Cyclical change in Hungarian comparatives[*]

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1. Introduction

This paper examines cyclical changes in comparative subclauses, showing how operators are reanalysed into complementisers via the relative cycle, and how this is related to whether certain lexical elements have undergo deletion at the left periphery. I will also show that only operators appearing without a lexical XP can be grammaticalised, which follows from to the nature of the formal features associated with the various operator elements. Though the main focus is on Hungarian historical data, the framework will be applied to other languages too, such as German and Italian, since the changes stem from general principles of economy.

The paper is organised as follows. Section 1 summarises the relevant theory concerning the relative cycle and Comparative Deletion. Section 2 presents the data from Old and Middle Hungarian; section 3 provides an account in terms of cyclic changes. Section 4 extends the analysis to other Hungarian complementisers; section 5 addresses complementiser combinations. Section 6 shows that overt polarity markers in Hungarian comparatives participated in combinations in a systemic way. Section 7 summarises the findings concerning the relation between the status of operators, grammaticalisation and Comparative Deletion, and applies the conclusions to similar phenomena in German and Italian.

1.1 The relative cycle – van Gelderen (2004, 2009)

Following Roberts & Roussou (1999, 2003), van Gelderen (2004) argues that grammaticalisation processes can be accounted for in structural terms. There are three major ways of grammatical changes: loss of movement, reanalysis due to a loss of morphological endings, and the combination of these two. The economy principles underlying these changes are the Late Merge Principle (LMP) and the Head Preference Principle (HPP).

The HPP states that it is more economical for an element to be base-generated as a head than to move to the specifier of that head; many changes hence involve the reanalysis of a

phrase-sized specifier into a head (van Gelderen 2004: 11, 17). The LMP states that it is more economical for an element to be merged later in the structure than to be merged early and move up subsequently; this explains why elements go to higher positions when they grammaticalise (van Gelderen 2004: 12, 17, 28–29; for previous accounts, see for instance Haspelmath 1989, van Gelderen 1993, IJbema 2002, Roberts & Roussou 2003).

Following Rizzi (1997), van Gelderen (2004: 41–44) adopts the split CP hypothesis: there are two CP layers at the left periphery that may accommodate complementisers in subclauses.[1] This may result in double complementisers, such as *of dat* "if that" in Dutch; however, it is also possible for languages not to have a split CP in, as in Old English subclauses (van Gelderen 2004: 48–55).

Modern English has two fundamental ways of relative clause formation: *that*-relatives and *wh*-relatives; the positional differences are shown below (van Gelderen 2004: 78, ex. 5):[2]

(1)

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        CP
       /  \
     wh    C'
          /  \
       that   IP
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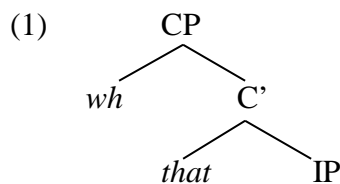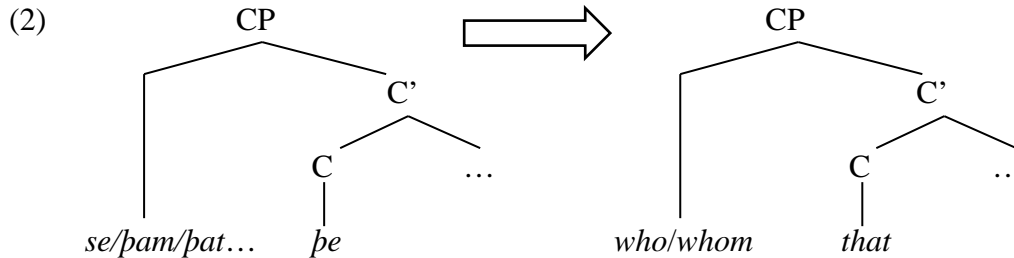
The *wh*-pronoun is in a specifier while *that* is a head: there is a strong preference for the more economical head position (HPP), and the lack of overt case-marking in certain *wh*-elements (e.g. *who* instead of *whom*) may result in their reinterpretation as heads; in fact *that* had also been reanalysed in such a way (van Gelderen 2004: 78–87).

As van Gelderen (2004: 81–82) argues, the regular Old English relative complementiser was *þe* "that", and relative clauses could be marked by demonstratives like *se* "the" or *þæt* "that" (based on Quirk & Wrenn 1955, Allen 1977; on demonstratives becoming relative markers, see Hopper & Traugott 2003 and Heine & Kuteva 2002 among others). Initially, *se* and *þæt* were located in a [Spec,CP] while *þe* was a C head, until *þæt* replaced *þe* in the 13th

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[1] Rizzi (1997) assumes a more articulate left periphery, in that there are several functional layers in between the two CPs; however, this is irrelevant both for van Gelderen (2004) and the present investigation.

[2] The distinction taken up by van Gelderen (2004) is a standard one, going back to Chomsky (1977, 1981); see also Kenesei & Ortiz de Urbina (1994). There are nevertheless opposing views in the literature: for instance, Kayne (2009, 2010a, 2010b) argues that complementisers are merely demonstrative/relative pronouns. I will not venture to examine this question in detail here: suffice it to mention that there are considerable counterarguments, and that counterevidence is to a large extent based on diachronic data, cf. e.g. Franco (2012: 12–13) on Germanic. In my view, the diachronic examination of Hungarian reinforces the structural difference between complementisers and operators, as will be demonstrated in the forthcoming sections.

century: *þat* was reanalysed into a head and the [Spec,CP] position could now be filled by other relative pronouns such as *hwa* "who". Consider (van Gelderen 2004: 82, ex. 22):

(2)

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        CP                              CP
       /  \                            /  \
      /    C'          ⟹             /    C'
      |   /  \                        |   /  \
      |  C    …                       |  C    …
      |  |                            |  |
 se/þam/þat…  þe                  who/whom  that
```

There are two changes: the reanalysis of *that* from specifier to head, motivated by economy, and the appearance of new relative pronouns in the specifier position as a way of reinforcement. This is referred to as the relative cycle (van Gelderen 2009: 161–168).

According to van Gelderen (2004: 83), *that* was a relative since it could co-occur with *þe* and also with prepositions (e.g. *embe þæt* "about that"), and V2 word order is attested in its presence (hence it cannot be in C). Later, *that* was reanalysed as a head (first as Fin, later as Force): it lost its original gender and agreement features (van Gelderen 2004: 83–86). These changes are attested in other languages and in Modern English too, e.g. in the case of *whether* or *how* (van Gelderen 2004: 96–99; 2009: 140–145, 154–157).

Similar changes took place in *that*-clauses (van Gelderen 2004: 89–92; 2009: 157–161). As a Fin head, *that* appeared in combinations like *for that* (finite *for*) or *whether that*: Force always precedes Fin, hence the combinations *for that*, *for if* or *till that* but not *that for*, *if for* or *that till* (cf. van Gelderen 2004: 92, 104–105). The co-occurrence of two Force heads is also prohibited, hence *till for* is not attested. The change in the status of *that* from Fin to Force (in line with the LMP) is shown by the disappearance of these combinations; in addition, *that* could not appear with topics when it was in Fin (van Gelderen 2004: 105–106, 126). Middle English allowed the co-occurrence of *wh*-pronouns in the specifier of a CP headed by *that*: thus the sequence of a *wh*-pronoun + *that* was available but only as long as *that* was in Fin.

The economy principles underlying cyclic changes are reformulated by van Gelderen (2009) as principles of feature economy: an original demonstrative "is incorporated into the head of the CP and then reanalysed as the head C" (van Gelderen 2009: 157); under this view, the demonstrative originates in the matrix clause (cf. Lockwood 1968, Hopper & Traugott 2003). Feature economy states that semantic and interpretable features should be minimised

in the derivation: semantic features are reanalysed as interpretable features, and interpretable features as uninterpretable features (van Gelderen 2009: 186).

1.2. Comparative Deletion

In comparative subclauses, the degree expression moves to a [Spec,CP] position via regular relative operator movement, the comparative operator being a relative operator (Chomsky 1977, Kennedy & Merchant 2000). The operator may be overt or covert, and it may or may not co-occur with a lexical XP (e.g. an AP or NP). Consider:[3]

(3) a. % *Mary is taller than* **how tall** *Peter is* ~~**how tall**~~.   (overt operator with lexical AP)

   b. % *Mary is taller than* **what** *Peter is* ~~**what**~~.   (overt operator without lexical AP)

   c. *Mary is taller than* ~~**Op. tall**~~ *Peter is* ~~**Op. tall**~~.   (Comparative Deletion)

The acceptability of (3a) and (3b) varies among speakers and dialects in English; the same configurations may be uncontroversial in other languages. In (3a), an overt comparative operator (*how*) obligatorily takes the lexical AP to the [Spec,CP] because the operator cannot be extracted from the degree expression. The same holds for the morpho-phonologically identical interrogative degree operator (*how*):

(4) a. ***How tall*** *is Mary?*

   b. ****How*** *is Mary* **tall***?*

Note that (4b) is grammatical with a different meaning, but then *how* is not a degree operator; with *how* as a degree operator, only (4a) is valid. Hence *how*, either in (3) or (4), is an operator that can only move together with the AP; thus the entire degree expression is overt in the [Spec,CP] in comparative subclauses.

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[3] The examples in (3) show the pattern with lexical Aps (predicative comparatives); examples for lexical NPs (nominal comparatives) are given below:

(i)   % *Mary has more cats than* **how many cats** *Peter has* ~~**how many cats**~~.
(ii)   % *Mary has more cats than* **what** *Peter has* ~~**what**~~.
(iii) *Mary has more cats than* ~~**Op. cats**~~ *Peter has* ~~**Op. cats**~~.

Since the difference between predicative and nominal comparatives is irrelevant for the present discussion on grammaticalisation, I will restrict myself to quoting predicative examples in this section; however, the generalisations are valid for nominal structures too.

The pattern in (3b) is well-known since Chomsky (1977): the proform operator *what* stands for the entire degree expression and it does not take a lexical AP; the degree expression is visible in the lower [Spec,CP]. As indicated in (3a) and (3b), if the operator is overt, the higher copy of the degree expression remains, and the lower copy is deleted.

Finally, (3c) represents the pattern traditionally associated with Comparative Deletion (see Bresnan 1973; Lechner 1999, 2004; Kennedy 2002): the operator is phonologically zero. In this case, the higher copy cannot appear in [Spec,CP], due to an overtness requirement which prohibits overt lexical material in an operator position in the absence of an overt operator. All the copies of the movement chain are deleted in (3c); the overt realisation of a lower copy is forced only if the AP is contrastive (cf. Bacskai-Atkari 2010a):

(5)   *The cat is fatter than the cat flap is **wide***.

Configurations like (3b) feed the reanalysis of the operator into a C head, as operators like *what* have the same features that potential comparative C heads can have: relative and comparative ([+rel] and [+compr]). The [+rel] feature operates in a way analogous to ordinary relative clauses, where an uninterpretable [+rel] feature on the C head attracts an operator with an interpretable [+rel] feature to its specifier. Comparative operators differ from ordinary relative operators in their having an additional interpretable [+compr] feature, which is likewise present (as an uninterpretable feature) on the comparative C head; the [+compr] C head is in turn selected by a [+compr] element (e.g. the morpheme *-er*) in the matrix clause.

The reanalysis of the operator into a C head may result in the co-presence of two C heads in one left periphery, which then feeds the appearance of Comparative Deletion constructions, since the overt co-presence of two comparative C heads and a comparative operator would violate economy. Lower C heads may be reanalysed as higher ones, resulting in a new single comparative C head: this feeds the appearance of constructions like (3a), as the overt operator can appear in a CP other than the one headed by an overt complementiser. These processes are attested in Hungarian, and partially in German and Italian.

Consider now the following examples from Modern Hungarian:[4]

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[4] I conform to the Leipzig Glossing Rules; in addition, the following abbreviations have been used: DEL = delative; ELA = elative; FIN = finalis; ILL = illative; INE = inessive; POSSIB = possibility; PRT = particle; SUB = sublative; SUP = superessive.

(6)   a. *Mari   magasabb, mint **amilyen   magas**   Péter   volt.*
        Mary   taller   than how   tall   Peter   was.3SG
        "Mary is taller than Peter was."

      b. **Mari   magasabb, mint **amilyen**   Péter   volt   **magas**.*
        Mary   taller   than how   Peter   was.3SG tall
        "Mary is taller than Peter was."

      c. *Mari   magasabb, mint **amennyire   magas**   Péter   volt.*
        Mary   taller   than how.much   tall   Peter   was.3SG
        "Mary is taller than Peter was."

      d. *Mari   magasabb, mint **amennyire**   Péter   volt   **magas**.*
        Mary   taller   than how.much   Peter   was.3SG tall
        "Mary is taller than Peter was."

Unlike English, Hungarian has no zero comparative operator; there are two overt ones, *amilyen* "how" and *amennyire* "how much". The former, like *how* and the zero in English, cannot be separated from the AP, see (6a) and (6b). By contrast, *amennyire* allows stranding, see (6d), even though stranding is not obligatory, see (6c). The difference is related to the two operators occupying distinct positions[5] within the degree expression; what matters here is that the obligatory deletion of the lexical AP is not attested with overt operators, irrespectively of the extractability of the operator.

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[5] I assume that there are two functional layers in the functionally extended AP (following Corver 1997; Lechner 1999, 2004): the DegP (degree phrase) and the QP (quantifier phrase). The operator can be a Deg head, which cannot be extracted on its own (e.g. *amilyen*), or it can be a phrase in the specifier position of the QP above the DegP (e.g. *amennyire*), which as a fully-fledged QP can move out if the entire QP is a predicate. The two operators cannot co-occur: this is essentially an economy principle ruling out the co-presence of two elements with the same features, similarly to the Doubly Filled Comp Filter in the CP-domain.

2. Diachronic change in Hungarian comparatives

Modern Hungarian comparative subclauses are introduced by *mint* "than/as", which may be followed by an overt operator + an overt lexical XP (e.g. *amilyen magas* "how tall"). By contrast, in Old Hungarian the subclause was initially introduced by *hogy* "that", and the operator remained covert.[6] Maintaining the split CP hypothesis, all the four Modern Hungarian complementisers (*mint*, *hogy*, *mert* "because", *ha* "if") are higher C heads; the reasons will be discussed later. Hungarian, like Standard Italian (see Rizzi 1997, 2004), prohibits the co-presence of overt C heads, unlike Welsh (see Roberts 2005) and a number of present-day and historical Romance dialects (e.g. Turinese and Ligurian, see Paoli 2007).

All four complementisers were originally operators: *hogy* "how", *ha* "when", *mint* "how", and *mert* "why" (cf. Juhász 1991, 1992; Haader 1991, 1995). The earliest examples for the original pronominal uses[7] are given below:[8]

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[6] In Hungarian, comparatives expressing equality (*as*-clauses) and ones expressing inequality (*than*-clauses) developed in a parallel fashion: they had the same complementisers and complementiser combinations in all periods, except for the presence of negative-like elements, which was restricted to *than*-clauses. I will therefore mainly concentrate on the development of *than*-clauses, though the analysis can well be applied to *as*-clauses too; at any rate, there is no "*as*-clauses > *than*-clauses change" to be considered (unlike in German).

[7] Note that (7a) and (7c) are instances of *as*-clauses with the operators *hogy* and *mint*, respectively. Both operators were available in embedded *wh*-interrogatives too, where they cannot be considered C heads; as relative operators, they changed their forms into *ahogy* and *amint*, as shown in Table 1, during Middle Hungarian, and are still available as such in Modern Hungarian (in fact, they would appear in (7a) and (7c) in the Modern Hungarian equivalents). The reason why they cannot be C heads in (7) is that the availability of a comparative subclause introduced by an overt C head is licensed by a comparative morpheme in the matrix clause (*olyan* "how-Adj." or *úgy* "how-Adv." in equatives) in a non-extraposed position. This condition is not met in (7a), where the matrix pronominal element *ug* is extraposed to the right, and is again not met in (7c), where there is no matrix pronominal element at all.

[8] I have retained the original spelling in the examples throughout this paper, as well as the original punctuation; note that in Old Hungarian the question mark and the exclamation mark were not employed as they are today; instances of e.g. the exclamation mark in (7a) are merely period markers. Furthermore, spelling was not normalised and hence what was written together or separately shows a lot of variation; for instance, *mvnyb [ele]* in (7b) should be read as *mennybe le* "heaven-Ill. down" and is independent from the word *bele* "it-Ill.".

(7) a. *furiſcte muſia!|| etetý ýmletí.   ug **hug** ana   ſciluttet.*
      bathes   washes feeds breastfeeds so   how mother child-POSS-ACC
      "she bathes, washes, feeds and breastfeeds him as a mother does her child" (KTSz.)

   b. *mvnyb [ele]   **ha**   tekunte   [ek]eſſen   tegud   e[ſ]   **ha***
      heaven-ILL.down when looked.3SG embellished you-ACC too   when

      lata.   ýſte[n]||ſegnec [ne]we   mia ro[la]d   ozun keppe[n]
      saw.3SG deity-DAT   name-POSS for you-DEL that.way

      ſcola
      spoke.3SG

      "when he looked down to heaven and saw you embellished, he spoke of you that way
      for the name of God" (KTSz.)

   c. *Ez   oz ýſten   **mynt**evt   eſmeríuc!*
      this the God   how.he-ACC know-1PL
      "this is God as we know him" (KTSz.)

   d. *Sydou || mynth thez   turuentelen / ||fyom   **merth** hol byuntelen*
      Jew   how   do.2SG unlawful   son-POSS-1SG why   dies innocent
      "Jew, what are you doing unlawfully, why does my son die innocent" (ÓMS.)

The functional split from the original operator functions did not take place at the same time:

Table 1. The etymology of present-day Hungarian complementisers

Complementiser	Original operator	Time of split	Present-day related operator
***ha** "if"*	*ha* "when"	before Old Hungarian – Early Old Hungarian	–
***hogy** "that"*	*hogy* "how"	before Old Hungarian – Old Hungarian	*hogyan* "how-Int.", *ahogy* "how-Rel."
***mint** "than/as"*	*mint* "how"	Old and Middle Hungarian	*miképpen* "how", *miként* "how", *amint* "how-Rel."
***mert** "because"*	*mert* "why"	Old and Middle Hungarian	*miért* "why"

Comparative subclauses were initially introduced by *hogy* and contained the element *nem* "not" (or, less typically, *sem* "neither"), see Haader (2003a: 515).[9] Consider the following example (for more examples, see Haader 2003a and Bacskai-Atkari 2013):

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[9] The differences between *nem* and *sem* will be discussed in section 6 in detail.

(8) *Zōnėkm̄g*   *te*   *meltatlākodatod*   *mv̇*   *èllènōc*   *mėt*   *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*   *nèkėd*   ***hog***   ***nē***   *meghaluāc*   *mv̇*
     cringe-SBJV-1PL   you   you.DAT   that   not   PRT-dying-1PL   we

     vèzèdelmōcbèn   *mv̇nmagonc*   *mv̇*   *zolgalatōknac*
     peril-POSS.1PL-INE   ourselves   we   service-POSS.1PL-DAT

     karat   *zènuèggu̇c*
     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" (BécsiK. 14)

Later in Old Hungarian (Haader 2003a: 515, 2003b: 681) *mint* also appeared in the clause, rendering the sequence *hogynemmint* "that not than" (or *hogysemmint* "that neither than"). The example in (9) shows *hogynemmint*:[10]

(9) *Te*   *igyekevzeted*   *az*   *isteny*   *zolgalatban*   *jnkab*   *légen*   *arra*
you   diligence-POSS.2SG   the   divine   service-INE   rather   be.SBJV.3SG   that-SUB

     hog   *az*   *zent*   *irasnak*   *igy*   *ebevl*   *lelky*   *ertelmet*
     that   the   sacred   writing-DAT   thus   this-ELA   spiritual   sense-ACC

     vegy   *es*   *aytatossagnak*   *keuansagat*   ***hog***   ***nem***   ***mynt***
     take.SBJV.2SG   and   prayer-DAT   desire-POSS-ACC   that   not   than

     vduarlokeppen   *eneklesnek*   *mogyat*   *tegyed*
     courting   singing-DAT   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" (HorvátK. 138v–139r)

The following example shows *hogysemmint*:

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[10] Old and Middle Hungarian orthography was far from being standardised with respect to whether the combinations discussed here were written as one word or separately; I will consistently write them together throughout the text (that being the established norm in the literature, partially because the surviving combinations are written together in Modern Hungarian); however, in the examples I retain the original spelling.

(10) *az   mi   nem tisztesǵes sem   embernek   sem   Istennek   ne*
     that what not moral   neither human-DAT neither God-DAT   not

     igerie,   ha penigh   valamid   ollyat   ighér,   tehat
     promise-SBJV-3SG if however something-ACC such-ACC promises thus

     *szenvedhetöb   ha   megh nem fizeti, **hogy sem   mint** megh*
     more.desirable if   PRT   not pays   that neither than   PRT

     adgya   az   mi   illetlen
     give-SBJV-3SG that what inappropriate

     "he should not promise anything immoral either to man or to God; however, if he does so, it is more appropriate if he does not keep it than if he fulfils something inappropriate" (Szepsi Csombor Márton: Udvari Schola, XVI)

The later drop of the negative element produced *hogymint* (Haader 2003a: 515):

(11) *mínd anne   bǫsegǫs kǫńhullatasoc mene   a   vízeknec*
     all   so.much plenty   crying-PL   as.much the waters-DAT

     sokassaghí   sem   volnanac   en elǫttem   kellemetǫsek/ Auaǵ
     multitude-POSS-PL neither be-COND.3PL I   before-1SG pleasant-PL or

     *foganatosoc   **hoǵ mint** akki zǫnetlen   a   kereztfanac ǫ*
     effective-PL that as   who   incessantly the rood-DAT   he

     keserúseget   v́ testeben   víselí
     bitterness-POSS.3SG-ACC he body-POSS.3SG-INE bears

     "not even as much crying as the multitude of waters would be as pleasant and touching to me as the one who incessantly bears the bitterness of the rood in his body" (NagyszK. 40–41)

The final stage is a single *mint*:[11]

(12) *hogynem*   (Stage 1 – Old Hungarian)
     ⇩
     hogynemmint   (Stage 2 – Late Old Hungarian/Middle Hungarian)
     ⇩
     hogymint   (Stage 3 – Late Old Hungarian/Middle Hungarian)
     ⇩
     mint   (Stage 4 – Late Old Hungarian/Middle Hungarian/Modern Hungarian)

As far as language use and corpus data are concerned, there was considerable overlapping among these stages in Old Hungarian (see Bacskai-Atkari 2013: 15–16). However, comparing texts from more distinct periods gives a clearer picture. I compared four translations of the four gospels, examining altogether 36 loci; the distribution of the various types of comparatives is shown in Table 2 (there were no instances of *hogymint* in this small corpus).

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[11] Note that *mint* is itself a morphologically complex unit, as far as its etymology is concerned: it contains the stem *mi* "what" and two adverbial suffixes, the modal *-n* and the locative *-t*.

Note that there are additional ways of expressing comparison, hence the apparent discrepancy that can be observed when comparing the individual columns:

Table 2. Elements introducing Hungarian comparative subclauses

	Old H.		Middle H.	Modern H.
	Munich Codex (1466)	**Jordánszky Codex (1516–1519)**	**Káldi's translation (1626)**	**Neovulgata (1997)**
hogynem	34	20	–	–
hogynemmint	–	11	–	–
mint	–	4	23	20

The data show that while in the Munich Codex comparative subclauses were introduced by *hogynem*, in the Jordánszky Codex the number of *hogynem* significantly decreased in favour of *hogynemmint*, and single *mint* was also possible. In the Káldi and the Neovulgata translations only *mint* is used, even though *hogynemmint* was still possible in Middle Hungarian. Note that neither *hogynem* nor *hogynemmint* is a Latin reflex: in all the instances under scrutiny, the Latin text simply contains *quam* "than".
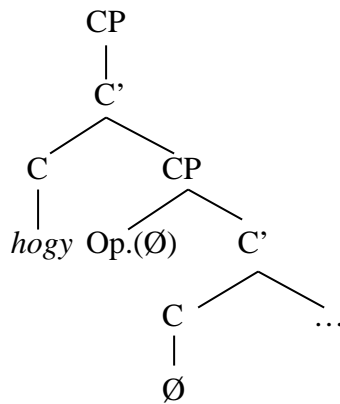
3. Cyclic change in comparatives

Let us turn to the analysis of data presented in section 2. As was mentioned, the subclause was initially introduced by the higher C head *hogy* "that", and it also contained *nem* "not", originally required by the negative polarity of the subclause (this later disappeared from the construction, as comparatives are not universally accompanied by overt negative elements; I will discuss this issue in section 6).

The configuration with respect to the two CPs is as follows (the operator is covert):[12]

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[12] The analysis presented here builds on the availability of two CP layers. This is evidently needed in cases when there is an overt C head followed by an overt operator moving to a [Spec,CP] position: the operator then cannot be located in the specifier of the CP headed by the complementiser, as that would produce exactly the opposite order (as in the English historical data presented by van Gelderen 2004, 2009, see section 1.1). In addition, the co-presence of two distinct C heads in one and the same left periphery also shows that there is not merely one single CP projection.

(13) Stage 1:

```
            CP
            |
            C'
          /    \
         C      CP
         |     /   \
       hogy Op.(Ø)  C'
                   /   \
                  C     ...
                  |
                  Ø
```

Comparative C heads may coincide with the general subordination marker in other languages too; this is frequent in Romance: Italian *che* "that", French *que* "that" or Portuguese *que* "that" show this (cf. Rizzi 1997 on Italian, Rowlett 2007: 147–148 on French, Matos & Brito 2008 on Portuguese). The following example comes from Portuguese:

(14) *A   Maria é mais alta   **que** o   Pedro.*
    the.F   Mary is more tall-F that the.M Peter
    "Mary is taller than Peter."

The appearance of *mint* "than/as" in Old Hungarian has a parallel phenomenon in ordinary relatives: in Old and Middle Hungarian, relative clauses could be introduced by the string *hogy* + a relative pronoun (see Galambos 1907: 14–18; cf. also Haader 1995; Dömötör 1995; and for a recent analysis Bacskai-Atkari 2013),[13] rendering combinations like *hogy ki* "that who" or *hogy mi* "that what":

(15) *olÿaat   tezǫk   raÿtad   **hog kÿtǫl**   felz*
    such-ACC do-1SG you-SUP that who-ABL   fear-2SG
    "I will do such on you that you fear." (SándK. 14v)

In (15), the complementiser *hogy* is followed by the operator *kÿtǫl* "who-Abl.". Note that there was then no phonological difference between interrogative and relative pronouns (e.g. *ki* "who-Int." vs. *aki* "who-Rel."): this started to emerge in late Old Hungarian but was not

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[13] Although the first formal account for relative clauses containing *hogy/ha* was given by Galambos (1907), who placed these constructions in the general (diachronic) system of Hungarian relative clauses, the literature on Hungarian historical linguistics later forgot about his work and hence most traditional analyses are not influenced by his ideas at all. This may well be the reason why the *hogy/ha* + operator combinations received very little attention, thereby also leaving many questions regarding relative clauses (and finite subordination) unanswered. The first to (re)discover the due merits of Galambos (1907) was Kenesei (1992a, 1992b).

completed even in early Middle Hungarian (Sipos 1991: 398; G. Varga 1992: 524–525; Juhász 1992: 791; Haader 1995).
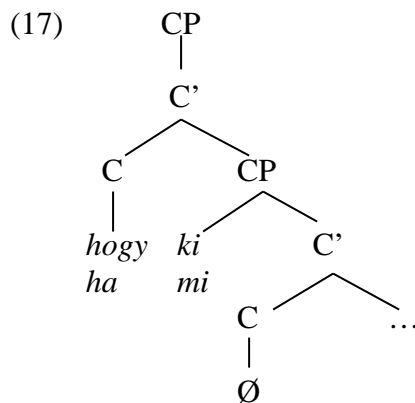
The same configuration was possible with *ha* "if" too:

(16) *Bizoń   bizō   mōdom   tùnèctec   **ha mit**   keèndetec   èn*
indeed   indeed   say-1SG   you.DAT   if   what-ACC   ask-FUT-2PL   I

at'amtol   èn   nèuembè /   agga   tùnèctec
father-POSS.1SG-ABL   I   name-POSS.1SG-ILL   gives   you.DAT

"Verily, verily, I say unto you, Whatsoever ye shall ask the Father in my name, he will give it you." (MünchK. 103ra)

The base-generated C head is *ha*, and the relative pronoun moving to the CP-domain is *mit* "what-Acc.". This configuration (*hogy/ha* + relative pronoun) has disappeared from the language; to investigate the reasons would be far beyond the scope of the present study.

In configurations like (15) and (16), the higher C head is *hogy/ha*, while the lower [Spec,CP] hosts a relative operator:

(17)
```
        CP
        |
        C'
       /  \
      C    CP
      |   /  \
   hogy  ki   C'
   ha    mi  /  \
            C    …
            |
            Ø
```

Like ordinary relative operators, the comparative operator *mint* started to appear in the lower [Spec,CP] in examples like (9), repeated here as (18):

(18) *Te igyekevzeted az isteny zolgalatban jnkab légen arra*
you diligence-POSS.2SG the divine service-INE rather be.SBJV.3SG that-SUB

    hog az zent irasnak igy ebevl lelky ertelmet
    that the sacred writing-DAT thus this-ELA spiritual sense-ACC

    vegy es aytatossagnak keuansagat **hog nem mynt**
    take.SBJV.2SG and prayer-DAT desire-POSS-ACC that not than

    vduarlokeppen eneklesnek mogyat tegyed
    courting singing-DAT 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" (HorvátK. 138v–139r)

Again, *mint* as a relative operator did not have a distinctive morpho-phonological form (marked by *a-*, hence *amint*). The structure (disregarding the negative) is shown in (19):

(19) Stage 2:
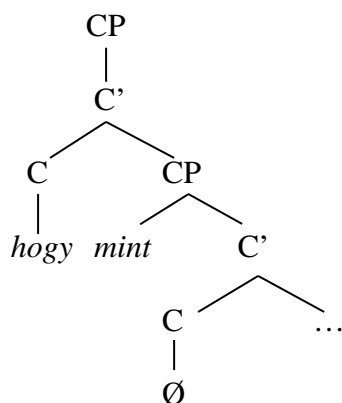
The higher C is filled by *hogy*, and the lower [Spec,CP] hosts the operator *mint*. Though the structures in (17) and (19) are fundamentally the same, they developed from the opposite directions: in comparatives, *hogy* was present first[14] and the operator appeared later, while in ordinary relatives the operator was there originally and *hogy* was inserted later.

    The operator *mint* was similar to English *what* (see section 1.2): it was a proform standing for the entire QP (or a DP modified by a QP), hence these QPs (and DPs) did not contain lexical XPs. The relative pronouns *milyen*/*amilyen* "how-Adj./Adv." and *mekkora*/*amekkora* "how big" that can combine with lexical APs or NPs were still missing in Old Hungarian (G. Varga 1992: 525), hence option for an overt comparative operator was a

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[14] See the occurrence of bare *hogy* in (7) and its co-occurrence with the negative as the earliest configuration in (12) and in Table 2.

proform (*mint*). Furthermore, *mint* as an operator could alternate with *miként* "how" and *miképpen* "how": these did not grammaticalise as complementisers even in later periods.

Next, *mint* was reanalysed from an operator into a (lower) C head, while the higher C still contained *hogy* (and the negative element *nem*/*sem* was allowed to be present); this is indicated by the fact that *mint* behaves differently from elements that did not undergo reanalysis. First, unlike ordinary relative operators, *mint* remained insensitive to the choice of the matrix pronominal element (Juhász 1992: 799). These matrix pronominal elements all allow comparative subclauses to be introduced by *mint*; however, overt operators show some correspondence to matrix pronominal elements: the operator *ahányszor* "how many times" occurs with *annyiszor* "many times", *amekkora* "how big" occurs with *akkora* "such big", and *amilyen* "how" occurs with *olyan* "such". Second, *mint* did not develop into a proper relative operator as far as its morpho-phonological form is concerned, while relative pronouns started to be distinguished from interrogative operators (e.g. *mi* "what-Int." and *ami* "what-Rel.").

The structure of left peripheries containing *hogy* and *mint* is given in (20):[15]

(20)   Stage 3:
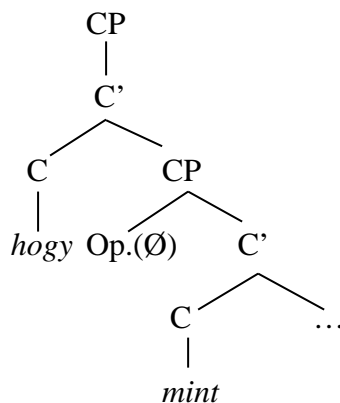
Both C heads were filled, the higher by *hogy*, the lower by *mint*. The lower [Spec,CP] could contain only a covert operator, otherwise there would have been an economy violation by having an overt C head and an overt operator in the same projection, in addition to the overt C head in a higher projection, all equipped with the same features [+rel] and [+compr]. This is generally referred to as the Doubly Filled Complementiser Filter, though it is not a special

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[15] The status of the negative-like element will be dealt with in section 6. The projection headed by this element is in between the two CPs: the negative-like element is base-generated there and hence there is no need to cross either of the CP layers by head movement.

filter but an economy principle disfavouring the co-occurrence of an overt head and an overt phrase in its own specifier that have largely overlapping functions, such as a [+rel] and [+compr] operator and a [+rel] and [+compr] complementiser. The application of the Doubly Filled Comp Filter is not universal: its effect may be modified by another major principle, the need for reinforcement (or overt marking), as also shown by van Gelderen (2009) in the history of English. Still, it is and has been operative in Hungarian and it can be observed in domains other than the CP-periphery as well, e.g. in the ban on two operators in two distinct positions within one degree expression (e.g. *amilyen* "how" and *amennyire* "how much").

Turning back to *mint*, the final step constitutes the reanalysis from lower C to higher C, accompanied by the disappearance of *hogy*: *mint* came to be associated with marking finite subordination, and was preferably base-generated in the relevant position (higher C). As a consequence, new, overt comparative operators could appear in the lower [Spec,CP]. These (e.g. *amennyi* "how many", *ahányszor* "how many times", *amilyen* "how") allow the co-presence of a lexical AP/NP, and since they are phonologically overt, Comparative Deletion is not attested in Modern Hungarian. This final stage is illustrated in (21):

(21) Stage 4:
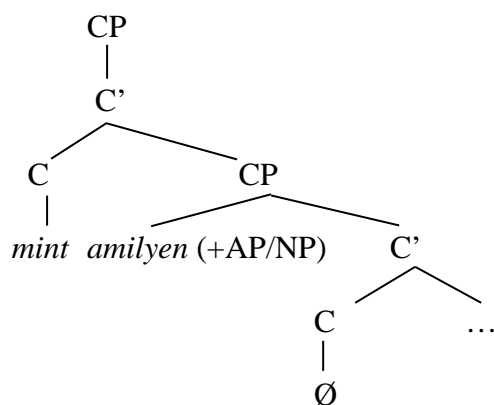
As can be seen, *mint* is a higher C, and the lower [Spec,CP] hosts an overt operator (and potentially also a lexical XP).

Hungarian comparatives are particularly interesting because the relative cycle happened twice (iterated cycle). The cycle in both cases involved an operator meaning "how"; a third cycle is not attested since new operators may also take a lexical XP to the [Spec,CP] position.

4. The relative cycle and Hungarian complementisers

The relative cycle and the reanalysis from lower to higher C apply to all Modern Hungarian complementisers and hence the behaviour of *mint* "than/as" is not exceptional. Section 2 established that all the four complementisers (*hogy* "that", *ha* "if" *mint* "than/as", *mert* "because") started as operators (*hogy* "how", *ha* "when", *mint* "how", *mert* "why"). Apart from future complementisers, ordinary relative pronouns (e.g. *ki* "who", *mi* "what") were also located in the lower [Spec,CP] position. An early example of *ki* is shown in (22):

(22) *Eſ   uimagguc || ſzent   peter   urot.   **Kinec**   odut   hotolm*
     and   pray-SBJV-1PL   saint   Peter   lord-ACC   who-DAT   given   power

     ovdonia.   eſ   ketnie
     loose-INF-3SG   and   bind-INF-3SG

     "and let us pray to the lord Saint Peter, to whom the power was given to loose and to bind" (HB.)

The starting position of all these elements is as follows:

(23)

CP
|
C'
/   \
C   CP
| /   \
Ø   *ha*   C'
    hogy   /   \
    mint   C   …
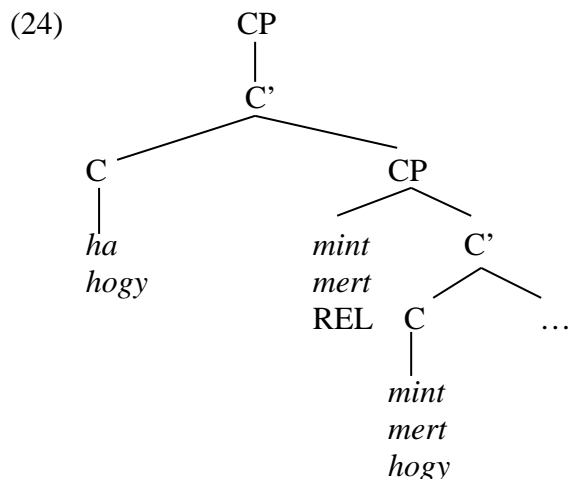   *mert* |
    REL   Ø
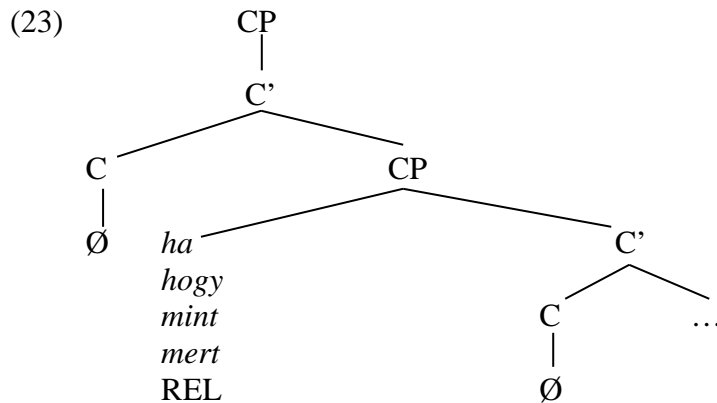
The original position (before Old Hungarian) is shared; as changes started to affect some of the elements earlier, their positions also started to differ, as will be shown later. Both *hogy* and *mint* started in the same position, and were reanalysed as C heads (and finally as higher C heads) in the same way, though at different stages of the language. Hence the relative cycle is attested in Hungarian comparatives twice (iterated cycle); this it clearly shows that the nature of these changes is indeed cyclical and is not the property of a single operator.

The grammaticalisation of complementisers followed the general mechanism of the relative cycle and hence the two basic economy principles, the HPP and the LMP. The

functional split between the original operators and the new complementiser functions took place at different times (cf. Table 1): while for *hogy* and *ha* it happened before Old Hungarian and partly in Early Old Hungarian, for *mint* and *mert* it took place in Old and Middle Hungarian. This led to a difference in their typical positions in Old and Middle Hungarian: *ha* was invariably a higher C, *hogy* was typically a higher and less frequently a lower C, while *mint* and *mert* were either lower C heads or were still operators in the lower [Spec,CP].

Ordinary relative pronouns (e.g. *ki* "who") did not develop into C heads and hence stayed in the lower [Spec,CP], due to the lack of feature loss. Operators grammaticalising into C heads have to lose, for instance, their person and number features (if they have any). Such feature loss and reanalysis are attested for *where* in certain English dialects (Comrie 1999: 88; Brook 2011) or *wo* "where" in various (southern) German dialects (Bayer & Brandner 2008) but not for ordinary relative pronouns in Hungarian. The loss of features is seen as the 'associated result' of the LMP by Hancock & Bever (2009: 305), in that "the word that originally required a theta role, now becomes a pure 'syntactic' word without a theta role".[16]

The possible positions for complementisers and operators in Old Hungarian are shown in (24); note that comparative complementisers developed in a parallel fashion in comparatives expressing equality and ones expressing inequality:

(24)

```
                    CP
                    |
                    C'
          _____|_____
         C                     CP
         |             _____|_____
        ha           mint            C'
       hogy          mert         ___|___
                     REL       C        …
                               |
                             mint
                             mert
                             hogy
```

---

[16] Operators develop into C heads introducing similar types of clauses that the operator occurs in, that is, clause types in which they were licensed as operators. This does not exclude the possibility of later functional changes; however, there are certain typical co-occurrences, e.g. a temporal operator (e.g. *when*) is frequently reanalysed as a conditional, or a modal operator (e.g. *how*) as a comparative complementiser.

The possible positions in (24) naturally give the combinations *hogymint* and *hogy/ha* + an ordinary relative pronoun (see section 2); however, as section 5 will show, there are several other combinations to be considered and these come in a systemic way.

5. Multiple and complex complementisers

In Old and Middle Hungarian, a higher C could co-occur with a lower C or an operator, see the representation in (24). The higher C head *ha* "if" appeared in the combinations *hamint* "if as", *hahogy* "if that", and with relative pronouns. The following example shows *hamint* in conditional ('unreal') comparatives:

(25) *de   **ha mÿnt** <ak   el   aluttak   volna   lelkǫketh   istennek*
     but   if   as   only   off   slept-3PL   be-COND.3SG   soul-POSS.3PL-ACC   God-DAT

     meg   adaak
     PRT   gave.3PL

     "but as if they had only fallen asleep, they gave their souls to God" (SándK. 28)

Examples for *hahogy* are shown in (26); the availability of the adverb *késen* "late" between *ha* and *hogy* "that" in (26a) shows that these two elements are base-generated as distinct C heads:

(26) a. ***Ha** késen **hogy**   el   nyugot   az   nap, hamar   esǫt   váry*
        if   late   that   off   set-PST.3SG   the   sun   soon   rain-ACC   expect-IMP.2SG
        "if the sun has set late, expect rain soon" (Cis. G3)

     b. *Az   én   jó   istenem,   **ha hogy**   sok   ellenség, ream   fegyverkezék,*
        the   I   good   God-POSS-1SG   if   that   many   enemy   I.SUB   armed.3PL

        tolok   megmente
        they.ABL   PRT-saved.3SG

        "my good God, if many enemies armed against me, saved me from them"
        (Balassa: Ének., 32)

Though adverbs do not typically move into a position above the lower C, it is a possible option; since in (26a) the C heads *ha* and *hogy* clearly belong to the same left periphery,[17] there is no reason to assume that *késen* would be located in a higher clause than the one containing *hogy*.

---

[17] If *ha késen* "if late" were a separate clause, the copula would be overt: in Hungarian (all periods), the copula must be overt if a verb-modifying adjunct is present; this is not the case in (26a).

The higher C head *hogy* appeared in the combinations *hogymint* "that than" and *hogymert* "that because", and with relative pronouns. Consider the example of *hogymint* in (11), repeated here as (27):[18]

(27) *mínd   anne   bǫsegǫs   kǫńhullatasoc   mene   a   vízeknec*
     all   so.much   plenty   crying-PL   as.much   the waters-DAT

     sokassaghí   sem   volnanac   en   elǫttem   kellemetǫsek/ Auaǵ
     multitude-POSS-PL   neither   be-COND.3PL   I   before-1SG   pleasant-PL   or

     *foganatosoc   **hoǵ   mint**   akki   zǫnetlen   a   kereztfanac ǫ*
     effective-PL   that   as   who   incessantly   the rood-DAT   he

     keserúseget   v́   testeben   víselí
     bitterness-POSS.3SG-ACC   he   body-POSS.3SG-INE   bears

     "not even as much crying as the multitude of waters would be as pleasant and touching to me as the one who incessantly bears the bitterness of the rood in his body" (NagyszK. 40–41)

The combination *hogymert* is illustrated in (28):

(28) ***Dehogÿ   mert***   *zent ferenc   ÿgen zeretiuala ewtett   tÿztasagert   es*
     but-that   because saint Francis   well loves-was him-ACC purity-FIN   and

     alazatossagaert   kyt   valuala   Monda   nekÿ
     humility-POSS.3SG-FIN   who-ACC has.was   said.3SG   he.DAT

     "but because Saint Francis liked him well for his purity and for his humility" (JókK. 46)

The possible structures underlying the combinations dealt with in this section so far are shown in (29), using the example of *hamint*:

(29)

---

[18] In the combination *hogymint* (see section 3), there were originally two C heads equipped with a [+rel] and a [+compr] feature; however, *hogy* was also available as a simple subordinator without these features, and eventually it was reinterpreted as a subordination marker in comparatives too.

The left-hand side diagram shows a higher C (*ha*) followed by an operator in the lower [Spec,CP]; the operator could be a future C (e.g. *mint*) or an ordinary relative operator (e.g. *ki* "who"). The right-hand side diagram shows two C heads in one periphery: this was not available for ordinary relative operators as they did not develop into C heads.[19] The same structures hold for comparatives too, see the representations in (19) and (20), respectively.[20]

Lower C heads started to move up to the higher C position (see section 4), and were later reanalysed as base-generated higher C heads. Movement was possible even if the higher C was already filled by another element: this resulted in head adjunction, which produced the reverse order in the linear structure of the two heads, conforming to Kayne's Linear Correspondence Axiom (Kayne 1994); cf. also the Mirror Principle of Baker (1985, 1988).[21] In Old and Middle Hungarian the reverse order of all C + C combinations mentioned so far is found, hence: *mintha* "as if", *hogyha* "that if", *minthogy* "than that", *merthogy* "because that". This gives a symmetric arrangement of multiple and complex complementiser combinations:

---

[19] This is because relative operators kept features that are incompatible with C heads in Hungarian; see the discussion at the end of section 4.

[20] There is reason to believe that both configurations in (29) existed: combinations like *hamint* appeared relatively early, that is, when the original operator use of *mint* and *mert* was still frequently attested. Furthermore, such combinations are attested even in Middle Hungarian, at a period when *mint* and *mert* could no longer be relative operators, as then they would have had to appear in the appropriate morpho-phonological form (that is, *amint* and *amiért*), just as was argued for ordinary comparatives in section 3.

[21] There are certain criteria that show which order is base-generated and which is derived: base-generated orders allow intervening elements between the two C heads, such as negative-like elements and certain adverbials; the base-generated orders gradually disappeared, while the derived orders remained in the language, which follows from the nature of the derivation in question; finally, elements that are claimed to have been base-generated as higher C heads early on (*hogy* and *ha*) could combine with other operators as well, while *mint* and *mert* could not. I will return to these arguments later.

Table 3. Combinations of the four Hungarian complementisers

	ha	*hogy*	*mert*	*mint*
ha	–	hahogy	–	hamint
hogy	<u>hogyha</u>	–	hogy mert	hogymint
mert	–	<u>merthogy</u>	–	–
mint	<u>mintha</u>	<u>minthogy</u>	–	–

For every C + C combination the reverse order (underlined in Table 3) is attested. These reverse order combinations are complex C heads, which survive into Modern Hungarian (unlike the original C + C combinations); I will return to the issue of why this should be so later. Note that for any pair of C + C and complex C combinations it is true that they had the same meaning and function.

Examples for complex complementisers are given below:[22]

---

[22] The combination *minthogy* seems to have been restricted to non-elliptical subclauses; the same is partially true for *hogymint* and *hogysemmint* "that neither than", which in most cases also introduce non-elliptical clauses; by contrast, elliptical patterns are frequently attested with the single C heads *hogy* and *mint*, as well as the combination *hogynemmint* "that not than". The difference lies in whether there are two overt C heads or a single C head (that may combine with an operator, and recall that *mint* started as an operator itself): elliptical patterns are generally disfavoured with two overt comparative C heads. This seems to be a restriction independent from the idiosyncratic properties of Hungarian (cf. *als dass* "than that" in German or *dan dat* "than that" in Dutch), and possibly rather linked to the properties of clausal ellipsis.

(30) a. *kí menének ȝocaſoc ȝerent **mint ha** aȝ imadſagra*
out went-3PL custom-POSS.3PL according as if the prayer-SUB

    mēnenec
go-COND-3PL

"they went out as was their custom, as if going for prayer" (GuaryK. 113–114)

b. *vig orchaual elmegien vala, **hogiha** ingen nem hallanaẏa*
happy face-COM off-go-3SG was that-if absolutely not hear-COND-3SG
"(s)he went away with a happy face, as if (s)he had absolutely not heard it"
(VirgK. 81)

c. *Melẏ bozzosagokot frater Bernald.| bẏzon zent. nem czak engedelmest.|*
which irritations-ACC brother Bernald indeed saint not only obeying

    *de es vẏgasagost zenuediuala:| **Mert hogẏ** bizonual*
but too joyfully suffers-was because that indeed

    uoltuolna cristusnak tekelletes tanoẏtuanẏa nepnek
was.3SG-be.COND.3SG Christ-DAT perfect student-POSS folk-DAT

    vtalatẏa es emberek zemerme
detest-POSS and people shame-POSS

"which irritations brother Bernald, indeed a saint, suffered not only obeyingly but also joyfully: for he was indeed a perfect student of Christ, and the detest and the shame of people" (JókK. 20–21)

d. *kynek egyeswleesere meltọbat nem gondolhata*
who-DAT communion-POSS-SUB worthier-ACC not think-POSSIB-PST.3SG

    *attya myndenhato wr ystennek bewlczesege **mynt hogy** ewnnen*
father almighty lord God-DAT wisdom-POSS than that own

    magat oly allatban enyeztene ees waltoztatna
self-ACC so animal-INE decay-COND.3SG and change-COND.3SG

"for whose communion the wisdom of the almighty God could not have thought better than to lower and change himself into such body" (ÉrsK. 279r)

Combinations of the type given in (30) derive from the type given in (25)–(28); this suggests that the derived type was less frequent in earlier texts than in later ones. This is indeed the case, as reinforced by the short survey I carried out on the four different translations of the gospels (see section 2). Table 4 shows the number of each complex complementiser:[23]

---

[23] Table 4 shows the (derived) complex complementisers only, since the selected texts did not include comparable examples of the combinations involving two separate heads; this is so because the same functions could be expressed also by single C heads, or even by using constructions other than subordinate clauses.

Table 4. The appearance of complex complementiser heads (derived orders)

	Munich Codex (1466)	Jordánszky Codex (1516–1519)	Káldi's translation (1626)	Neovulgata (1997)
hogyha	9	8	9	–
mintha	–	1	3	7
minthogy	–	–	4	1
merthogy	–	1	–	–

Only *hogyha* appears in the Munich Codex: all the other complex complementisers have merely sporadic examples in the Jordánszky Codex and a more significant number of occurrences in later translations. All these combinations exist in Modern Hungarian, hence their absence from the Neovulgata translation is merely accidental. The early and frequent appearance of *hogyha* is not surprising: *hogy* preferably moved up even in its combinations with *ha*, as it was preferably a higher C head anyway, thus *hogyha* appeared considerably earlier than all the other complex complementisers under scrutiny.

All C + C combinations regularly developed their complex C counterparts by movement. The *hogy/ha* + relative pronoun combinations had no inverse order counterparts as ordinary relative operators did not develop into C heads. Though movement from lower to the higher C was responsible for the appearance of complex complementisers, they ultimately grammaticalised as base-generated single higher C heads due to economy: base-generation is more economical than movement, cf. van Gelderen (2004).

The possible structures underlying complex complementisers like *mintha* are as follows:

(31)
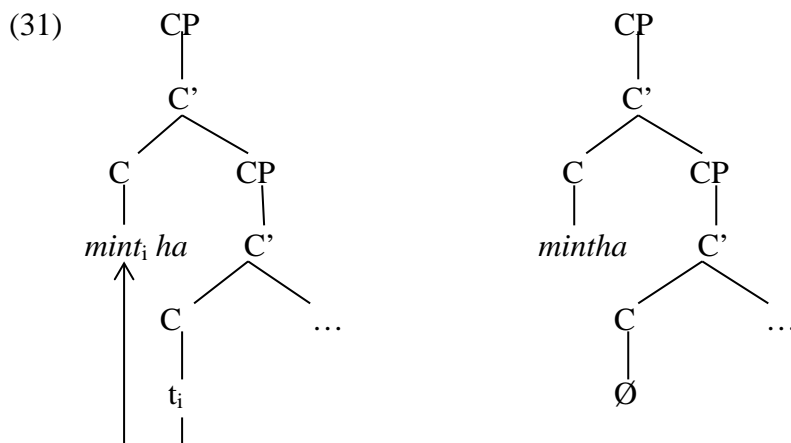
The left-hand side diagram shows the earlier configuration, where the complex complementiser is derived by the lower C head moving to the higher one to form a complex unit via adjunction. In the right-hand side diagram, the complex complementiser is already grammaticalised and is base-generated as a complex unit in the higher C head.

One consequence is that Modern Hungarian no longer has C + C combinations, as there is no overt complementiser to occupy the lower C head. Accordingly, the combinations *hamint*, *hahogy*, *hogymint* and *hogymert* have disappeared, unlike fully grammaticalised complex C heads. The analysis given here hence explains not only how complex complementisers arose but also why certain configurations necessarily disappeared.

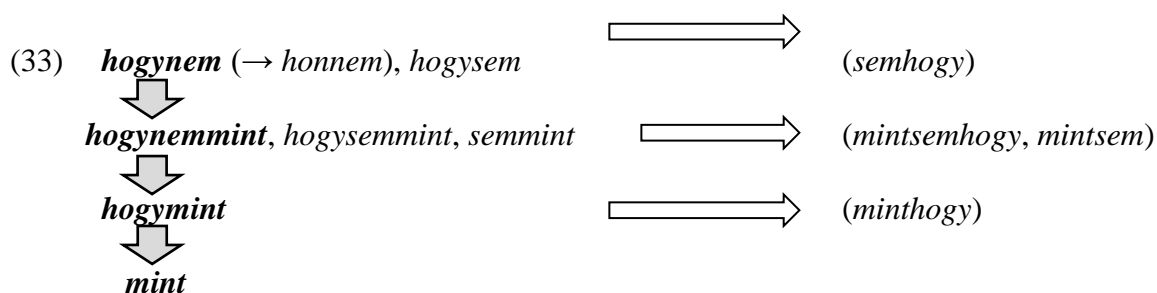The main steps leading to complex grammaticalised C heads are summarised below:

(32)
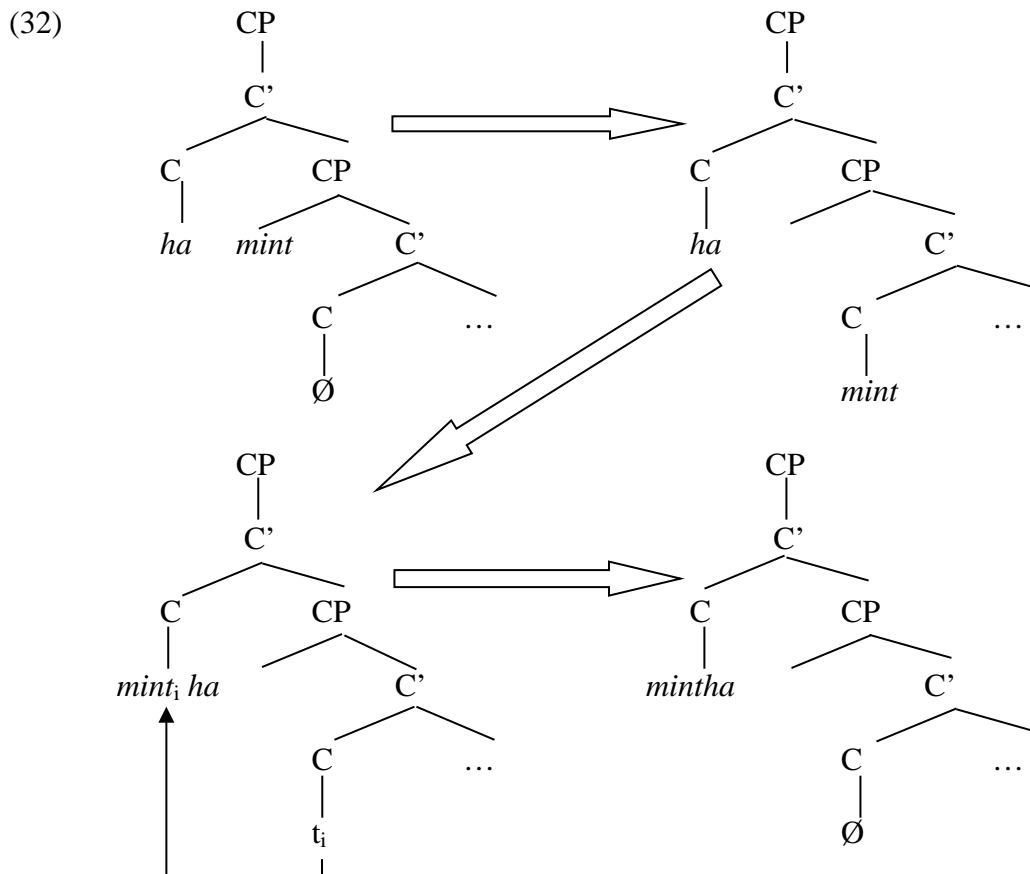
This way not only the development of *mint* but also the emergence and the disappearance of *hogymint* can be linked to generally attested grammaticalisation processes in Hungarian, apart from the theoretical foundations presented in section 1.1; hence the behaviour of comparatives in this respect is not exceptional.

6. The role of negative-like elements

As mentioned in section 2, comparative subclauses in Old Hungarian initially contained the element *nem* "not" (or *sem* "neither"), which could also co-occur with *mint* "than/as" for some time. The following diagram shows the main points in the development of the left periphery of comparative subclauses expressing inequality, including now also the inverted orders:

(33) **hogynem** (→ *honnem*), *hogysem* ⟹ (*semhogy*)

⟱ **hogynemmint**, *hogysemmint*, *semmint* ⟹ (*mintsemhogy*, *mintsem*)

⟱ **hogymint** ⟹ (*minthogy*)

⟱ **mint**

The negative-like element is licensed by the negative polarity of the clause; note that comparative subclauses do not necessarily contain overt negative elements – hence *hogymint* could arise and that ultimately comparatives are marked only by *mint* in Modern Hungarian, just as in many other languages, e.g. English *than* or German *als* "than". Overt negative elements can be observed cross-linguistically (see Salvi & Vanelli 2004: 283–285; Seuren 1973: 532–537; Marques 2006: 16–17); consider the following Italian example:
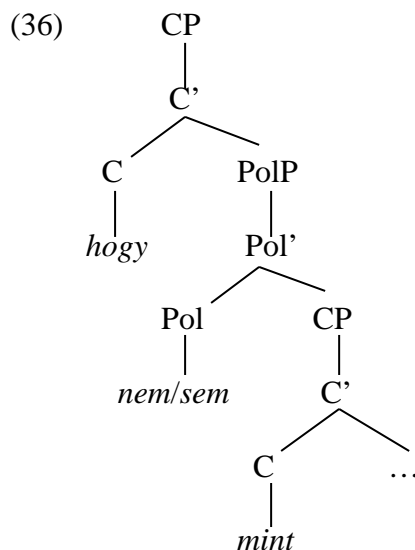
(34) *Maria beve   più   che   **non** Pietro.*
      Mary drinks more that   not   Pietro
      "Mary drinks more than Peter."

The comparative subclause in (34) includes the negative element *non* "not", though semantically there is no negation involved; the presence of *non* is optional and the meaning is not affected if it is left out (the difference is stylistic: the presence of *non* makes the clause sound more formal or elevated). A similar phenomenon is attested in French too, see Seuren (1973: 535). Negative polarity may also be manifest in a negative element other than the head, such as *never*. This can be traced in Cockney English (Seuren 1973: 535) and also in Portuguese (Marques 2006: 16–17). Consider (Seuren 1973: 535, ex. 48):

(35) *She did a better job than what **I never** thought she would.*

The phenomenon can partly be observed in Standard English in the acceptability of negative polarity items (e.g. *lift a finger*) in the subclause (Seuren 1973). All this shows that comparative subclauses have negative polarity (cf. also Gergel 2010). I do not wish to elaborate further on the (optional) presence of negative elements in comparatives and on the possible semantic reasons thereof here; for that, see Matushansky (2011).

Since negative elements such as *nem* or *sem* in Old and Middle Hungarian do not express negation but represent the negative polarity of the subclause, I assume that they head a polarity projection (PolP – cf. Homer 2011), which appears in between the two CPs:

(36)

```
            CP
            |
            C'
           /  \
          C    PolP
          |      \
        hogy     Pol'
                /    \
              Pol     CP
               |       |
           nem/sem     C'
                      /  \
                     C    …
                     |
                   mint
```
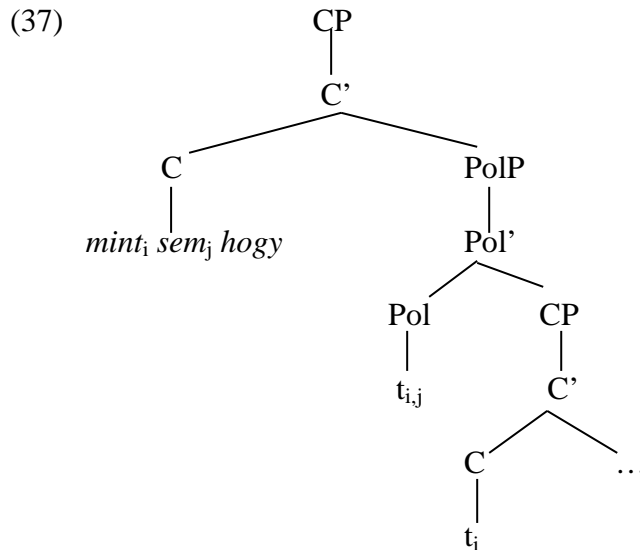
In (36), *mint* is already a C head; the previous stage would include *mint* in the lower [Spec,CP] and initially the lower CP did not contain any overt element. The PolP appears between the two CP projections headed by two distinct complementisers.[24] Note that *nem* and *sem* differ in that the former but not the latter became a clitic. The cliticization of *nem* is shown by the combination *hogynem*, which appears invariably as *hogynem* in the Munich Codex (1466) and as *honnem* (*mint*) in the Jordánszky Codex (1516–1519), showing phonological assimilation in the latter case.[25]

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[24] While the overt presence of a Pol head is due to a polarity-sensitive context, there is no entailment the other way round: not all polarity-sensitive contexts require an overt Pol head.

[25] The behaviour of *nem* and *sem* as Pol heads is different from *nem* and *sem* as Neg heads: as a Neg head, *nem* is not a clitic but *sem* is (É. Kiss 2002: 141–142). This reinforces that *nem* and *sem* in Old and Middle Hungarian comparatives are categorically distinct from Neg heads; this distinction cannot be the result of Neg heads moving up to the Pol head (that is, from a projection below the CP-domain into a position between the two CPs). Hence, though Pol heads are historically related to Neg heads, grammaticalised Pol heads are ultimately base-

The movement and adjunction analysis for complex complementisers (see section 5) can also be applied if the structure contained a PolP as the combination *mintsemhogy* is attested in the language; the derivation is shown in (37):

(37)

```
                        CP
                        |
                        C'
                _____|_____
               C              PolP
               |               |
      mintᵢ semⱼ hogy          Pol'
                          _____|_____
                         Pol          CP
                          |            |
                        tᵢ,ⱼ          C'
                                   ___|___
                                  C      …
                                  |
                                 tᵢ
```

First, the lower C head *mint* moves up to the Pol head *sem*, and as adjunction takes the original lower head to the left of the original higher head, the result is *mintsem* "than neither". Second, *mintsem* moves up to the higher C in the same way, to left-adjoin to *hogy*, resulting in *mintsemhogy* "than neither that". This process can be traced only if the PolP was headed by *sem* but not in the case of *nem*, which was a clitic and did not take part in movement.

Since the lower C head ultimately moves up to the higher C, its landing in the Pol head is only an intermediate step in the derivation but never a final state. In other words, there are no combinations that would include this step without the further movement to the higher C, hence there are no combinations such as *hogymintsem* "that than neither" attested: if the higher C was filled by *hogy*, then the result of *mint* moving up was invariably *mintsemhogy*, as in (37) – if the higher C was empty, the combination was realised as *mintsem*.

Just as with combinations involving two C heads, only the grammaticalised complex C head (*mintsemhogy*) remained in the language: configurations like (36) disappeared both because lower C heads are no longer attested and because overt Pol heads are not present in comparative subclauses either. The two changes are presumably not independent of each other: the change from *hogy* to *mint* as the comparative complementiser is accompanied by

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generated directly. The same is true for French *ne*: *ne* in itself is no longer able to express negation (that being rather expressed by *pas*), thus its presence in comparatives is merely an overt indication of negative polarity.

the loss of an overt PolP. The key difference between *hogy* and *mint* is that while *hogy* was a general subordination marker that appeared in a large number of (very different) constructions, *mint* is unambiguously associated with comparative Force. Note also that in Italian and French, where the optional presence of Pol heads is attested, the comparative complementisers *che* and *que* are not exclusive to comparatives, similarly to *hogy* in Old Hungarian. By contrast, *than* in English is unambiguously a comparative complementiser and though the presence of negative polarity items is permitted (as well as certain negative elements in, for example, Cockney English), there seems to be no grammaticalised Pol head. In sum, the disappearance of Pol heads in Hungarian is presumably due to the fact that the generation of an overt Pol head was no longer necessary to encode negative polarity, since the new comparative complementiser was unambiguously associated with comparative Force and hence negative polarity. The PolP was thus ruled out by general principles of economy that disfavour the generation of superfluous structural layers.

7. Comparative Deletion and grammaticalisation

Comparative Deletion, as shown in section 1.2., depends on the overtness of the operator. If the operator moves out on its own, the AP may escape deletion by remaining in its base position; furthermore, AP-deletion is not attested with overt operators taking no AP. The question is which configurations favour the grammaticalisation of the operator into a C head.

Grammaticalisation is not attested with zero operators, irrespectively of whether the operator is extractable: grammaticalisation affects overt elements that become reanalysed (in language acquisition) as elements having a different underlying structural status. Not all overt operators can be reanalysed as C heads: operators that appear together with a lexical XP cannot be reinterpreted as heads since there is a visibly phrased-sized constituent moving to the [Spec,CP] that could not be base-generated as a C head. This leaves only one option for operators to be reanalysed as C heads and that is when an overt operator moves to the [Spec,CP] on its own: either because it is a proform that does not take a lexical AP, or because it is preferably stranded from the lexical AP, and is ultimately re- interpreted as an element independent from that AP.

The grammaticalisation of an operator into a (lower) C leads to the appearance of new comparative operators: these are not necessarily overt but the degree expression has to have an operator element that is associated with the degree expressed by the subclause. As long as the comparative complementiser is in the lower C head and the operator moves to the specifier of the same CP, the presence of overt material in the [Spec,CP] is generally ruled out by economy (the Doubly Filled Comp Filter). With the reanalysis of lower C heads into higher ones, however, overt operators – together with potential lexical phrases – may appear in the lower [Spec,CP]. Hence while grammaticalisation from operator to lower C head feeds Comparative Deletion, grammaticalisation from lower C to higher C bleeds it.

The three stages are schematically illustrated in (38):

(38)
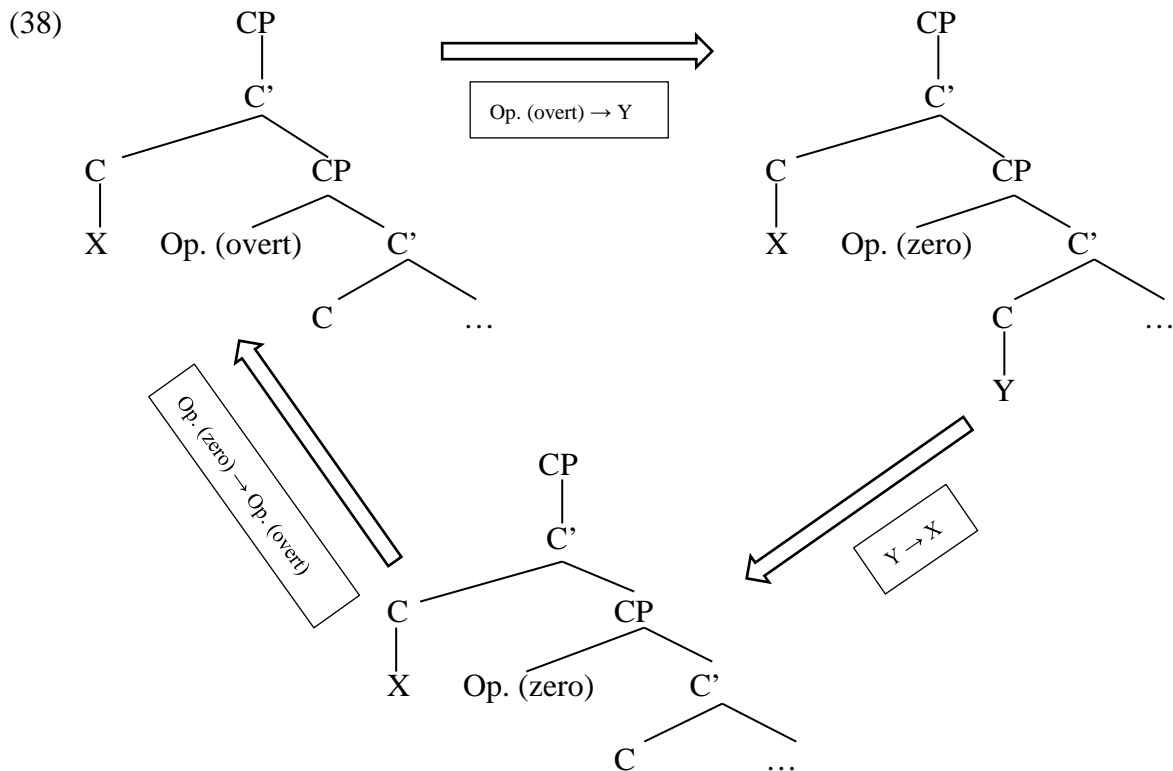
Comparative Deletion is possible (but not necessary) in the patterns involving a zero operator.

7.1. Hungarian

There are altogether three overt operator stages in the history of Hungarian comparatives: *hogy* "how", *mint* "how", and the operators like *amilyen* "how" or *amennyire* "how much".

Examples of the operator *hogy* in comparatives are scarce since *hogy* "that" was already a complementiser in Old Hungarian. An example from Early Old Hungarian was given in (7a), repeated here as (39):[26]

(39) *furiſcte muſia!|| etetý ýmletí.   ug **huᵹ** ana   ſciluttet.*
     bathes washes feeds breastfeeds so how mother child-POSS-ACC
     "she bathes, washes, feeds and breastfeeds him as a mother does her child" (KTSz.)

Here *huᵹ* "how" appears on its own at the beginning of the subclause; as a VP-adverb, it does not co-occur with a lexical XP. This was most probably the case for *hogy* in general and since it could also grammaticalise into a C head, it is plausible that *hogy* was a proform operator.

Next, *hogy* was a higher C, above the PolP headed by *nem* "not" (or *sem* "neither"), in examples like (8), repeated here as (40):

(40) *Zͦ̄nėkm̄ᵹ   te   meltatlākodatod   mv̇   èllènͦ̄c   mėt   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   nèkėd   **hog nē** meghaluāc   mv̇*
     cringe-SBJV-1PL you you.DAT that not PRT-dying-1PL we

     vèzèdelmͦ̄cbèn   mv̇nmagonc   mv̇   zolgalatͦ̄knac
     peril-POSS.1PL-INE ourselves we service-POSS.1PL-DAT

     karat   zènuèggu̇c
     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" (BécsiK. 14)

No overt comparative operators are attested until the appearance of *mint* (and its alternates *miképpen* "how" and *miként* "how"); recall that interrogative and relative operators that may combine with lexical APs and NPs were missing from the language (cf. G. Varga 1992: 525). Hence it seems plausible that Hungarian had a zero comparative operator, and if lexical

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[26] See the argumentation in section 4 as to why *hogy* cannot be a head in (39).

material moved together with it, then this had to be eliminated by Comparative Deletion in order to avoid the violation of the overtness requirement on left-peripheral elements.

It is impossible to detect whether APs obligatorily moved together with the zero operator, mainly because most subclauses are like the one in (40): apart from the complementiser – and, if applicable, the Pol head –, there is only one overt constituent in the subclause; this constituent is focussed and the rest of the clause undergoes sluicing.[27] Disregarding the case of subcomparatives, where the main contrast is expressed by the QP itself, the AP is usually GIVEN and is preferably not pronounced, even if its appearance would be grammatical. In other words, while it is perfectly possible that Old Hungarian permitted the overt realisation of non-contrastive APs in their base position, such examples are not attested and it may merely be due to the fact that these APs would have been superfluous.

The overt operators *mint*, *miképpen* and *miként* were proforms that did not co-occur with lexical elements. Recall the example in (9), repeated here as (41):

(41) *Te   igyekevzeted   az   isteny   zolgalatban jnkab légen   arra*
       you   diligence-POSS.2SG the   divine   service-INE rather be.SBJV.3SG that-SUB

       hog   az   zent   irasnak   igy   ebevl   lelky   ertelmet
       that the sacred   writing-DAT   thus this-ELA spiritual sense-ACC

       *vegy   es   aytatossagnak keuansagat   **hog   nem   mynt***
       take.SBJV.2SG and   prayer-DAT   desire-POSS-ACC that   not   than

       vduarlokeppen eneklesnek   mogyat   tegyed
       courting   singing-DAT   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" (HorvátK. 138v–139r)

Since in these cases the overtness condition is not violated, as the operator is overt, there is naturally no Comparative Deletion attested.

The reanalysis of *mint* into a C head resulted in a situation similar to the one involving *hogy* as a sole comparative complementiser, that is, the comparative operator was zero: as

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[27] These are still elliptical clausal comparatives and not phrasal comparatives, that is, *hogy* is a C head and not a preposition (or a coordinating conjunct, as in Osborne 2009: 431, 437–439) even in cases where there is no finite clause as in (40) or (41). Apart from general problems concerning coordination and comparatives (see Bacskai-Atkari 2010b) and the fact that prepositions are not attested in Hungarian in any period, there are a number of reasons in favour of the clausal analysis. First, the remaining constituent can be a phrase other than a DP, e.g. a PP or a non-finite VP. Second, even DPs are not marked for a special case defined by *hogy* but in any case as defined by their function in the clause, e.g. in the nominative if they are subjects. Hence the direct analysis (starting from Hoeksema 1983) cannot be applied to these cases. Note that Hungarian does in fact have true phrasal comparatives (where a DP marked for the adessive case appears instead of subclause, cf. Bacskai-Atkari 2010b) but the examination of these structures falls outside the scope of the present paper.

long as *mint* was a lower C, the co-presence of overt material in the [Spec,CP] is expected to have been ruled out by economy, and after *mint* was reanalysed as a higher C head, zero operators occurred until the introduction of new operators in Middle Hungarian.

Unlike *hogy* and *mint*, operators in Modern Hungarian have not been reanalysed into C heads: they can take lexical XPs, which disallows their interpretation as C heads. Moreover, they show agreement with the lexical XP, thus they have features incompatible with C heads in Hungarian. By contrast, *mint* and *hogy* were proform operators equipped with a [+compr] and a [+rel] feature only. The reanalysis from operator into C head involves the loss of the degree property[28] but cannot be accompanied by the abrupt loss of essentially lexical features.

7.2. German

In German, *wie* "how" is available as a non-extractable interrogative degree operator:

(42) a. **Wie   groß   ist Johann?**
         how   tall   is   John
         "How tall is John?"

      b. ***Wie ist Johann groß?**
          how is   John   tall
          "How tall is John?"

However, the pattern in (42a) is not attested in comparative subclauses:

(43) a. **Maria ist größer als   **wie groß**   Johann ist.*
          Mary is   taller than how tall   John   is
          "Mary is taller than John."

      b. **Der Tisch ist länger als   **wie breit** das   Büro   ist.*
          the.M table is   longer than how wide   the.N   office is
          "The table is longer than the office is wide."

Consider now the following data involving the apparent stranding of the APs:

---

[28] Comparative semantics (see e.g. Kennedy 2002) lies in the matrix clausal degree morpheme (*-er*), which is associated with a certain degree on a scale (*d*), and which binds a degree variable (*d'*) in the subclause: this is associated with the comparative operator but not with the complementiser, unlike the feature [+compr], which is present on both.

(44) a. [??]/* *Maria ist größer als* **wie** *Peter* **groß** *ist.*
        Mary is   taller   than how Peter tall   is
        "Mary is taller than Peter."

    b. [?/??] *Der Tisch ist länger als* **wie** *das Büro* **breit** *ist.*
        the.M desk is longer than how the.N office wide is
        "The desk is longer than the office is wide."

If *wie* were a non-separable operator, (43) should be grammatical and (44) ruled out, which is not the case: though the sentences in (44) are not fully acceptable for all speakers, they are clearly better than the ungrammatical ones in (43). If *wie* were a separable operator, both (43) and (44) should be acceptable. Furthermore, *wie* cannot be a proform operator either since then the presence of lexical APs would not be allowed. It is nevertheless possible for *wie* to appear without a lexical AP:
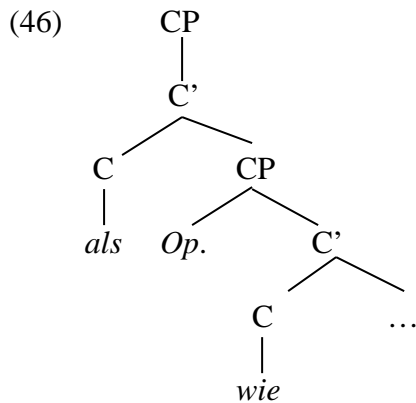
(45) [?/??] *Maria ist größer als* **wie** *Peter.*
       Mary is taller   than how Peter
       "Mary is taller than Peter."

Though the average judgement of (45) is quite marked, there is considerable variation among speakers: whereas for some the use of *wie* is indeed very marked, many speakers find it only slightly marked and judge it as a substandard form, and there are speakers for whom sentences like (45) are fully acceptable.[29] Hence the markedness of (44) is in fact the consequence of *wie* in *als*-clauses and not of the overt presence of the AP.

    All this points to the conclusion that *wie* in German *als*-clauses is not an operator but rather a lower C head, in line with Jäger (2010: 482; 2012). Note that the grammaticalisation of *wie* "as" in comparatives expressing equality has already taken place (cf. Jäger 2012) and hence the way German crucially differs from Hungarian is that comparatives expressing equality and inequality do not develop in a parallel fashion.

    The left periphery of subclauses involving *als* "than" and *wie* is hence the following:

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[29] The differences in contemporary judgements can be traced back to the different stages of diachronic development that the individual dialects show. In dialects that use *als* exclusively (most Northern dialects), (45) counts as a neologism, while the same structure is fully acceptable in Western dialects (such as Hessian). On the other hand, in a number of Southern dialects (such as Bavarian) *wie* had actually taken over *als* as a comparative complementiser also in comparatives expressing inequality, and hence (45) counts as archaic.

(46)

```
           CP
           |
           C'
          /  \
         C    CP
         |   /  \
        als Op.  C'
               /  \
              C    …
              |
             wie
```

The structure in (46) shows why lexical APs cannot co-occur with *wie* in the [Spec,CP]: *wie* is a C head and cannot take an AP into the specifier, which hence hosts covert operators (which may or may not move together with the AP). There seems to be no candidate for an overt comparative operator in German and even if there were one, it might not be acceptable to co-occur with *wie* in the lower C head. Note also that it was possible for *wie* to be reanalysed as a C head because, just like Hungarian *mint*, it did not show feature incompatibility with a grammaticalised C head. The zero operator can move out on its own , both in *als wie* clauses and in ordinary *als*-clauses.

In sum, the fact that German *wie* is not available as a comparative operator is the result of grammaticalisation processes that are attested cross-linguistically.

7.3. Italian

The Italian interrogative operator *quanto* "how much" is non-separable (Northern dialects):[30]

(47) a. **Quanto alta** *è Maria?*
       how   tall-F is Mary
       "How tall is Mary?"

   b. ***Quanto** *è Maria* **alta***?*
        how   is Mary   tall-F
       "How tall is Mary?"

However, the configuration in (47a) has no matching counterpart in comparative subclauses:

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[30] The discussion here is restricted to these Northern dialects, as I am not concerned with dialectal variation here but intend to show how the grammatical processes discussed so far may be applied to this particular variety.

(48) a. *Maria è più alta di **quanto** Giovanni sia **alto**.*
      Mary is more tall-F of how John be.SBJV.3SG tall-M
      "Mary is taller than John."

    b. **Maria è più alta di **quanto alto** Giovanni sia.*
      Mary is more tall-F of how tall-M John be.SBJV.3SG
      "Mary is taller than John."

    c. *La tavola è più lunga di **quanto** l'ufficio sia **largo**.*
      the.F table is more long-F of how the-office be.SBJV.3SG wide-M
      "The table is longer than the desk is wide."

    d. **La tavola è più lunga di **quanto largo** l'ufficio*
      the.F table is more long-F of how wide-M the-office
      sia.
      be.SBJV.3SG
      "The table is longer than the desk is wide."

If *quanto* were a non-separable operator, (48b) and (48d) should be grammatical and (48a) and (48c) ruled out. Since this is not the case, *quanto* in comparative subclauses is not an operator. Again, just as was argued for German *wie*, the unavailability of *quanto* together with the AP in the [Spec,CP] shows that it cannot be an extractable operator either, since separable operators allow not only extraction patterns like (48a) and (48c) but also non-extraction patterns like (48b) and (48d). Finally, *quanto* cannot be a proform operator because then (48a) and (48c) would not be acceptable.

Hence *quanto* is not a comparative operator but a C head: the operator itself is a zero that may move out on its own, leaving the AP in its base position. In this case there is only one overt C head (*quanto*): *di* "of" is a preposition, which takes a DP in its complement position and the comparative subclause is in fact an adjunct to this DP and not a complement clause (cf. Bacskai-Atkari 2010b). The C head *quanto* is in complementary distribution with *che* "that", hence there is reason to believe that both are generated as higher C heads. I do not wish to further elaborate on this here as the discussion would then have to involve details of subordination in Italian that are not relevant here.

In sum, Italian displays a grammaticalisation process leading to the reanalysis of an original operator into a C head and hence resulting in the asymmetry between interrogative operators, which still prevail, and their original relative operator counterparts, which have been reinterpreted as C heads. Unlike *wie* in German, *quanto* in Italian is not only marginally acceptable as a comparative C head but is in fact a standard one, just as *mint* in Hungarian.

8. Conclusion

This paper aimed at accounting for how the changes in the status of comparative operators are related to the phenomenon of Comparative Deletion. I argued that the difference between proform operators and those that take lexical XPs has a bearing on whether they can be reanalysed as C heads: only operators without a lexical XP can be grammaticalised.

In Hungarian, cyclic changes can be observed multiple times in comparatives and they are also attested in other subclauses during Old and early Middle Hungarian. I showed that the present-day complementiser *mint* "as/than" started as an operator, and since it did not take lexical XPs, it could be reanalysed as a C head. This ultimately led to the disappearance of the original configuration, where *hogy* "that" was the complementiser and the negative polarity of the subclause was marked by an overt Pol head. The co-occurrence of two overt C heads in one left periphery is attested in other constructions and languages too, and the mechanisms underlying the appearance/disappearance of the various combinations follow from general economy principles. German and Italian comparative subclauses were argued to show the effect of similar grammaticalisation processes.

The presence of two complementisers bleeds the appearance of overt operators in the left periphery, which either leads to Comparative Deletion, or the language uses zero operators that move without lexical XPs. On the other hand, if a lower C head is reanalysed as a higher one, new overt operators can appear without violating economy principles, and this arrangement bleeds Comparative Deletion.

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