Equatives, comparatives, and polarity in Slavic*

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1. Introduction

This article examines the role of polarity marking in overtness requirements on the left periphery of comparative subclauses, especially regarding the differences from equative subclauses. The phenomenon can be well observed in Slavic, where comparative complementisers tend to be transparent in terms of marking negative polarity.

Embedded degree clauses fall into two major types: AS-clauses (equatives) and THAN-clauses (comparatives). They are illustrated in (1) below: (1a) shows an equative clause, (1b) shows comparison to a lower degree, and (1c) shows comparison to a higher degree.

- (1) a. Anthony is as tall **as** Mary is.
 - b. Anthony is taller than Mary is.
 - c. Anthony is less tall than Mary is.

Regarding degree semantics, the following can be established: AS-clauses encode degree equality (d=d') and THAN-clauses encode degree inequality (d \neq d'). The relevant semantics of the examples in (1) can be schematised as follows:

- (2) a. $\exists d \exists d' [TALL (a,d) \& TALL (m,d') \& (d=d')]$
 - b. $\exists d \exists d' [TALL (a,d) \& TALL (m,d') \& (d > d') \& (d \neq d')]$
 - c. $\exists d \exists d' [TALL (a,d) \& TALL (m,d') \& (d < d') \& (d \neq d')]$

The relation between the degrees is encoded by the matrix Deg (*as/-er/more/less*) and partially by the subclause. In AS-clauses, both encode degree equality. In THAN-clauses, the matrix Deg encodes superiority or inferiority, and the subclause encodes merely degree inequality (referred to as "degree negation"). Evidence for the lack of further specification by the subclause comes from the fact that while the matrix degree determines the choice between AS and THAN, there are no subtypes in comparative complements according to superiority/inferiority.

Degree negation in THAN-clause can also be reflected lower than the THAN-CP itself in the subclause. As shown already by Seuren (1973), comparative subclauses are negative polarity environments, and negative polarity items are licensed. Consider:

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(3) She would rather die than **lift a finger** to help.

In (3) above, the element *lift a finger* is a negative polarity item that is licensed to appear only if there is a (covert or overt) negation element present in the structure.

In connection with the issue of negative polarity, the following questions arise. First, the question is whether negative polarity has a reflex in the CP-domain: it is expected that the licensor of negative polarity items, see (3), is located high in the clause. Second, it should be clarified whether and how C heads in AS-clauses and THAN-clauses differ: based on the semantics given in (2), they are expected to differ inasmuch as comparatives express inequality. Third, it should be investigated whether comparative operators suffice as overt markers instead of complementisers: as shown by Bacskai-Atkari (2016), operators suffice in equative clauses in various languages but this is apparently not the case in comparatives.

Using data from Czech, Polish, Serbo-Croatian and partially Russian, this paper proposes that Slavic languages provide explicit answers to these questions. Since degree operators are essential in this matter, section 2 examines the status of these operators in the respective languages, concentrating on degree questions, where operators are obligatory. Section 3 then discusses the availability of degree operators in equatives, showing that while ordinary degree operators indeed show up in these constructions, some languages show them either as grammaticalised complementisers or they allow only relative operators that are not tied to a degree interpretation. Finally, section 4 examines the same questions in comparatives, showing that operators in comparative subclauses do not suffice as overt markers, except in languages that allow them to be inserted directly into C. The findings presented in this paper are important for the theory because they show that the consistent differences between equatives and comparatives can be traced back to general requirements that follow from the semantic properties of the constructions. In addition, the study summarises a systematic investigation of degree constructions in the Slavic languages under scrutiny.

2. Degree operators

Equative and comparative subclauses contain relative operators as degree operators: these can be overt or covert (cf. Bacskai-Atkari 2014b). These often have their interrogative counterparts;

the phenomenon is illustrated for English *how*, which is available in certain non-standard dialects in embedded degree clauses as well:¹

- (4) a. **How tall** is Mary?
 - b. % Anthony is as tall as **how tall** Mary is.
 - c. % Anthony is taller than **how tall** Mary is.

In interrogatives, the degree operator must be overt; movement targets a [Spec,CP] position. The theoretically possible configurations regarding the relative positions of the operator and the lexical AP are as follows (cf. Bacskai-Atkari 2014a, 2014b):

(5) a. OP AP ...
b. OP ... AP (...)
c. OP ...

In (5a), the lexical AP moves together with the operator to the [Spec,CP] position. In (5b), the AP is stranded. Finally, in (5c) there is no lexical AP present: the operator is a proform. Similar variation can be observed in the case of lexical NPs as well. Note also that a single operator may allow for more than one configuration: in particular, stranding in (5b) is always optional and allows for the option in (5a), even though one may be preferred to the other.

Slavic languages demonstrate all of the following types. First, there are operators that always take an AP(/NP) to the [Spec,CP], resulting in the configuration given in (5a). Second, there are operators that may also strand the AP; hence, both (5a) and (5b) are possible. Third, there are proform operators that render the pattern in (5c).

Polish jak shows no stranding (see also Borsley and Jaworska 1981: 81). Consider:

(6) **Jak wysoki** jest Karol? / ***Jak** jest Karol **wysoki**? how tall is Charles how is Charles tall 'How tall is Charles?'

¹ The cross-linguistic observation of Bacskai-Atkari (2014b: 98–123) is that languages or dialects that have overt comparative operators license these both in ordinary comparatives such as (4b) and in so-called subcomparatives such as (4c), and there is no significant difference between the judgements for the two. That is, constructions like (4b), where the gradable adjective is identical in the two clauses, and constructions like (4c), where the gradable adjective is different from the one in the matrix clause (and therefore contrastive) are about equally grammatical. This holds for English, where speakers judged the sentences equally grammatical (Bacskai-Atkari 2014b: 109). Naturally, some speakers may find constructions like (4b) slightly marked due to redundancy, but it is equally possible for other speakers to perceive (4c) as slightly marked due to its relative conceptual complexity. However, this does not affect the overall claim that the constructions are both grammatical.

By contrast, stranding allowed with Czech *jak*, Polish *jako*, Serbo-Croatian *koliko*, and with Russian *naskol'ko*. The Czech data are illustrated in (7):

(7) **Jak vysoký** je Karel? / **Jak** je Karel **vysoký**? how tall is Charles how is Charles tall 'How tall is Charles?'

The Polish data are given in (8) below (see Borsley and Jaworska 1981: 81):

(8) **Jaki wysoki** jest Karol? / **Jaki** jest Karol **wysoki**? how tall is Charles how is Charles tall 'How tall is Charles?'

The Serbo-Croatian pattern is illustrated by (9):

(9) **Koliko visok** je Petar? / **Koliko** je Petar **visok**? how tall is Peter how is Peter tall 'How tall is Peter?

Finally, the Russian data are given in (10):

(10) ? Naskol'ko vysok Piotr? / Naskol'ko Piotr vysok? how tall Peter how Peter tall 'How tall is Peter?'

Apart from operators taking APs, there are proform operators in Slavic, such as Czech *jaký* (which is always a proform) and Polish *jako* (which is optionally a proform but may take an AP as well and then it is inflected, as in (8) above). An example from Czech is given in (11):

(11) **Jaký** je Karel? how is Charles 'What is Charles like?'

The Polish pattern is illustrated in (12) below (cf. Borsley and Jaworska 1981: 92):

(12) **Jaki** jest Karol? how is Charles 'What is Charles like?'

Naturally, the fronted *wh*-element in main clause interrogatives can only be interpreted as an operator. The question arises whether there is a potential ambiguity of head-sized relative operators in equative/comparative subclauses between an operator interpretation and a C head interpretation (cf. the analyses of Jäger 2010 and Bacskai-Atkari 2014a for similar instances in the historical development of German *wie*). The expectation is that ambiguity (between operator

and C head) and reanalysis (from operator into C head) are possible if the operator takes no AP: this is possible in the stranding and in the proform patterns.

3. Equatives

Contrary to English, where the overt presence of the head *as* is obligatory, AS-clauses in Slavic languages may be introduced by operators, too. Evidence for the operator-status of these elements comes from the availability of a co-occurring AP(/NP).

Let us start with Czech. The examples in (13) show the difference between *jak* and *jako*:

| (13) | a. | Ten | stůl | je | stejně | dlouhý, | jak | sire | oká | je | ta | kancelář. |
|------|---|-------------|---|-----------|------------------|--------------------|-----------------------|---------|----------------------|------------|-----------|---------------------|
| | | the | table | is | same | long | how | wic | wide | | the | office |
| | | 'The | 'The table is as long as the office is wide.' | | | | | | | | | |
| | b. | Ten | stůl | je | stejně | dlouhý, | jak | je | ta | kano | celář | siroká. |
| | | the | table | is | same | long | how | is | the | offic | ce | wide |
| | 'The table is as long as the office is wide.' | | | | | | | | | | | |
| | c. | *Ten the | stůl table | je e i | e stejr s sam | ně dlouh e long | vý, ja l ho | ko w | sirok wide | á je is | ta the | kancelář. office |
| | | The | table is | s as | long as | the office | 15 W10 | ie. | | | | |
| | d. | Ten | stůl | je | stejně | dlouhý, | jako | je | ta | kano | celář | siroká. |
| | | the | table | is | same | long | how | is | the | offic | ce | wide |
| | | 'The | table is | s as | long as | the office | is wid | le.' | | | | |

Hence, *jak* behaves like an ordinary operator that may take the lexical AP to the [Spec,CP] position, though the AP may also be stranded. By contrast, *jako* cannot take the lexical AP to the [Spec,CP], as demonstrated by the ungrammaticality of (13c); since the presence of an overt AP is allowed, as in (13d), it should also be obvious that the ungrammaticality of (13c) cannot be attributed to *jako* obligatorily being a proform: instead, the pattern demonstrates that *jako* is a C head. Further evidence for the difference between *jak* and *jako* regarding their syntactic status comes from co-occurrence options with other operators. Consider:

- (14) a. *Renault stojí stejně jak (kolik) stojí Dacia. Renault costs same how how.much costs Dacia
 'Renault costs as much as Dacia.'
 - b. ? Renault stojí stejně jako (kolik) stojí Dacia. Renault costs same as how.much costs Dacia 'Renault costs as much as Dacia.'

The ungrammaticality of (14a) follows naturally if *jak* is an operator: only one degree operator is allowed in the subclause, and that is either *jak* or *kolik*. By contrast, the doubling pattern in

(14b) is allowed, though slightly marked since the overt presence of the operator *koliko* is superfluous. The question is how this kind of doubling can be analysed formally.

I propose that there is a split in the overt marking of semantic/syntactic features. In equatives, there are two relevant properties, referred to as [rel] and [compr] in shorthand. The property [rel] stands for relative, and it refers to the encoding of the relative nature of the clause (see Chomsky 1977 on comparative clauses being relative clauses). The property [compr] stands for comparative, and it refers to the encoding of a comparison property (equative or comparative). The relevant structures involving *jak* and *jako* are schematised in (15):



In (15a), the C head is specified as [compr] and [rel], and the element *jak* moving to the specifier carries both properties, hence the features are checked off. The same applies to (15b) as well, with the exception that the [compr] property is doubled on a second C head. Note that the feature [rel] cannot be doubled syntactically (that is, appearing on two separate C heads) as there can be only one relative operator present in the structure, while the comparison property is not unique to operators. In case the relative operator is zero, the complementiser may be inserted into the lower C head as well, in which case *jako* lexicalises the [compr] property on its own, as in (13d). The generation of the higher CP in (15b) is enabled by the matrix degree element, which selects a CP complement headed by particular C elements.

The availability of Serbo-Croatian što provides evidence for the lower CP marking [rel]:

(16) Pavao je visok kao što ie visok Petar. Paul tall what tall Peter is as is 'Paul is as tall as Peter is.'

The structure (regarding the overt elements) is given in (17); note that a covert comparative operator moves to the lower [Spec,CP] position:



As can be seen, in this case the element *što*, which has no degree specification (but is an appropriate relativiser), appears lower than the comparative complementiser in the structure. The lower C head still carries the [compr] specification, which is checked off by the covert comparative operator, and [compr] is hence doubled, similarly to (15b). However, as opposed to (15b), doubling is not optional in (17) since *što*, unlike Czech *kolik*, does not mark the [compr] property overtly, and this function has to be taken over by the higher C head (*kao*).

Regarding overt encoding in equative clauses, then, the following points can be established. Overt encoding can be carried out both by C heads (complementisers) and by operators. In the case of C heads, while the C head is syntactically specified as both [compr] and [rel], the inserted lexical element does not necessarily carry both of these features. Complementisers specified as [rel] only, such as Serbo-Croatian *što*, occupy a lower C head. The higher C head (whenever there is a split CP) is specified for [compr] only and complementisers specified as only [compr] can be inserted into this position. On the other hand, operators are invariably specified as both [rel] and [compr]: the [compr] feature is required by degree semantics, and the [rel] feature ensures that the operator moves up to the [Spec,CP].

Operators can grammaticalise into complementisers in equatives because operators encode the relevant properties overtly and no further features need to be acquired. In addition, operators may stand alone in equatives, which facilitates their reinterpretation.

Consider the syntactic paradigm for Polish equatives (cf. Borsley and Jaworska 1981):

| (18) | a. | Maria | jest | tak v | vysoka | jak | wysoki | był | Karol. | | | |
|------|----|-----------------------------------|---------|--------|-----------|---------------|---------|-------------|------------|--|--|--|
| | | Mary | is | as t | all | how | tall | was | Charles | | | |
| | | 'Mary is as tall as Charles was.' | | | | | | | | | | |
| | b. | Maria | jest | tak | wysoka | jak | Karol | był | wysoki. | | | |
| | | Mary | is | as | tall | how | Charles | is | tall | | | |
| | | 'Mary is as tall as Charles was.' | | | | | | | | | | |
| | c. | Maria | jest | taka | wysok | ta jak | i wysok | i by | ł Karol. | | | |
| | | Mary | is | as | tall | hov | v tall | Wa | as Charles | | | |
| | | 'Mary | is as t | all as | Charles v | was.' | | | | | | |

 d. Maria jest taka wysoka jaki Karol był wysoki. Mary is as tall how Charles is tall 'Mary is as tall as Charles was.'

Both *jak* and *jaki* can take the AP to the [Spec,CP] and both allow the stranding of the AP as well. The behaviour of *jako* is expected based on its behaviour as an interrogative operator, see (8); Polish *jako* is thus similar to Czech *jak*. On the other hand, the behaviour of Polish *jak* in (18b) is unexpected inasmuch as stranding is possible, contrary to what we saw in interrogatives. In addition, *jak* appears on its own (without the AP) in elliptical clauses:

(19) Maria jest tak wysoka jak Karol.
 Mary is as tall how Charles 'Mary is as tall as Charles.'

Hence, *jak* demonstrates a first step towards reanalysis, but the process is not yet complete, as demonstrated by the availability of constructions like (18a). By contrast, a complete reanalysis can be detected in the case of Czech *jako*, Serbo-Croatian *kao* and *koliko*, and Russian *kak* in AS-clauses. Regarding Serbo-Croatian *koliko*, note that *koliko* in AS-clauses is different from its interrogative operator counterpart with respect to its syntactic behaviour. Consider:

| (20) | a. | Pavao Paul 'Paul is | je is as ta | visok tall all as Pet | koliko as ter.' | je is | Petar Peter | visok . tall |
|------|----|----------------------------|-------------------|-----------------------------|------------------------------|---------------------|-------------------|------------------------|
| | b. | *Pavao Paul 'Paul is | je is as ta | visok tall all as Pet | koliko as ter.' | viso tall | k je is | Petar. Peter |

If *koliko* were an operator in AS-clauses, then (20b) should be possible; since, however, only (20a) is grammatical, *koliko* must be a complementiser.

Hence, operators show various stages with respect to reanalysis in Slavic.

4. Comparatives

Let us now turn to THAN-clauses, which have to express degree negation in addition to [rel] and [compr]; the property of degree negation will be abbreviated as [d-neg]. Crucially, the comparative operator cannot encode this property since it is not a negative operator: it is associated with the degree d' and cannot at the same time express that $d\neq d'$. There is ample cross-linguistic evidence that the [d-neg] property is marked by the C head above operator, hence double CPs are generated in THAN-clauses. Note that the C head encoding [d-neg] has to

be overt since negative polarity/negation has to be marked morphologically (Dryer 2013). The comparative complementiser is often morphologically transparently negative: this applies to Czech *než*, Polish *niž*, and Serbo-Croatian *nego* and *no*.

In addition to the overt complementiser, an overt operator may appear in certain languages but not in others. In Polish, the presence of an overt operator is not allowed (cf. Bacskai-Atkari 2015); recall that there is no doubling in Polish equatives either. Consider:

(21) Maria jest wyższa **niż** (***jak wysoki** był) Karol. Mary is taller than how tall was Charles 'Mary is taller than Charles.'

The combination of a C head and an operator is possible in Czech (cf. Bacskai-Atkari 2015):

| (22) | a. | ? Ten the 'The ta | stůl table ble is | je is long | delší, longer ger thar | než than the of | jak how fice is | široká wide wide.' | je is | ta the | kancelář. office |
|------|----|---------------------------|-------------------------|----------------------|------------------------------|------------------------------|------------------------------|---------------------------------|----------|----------------|-----------------------------|
| | b. | Ten s the t 'The ta | stůl able ble is | je č is l long | lelší, onger ger thar | než than the of | jak how fice is | je ta is the wide.' | k | ance office | lář široká . wide |

While doubling is possible, the presence of the overt operator does not substitute the overt presence of the complementiser: the presence of *než* is obligatory. Consider:

| (23) | a. | *Ten the 'The ta | *Ten stůl the table 'The table is | | delší, longer ger than | jak šir how wi the office | | oká de is w | je t is t ide.' | ta the | kancelář. office |
|------|----|------------------------|---|-----------------|------------------------------|--|------------------|--------------------------|--------------------------|-----------|-------------------------|
| | b. | *Ten the 'The ta | stůl table ble is l | je is ong | delší, longer ger than | jak how the off | je is fice | ta the is w | kance office ide.' | elář e | široká . wide |

Considering all factors, the Czech pattern is expected. On the one hand, the behaviour of *jak* is expected based on its behaviour in interrogatives and in AS-clauses. On the other hand, the behaviour of *než* is expected cross-linguistically: [d-neg] has to be encoded on the head overtly. The structure showing the positions of *než* and *jak* is shown in (24):



As can be seen, while the [compr] feature is again doubled, the marking of [rel] and [d-neg] is split: [rel] can be encoded only once and it is encoded on the lower C head so that the movement of the operator is as short as possible, and [d-neg] has to be encoded separately.

Again, it is possible, just like in equatives, that the lower C head lexicalises merely [rel] overtly on the head and the operator is silent. Evidence for this comes from Serbo-Croatian:

(25) Pavao je viši **nego/no što** je Petar. Paul is taller than what is Peter 'Paul is taller than Peter.'

Note that while both *nego* and *no* are possible elements corresponding to *than*, the distribution of *no* seems to show considerable differences among Croatian and Serbian dialects; in the subsequent discussion, I will therefore only use *nego* but the behaviour of *no* would not differ. The structure regarding *nego* and *što* is given in (26):



Two comparative C heads are also possible; Serbo-Croatian koliko may appear as a lower C:

(27) ? Pavao je viši **nego koliko** (***visok**) je Petar. Paul is taller than how tall is Peter 'Paul is taller than Peter.'

The corresponding structure is given in (28) below:



The difference between (26) and (28) lies in the feature specification of the complementiser inserted into the lower C head. In either case, the complementiser *nego* (or *no*) is obligatory.

The Serbo-Croatian pattern is again expected. On the one hand, the behaviour of *koliko* is expected based on its behaviour in AS-clauses, as opposed to interrogatives: in AS-clauses, it is already a grammaticalised C head and not an operator. On the other hand, the behaviour of *nego* (and *no*) is expected cross-linguistically since the encoding of [d-neg] has to be carried out by an overt element in the head.

Regarding overt marking, the following points can be established so far. In all the patterns, a comparative complementiser can be detected: examples include Polish *niż*, Russian *čem*, Czech *než*, and Serbo-Croatian *nego* and *no*. An operator may appear overtly in addition to the comparative complementiser, such as Czech *jak*. Moreover, a lower complementiser may appear in addition to the regular comparative complementiser, such as Serbo-Croatian *koliko* and *što*. However, a pattern where a comparative operator appears on its own (without the higher comparative complementiser) is excluded, unlike what we saw in equatives.

An apparent counter-example to this seems to be Czech *jak* in examples like (29) below:

(29) Marie je vyšší, jak (*je) Karel. Mary is taller how is Charles 'Mary is taller than Charles.'

However, the appearance of a single *jak* is subject to restrictions. An AP is excluded, see (23), and the clause is always elliptical, as shown by the ungrammaticality of the copula in (29).

I propose that in examples like (29) only one CP is generated, and the operator moves to the C head and not to the [Spec,CP]. Ellipsis effectively eliminates the (feature) mismatch between the base-generation site and the landing site. The relevant structure is given in (30):



In line with Merchant (2001), I assume that the remnant (the NP *Karel*) moves to the specifier of a functional projection (FP), the head of which contains the ellipsis feature [E]. Regarding

the issue of head-sized operators moving to C, the following points should be mentioned. The phenomenon is not restricted to Czech comparatives but can be detected in certain German dialects (such as Alemannic and Bavarian) in relative clauses, too, as shown by Bayer and Brandner (2008). Bayer and Brandner (2008) argue that such a movement operation constitutes no violation of the Chain Uniformity of Chomsky (1995), as head-sized operators have a dual status anyway (they are heads and phrases at the same time); there is no feature mismatch either in relative clauses. In Czech, however, the comparative operator moving to the C head encoding [d-neg] causes a feature mismatch between the base-generation site and the landing site, because the operator cannot originate as [d-neg]. Ellipsis saves the construction by eliminating this mismatch, similarly to sluicing repairing island violation effects (see Merchant 2001).

Hence, a comparative operator taking over the complementiser function in THAN-clauses is not as straightforward as in AS-clauses. The behaviour of Czech *jak* is still consistent with the general theory that the property of [d-neg] is marked on C head.

Regarding overt marking, then, the conclusions have to be slightly modified. There are patterns involving a single comparative complementiser, such as Polish *niż*, Russian *čem*, Czech *než*, and Serbo-Croatian *nego* and *no*. An overt operator may appear in addition to the comparative complementiser, such as Czech *jak*. In addition, a lower complementiser may appear in addition to the regular comparative complementiser, such as Serbo-Croatian *koliko* and *što*. Finally, while comparative operators are normally not possible on their own, they may be licensed if they move to the C head; this is a language-specific option, and it can be detected with obligatory ellipsis in the case of Czech *jak*.

5. Conclusion

This paper examined some issues related to the syntax of degree operators and embedded degree clauses in Slavic. The major conclusions can be summarised as follows. Degree operators appear in the [Spec,CP] either with or without lexical XPs (the latter case is either the result of stranding the XP or the operator is a proform). In AS-clauses, clause typing is marked overtly either by complementisers or by operators, or by combinations (C+C, C+operator). In THAN-clauses, clause typing is marked overtly by a C head (lexicalised normally by a complementiser and in certain cases by a moved operator), or by combinations (C+C, C+operator). The minimal difference between AS-clauses and THAN-clauses is due to demands on the overt marking of [d-neg] in THAN-clauses, and hence the asymmetry can be accounted for in a principled way.

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