knygų   už   Tomą.
          John read.pst.3 more   book.pl.gen than Tom.acc

'John read more books than Tom.' (Nominal comparative)

Now we review some empirical generalizations about Lithuanian phrasal comparatives that were discussed in Grinsell (2012), and introduce a new empirical generalization. We already observed the first empirical generalization in connection with (3), namely that the complement of *už* 'than' is a single accusative-case marked noun phrase. Furthermore, adjectival phrasal comparatives are ungrammatical with measure phrases even if the case-marking requirement is met as the examples in (4) show.

(4)   a.   * Jonas   aukštesnis   už   du   metrus.
           John.nom tall.m.sg.nom than two.acc meter.pl.acc

           'John is taller than two meters.'

       b.   * Jonas   bėga   greičiau už   devynis kilomterus   per
           John.nom run.prst.3 faster   than nine.acc kilometers.acc per
           valandą.
           hour.acc

           'John runs faster than 9 km/h.'

Furthermore, nominal phrasal comparatives are ungrammatical with 'more NP subjects' as exemplified in (5a). Lithuanian shares this restriction with many other Balto-Slavic languages (e.g. Polish, Serbo-Croatian, and Bulgarian, see Pancheva 2009 for more details).

(5)   a.   * Daugiau vyrų   valgo   obuolius   už   moteris.
           more   men.gen eat.prs.3 apple.pl.acc than women.acc

           'More men eat apples than women.'

       b.   Vyrai   valgo   daugiau obuolių   už   moteris.
           men.nom eat.prs.3 more   apple.pl.gen than women.acc

           'Men eat more apples than women.'

The sentence in (5a) is ungrammatical because the associate, *vyrų* 'men', is the subject of the sentence is preceded by the comparative morpheme *daugiau* 'more'. When the object of the sentence is preceded by the comparative morpheme, the sentence is grammatical as shown in (5b). To express the meaning of (5a), a clausal comparative must be used as shown in (6).

(6)   Daugiau vyrų   valgo   obuolius   negu moterų.
       more   men.gen eat.prs.3 apple.pl.acc than women.gen

       'More men ate apples than women.'

A novel contribution of this paper is a description of a previously unnoticed empirical generalization. Phrasal comparatives in Lithuanian are only acceptable if the associate is the subject (which in Lithuanian is marked by nominative case) as shown in (7).[1] The sentence in (7a) contrasts the nominative case-marked subject of the sentence, *Jonas* 'John' and the standard of comparison,

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[1] A small set of verbs (e.g. *mylėti* 'to love', *nekęsti* 'to hate', *mėgti* 'to like') do not follow this pattern and allow the object to function as the associate:

Tomą 'Tom'. In (7b), the associate is *spurgų* 'doughnuts', a genitive-case marked object.

(7) a. <u>Jonas</u>   suvalgė daugiau spurgų   už   Tomą.
         John.nom eat.pst.3 more   doughnut.pl.gen than Tom.acc

         'John ate more doughnuts than Tom.'

    b. * Jonas   suvalgė daugiau spurgų   už   sausainius.
         John.nom eat.pst.3 more   doughnut.pl.gen than cookie.pl.acc

         Intended meaning: 'John ate more doughnuts than cookies.'

This empirical generalization is further exemplified in (8). The examples show that the sentence with a ditransitive verb *padovanoti* 'to gift' is licensed in a context in which the associate is the subject of the sentence *Jonas* 'John'. The same sentence is ruled out if the associate is the dative object *Marijai* 'Maria'.

(8) a. Context: It is Maria's birthday. John and Tom were both invited to the party. John brought three gifts for Maria, and Tom brought two.

         Jonas   padovanojo daugiau dovanų   Marijai   už
         John.nom gift.pst.3   more   present.pl.gen Maria.dat than
         Tomą.
         Tom.acc

         'John gave more presents to Maria than Tom (did).'

    b. Context: Tom and Maria have a joint birthday party. John brought three gifts for Maria, and two for Tom.

         # Jonas   padovanojo daugiau dovanų   Marijai   už
         John.nom gift.pst.3   more   present.pl.gen Maria.dat than
         Tomą.
         Tom.acc

         'John gave more presents to Maria than (he did to) Tom.'

In sum, all Lithuanian phrasal comparatives share the following restrictions: i) the standard of comparison must be a single accusative case-marked NP, ii) a measure phrase cannot function as the standard of comparison, iii) the associate must be the subject of the sentence. Furthermore, nominal comparatives are ungrammatical with 'more' NP subjects. Any adequate analysis of phrasal comparatives needs to account for these empirical generalizations.

(i) Jonas   myli   Agnę   labiau už   viską.
     John.nom love.prs.3 Agne.acc more   than everything.acc

     'John loves Agnes more than anything else.'

Further research is necessary to determine why and under which conditions an object can serve as the associate with these verbs.

3   Grinsell's (2012) Analysis of Lithuanian Phrasal Comparatives

The previous analysis of Lithuanian phrasal comparatives is couched within the Minimalist Program. Grinsell (2012) advocates for a clausal analysis of Lithuanian phrasal comparatives by adopting Merchant's 2009 analysis of Modern Greek phrasal comparatives. Grinsell, following Merchant (2009), provides an analysis roughly along the following lines: the complement of *už* 'than' underlyingly is a full clause. The surface form of a phrasal comparative is obtained via TP-ellipsis as shown in (9, the ellipsis site is indicated by angled brackets).

(9)   Jonas   bėga   greičiau už   Tomą   <bėga>.
      John.nom run.prst.3 faster   than Tom.acc run.prst.3

      'John runs faster than Tom.'

   The derivation of a phrasal comparative proceeds as follows: first, standard of comparison moves out its base position in the TP to a clause external position, SpecFP, to escape ellipsis. The standard of comparison then moves again to SpecPP, which leads to phrasal-like effects, e.g. case-marking. The preposition *už* 'than' under this analysis is assumed to be embedded in a pP shell (following Matsubara 2000), and the preposition itself moves from P to p. This analysis is exemplified in (10), whereby the standard of comparison, *Tomas* 'Tom', moves to Spec,PP via SpecFP leaving an unelided trace, t_1, in Spec,FP.

(10)   Jonas bėga greičiau
       $[_{pP}$ už$_2$ $[_{PP}$ $[_{DP1}$ Tomą $[t_2$ $[_{CP}$ $[_{FP}$ t_1<$[_{TP}$ t_1 bėga $]]]]]]]]$

   The main reason that Grinsell proposes that phrasal comparatives have a covert syntactic structure is that phrasal comparatives seem to exhibit island sensitivities in Lithuanian. He suggests that the phrasal comparative in (11) is ruled out on the basis of relative clause island violation (the example is adapted from Grinsell 2012: 40).[2] The standard of comparison in (11), *Medvedevą* 'Medvedev', contrasts with an nominal phrase that is internal to a relative clause, *Obama* 'Obama'.

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[2] The example in (10) is corrected for some grammatical and lexical errors and is written in standard Lithuanian orthography. The original sentence with the phrasal comparative that appeared in Grinsell (2012: 40) is provided below:

(ii)   * Daugiau žmonių kas gyvena valstijoje, kurią valdo   Obama   už
          More   people who live   in.the.state which governs Obama.nom than
          Medvedeva.
          Medvedev.acc

          'More people live in the state that Obama governs than in the state that Medvedev governs.'

(11)   * Daugiau žmonių   gyvena   valstybėje, kurią   valdo
        more   people.gen live.prs.3 country.loc that.acc govern.prs.3
        Obama   už   Medvedevą.
        Obama.nom than Medvedev.acc

        'More people live in the country that Obama governs than in the
        country that Medvedev governs.'

Island sensitivities would be unexpected under a direct analysis as under such
an analysis there is no covert syntactic structure and consequently no syntactic
movement. Grinsell (2012) thus concludes Lithuanian phrasal comparatives must
be underlyingly clausal.

Under this view, the ungrammaticality of (11) results from a prohibition
against unelided island-violating traces. Essentially, when *Medvedevą* 'Medvedev'
moves to SpecPP from SpecFP, it leaves an island-violating trace above the
elided TP as shown. The island-violating trace makes the sentence uninter-
pretable at the PF as is schematically shown in (12):

(12) $[_{pP}$ už$_2$ $[_{PP}$ $[_{DP1}$ Medvedevą $[t_2$ $[_{CP}$ $[_{FP}$ *t$_1$ $<[_{TP}$ gyvena valstybėje,
        kurią valdo t$_1$]$>$]]]]]]

However, (11) does not constitute evidence for island effects. Recall from
Section 2 that Lithuanian phrasal comparatives are ungrammatical with 'more'
NP subjects. Given that empirical generalization (which Grinsell was also aware
of), (11) is independently predicted to be unacceptable because it has a 'more'
NP subject. Thus, (11) is not empirical evidence for island effects in Lithuanian
phrasal comparatives.

In (13), I present a phrasal comparative that does not violate any of the em-
pirical generalizations laid out in Section 2. The phrasal comparative is presented
in two minimally different contexts that illustrate that the subject of the main
clause, *Jonas* 'John', can serve as the associate, while the subject of the relative
clause, *Agnė* 'Agne', cannot. One could attribute this effect to island sensitivity,
since *Agnė* 'Agne' is a nominal phrase that is internal to a relative clause. I will
suggest in Section 4 that these apparent island effects are an epiphenomenon of
lexical specifications of comparative operators.

(13)   a.   Context: Agne baked a dozen cookies. John ate four of the cookies,
             while Tom ate two.

             Jonas   suvalgė daugiau sausainių,   kuriuos   Agnė
             John.nom eat.pst.3 more   cookie.pl.gen which.acc bake.pst.3
             iškepė   už   Tomą.
             Agne.nom than Tom.acc

             'John ate more cookies that Agne baked than Tom ate.'

        b.   Context: Agne and Tom each baked a dozen of cookies for a party.
             John ate five cookies baked by Agne, and one cookie baked by Tom.

> \# Jonas   suvalgė daugiau sausainių,   kuriuos   Agnė
> John.nom eat.pst.3 more   cookie.pl.gen which.acc bake.pst.3
> iškepė   už   Tomą.
> Agne.nom than Tom.acc
> 'John ate more cookies that Agne baked than the cookies that Tom baked.'

Grinsell's analysis correctly predicts that the reading in (13b) would be unavailable, which is explained as a relative island violation, since the movement of *Tomą* 'Tom' would leave an unelided island-violating trace (cf. 12).

While the clausal analysis captures the island effects, it does not deal well with the empirical generalizations outlined in Section 2. Grinsell suggests (2012: 39) that the reduced clause analysis sketched out above may account for the 'more' NP restriction as such sentences would be ruled because of an unelided island-violating trace. The claim however is not presented in more explicit detail. The sentence in (14) is a simple phrasal comparative that does not involve extraction from an island and thus would wrongly be predicted to be grammatical by Grinsell. The analysis he advocates for thus offers no explanation for why 'more' NP subjects are ungrammatical in Lithuanian.

(14)   * Daugiau vyrų   atvyko   už   moteris.
        more   man.pl.gen arrive.pst.3 than woman.pl.acc
        'More men arrived than women.'

Furthermore, the analysis cannot capture the empirical generalization that phrasal comparatives are incompatible with measure phrases, a fact that Grinsell acknowledges and leaves for future research. Given that the clausal analysis does not capture any of the empirical generalizations listed in Section 2, an empirically motivated and formally explicit analysis of Lithuanian phrasal comparatives is necessary.

4   Phrasal Comparatives and Hybrid TLCG

In this section, I develop an analysis of Lithuanian phrasal comparatives within Hybrid Type-Logical Categorial Grammar (Hybrid TLCG), a framework with a flexible mapping between the syntax, semantics and the surface string. I show that the empirical generalizations about phrasal comparatives in Lithuanian can be straightforwardly captured by an analysis that does not assume covert syntactic structures. Under the analysis in HTLCG, the empirical generalizations emerge as simple effects of lexical specifications.

4.1   Hybrid TLCG

In this subsection, I introduce Hybrid Type-Logical Categorial Grammar (Hybrid TLCG). Due to space limitations I will only introduce the most important

tenets and assumptions of Hybrid TLCG; see Kubota (2010, 2015), Kubota & Levine (2015, 2016) for a detailed introduction.

In HTLCG, there are at least three atomic syntactic categories: NP, S, and N. Other syntactic categories are recursively built out of these atomic categories via syntactic connectives. There are two directional connectives in HTLCG (forward slash / and backward slash \). Lexical entries consist of tuples: a prosodic component, a semantic component, and a syntactic component. A sample lexicon of Lithuanian is provided in (15). Since Lithuanian is a highly inflectional language, I assume a restricted set of syntactic features (possibly formally represented in terms of subtypes of the underspecified type NP) that I will mark as subscripts of syntactic categories.

(15)   Jonas; john; NP_{nom}
        Tomą; tom; NP_{acc}
        bėga; run; $\mathrm{S}\backslash\mathrm{NP}_{nom}$
        mato; see; $(\mathrm{NP}_{nom}\backslash\mathrm{S})/\mathrm{NP}_{acc}$

The intransitive verb *bėga* 'run' takes a nominative NP to its left and returns a declarative sentence S. The transitive verb *mato* 'see' takes two arguments: an accusative NP to its right, and a nominative NP to its left. The difference between directional slashes hence corresponds to the surface word order of the arguments as shown in (16, where ○ denotes the concatenation operator mapping a pair of string terms to a string).

(16)   Forward slash elimination   Backward slash elimination

$$\frac{\text{a}; \mathcal{F}; \mathrm{A}/\mathrm{B} \qquad \text{b}; \mathcal{G}; \mathrm{B}}{\text{a} \circ \text{b}; \mathcal{F}(\mathcal{G}); \mathrm{A}} \qquad\qquad \frac{\text{a}; \mathcal{F}; \mathrm{B} \qquad \text{b}; \mathcal{G}; \mathrm{B}\backslash\mathrm{A}}{\text{b} \circ \text{a}; \mathcal{F}(\mathcal{G}); \mathrm{A}}$$

A sample proof of a simple transitive sentence is provided in (17). The transitive verb *mato* 'see' takes two NP arguments to derive a sentence. By applying the two rules for directional connectives in (16), we obtain the correct surface word order and semantics.

(17)
$$\frac{\text{jonas; john; } \mathrm{NP}_{nom} \qquad \dfrac{\text{tomą; tom; } \mathrm{NP}_{acc} \qquad \text{mato; see; } (\mathrm{NP}_{nom}\backslash\mathrm{S})/\mathrm{NP}_{acc}}{\text{mato} \circ \text{tomą; see(t); } \mathrm{NP}_{nom}\backslash\mathrm{S}} {\scriptstyle /\mathrm{E}}}{\text{jonas} \circ \text{mato} \circ \text{tomą; see(t)(j); } \mathrm{S}} {\scriptstyle \backslash\mathrm{E}}$$

The key feature of HTLCG is that it exploits directional slashes as well as a non-directional (vertical) slash. The non-directional slash as the name suggests is not sensitive to the order of arguments in the syntactic component. The word order is kept track of in the prosodic component via λ-binding. The proof theory of HTLCG, with this syncretic set of implicational connectives, represents a fusion of the type logics proposed in Lambek 1958 (essentially following the formulation in Morrill 1994) and Oehrle (1994), with the further development of the latter in de Groote (2001) and Muskens (2003). The proof theory of HTLCG

appears to correspond closely to the intuitionistic non-commutative linear logic outlined in Polakow and Pfenning (1999), with which it shares the right, left and linear implication (here, vertical slash) connectives. The elimination rule for the vertical slash is presented in (18).

(18)   Vertical slash elimination

$$\frac{\text{a; } \mathcal{F}; \text{B} \qquad \text{b; } \mathcal{G}; \text{B}|\text{A}}{\text{b(a); } \mathcal{F}(\mathcal{G}); \text{B}}$$

A sample proof of the same transitive sentence is provided in (19). The transitive verb *mato* 'see' takes two NP arguments to derive a sentence. The only difference this time is that word order is explicitly kept track of in the prosodic component via λ-binding of variables over strings that are indicated as subscripted ϕs in (19), while the syntactic connective is not sensitive to directionality. A vertical slash can be converted to a forward or a backward slash via slanting (see Kubota & Levine 2015 for more information about slanting),

(19)
$$\frac{\text{jonas; john; } \text{NP}_{nom} \qquad \dfrac{\text{toma; tom; } \text{NP}_{acc} \qquad \lambda\phi_1\lambda\phi_2.\phi_2 \circ \text{mato} \circ \phi_1; \text{ see; } (\text{S}|\text{NP}_{nom})|\text{NP}_{acc}}{\lambda\phi_2.\phi_2 \circ \text{mato} \circ \text{toma; see(t); } \text{S}|\text{NP}_{nom}} |\text{E}}{\text{jonas} \circ \text{mato} \circ \text{toma; see(t)(j); S}} |\text{E}$$

In the analysis proposed in the next subsection, I will employ the directional implication rules in (16) and the non-directional implication in (18).

4.2   Analyzing Lithuanian Phrasal Comparatives in HTLCG

In generative analyses of comparatives, adjectival, adverbial, and nominal comparatives are given a uniform analysis, i.e. essentially they have the same derivation. This means that in the nominal comparatives the cardinality of a set of individuals has to be assimilated to the supremum of a set of degrees (see e.g. Bresnan 1973). This is achieved by positing a phonologically null operator MANY which is a function that binds a degree argument to the cardinality of individuals (Hackl 2000). Here I propose that the three types of comparatives are derived through district comparative operators instead, while this results in an expanded lexicon, we do not have to posit phonologically null operator. I will now introduce each comparative operator in turn.

Adjectival Comparative. I propose that predicative adjectival comparatives are constructed with a three place operator in (20). The operator combines with a gradable predicative adjective (($\text{NP}_{nom}\backslash\text{S}$)| Deg)), and two noun phrases. In the prosodic component, subscripted ϕs are variables over strings, while σ is a variable over string to string function. The first argument of the gradable adjective is a degree (Deg), which is phonologically null (ϵ) as per standard assumptions (see e.g. von Stechow 1984). In the semantic component, inequality relation is established between two gradable predicates, where MAX is a function that returns a maximum degree to which a property holds. The semantic

component thus can be paraphrased as 'the maximum degree to which x is P exceeds the maximum degree to which y is P.'

(20)   Adjectival comparative operator:
$\lambda\sigma\lambda\phi_1\lambda\phi_2.\phi_1 \circ \sigma(\epsilon)\circ$už$\circ\phi_2$;
$\lambda P\lambda x\lambda y.\text{MAX}(\lambda d.P(d)(x)) > \text{MAX}(\lambda d'.P(d')(x))$;
$S|NP_{acc}|NP_{nom}|((NP_{nom}\backslash S)|Deg)$

A sample derivation of an adjectival comparative is provided in (21):

(21)   Jonas   aukštesnis už   Tomą.
         John.nom taller   than Tom.acc

         'John is taller than Tom.'

$$\lambda\phi_1.\phi_1\circ\text{aukštas}; \qquad \lambda\sigma_1\lambda\phi_1\lambda\phi_2.\phi_1 \circ \sigma(\epsilon)\circ\text{už}\circ\phi_2;$$
$$\lambda d_1.\text{tall}(d_1); \qquad \lambda P\lambda x\lambda y.\text{MAX}(\lambda d.P(d)(x)) > \text{MAX}(\lambda d'.P(d')(y));$$
$$\underline{(NP_{nom}\backslash S)|Deg} \qquad \underline{S|NP_{acc}|NP_{nom}|((NP_{nom}\backslash S)|Deg)}$$
$$\text{jonas}; \qquad \lambda\phi_2\lambda\phi_3.\phi_2\circ\text{aukštesnis}\circ\text{už}\circ\phi_3; \qquad |E$$
$$j; \qquad \lambda x\lambda y.\text{MAX}(\lambda d.\text{tall}(d)(x)) > \text{MAX}(\lambda d'.\text{tall}(d')(y));$$
$$\underline{NP_{nom}} \qquad \underline{S|NP_{acc}|NP_{nom}}$$
$$\text{tomą}; \qquad \lambda\phi_3.\text{jonas}\circ\text{aukštesnis}\circ\text{už}\circ\phi_3; \qquad |E$$
$$t; \qquad \lambda y.\text{MAX}(\lambda d.\text{tall}(d)(j)) > \text{MAX}(\lambda d'.\text{tall}(d')(y));$$
$$\underline{NP_{acc}} \qquad \underline{S|NP_{acc}}$$
$$\text{jonas}\circ\text{aukštesnis}\circ\text{už}\circ\text{tomą}; \qquad |E$$
$$\text{MAX}(\lambda d.\text{tall}(d)(j)) > \text{MAX}(\lambda d'.\text{tall}(d')(t));$$
$$S$$

Since the lexical entry in (20) specifies that the operator takes an accusative case-marked NP as its first argument, which is interpreted as the standard of comparison, the first empirical generalization, that the standard of comparison is an accusative-marked NP, has been captured.

The analysis also captures the second empirical generalization. Recall that phrasal comparatives are incompatible with measure phrases like *du metrai* 'two meters' when they are used as the standard of comparison. Semantically, measure phrases have been proposed to be either of type $\langle d\rangle$ in which case they are seen as points on a scale, or as predicates over scale intervals $\langle d,t\rangle$ (see e.g. Schwarzschild 2005 for discussion). Whether Lithuanian measure phrases are $\langle d\rangle$ or $\langle d,t\rangle$ has no bearing on the current analysis, as either way they would be of a wrong semantic type to combine with the comparative operator since it expects an argument of type $\langle e\rangle$. The third empirical generalization that the associate must be the subject is also captured under this analysis, since the gradable predicate that combines with the comparative operator is of syntactic type $((NP_{nom}\backslash S)|Deg$, i.e. it is a predicate that lacks a subject.

Adverbial Comparative. The adverbial comparative in (22) is a four place operator: it combines with a gradable adverb $((NP\backslash S)\backslash(NP\backslash S))|Deg$ (for which I will use the shorthand notation $(VP\backslash VP)|Deg$), a predicate $NP_{nom}\backslash S$ and two noun phrases.

(22)   Adverbial comparative operator
$\lambda\sigma\lambda\phi_1\lambda\phi_2\lambda\phi_3.\phi_2\circ\phi_1\circ\sigma(\epsilon)\circ$už$\circ\phi_3$;
$\lambda f\lambda P\lambda x\lambda y.\text{MAX}(\lambda d.f(P(d))(x))>\text{MAX}(\lambda d'.f(P(d'))(y))$;
$S|NP_{acc}|NP_{nom}|(NP_{nom}\backslash S)|((VP\backslash VP)|Deg)$

A sample derivation of an adverbial comparative is provided in (23):

(23)   Jonas   bėga   greičiau už   Tomą.
John.nom run.prs.3 faster   than Tom.acc
'John runs faster than Tom.'

The analysis correctly predicts that the subject of the transitive verb must be the associate, to the exclusion of the object. The syntactic category of the verb must be $NP_{nom}\backslash S$, i.e. a verb that lacks only a single nominative argument to its left. This means that if we have transitive verb like *suvalgė* 'ate' of syntactic type $(NP\backslash S)/NP$, it must first combine with an accusative object. This predicts that (24a) is a well formed sentence with the nominative case-marked subject serving as the associate. Crucially however, it also predicts that the minimally different sentence in (24b) is ruled out as it would predict that *obuolius* 'apples' is interpreted as the subject of *suvalgė* 'ate.'

(24)   a.   Jonas   suvalgė sausainius   greičiau už   Tomą
John.nom eat.pst.3 cookie.pl.acc faster   than Tom.acc
'John ate cookies faster than Tom.'

    b.   # Jonas   suvalgė sausainius   greičiau už   obuolius.
John.nom eat.pst.3 cookie.pl.acc faster   than apple.pl.acc
Intended meaning 'John ate cookies faster than (he did) apples.'
Predicted meaning 'John ate cookies faster than apples (did).'

Equivalent to the adjectival comparative operator in (20), the lexical entry for the adverbial operator specifies that the accusative case-marked NP argument is interpreted as the standard of comparison. Thus the empirical generalization that the standard of comparison must be a accusative case-marked NP has been

captured. The fact that the standard of comparison cannot be a measure phrase is also captured, since it is of a wrong semantic type to combine with the comparative operator.

The Nominal Comparative. The nominal comparative operator in (25) combines with four arguments, two noun phrases, a noun, and an expression of syntactic category (S\NP)/NP (abbreviated as TV for transitive verb). The nominal comparative differs from the other two operators proposed in this section in that the comparison relation is not expressed in terms of degrees, instead the comparison is drawn between cardinality of sets.

(25)   Nominal comparative operator
$\lambda\phi_1\lambda\phi_2\lambda\phi_3\lambda\phi_4.\phi_3\circ\phi_2\text{daugiau}\circ\phi_1\text{už}\circ\phi_4$;
$\lambda P\lambda Q\lambda k\lambda z|\lambda x.P(x)\wedge Q(x)(k)| > |\lambda x.P(x)\wedge Q(x)(z)|$;
$S|NP_{acc}|NP_{nom}|TV|N_{gen}$

A sample proof for a nominal comparative is provided in (26).

(26)   Jonas   suvalgė   daugiau saldainių   už   Tomą.
        John.nom eat.pst.3 more   candies.gen than Tom.acc
        'John ate more candies than Tom.'

To paraphrase, the meaning of (26) is 'there are more x that are candies that John ate than there x that are candies that Tom ate.' Since the genitive argument of the operator is repeated in the semantic component of both conjuncts, it ensures that the two conjuncts can only differ in their respective subjects. This captures the empirical generalization in Lithuanian that the associate must be the subject. Consequently, sentences like (27) are ruled out on the grounds of being infelicitous. The predicted meaning of (27) would be 'John ate more candies than cookies ate candies', which is infelicitous given that cookies are inanimate.

(27)   # Jonas   suvalgė   daugiau saldainių   už   sausainius.
          John.nom eat.pst.3 more   candies.gen than cookies.acc

'John ate more candies than cookies.'

The proposed operator in (25) also accounts for the empirical generalization that nominal comparatives are unacceptable with 'more' NP subjects. This generalization is captured quite straightforwardly as in such sentences there are simply not enough NPs to saturate all the expected arguments of the nominal operator. Consequently, the sentence in (28) is deemed ungrammatical.

(28)   * Daugiau vyrų   atvyko   už   moteris.
          more   men.pl.gen arrive.pst.3 than women.pl.acc
          'More men arrived than women.'

Furthermore, a welcome consequence of adopting the operator in (25) is that we predict that certain meanings will never arise with phrasal comparatives. For instance, we correctly predict that the sentence in (29, repeated from 13) has only one possible reading, where the associate is *Jonas* 'John'.

(29)   Jonas   suvalgė daugiau sausainių,   kuriuos   Agnė
          John.nom eat.pst.3 more   cookie.pl.gen which.acc bake.pst.3
          iškepė   už   Tomą.
          Agne.nom than Tom.acc
          'John ate more cookies that Agne baked than Tom ate.'
          # 'John ate more cookies that Agne baked than the cookies that Tom baked.'

The semantics of the unavailable reading is presented in (30), this semantics simply cannot be derived given the operator in (25).

(30) $|\lambda x.\text{cookie}(x) \wedge \text{bake}(x)(\text{Agne}) \wedge \text{eat}(x)(\text{John})| >$
          $|\lambda x.\text{cookie}(x) \wedge \text{bake}(x)(\text{Tom}) \wedge \text{eat}(x)(\text{John})|$

The reason for the unavailability of this reading is that the first argument to nominal comparative operator is a noun, N, the semantics of which is inserted in the semantic component of both conjuncts simultaneously. The consequence of which is that the two conjuncts can only differ in the respective subjects of the verb in the main clause, as shown in the partial proof in (31). Under this analysis, the apparent island effects are just an epiphenomenon of lexical specification of comparative operators.

(31)

$$
\cfrac{
\begin{array}{cc}
\begin{array}{c}
\text{sausainių} \circ \text{kuriuos} \circ \text{Agnė} \circ \text{iškepė}; \\
\lambda x.\text{cookie}(x) \wedge \text{bake}(x)(A); \\
N_{gen}
\end{array}
&
\begin{array}{c}
\lambda \phi_{1,2,3,4}.\phi_3 \circ \phi_2 \circ \text{daugiau} \circ \phi_1 \circ \text{už} \circ \phi_4; \\
\lambda P \lambda Q \lambda k \lambda z |\lambda x.P(x) \wedge Q(x)(k)| > |\lambda x.P(x) \wedge Q(x)(z)| \\
S|NP_{acc}|NP_{nom}|TV|N_{gen}
\end{array}
\end{array}
}{
\begin{array}{c}
\lambda \phi_{2,3,4}.\phi_3 \circ \phi_2 \circ \text{daugiau} \circ \text{sausainių} \circ \text{kuriuos} \circ \text{Agnė} \circ \text{iškepė} \circ \text{už} \circ \phi_4; \\
\lambda Q \lambda k \lambda z |\lambda x.\text{cookie}(x) \wedge \text{bake}(x)(A) \wedge Q(x)(k)| > |\lambda x.\text{cookie}(x) \wedge \text{bake}(x)(A) \wedge Q(x)(z)| \\
S|NP_{acc}|NP_{nom}|TV
\end{array}
} \;|E
$$

In sum, this section showed that by virtue of adopting Hybrid TLCG we easily account for all the empirical generalizations of Lithuanian phrasal comparatives, as well as predict apparent island effects.

5   Conclusions

There is a long-standing debate in the literature on phrasal comparatives about whether they are derived from clausal sources or whether they are directly licensed. Most recently it has been suggested that both strategies are instantiated languages with phrasal comparatives (see e.g. Beck et al. 2004, Pancheva 2006, 2009, Bhatt and Takahashi 2007, 2011, Merchant 2009, 2012, Lechner 2015). Different diagnostics have been proposed to help adjudicate between direct and clausal analyses for different languages; essentially if a phrasal comparative exhibits clausal-like properties it should be given a reduced clause analysis. Lithuanian phrasal comparatives have been previously argued to contain covert syntactic structures on account that they exhibit island effects. In this paper, I have shown that while the previous analysis accounts for island effects, it does not capture all empirical generalizations. In this paper, I have developed a direct analysis of Lithuanian phrasal comparatives formalized in HTLCG. Under the analysis proposed here, the three kinds of phrasal comparatives in Lithuanian (i.e. adjectival, adverbial, and nominal comparatives) are derived through distinct comparative operators. The empirical generalizations about Lithuanian phrasal comparatives are captured without the assumption of covert syntactic structures. The analysis indicates that it is possible to account for the apparent clausal properties of phrasal comparatives (i.e. propositional semantics and apparent island sensitivity) without appealing to complex unpronounced structures.

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