

Towards a cross-linguistic typology of marking polarity in embedded degree clauses

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Abstract: The article focuses on comparative complementisers in comparative clauses expressing inequality in various languages, with particular attention paid to their role as lexicalising negative polarity. I argue that the relevant property follows from degree semantics, in that the comparative subclause encodes the inequality of the degree expressed by a matrix clausal element and the one expressed by the comparative operator. Just like ordinary negation, this has to be encoded overtly; however, as it does not constitute an instance of genuine clausal negation, the property cannot be encoded by an operator, and hence must be realised on a functional head, which is either the complementiser or a separate polarity head.

Keywords: comparative subclauses; complementisers; CP-periphery; negative polarity; overtiness

1. Introduction

Embedded degree clauses fall into two major types: AS-clauses and THAN-clauses, as illustrated in (1):

- (1) a. Ralph is as tall **as** Mary is.
b. Ralph is taller **than** Mary is.

In (1a), the subclause introduced by *as* expresses that the degree to which Mary is tall is the same as to which Ralph is tall, while in (1b) the subclause introduced by *than* expresses that the degree to which Mary is tall is lower than the degree to which Ralph is tall. Note that while the examples in (1) contain full subclauses, the subclause is often reduced to a single focussed remnant, resulting in reduced clauses that can be derived by ellipsis, see Bacskai-Atkari (2014b;c).¹

¹ The elliptical counterparts of the clauses in (1) are illustrated in (i) and (ii) below:

Regarding THAN-clauses, Seuren (1973) shows that they are negative polarity environments: for instance, they license negative polarity items.² Consider:

- (2) a. He would rather continue complaining than **lift a finger** to improve his life.
 b. Ralph has spent more time travelling than **any** other professor (has).

Essentially, Seuren (1973) claims that there is some sort of negation in THAN-clauses. On the one hand, I adopt the idea that embedded degree clauses have negative polarity because they are downward entailing environments.³ On the other hand, I would like to suggest that there is a difference between AS-clauses and THAN-clauses in terms of what I will tentatively refer to as “degree negation”, a property associated with THAN-clauses but not with AS-clauses. The difference follows from comparative semantics: AS-clauses express degree equality ($d = d'$), while THAN-clauses express degree inequality ($d \neq d'$, which is further specified either as $d > d'$ or $d < d'$). This is represented in (3) below:⁴

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- (i) Ralph is as tall as Mary.
 (ii) Ralph is taller than Mary.

The point is that (i) and (ii) are not instances of a DP directly taken by *as* and *than* but they are remnants of clauses that are present in the syntactic derivation. The exact way ellipsis works is not relevant for the present paper; what matters for us is that in the examples discussed here, elliptical clauses can be treated on a par with non-elliptical ones, and the category of the complementiser is invariably C.

² There is ample literature on the licensing of negative polarity items, going back to the seminal work of Klima (1964).

³ Taking the example in (2), the sentence entails that Ralph has spent a certain amount of time travelling, call it d , and for all the other professors it is true that the amount they travelled is lower, call it d' ; hence d' , is always lower on a scale than d is, while the exact value of d is not necessarily known in the context. See Ladusaw (1979) on the relation between downward entailment and negative polarity contexts.

⁴ As indicated, encoding degree inequality is compositional: the idea is that while in AS-clauses both the matrix degree head (*as* in English) and the subclause encode degree equality, in THAN-clauses the subclause encodes merely inequality, while the exact relation of the two degrees – $d < d'$ or $d > d'$ – is specified by the matrix degree element (*-er/more/less* in English). 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.

- (3) a. x is as tall as y : $\exists d \exists d' [\text{TALL}(x, d) \ \& \ \text{TALL}(y, d') \ \& \ (d = d')]$
 b. x is taller than y : $\exists d \exists d' [\text{TALL}(x, d) \ \& \ \text{TALL}(y, d') \ \& \ (d \neq d') \ \& \ (d > d')]$
 c. x is less tall than y : $\exists d \exists d' [\text{TALL}(x, d) \ \& \ \text{TALL}(y, d') \ \& \ (d \neq d') \ \& \ (d < d')]$

However, while degree negation is present in THAN-clauses, neither this nor the presence of negative polarity implies clausal negation: the degree is negated, not the lexical predicate. Hence, there is no negative operator either: the relevant property has to be encoded directly on the CP-periphery on a functional head as there is no negative operator that would move from a clause-internal position to a left-peripheral specifier (note that the comparative operator is a relative operator, not a negative operator). The property of degree negation has to be encoded overtly: this is because negation generally has to be marked morphologically (see Dryer 2013). The question is thus which head can be responsible for marking degree negation.

In this article, I am going to propose that it is either a separate Pol head or a comparative C head (with various subtypes) that encodes degree negation. Further, I am going to show that not even overt comparative operators can take over this function (as they are not negative operators), hence operators first have to acquire a head status in order to lexicalise a negative comparative head: I will argue that this can happen in two basic ways, via doubling or radical replacement.

The organisation of the paper is as follows. In section 2, I am going to examine languages where negative polarity is marked by a separate Pol head. Section 3 will consider languages where negative polarity is marked by the comparative C head itself, and it will be shown that the C head has to be overt in all cases. In section 4, I examine instances of multiple C heads, and I will argue that the two C heads share the comparative feature, whilst there is a clear feature distinction in that the lower head is specified as relative and the higher one marks degree negation. Finally, section 5 is devoted to a particular phenomenon in Czech that seems to refute the general claim that the comparative C head has to be filled by overt material: I argue that this is only apparently so, and the operator in these cases in fact moves to the C head, accompanied by obligatory clausal ellipsis.

2. Negative polarity heads

In this section, I am going to investigate languages where a separate negative polarity head can be detected in the THAN-clause. The phenomenon can be observed in Italian, as shown by the following examples taken from Seuren (1973, 535, exx. 45 and 46):

- (4) a. Giovanni è più alto che **non** pensassi.
 John is more tall.M that not thought.SBJV.1SG
 ‘John is older than I thought.’
- b. Giovanni è più alto che pensavo.
 John is more tall.M that thought.1SG
 ‘John is older than I thought.’

As can be seen, the negative element *non* ‘not’ appears with a finite verb in the subjunctive in (4a), which is associated with formal style, while the informal variant in (4b) lacks the negative element and the finite verb is in the indicative. Since the meaning of the two clauses is exactly the same (the difference being restricted to style), it should be obvious that *non* in (4a) is not a true negator.

A similar phenomenon can be detected in French, where *ne* appears with finite verbs (Seuren 1973, 535, ex. 44):

- (5) Jean est plus grand que je **ne** pensais.
 John is more tall.M that I not thought.1SG
 ‘John is taller than I thought.’

The French example in (5) clearly shows that the overt marking of degree negation is not the same as clausal negation: in French, the polarity marker is *ne*, while negation is carried rather by a negative particle such as *pas* otherwise.⁵

⁵ Consider the following example:

- (i) Je (**ne**) sais *(**pas**).
 I not know.1SG no
 ‘I don’t know.’

As can be seen, the element *pas* has to be overt, indicating that *ne* cannot express negation on its own. By contrast, colloquial French allows *ne* to be absent altogether, which shows that *pas* is able to express negation by itself.

While both Italian and French show that the negative head does not express clausal negation,⁶ the position of this functional head is relatively low in the clause: as can be seen in (5), the subject precedes the negative element. However, there are languages where the polarity head is high in the clause: Old Hungarian is such an example, where the original comparative C head was *hogy* ‘that, how’, which was immediately followed by the polarity marker *nem* ‘not’ in THAN-clauses, see Bacskai-Atkari (2014a;c). This is demonstrated by the following example:

- (6) Zṛnèkṁg te meltatlākodatod mṽ èllènṓc mēt iob
 cease.SBJV.3SG.PRT you indignance.POSS.2SG we against.1PL because better
 hog èlèuènèn zolgallonc Nabuhodonozor nag kiralnac &
 that alive serve.SBJV.1PL Nebuchadnezzar great king.DAT and
 alazkoggonc te nèkéd **hog nē** meghaluāc mṽ vèzèdelmṓcβèn
 cringe.SBJV.1PL you you.DAT that not PRT.dying.1PL we peril.POSS.1PL.INE
 mṽnmagonc mṽ zolgalatōknac karat zènuèggüc
 ourselves we service.POSS.1PL.DAT damage.POSS.ACC suffer.SBJV.1PL
 ‘cease to be indignant towards us because it is better for us to serve the great king
 Nebuchadnezzar alive and to cringe before you that not (= than) to suffer the damages
 of our service dying’ (*Vienna Codex* 14, after 1416)

⁶ Essentially, degree negation is an instance of what is traditionally referred to as expletive negation, whereby a negative marker is present in the structure without actually expressing true clausal negation. The phenomenon can be observed in constructions other than comparatives as well; for instance, in French it can occur in complement clauses of the verbs *craindre* ‘fear’ and *douter* ‘doubt’, as well as in clauses introduced by *avant que* ‘before’ and *à moins que* ‘unless’. Consider:

- (i) Je doute qu’il (**ne**) vienne ce soir.
 I doubt.1SG that.he not comes.SBJV this.M evening
 ‘I doubt that he will come tonight.’

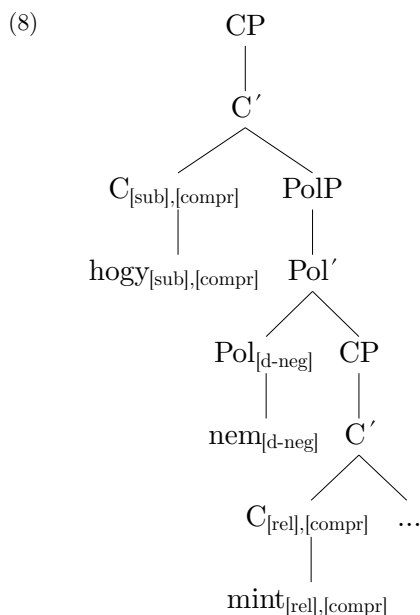
As indicated, the presence of the expletive *ne* is not compulsory (it is more likely to appear in formal register), given that it does not express clausal negation. Similar patterns can be well observed across Romance (see, for instance, Espinal 2000 on Spanish). A common property of expletive negation structures is that the negative element is required by an element in the high CP-periphery of the clause. As Abels (2005) argues, there is some sort of negation involved in expletive negation, but it is unusually high in the clause. In our case, this holds for degree negation, which is assumed to be defined by the highest CP projection – and ultimately required by the matrix degree head –, encoding the non-identity of the matrix degree and the degree expressed by the subclause in a lower CP projection. Just like in other cases of expletive negation, an overt negative element may be realised lower in the clause. Essentially, the lower CP is a definite description of the degree expressed by the subclause, and its non-identity with the matrix degree is expressed by a higher C head, which is necessarily overt even if there is a separate negative Pol head lower in the clause.

The example in (6) demonstrates the earliest attested pattern in Old Hungarian; a somewhat later pattern involves the appearance of *mint* ‘how, as’ as an overt operator (and later as a grammaticalised lower C head):

- (7) Te igyekevezeted az isteny zolgalatban jnkab légen arra hog
 you diligence.POSS.2SG the divine service.INE rather be.SBJV.3SG that.SUB that
 az zent irasnak igy ebevl lelky ertelmet vegy es
 the sacred writing.DAT thus this.ELA spiritual sense.ACC take.SBJV.2SG and
 aytatossagnak keuansagat **hog nem mynt** vduarlokeppen eneklesnek
 prayer.DAT desire.POSS.ACC that not than courting singing.DAT
 mogyat tegyed
 mode.POSS.ACC do.SBJV.2SG
 ‘your diligence in serving God should be directed at gaining a spiritual understanding
 of the Scripture and a desire for prayer, rather than at taking the opportunity to sing
 for courting’ (*Horvát Codex*, 138v–139r, 1522)

My analysis for the structure of the CP-periphery of the comparative sub-clause in (7) is represented in (8) below (see also Bacskai-Atkari 2014a;c):⁷

⁷ Note that while the complementisers *hogy* and *mint* do have an overlapping function in that both mark [compr], (8) is not an instance of complementiser reduplication or recomplementation. The two complementisers here are different in their further functions, in that only *hogy* encodes subordination, and only the lower complementiser *mint* is specified as [rel]. If (8) were an instance of recomplementation, one would expect two instances of the same complementiser, that is, with the same morpho-phonological shape, as in Spanish quotative reduplication with *que* ‘that’, see González i Planas (2014). It is possible to have complementiser reduplication with morpho-phonologically distinct C heads, as in Welsh with the complementisers *mai* ‘that’ and *a* ‘that’, see Roberts (2005, 122); however, this sort of reduplication occurs if there is a topic in between the two complementisers, and the same holds for Spanish recomplementation, where duplication has a special discourse function. In (8), however, there is no topic in between the two complementisers, only a polarity phrase, which is also directly related to clause typing; accordingly, there is no interpretive difference between comparative clauses with two overt complementisers and ones with a single overt complementiser.



As can be seen, the left periphery contains two CPs, in between the two there is a PolP (Polarity Phrase). The marking of the properties comparative and relative on the CP-periphery is in line with the assumption of Rizzi (1997; 2004) that these are types of Force.⁸

The properties relevant for comparative subclauses (THAN-clauses) are marked on separate heads in (8); in the present investigation, they are represented as features for the sake of simplicity. The property [sub] stands for marking finite subordination: this does not have to be overt, and it is encoded by a functional C head. The feature [compr] is responsible for marking the comparative nature of the clause; this has to be overt, and can be encoded either by a functional C head or by an operator (there

⁸ In all the representations in this paper, I assume a non-cartographic approach to the left periphery. That is, while I adopt the idea of Rizzi (1997; 2004) that the CP may be split, I do not assume the individual CPs to be designated projections for encoding specific functions. As can be seen in (8) as well, a single complementiser may encode multiple properties, and a single property may be spread across multiple complementisers; under this approach, the number and order of CP-projections are essentially dependent on the lexical properties of the elements encoding clause-typing properties, which in turn follow from the semantics of the individual constructions. For arguments against a cartographic approach and in favour of a feature-based approach, see Bacskai-Atkari (2015).

is operator movement to the specifier of the lower CP). The feature [rel] represents marking the relative nature of the clause; depending on the language, this may or may not have to be overt, and can be overtly encoded either by a functional head or by an operator. The importance of [rel] in comparatives is that it ensures that the comparative operator moves to the left periphery (cf. Chomsky 1977; Kennedy 2002 on comparative operators being relative operators). Finally, the property [d-neg] carries degree negation (to be distinguished from clausal negation); this, as has been said before, has to be overt and it is encoded by a functional head.

In the Old Hungarian cases above, there is a separate Pol head in the CP-periphery, and in the case of Italian and French, there is a lower Pol head selected by the comparative C head. However, the Pol head is not universally attested; note that the (low) Pol head is not always overt in Italian and French either. Regarding Hungarian, it should be mentioned that the Pol head gradually disappeared from the language (cf. Bacskai-Atkari 2014a;c).

3. The overtness of comparative C heads

In this section, I am going to show that the property [d-neg] can be encoded by a comparative C head as well, and in these cases there is no reason to assume that there is a separate Pol head. As was mentioned in the previous section, the encoding of [compr] can be carried out either by a C head or by an operator. This is illustrated by the possible patterns in Modern Hungarian AS-clauses:

- (9) a. Mari olyan magas, **mint amilyen (magas)** Péter.
 Mary so tall as how.REL tall Peter
 ‘Mary is as tall as Peter.’
- b. Mari olyan magas, **mint** Péter.
 Mary so tall as Peter
 ‘Mary is as tall as Peter.’
- c. Mari olyan magas, **amilyen (magas)** Péter.
 Mary so tall how.REL tall Peter
 ‘Mary is as tall as Peter.’

As shown by (9a), Hungarian allows the co-presence of the overt complementiser *mint* ‘as’ and an overt operator such as *amilyen* ‘how’, whereby the latter may also occur together with a lexical adjective (note that the Hungarian data throughout this paper were tested on several speakers,

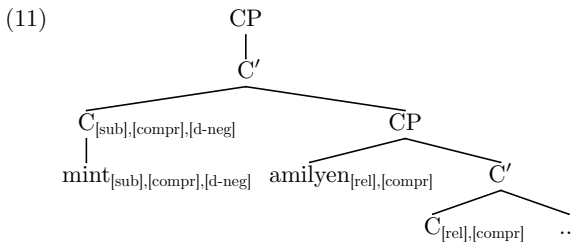
and the judgements were uniform and clear). It is also possible that only *mint* is overt but not the operator, as in (9b): in this case, the finite verb is also elided (see the discussion below). Finally, it is also possible that *mint* is absent and the [compr] property is marked only by the operator, as in (9c). Hence, [compr] has to be encoded by at least one element, and doubling is also possible.

The picture is slightly different in THAN-clauses, where *mint* cannot be absent, as shown by the following set of examples:

- (10) a. Mari magasabb, **mint amilyen (magas)** Péter.
 Mary taller as how.REL tall Peter
 ‘Mary is taller than Peter.’
- b. Mari magasabb, **mint** Péter.
 Mary taller as Peter
 ‘Mary is taller than Peter.’
- c. *Mari magasabb, **amilyen (magas)** Péter.
 Mary taller how.REL tall Peter
 ‘Mary is taller than Peter.’

Just like in AS-clauses, Hungarian allows the co-presence of the overt complementiser *mint* and an overt operator in THAN-clauses, as shown by (10a). Further, it is again possible that only *mint* is present, as in (10b), where the finite verb is again deleted. However, the configuration where only the operator is overt but the complementiser is absent is ungrammatical, as shown by (10c).

The ungrammaticality of (10c) follows from the lack of encoding [d-neg]. In order to understand how this is supposed to work, let us first consider the structure of the left periphery in full clauses like (10a):



Unlike in (8), there is no separate PolP projection in (11), hence the property [d-neg] has to be encoded on a C head that has different functions, too. Importantly, while both C heads encode [compr], only the higher C head encodes [d-neg] and only the lower C head encodes [rel]: neither of

these features is iterable on multiple heads (degree negation is semantically determined to be single, and multiple [rel] heads would assume multiple relative operator movement, which is ruled out).

In elliptical structures like (10b), the lower CP is absent, hence there is no operator movement to the left periphery. However, the [rel] element is not licensed in situ, thus ellipsis has to occur, as was pointed out previously by Bacskai-Atkari (2014c); Bacskai-Atkari & Kántor (2011; 2012). I assume that the reason why the operator does not (and cannot) move up is that there is no C head generated with the relevant [rel] specification that could trigger movement.

Regarding the structure of (10c), here the higher CP with the [d-neg] specification is absent, thus [d-neg] fails to be encoded: it cannot be encoded by the lower CP either, since there is nothing in the head that could lexicalise the feature, and the operator cannot carry it, as the comparative operator is not a negative operator. However, [d-neg] would be required by the matrix clausal degree head (*-bb* ‘-er’), hence its absence results in ungrammaticality. Note that there is no such problem in AS-clauses like (9c), since there is no [d-neg] required anyway. In sum, the Hungarian data presented in this section provide evidence that [d-neg] has to be marked by an overt functional head, which can also be C.

Similar patterns can be observed in Czech with respect to the behaviour of the operator *jak* ‘how’. In Czech, AS-clauses are formed with the operator *jak*: there is no complementiser. Consider:

- (12) a. Ten stůl je stejně dlouhý, **jak široká** je ta kancelář.
 the table is same long as wide is the office
 ‘The table is as long as the office is wide.’
- b. Ten stůl je stejně dlouhý, **jak** je ta kancelář **široká**.
 the table is same long how is the office wide
 ‘The table is as long as the office is wide.’

As can be seen, the operator may move to the left periphery with the adjective, as in (12a), or the adjective may be stranded, as in (12b). Essentially the same pattern can be observed in Polish as well (cf. Borsley & Jaworska 1981):

- (13) a. Maria jest tak wysoka **jak wysoki** był Karol.
 Mary is as tall 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 was tall
 'Mary is as tall as Charles was.'

Czech THAN-clauses also allow the operator *jak*:

- (14) a. ?Ten stůl je delší, **než jak široká** je ta kancelář.
 the table is longer than how wide is the office
 'The table is longer than the office is wide.'
- b. Ten stůl je delší, **než jak** je ta kancelář **široká**.
 the table is longer than how is the office wide
 'The table is longer than the office is wide.'
- c. *Ten stůl je delší, **jak široká** je ta kancelář.
 the table is longer how wide is the office
 'The table is longer than the office is wide.'
- d. *Ten stůl je delší, **jak** je ta kancelář **široká**.
 the table is longer how is the office wide
 'The table is longer than the office is wide.'

As shown by the grammaticality of (14a) and (14b), the operator *jak* is available in THAN-clauses in essentially the same way as in AS-clauses (the preference for the stranding of the contrastive adjective is due to information structural reasons, as contrastive elements preferably appear in a clause-final position). However, the constructions are grammatical only as long as the complementiser *než* is present: its function cannot be fulfilled by the operator *jak*, irrespective of whether the adjective is stranded or not, as indicated by the ungrammaticality of (14c) and (14d). Similarly to Hungarian, the absence of an overt complementiser corresponding to *than* is ruled out because the operator cannot take over the function of encoding [d-neg]. Regarding Czech, the assumption that *než* is specified as a negative comparative complementiser is further strengthened by the fact that it contains an incorporated negative-like element,⁹ similarly to Polish

⁹ The incorporated negative-like element is in fact an adversative conjunction (see Stolz 2013, 64–71; the relatedness of negative/adversative elements and comparative markers was observed already in the 19th century, for instance by Ziemer 1884). As described by the typological study of Stolz (2013, 47–121), the adversative/contrastive source for comparative particles (complementisers, P heads) is quite common in European languages: apart from Slavic, it can be observed in Germanic languages as well, in the case of dialectal English *nor* or in North Germanic, such as Icelandic *en* 'but; than'.

niž ‘than’ and Serbo-Croatian *nego/no* ‘than’, which is fairly transparent for speakers.¹⁰

In sum, this section has shown that the obligatory overtness of comparative C heads in THAN-clauses follows from the necessity of lexicalising the property [d-neg]. The C head may or may not be negative-like; further, even transparently negative C heads differ from Pol heads in that they fulfil the function of clause typing as well, while Pol heads have to co-occur with a real C head.

4. Multiple C heads

While the previous section examined double CPs with combinations of an overt complementiser and an overt operator, in this section I am going to investigate double CPs with two overt C heads. Recall from section 2 that double CPs are attested in Hungarian comparatives historically: the original C head *hogy* ‘that’ was able to combine with a lower complementiser *mint* ‘as’. Since later only single *mint* can be observed, it can be concluded that the lower C head took over: for this, the higher C head had to pass on its features, which included a stage when it was interpreted as a mere subordinator without [compr] specification.

A similar phenomenon can be observed regarding the present-day patterns in German THAN-clauses (cf. Jäger 2010; Eggs 2006; Lipold 1983; Weise 1918). In Standard German and in northern dialects (north to the Berlin–Braunschweig line), the complementiser in THAN-clauses is *als* ‘than’. In southern dialects (essentially the dialect areas Alemannic, Hessian, Bavarian), the complementiser *wie* ‘as’ is also available, either on its own or in combination with *als*, rendering *als wie*; in Standard German and northern dialects, *wie* is restricted to AS-clauses. The patterns are illustrated in (15) below:¹¹

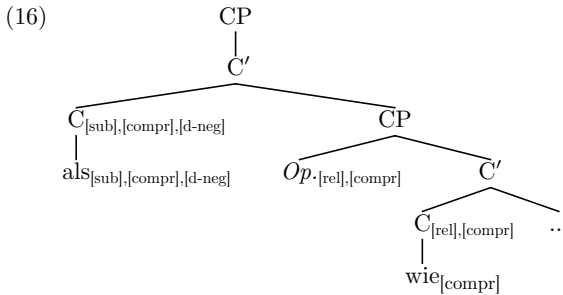
- (15) a. Ralf ist größer **als** Peter.
 Ralph is taller than Peter
 ‘Ralph is taller than Peter.’
- b. %Ralf ist größer **als wie** Peter.
 Ralph is taller than as Peter
 ‘Ralph is taller than Peter.’

¹⁰ See section 4 for a detailed discussion of the Serbo-Croatian data.

¹¹ The symbol % indicates that the acceptability of the sentence shows dialectal/idioclectal variation.

- c. %Ralf ist größer **wie** Peter.
 Ralph is taller as Peter
 ‘Ralph is taller than Peter.’

The three patterns also represent a diachronic change in the southern dialects, which originally started from the pattern in (15a), and via the intermediate stage in (15b) resulted in the pattern in (15c), see Jäger (2010); note that the diachronic change is gradient, hence the varieties co-exist in time. There is ample evidence that *wie* in embedded degree clauses is a grammaticalised C head and no longer an operator, see Jäger (2010); Bacskai-Atkari (2014a;c).¹² Accordingly, the structure of the doubling pattern in (15b) is as follows:



Regarding the feature specification of the lower C head, it is both [rel] and [compr], and a reanalysed operator can encode both of these features: still, the covert relative operator moves up to the specifier position, as relative operators are not licensed in situ. Given the availability of the

¹² The behaviour of *wie* can be well observed if the gradable adjective in the subclause is overt. Consider:

- (i) *Der Tisch ist länger als **wie breit** das Büro ist.
 the.M table is longer than as wide the.N office is
 ‘The table is longer than the office is wide.’
- (ii) %Der Tisch ist länger als **wie** das Büro **breit** ist.
 the.M table is longer than as the.N office wide is
 ‘The table is longer than the office is wide.’

The availability of the adjective *breit* in (ii) shows that the degree operator allows the co-presence of an overt AP: the operator is not a proform. However, *wie* cannot be the operator itself because then (i) should be acceptable as well: even operators that preferably strand the AP allow the movement of the AP to [Spec,CP] along with the operator. Hence, *wie* is not a moved element in the CP but it is base-generated there as a complementiser, and the operator is zero, which rules out the overt presence of the AP in [Spec,CP], due to the Overtness Requirement, see Bacskai-Atkari (2014c).

(comparative) relative operator, however, the complementiser may lose its [rel] specification and may thus be reanalysed as a higher C head, lexicalising the [d-neg] feature, as in the example in (15c). Note that in German the non-visibility of the operator does not imply the absence of the operator, unlike in Hungarian: German has a zero relative (comparative) operator, while Hungarian does not (see also Bacskai-Atkari 2014a;c). The gradual replacement of *als* by *wie* is facilitated by the fact that *als* contains no incorporated negative element, unlike the Slavic pattern discussed above in connection with Czech (and Polish and Serbo-Croatian).

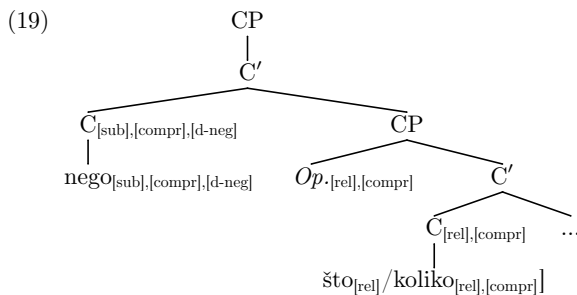
Multiple C heads are also possible in Serbo-Croatian: in AS-clauses, the complementiser *kao* ‘as’ may co-occur with a *wh*-like relative complementiser (*što* ‘what’). In THAN-clauses, the basic pattern involves merely the complementiser *nego* ‘than’ or *no* ‘than’. Consider:

- (17) a. Pavao je viši **nego** Petar.
 Paul is taller than Peter
 ‘Paul is taller than Peter.’
 b. Pavao je viši **no** Petar.
 Paul is taller than Peter
 ‘Paul is taller than Peter.’

Note that *nego* and *no* behave in the same way, and in the examples below, I will use *nego* throughout, also because the availability of *no* seems to be regionally bound. While the examples in (17) contain only one complementiser, it is possible to have a lower complementiser in addition:

- (18) a. Pavao je viši **nego što** je Petar.
 Paul is taller than what is Peter
 ‘Paul is taller than Peter.’
 b. [?]Pavao je viši **nego koliko** je Petar.
 Paul is taller than as is Peter
 ‘Paul is taller than Peter.’

The structure is illustrated in (19) below:



In either case, the lower C head is specified as [rel] and [compr], and these features are checked off by the covert comparative operator moving to the specifier. However, this does not mean that these properties are also marked overtly in the lower CP: the operator is covert, and the complementiser inserted into the head is not necessarily specified as [compr] or [rel].¹³ Regarding the pattern in (18a), the lower C head *što* is merely a relative head (that is, without any [compr] specification): in this sense, (18a) demonstrates no real doubling since [rel] is not marked on the higher C head anyway. Regarding the pattern in (18b), the lower C head *koliko* is specified for [compr], hence (18b) is an instance of genuine doubling, and the resulting redundancy results in markedness, which would disappear only if the higher C head lost its [compr] specification (as it was the case in Old Hungarian, see the beginning of the present section). Further, the replacement of *nego/no* by *koliko* seems to be hindered by the fact that the higher complementiser transparently contains a negative-like element, unlike German *als*, even though *koliko* is [compr], as opposed to *što*.

¹³ The question arises whether it is necessary for the lower head to be specified as [compr] at all, since the higher C head ultimately encodes [compr] overtly, and complementisers like *što* are not specified as [compr] in their lexical entry. There are several reasons to believe that the lower C is indeed [compr]. First, there are lower complementisers, such as Serbo-Croatian *koliko* and German *wie* that are indeed specified as [compr]. Second, the comparative operator is itself [compr], and it moves to the specifier of the lower CP. Third, the lower CP is responsible for encoding the degree associated with the subclause in the same way as in equatives, and the generation of the higher CP in equatives is not always necessary, see section 3: in other words, the lower CP contains no information regarding the presence of degree negation and a further CP layer. Naturally, if there is no overt [compr] element in the lower CP, as in the case of *što*, the higher CP has to be generated to encode [compr] overtly, irrespective of whether there is an additional [d-neg] property or not.

5. Radical replacement and Chain Uniformity

In the last section of the present investigation, I would like to examine a phenomenon attested in Czech THAN-clauses. Recall that Czech *jak* ‘how’ cannot replace *než* ‘than’ as an operator:

- (20) a. [?]Ten stůl je delší, ***(než) jak široká** je ta kancelář.
 the table is longer than how wide is the office
 ‘The table is longer than the office is wide.’
- b. Ten stůl je delší, ***(než) jak** je ta kancelář **široká**.
 the table is longer than how is the office wide
 ‘The table is longer than the office is wide.’

Interestingly, however, *jak* is possible in THAN-clauses as a C head (hence without *než*) iff the clause is elliptical. Consider:

- (21) a. Marie je vyšší, **jak** (*je) Karel.
 Mary is taller how is Charles
 ‘Mary is taller than Charles.’
- b. Renault stojí víc **jak** (*stojí) Dacia.
 Renault costs more how costs Dacia
 ‘A Renault costs more than a Dacia.’

The pattern in (21) suggests that *jak* occupies a higher C position, fulfilling the marking of [d-neg]: as it cannot co-occur with the lexical adjective, unlike in the regular operator pattern, it is logical to deduce that it cannot be in the specifier position. Yet, due to the requirement on verb deletion, it does not seem to behave like an ordinary complementiser either. Taking all this into consideration, I propose that *jak* is base-generated as an operator but moves to a C head position in cases like (21).

The analysis is based on the original proposal made by Bayer & Brandner (2008) for similar empirical phenomena in Alemannic and Bavarian embedded interrogative clauses with head-sized *wh*-phrases. In these dialects, the regular pattern is that the *wh*-phrase co-occurs with the C head *dass* ‘that’, resulting in the classical Doubly Filled COMP effect. However, for many speakers of these dialects, this does not apply to all *wh*-elements: head-sized *wh*-elements occur without *dass*, and Bayer & Brandner (2008) claim that this is so because the two elements are in complementary distribution, that is, the *wh*-element moves to the C head position. An example from Bavarian is given in (22) below (Bayer & Brandner 2008, 88, ex. 5a):

- (22) I woass aa ned, **wer** (***dass**) allas am Sunndoch
 I know too not who that all at Sunday
 in da Kiach gwen is.
 in the church been is
 ‘I don’t know either who all has been to church on Sunday.’

Naturally, the question of Chain Uniformity (cf. Chomsky 1995) arises since apparently a phrase is supposed to be moving to a head position. Without going into details here, Bayer & Brandner (2008) argue that head-sized phrases have a dual status anyway (they are heads and phrases at the same time), hence there is no violation of Chain Uniformity (that is, they move to a head position as heads, and therefore the idea that head positions cannot be occupied by phrases can be maintained). Note, however, that in embedded questions the operator moves to a head position of the same CP that hosts operators otherwise, hence the landing site of head-sized and phrase-sized *wh*-phrases differs only in terms of whether it is [Spec,CP] or C, but the CP projection (and its feature specification) is exactly the same.

In Czech comparatives, however, *jak* has to move to a C head responsible for [d-neg] and not to the one responsible for [rel]: if it moves to the lower CP, the higher C head would be lexicalised regularly by *než*, as [d-neg] has to be lexicalised. This is possible only if the lower CP is not generated (similarly to Hungarian elliptical comparatives): however, instead of lexicalising [d-neg] by way of merging *než*, *jak* is moved. The Chain Uniformity violation is hence given in the sense that the visible landing site of the operator is different in its feature specification from the one expected on the basis of the visible base-generation site: note also that the operator *jak* is base-generated with a lexical adjective, hence it is head-sized only after stranding the AP. Ellipsis saves the construction in that it eliminates the base-generation site, and hence there is no clash with the landing site. Thus, *jak* indeed occupies the C head position: however, unlike for German *wie*, this is not the result of grammaticalisation, as *jak* is not a C head in full constructions involving *než*. In this sense, the behaviour of *jak* in (21) represents an instance of radical replacement.

6. Conclusion

The aim of this paper was to provide a cross-linguistic overview of marking polarity at the left periphery of embedded degree clauses. I argued that in THAN-clauses, but not in AS-clauses, there is a property tentatively referred to as degree negation that has to be lexicalised by a functional head in

the left periphery. Based on the data discussed above, the cross-linguistic typology can be established as given in Table 1 (with some additional data from other languages not discussed here):

Table 1: The cross-linguistic typology of negative elements in THAN-clauses

(I)	separate Pol head	<ul style="list-style-type: none"> • Old Hungarian <i>nem/sem</i> • Italian <i>non</i> (below CP-level) • French <i>ne</i> (below CP-level)
(II)	incorporated negative C head	<ul style="list-style-type: none"> • English dialectal <i>nor</i> • Old/Middle High German <i>wan</i> • Swiss German dialectal <i>wan/weder</i> • Icelandic <i>en</i> • Swedish <i>än</i> • Norwegian <i>enn</i> • Danish <i>end</i> • Czech <i>než</i> • Polish <i>niz</i> • Serbo-Croatian <i>nego/no</i>
(III)	THAN-C head	<ul style="list-style-type: none"> • English <i>than</i> • German <i>als</i> • Old High German <i>denn</i> • Dutch <i>dan</i> • Russian <i>chem</i>
(IV)	comparative C head	<ul style="list-style-type: none"> • German dialectal <i>wie</i> • Hungarian <i>mint</i>
(V)	more general C head	<ul style="list-style-type: none"> • Italian <i>che</i> • French <i>que</i>

Type I represents the cases where there is a separate Pol head (without clausal negation): this can either be located in the CP-periphery or it may appear lower in the clause, but it is at all events taken by the comparative C head itself, since Pol is not responsible for clause-typing and can neither host the (comparative) relative operator, nor can it encode [compr]. In Types II–V, the property [d-neg] is marked directly on the C head that lexicalises the [compr] feature; regarding the morpho-phonological shape of the C head, there are several differences. In Type II, the C head is one occurring specifically in THAN-clauses and it contains an incorporated negative element, too. In Type III, the C head is again specific to THAN-clauses,

yet it contains no incorporated negative element. Type IV represents the cases where the comparative C head is not specific to THAN-clauses: the same complementiser appears in AS-clauses, too. Finally, in Type V the C head is not specific to comparatives either and may appear in other clause types as well, such as relative clauses or mere finite subordinate clauses.

Further, it was shown that regardless of the type of [d-neg]-marker, a double CP layer is necessary in THAN-clauses: the properties [rel] and [d-neg] are marked separately. Operators are not licensed to mark [d-neg] in an operator position, since there is no clausal negation and hence a negative operator cannot be generated: original comparative operators can lexicalise the C head equipped with [d-neg] in two ways. First, this may happen via reanalysis, whereby a double complementiser structure ends in the lower C head overtaking the functions of the original higher C head, as in German. Second, operators may have a dual status and may replace the complementiser, as in Czech. Despite considerable cross-linguistic differences, the behaviour of left-peripheral clause-typing elements is consistent with the assumption that a degree negation property has to be overtly realised on a functional head.

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