

# Cyclic changes in Hungarian relative clauses<sup>\*</sup>

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## 1 Introduction

As described by Van Gelderen (2004; 2009) and Roberts & Roussou (2003), relative pronouns may stem either from interrogative pronouns or from demonstrative pronouns cross-linguistically. The two patterns are demonstrated by English and German below, respectively:

- (1) a. The woman **who** lives next door has just left the supermarket.  
b. Die Frau, **die** nebenan wohnt, hat gerade den  
the.F.NOM woman who.F.NOM next.door lives has just the.M.ACC  
Supermarkt verlassen.  
supermarkt left.PTCP  
'The woman who lives next door has just left the supermarket.'

As can be seen, the English example in (1a) includes the relative pronoun *who*, which is morphophonologically identical to its interrogative counterpart. This type of relative pronoun will be referred to as wh-REL in our paper. By contrast, in the German example in (1b), the relative pronoun *die* is morphologically identical to a demonstrative pronoun from which it derives etymologically (Wiltschko 1998) and is likewise inflected for gender and case; this is in fact a standard option in Germanic (see Brandner & Bräuning 2013). In our paper, we will refer to this kind of relative pronoun as dem-REL.

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Hungarian is particularly interesting for the cross-linguistic status of relative pronouns as it demonstrates a peculiar historical change affecting the morphology of relative operators. The Old Hungarian<sup>1</sup> pattern is essentially similar to the English paradigm; consider:

- (2) a. de **qui** legen neký atia oꝝut nem tudiuc  
 but who be.SBJV.3SG he.DAT father.POSS DEM.ACC not know.1PL.DEF.OBJ  
 ‘but we do not know who his father is’  
 (Königsberg Fragment; middle of the 14th century)
- b. ꝑcuꝝ leannac [**qui** vleben tart chudalatuf fiot]  
 virgin girl.DAT who.REL lap.POSS.INE hold.3SG wonderful son.ACC  
 ‘of a virgin girl, who is holding a wonderful son in her lap’  
 (Königsberg Fragment; middle of the 14th century)

At this stage, relative operators are formally identical to their interrogative operator counterparts, as demonstrated for *qui* ‘who’ in (2).

In Modern Hungarian, interrogative operators are essentially unchanged (differences in the spelling may occur), while relative operators always have an *a-* prefix:

- (3) a. de nem tudjuk, **ki** lehet az atyja  
 but not know.1PL.DEF.OBJ who be.POSSIB.3SG the father.POSS  
 ‘but we do not know who his father is’
- b. szűz leánynak, **aki** csodálatos fiút tart az ölében  
 virgin girl.DAT REL.who wonderful son.ACC holds the lap.POSS.INE  
 ‘of a virgin girl, who is holding a wonderful son in her lap’

The Modern Hungarian pattern is peculiar inasmuch as the relative form consists of the prefix *a-*, which stems from an original demonstrative element, and of the original operator element (e.g. *ki* ‘who’). In this way, Modern Hungarian relative clauses demonstrate a third type of relative pronoun in addition to *wh-REL* elements, as the English pattern in (1a), and *dem-REL* elements, as the German pattern in (1b): Modern Hungarian relative operators contains both markers, and will hence be referred to as *dem-*

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<sup>1</sup>The Old Hungarian period refers to the stage between the early 9th century and the 16th century. The first coherent text from this period (and from the history of the Hungarian language) is the Funeral Sermon and Prayer from 1192–1195, and the first codex is the Jókai Codex from after 1370 (surviving copy from 1448). For the research reported here we used the Old Hungarian Corpus described in Simon & Sass (2012).

wh-REL. This pattern is actually not entirely unique cross-linguistically: it is one of the standard relative strategies in Modern Greek as well (Alexiadou & Anagnostopoulou 2000: 47; Alexopoulou 2006: 67).

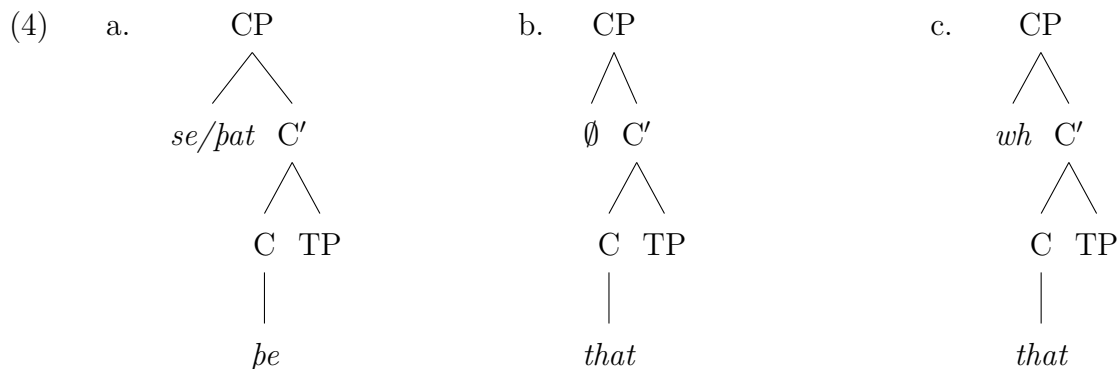
The question arises how the change from simple wh-REL elements in Old Hungarian to complex dem-wh-REL elements in Modern Hungarian can be described.<sup>2</sup> Regarding reanalysis processes affecting relativizing elements in general, the following can be established. As mentioned earlier, relative pronouns emerge from interrogative pronouns and from demonstrative pronouns cross-linguistically. In either case, reanalysis can be described by the notion of the relative cycle (see Van Gelderen 2004; 2009), which can be summarized as follows. First, a demonstrative/interrogative pronoun is reanalyzed as a relative pronoun. Second, the relative pronoun can be reanalyzed into a C head. Third, once an original operator has been reanalyzed as a complementizer, new relative pronouns can appear in the CP-domain. Naturally, not all interrogative/demonstrative pronouns enter the relative cycle; on the other hand, even if they do, they are not necessarily reanalyzed into complementizers, in which case the relative cycle is incomplete. In order to illustrate the phenomenon, let us consider the changes affecting English relative operators. As described by Van Gelderen (2004; 2009), there are two relative cycles in the history of English: the reanalysis of *that* in Old English, and the reanalysis of *wh*-pronouns in Middle English. The reanalysis of *that* shows a complete cycle: *that* was reanalyzed from a demonstrative into a relative pronoun, and subsequently the relative pronoun was reanalyzed into a complementizer. The reanalysis of *wh*-pronouns, however, demonstrates an incomplete cycle: the interrogative operators were reanalyzed as relative operators, but no further reanalysis can be detected into complementizers. Essentially, the full completion of the first cycle (the reanalysis of *that* into a relative

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<sup>2</sup>Note that diachronically, wh-REL pronouns must have themselves emerged via reanalysis from interrogative pronouns. This is because proto-Uralic is widely assumed to have had very little finite embedding, if at all (cf. Hajdú 1966: 82 and Berezki 1996: 94, among others). The original relative clauses were most likely pre-nominal and participial, employing the gap strategy (Nikolaeva to appear). Thus finite relatives in Hungarian (and so the appearance of relative pronouns) must be a relatively late development. In this paper we do not discuss the reanalysis of interrogative pronouns into relative pronouns in detail because this change took place in the unwritten period of the language: we find wh-REL pronouns already in the first language record (the Funeral Speech and Prayer from the late 12th century). The change from wh-REL to dem-wh-REL, however, can be tracked in the Old Hungarian short texts and codices. Our main concern here is this change.

complementizer) provided an environment for the start of the second cycle.

The relevant structures are given in (4) below:



As can be seen, *that* started as a relative operator in [Spec, CP] alongside other relative operators that likewise derived from demonstratives. Later, when the original *be* complementizer was lost, *that* was reanalyzed as a complementizer, base-generated in C: this involved the loss of an overt dem-REL operator in [Spec, CP]. The disappearance of overt dem-REL operators (*that* being reanalysed and other dem-REL elements obsolete), the [Spec, CP] became available for new relative pronouns, which appeared in Middle English in the form of wh-REL operators. These operators served to lexicalize the relative operator in the clause; if they co-occur with *that*, this leads to a Doubly Filled COMP pattern.

It should be clear that English historically has both dem-REL and wh-REL elements in relative clauses, whereby dem-REL patterns are actually standard in Germanic relatives (see Brandner & Bräuning 2013), and wh-REL elements can be considered an innovation. Nevertheless, it is straightforward that English does not show complex relative pronouns (dem-wh-REL) of the Hungarian type.

The present paper argues that the mechanisms underlying the reanalysis of relative operators in Hungarian are essentially similar to those attested in English. Crucially, however, the reanalysis of *wh*-operators into relative operators preceded the reanalysis of the matrix demonstrative pronoun, and *wh*-based relative operators did not grammaticalize into complementizers either. In other words, Hungarian demonstrates an incomplete cycle with respect to wh-REL pronouns, similarly to what can be observed in English. However, in English the dem-REL pronoun *that* was reanalyzed as a complementizer earlier and thus demonstrated a complete cycle, which was not an option in Hungarian. Still, the matrix demonstrative element was reanalyzed into [Spec, CP],

yet this was possible only via cliticization onto the *wh*-REL pronoun (and not via replacing it), resulting in morphologically complex relative pronouns (dem-*wh*-REL). We will argue that these changes had two important prerequisites, both related to features. First, the original *wh*-based relative operator did not lose its lexical features and was not grammaticalized into a functional head. Second, the matrix demonstrative lost its original definiteness feature, [+def], and became unspecified for this feature. Ultimately, this feature change brought about the emergence of a new morphosyntactic paradigm. This is in line with what Baker (2008) dubbed as the Borer–Chomsky Conjecture (going back to Borer 1984 and Chomsky 1995), according to which syntactic change is the result of changes in the lexicon. In essence, this view hypothesises that syntactic change exists only as a reflex of changes in other components of language (see the discussion in Biberauer & Walkden 2015).

This paper is built up as follows. Section 2 presents the historical data from Hungarian, providing an overview of the major changes affecting relative clauses. Section 3 provides the actual analysis underlying these processes, focussing on the two major points to be discussed here: (i) the lack of feature loss with respect to lexical features, which prevented *wh*-based relative operators from reanalysis into complementizers, and (ii) the loss of the definiteness feature in the case of the matrix demonstrative element, which enabled its cliticisation onto the original *wh*-REL element.

## 2 Changes in Hungarian relative clauses – the data

### 2.1 Stage 1: The starting point

Relative clauses appear in the first coherent Hungarian texts already: they are introduced by relative operators, and these operators are morphophonologically identical to interrogative operators. An example is given in (5) below:

- (5) es ana tartia uleb en [qui sciult dychev segut]  
 and mother hold.3SG.DEF.OBJ lap.POSS.INE who bore glory.ACC  
 ‘and the mother, who has given birth to glory, is holding him in her lap’  
 (Königsberg Fragment and its Ribbons; middle of the 14th century)

The elements in question are undoubtedly operators and not complementizers. On the

one hand, they can take plural marking and case marking: the operator *ki* ‘who’ is marked for the accusative case in (6a), and it bears both plural marking and dative case in (6b). Complementizers could not be inflected for number or case at any stage of Hungarian. On the other hand, the relative elements in question can also be modified by postpositions, as in (6c), which is again impossible for Hungarian complementizers.

- (6) a. eggedum illen maraggun uro dum  
 only.one.POSS.1SG live.SBJV.3SG stay.SBJV.3SG lord.DIM.POSS.1SG  
 [**ky-th** wylag felleyn]  
 who-ACC world fear.SBJV.3SG  
 ‘let my only one live and stay, so that the world shall fear him’  
 (Old Hungarian Lamentations of Mary; end of the 13th century)
- b. egyebeknek zerzamaual [**ky-k-nek** myatt-a ysten  
 others.DAT tool.POSS.INSTR who-PL-DAT because.of-3SG God  
 myuelkedyk eznek byzon gyewmelczet]  
 cultivate.3SG this.DAT sure fruit.POSS.ACC  
 ‘with other tools, with which God cultivates its assured fruit’  
 (Jókai Codex 113; ca. 1440)
- c. ez levn vy ignec chudaia [**qui mia** vrduguc  
 this became.3SG new case.DAT miracle.POSS who because.of devils  
 scurnevlenec]  
 wondered.3PL  
 ‘this was the miracle of the new event, due to which the devils were surprised’  
 (Königsberg Fragment; middle of the 14th century)

In certain cases the head of the relative clause was a demonstrative pronoun, and so the demonstrative in the main clause was immediately followed by the relative clause headed by the *wh*-REL operator. This demonstrative element is essentially a correlate that can also co-occur with a *that*-clause (see, for instance, É. Kiss 2002). The scenario presented here is thus very similar to the historical developments affecting German *dass*-clauses, where correlates are also attested (Axel 2009: 28–29). An example is given in (7).

- (7) Nağ bolondsag embernek zeretnye **az-t**, [**ki-nek** miatt-a ...]  
 great foolishness human.DAT love.INF.3SG DEM-ACC who-DAT because.of-3SG  
 ‘it is very foolish for humans to love the one because of whom ...’  
 (Bod Codex 2v; first half of the 16th century)

It is clear that the demonstrative belongs to the main clause, as it gets accusative case from the matrix predicate *zeret* ‘love’. The *wh*-REL, on the other hand, is part of the embedded clause, and gets case from the possessive head marked by the agreement suffix on the P: *miatt-a* (because.of-3SG) ‘because of’.

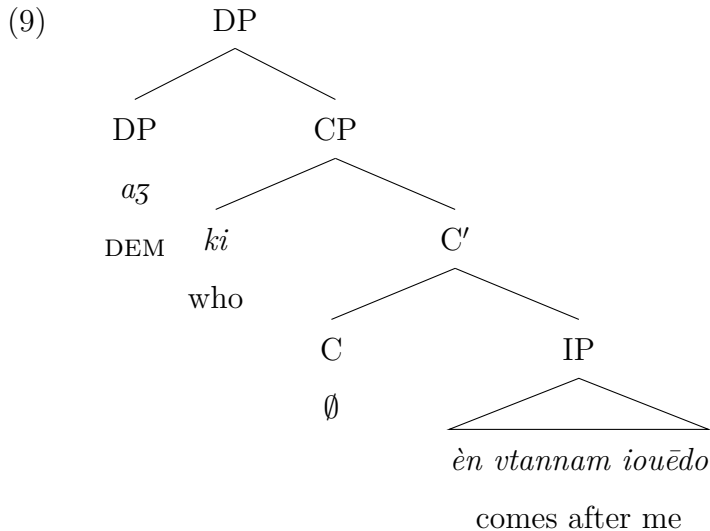
The reanalysis of the demonstrative into the relative clause could start in a subset of the above cases, specifically, in cases where the (distal) demonstrative *az* ‘that’ was morphologically unmarked (i.e. morphologically singular with nominative case), as in (8).<sup>3</sup> The examples in (8) contain identificational matrix clauses (with a dropped copula): *Ez az* ‘this is it/him’ and *o a3* ‘he is it/him’ are well-formed self-standing clauses with *Ez* ‘this’ or *o* ‘he’ as the subject and *az/a3* ‘that’ as the predicate.

- (8) a. *Ez az* [*ky* *cristust* *kerestfan tarsolkodtatt*] *Ez az* [*ky*  
 this DEM who Christ.ACC cross.SUP conversed.3SG this DEM who  
*cristusual coporsoba el reytetyk*]  
 Christ.INSTR coffin.ILL off is.hidden  
 ‘this is the one who talked to Christ on the Cross; this is the one who is put  
 into the coffin with Christ’  
 (Jókai Codex 133; ca. 1440)
- b. *o a3* [*ki* *èn vtannam iouēdo*]  
 he DEM who I after.me is.to.come  
 ‘he is the one who comes after me’  
 (Munich Codex 85va; 1446)

The structure of (8b) is shown in (9). For simplicity of exposition, we treat the relative clause as an adjunct to the demonstrative, but nothing crucial hinges on this. (See É. Kiss 2002 for a complement analysis of Hungarian relative clauses.)<sup>4</sup>

<sup>3</sup>That the modern Hungarian *a*- prefix of relative pronouns stems from an uninflected matrix demonstrative which was re-analyzed into the embedded clause has been observed in the descriptive diachronic literature such as Galambos (1907), Klemm (1928), Dömötör (1991; 1995; 2014; 2018), Juhász (1992), G. Varga (1992), D. Máta (1992), Haader (1995). These works, however, do not have any theoretical aspiration: they do not discuss the structure underlying the clauses before and after re-analysis, and do not place the Hungarian facts into a cross-linguistic perspective either. That the main-clause demonstrative was not simply adjacent to the relative operator but actually functioned as the head of the relative clause is a novel observation that we develop in Bacskai-Atkari & Dékány (in prep) in detail.

<sup>4</sup>The difference between the complement analysis and the adjunct analysis is ultimately related to what status is assigned to the matrix demonstrative, that is, whether it is treated as an expletive



## 2.2 Stage 2: Syntactic change

As the first step towards the emergence of dem-wh-REL operators, the demonstrative was reanalyzed as part of the relative clause (resulting in a pattern similar to Modern Greek, see Alexiadou & Anagnostopoulou 2000: 47; Alexopoulou 2006: 67). This involves the re-bracketing of the clausal boundary, which is in fact a common process cross-linguistically (for instance, it can be detected in the reanalysis of the German complementizer *dass* ‘that’, see Axel 2009).<sup>5</sup> The reanalysis is reflected in the morphological marking of the demonstrative: when it is already part of the relative clause, it does not bear the case assigned by the matrix predicate any more. In (10a) the matrix verb ‘take’ assigns accusative case to its object. Similarly, in (10b) the verb ‘burn’ takes an accusative object. In neither case does the demonstrative bear accusative, showing that it does not function as the matrix object (and so the head of the relative clause) any more.

- (10) a. *veged* [az mi thyed]  
 take.SBJV.2SG.DEF.OBJ DEM what yours  
 ‘take what is yours’

placeholder or as the element receiving theta-roles (see Axel 2009: 29).

<sup>5</sup>Axel (2009) argues that the element *das/dass* was initially a demonstrative element in the matrix clause, which came to be reanalyzed as a relative pronoun introducing a correlative clause. Subsequently, such adjunct clauses were reanalyzed as complement clauses, making the subclause the sister of the matrix lexical verb (Axel 2009: 23). The scenario presented here for Hungarian has thus parallels in Germanic, with the important difference that no complex relative elements emerged in Germanic.



(datum from 1456, published in *Régi magyar glosszárium*)

- b. es laang meg egethe [az ky-k bñnesek valanak]  
 and flame PRT burned.3SG.DEF.OBJ DEM who-PL guilty.PL were.3PL  
 ‘and (a/the) flame burned those who were guilty’

(Kulcsár Codex 261; 1539)

In these cases the relative clause has no overt head (a demonstrative in the object position would have the accusative form *az-t* ‘that-ACC’, which does not appear in (10a) and (10b)). Such sentences are formally ambiguous between headless (free) relatives (which are introduced by the same set of relative pronouns as relatives headed by a lexical noun or a pronoun<sup>6</sup>) and relatives whose pronominal head has undergone *pro*-drop. (Subject and object *pro*-drop are both in place at the time dem-wh-REL arises). This is shown for (10a) in (11), where  $\emptyset$  stands for the lack of any external head.

- (11) a. vegeđ *pro* [az mi thyed]  
 take-SBJV.2SG.DEF.OBJ DEM what yours  
 ‘take what is yours’ dropped pronominal head
- b. vegeđ  $\emptyset$  [az mi thyed]  
 take-SBJV.2SG.DEF.OBJ DEM what yours  
 ‘take what is yours’ free relative

Another indicator that the demonstrative has been analyzed into the relative clause is that the demonstrative can be renewed in the main clause. In other words, object *pro* (in the structure in (11a)) can alternate with an overt object demonstrative pronoun. In these cases we have two string-adjacent demonstratives. The first is part of the main

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<sup>6</sup>Cf. the following minimal quartet from modern Hungarian:

- (i) a. a fiú, aki szeret futni  
 the boy DEM.who like.3SG run.INF  
 ‘the boy who likes running’ lexically headed relative
- b. az, aki szeret futni  
 that DEM.who like.3SG run.INF  
 ‘that [person] who likes running’ pronominally headed relative
- c. Aki szeret futni, (az) egészséges.  
 DEM.who like.3SG run.INF that healthy  
 ‘[He] who likes running is healthy.’ headless relative in a correlative
- d. Meghívtam, aki-t javasoltál.  
 invite.PST.1SG.DEF.OBJ DEM.who-ACC suggest.PST.2SG  
 ‘I invited whom you suggested.’ free relative

clause: it serves as the head of the relative clause and gets case from the main clause. The second demonstrative is part of the embedded clause. Schematically: dem [<sub>CP</sub> dem wh-REL ... ]. As a result, the case of the matrix demonstrative and the case of the relative operator are independent of each other. In (12a), for instance, the matrix demonstrative bears nominative case and the embedded relative operator has accusative case. In (12b) we have the opposite situation: the renewed matrix demonstrative shows accusative, while the relative operator is assigned the morphologically zero nominative case.

- (12) a. kellemetes nekem Ferencz **az** [**a-mi-t** mondaz]  
 pleasant for.me Francis DEM DEM-what-ACC say.2SG  
 ‘it is pleasant for me, Francis, what you are saying’  
 (Virginia Codex 84; 1515)
- b. myre zereffem en **az-t** [**az-ky** keferew  
 what.SUB love.SBJV.1SG.DEF.OBJ I DEM-ACC DEM-who bitter  
 vegezetewt yger]  
 end.ACC promise.3SG  
 ‘why should I love that who promises a bitter end?’  
 (Book of Proverbs 74; 1510)

Let us now turn to the question of where the reanalyzed demonstrative pronoun is within the relative clause. In nominal positions, Old Hungarian demonstratives bear the appropriate number and case marking. In (13), for instance, the demonstrative serves as the object of the clause, and it is inflected for plural marking and bears the accusative case assigned by the verb ‘give’.

- (13) **az-ok-ot** agyad zegeneknek  
 DEM-PL-ACC give.SBJV.2SG.DEF.OBJ poor.PL.DAT  
 ‘give those to the poor’  
 (Jókai Codex 98; ca. 1440)

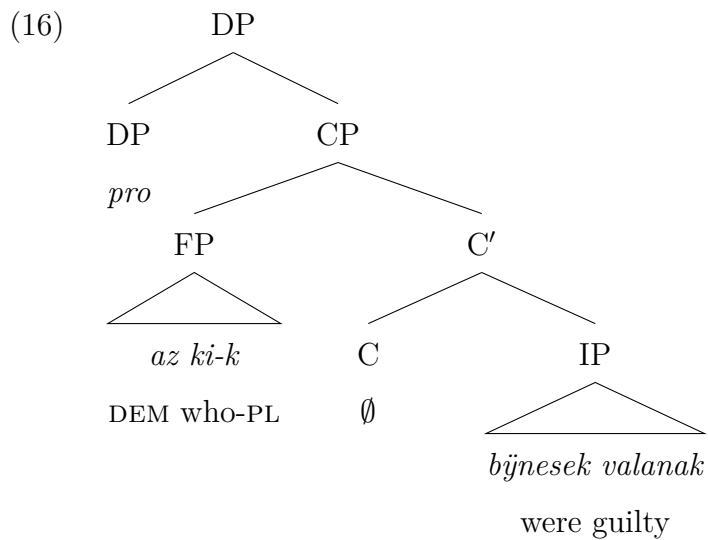
In adnominal position, however, demonstratives are bare, i.e they do not show concord for the case and number features of the head noun. Observe (14), where the head noun *kener* ‘(loaf of) bread’ is inflected for plural number and superessive case, but its demonstrative modifier is not.

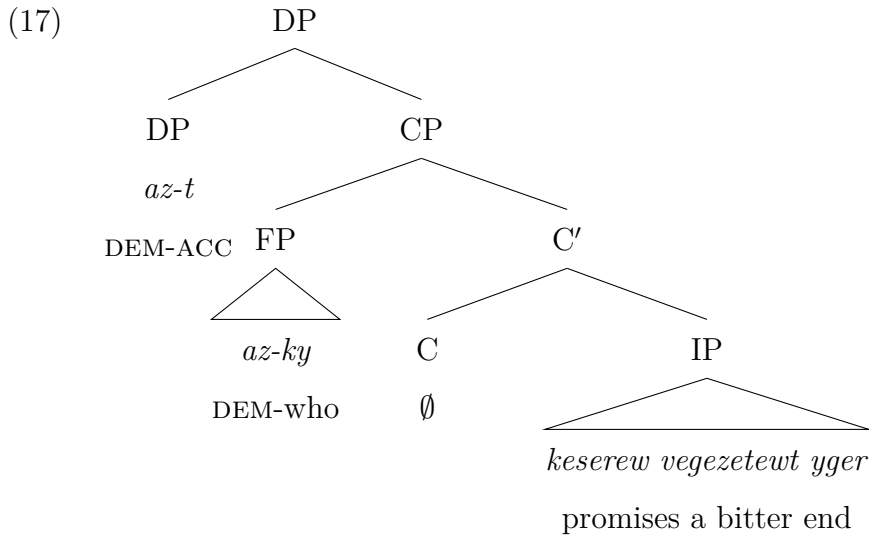
- (14) mend **az** kener-ek-en  
 all DEM bread-PL-SUP  
 ‘on all those loaves of bread’  
 (Jókai Codex 76; ca. 1440)

Demonstratives reanalyzed into the relative clause are bare. In (15), for instance, while the wh-REL operator is inflected for plural marking, the demonstrative remains morphologically singular.

- (15) es laang meg egethe [az ky-k bñnesek valanak]  
 and flame PRT burned.3SG.DEF.OBJ DEM who-PL guilty.PL were.3PL  
 ‘and those who were guilty were burned by flame’  
 (Kulcsár Codex 261; 1539)

From this, we conclude that the reanalyzed demonstrative stands in an adnominal position, specifically, it forms a constituent with the wh-REL operator. The structure of (15) is schematized in (16); the analysis of (12b) is shown in (17). In these trees we labeled [Spec, CP] containing the demonstrative and the wh-REL element as FP. We shall return to the internal structure of the FP in Section 3.





Given that demonstratives reanalyzed into the embedded clause are in an adnominal position, and adnominal demonstratives must be uninflected, a demonstrative that appeared at the end of the main clause but had overt morphological marking (e.g. a possessive suffix, a plural suffix, accusative or oblique case marking or was embedded in a PP) was not a possible input to the reanalysis rule. (18) provides some examples in which the re-bracketing of the clausal boundary was prevented by overt suffixation of the demonstrative.

- (18) a. Es yme egy az-**ok** **kezel** [ky-k Jefuffal valanak]  
and behold one DEM-PL among who-PL Jesus.INSTR were.3PL  
'and one of those who were with Jesus'  
(Jordánszky Codex 442; 1516–1591)
- b. ada [...] az-**ok-nak** [ky-k hyznek hw' neweeben]  
give.PST.3SG DEM-PL-DAT who-PL believe.3PL he name.POSS.3SG.INE  
'[the Lord] gave ... to those who believe in his name'  
(Jordánszky Codex 623; 1516–1591)

The question arises why the demonstrative was reanalyzed into the subordinate clause and how this change can be modelled. This will be discussed in detail in section 3.2; before turning to the analysis, let us discuss further changes affecting the left periphery of relative clauses.

### 2.3 Stage 3: morpho-phonological change

Once part of the [Spec, CP] of the relative clause, the demonstrative *az* ‘that’ was affected by further changes: it underwent morphological cliticization onto the wh-REL operator. In the first step, the *z* of the demonstrative could undergo assimilation to the consonant of the wh-REL operator (these start in a CV sequence, thus we can also describe this process as intervocalic gemination), as in (19).

- (19) [ah hol en vagyok], ty oda nē yehetek  
 DEM where I am you there not come.POSSIB.2PL  
 ‘you cannot come to where I am’  
 (Jordánszky Codex 650; 1516–1519)

The assimilation could be complemented by the loss of the space between the demonstrative and the wh-REL in orthography (20), showing an even greater degree of integration of the demonstrative into the wh-REL (though orthography is not standardized in this period, and it shows a great degree of diversity).

- (20) am-menere az zeretetekbe az zerelnec volta vaón  
 DEM-much the love.3PL.INE the love.DAT being is  
 ‘as much as love is in their liking’  
 (Nagyszombat Codex 5; 1512–1513)

In the final step the intervocalic consonant underwent degemination, leading to the present-day Hungarian pattern with relative pronouns having the *a-* prefix on the wh-REL element.

- (21) a. ahol én vagyok  
 DEM.where I am  
 ‘where I am’ (Modern Hungarian)  
 b. amennyire lehetséges  
 DEM.much possible  
 ‘as far as it is possible’ (Modern Hungarian)

The pattern in (21) could also arise in a different way. Some data show loss of the consonant from the demonstrative with the orthographic space between the demonstrative and the wh-REL retained.

- (22) a $\check{z}$ -t [a mel' alab valo]  
 DEM-ACC DEM which lower being  
 'that which is more pityful'  
 (Munich Codex 86rb; 1466)

The loss of *z* from *az* then could also be combined with the loss of space in orthography, again leading to the present-day Hungarian pattern, with the paradigm of relative pronouns marked by the *a-* prefix.

- (23) Mert [aki ezic], vrnac ezic, Es [aki nem ezic],  
 because DEM.who eat.3SG Lord.DAT eat.3SG and DEM.who not eat.3SG  
 vrnac nem ezic  
 Lord.DAT not eat.3SG  
 'because those who eat eat for the Lord, and those who do not eat do not eat for the Lord'  
 (Vitkovics Codex 54; 1525)

The strategies shown in (19) through (23) co-existed for a long time.<sup>7</sup> In Modern Hungarian only the pattern in (21) and (23) survives, however.

The assimilation of *z* in (19) and its loss in (22), we suggest, are different morpho-phonological manifestations of the same phenomenon: the syntactic reanalysis of the phrasal demonstrative into a functional head within the functional hierarchy projected by the wh-REL pronoun. We turn to the details of this analysis in the next section.

### 3 Feature changes on wh-REL and the demonstrative

#### 3.1 No loss of lexical features on wh-REL

As described in section 1, an important change potentially affecting the left periphery of relative clauses is the reanalysis of the relative operator into a complementizer. In order for this to happen, the relative pronoun has to lose any lexical feature that is not

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<sup>7</sup>The fact that such a phonological alternation arises indicates that these elements no longer count as demonstratives. Note that Hungarian also has demonstrative-based definite articles (showing a typologically very common pattern): these definite articles are subject to phonologically conditioned allomorphy and, unlike demonstratives, they are always unstressed.

compatible with the status of a complementizer in the given language. The reanalysis of English *that* involved the loss of person and number features; consequently, *that* as a relative complementizer does not show number agreement, as opposed to the demonstrative pronoun *that*:

- (24) a. Mary picked all of the flowers **that**/**\*those** were growing in the garden.  
 b. **Those**/**\*that** are nice.

Similarly, reanalysis is attested with original pronouns that do not show agreement, including English dialectal *where* (see Comrie 1999: 88) and German *wo* ‘where’ in various southern dialects (Bayer & Brandner 2008).

However, as pointed out in section 2, *wh*-based relative pronouns in Old Hungarian show number marking, in addition to being inflected for case, as shown by (6b), repeated here as (25a). The same is true throughout the history of Hungarian, as illustrated by the Modern Hungarian example in (25b).

- (25) a. egýebeknek zerzamaual [ky-k-nek myatt-a ysten mýuelkedyk  
 others.DAT tool.POSS.INSTR who-PL-DAT because.of-3SG God cultivates  
 eznek byzon gyewmelczet]  
 this.DAT sure fruit.POSS.ACC  
 ‘with other tools, with which God cultivates its assured fruit’  
 (Jókai Codex 113; ca. 1440)
- b. a szomszédok, **aki-k** miatt nem tudsz aludni  
 the neighbours DEM.who-PL because.of not can.2SG sleep.INF  
 ‘the neighbours because of which you cannot sleep’ (Modern Hungarian)

Since the relevant lexical features were not lost, Hungarian relative pronouns were not reanalyzed as complementizers and hence they continued to occupy the [Spec, CP] position instead of C (see also Bacskai-Atkari 2014).<sup>8</sup>

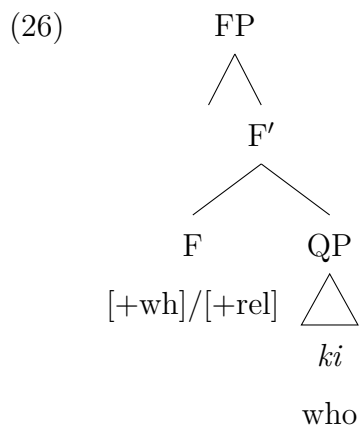
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<sup>8</sup>Consequently, while Germanic languages often demonstrate relative complementizers synchronically and/or historically, Hungarian has no relative complementizers throughout its history. Note that this does not exclude the availability of subordinating complementizers in relative clauses (see Bacskai-Atkari 2014 and Bacskai-Atkari & Dékány 2015), yet in these cases the complementizer merely marks finite subordination and does not check off the [rel] feature of the C head.

### 3.2 The loss of the [+def] feature on the demonstrative

Having established that there was no lexical feature loss in the case of ordinary relative operators in Hungarian, let us now turn to feature changes that can be held responsible for the changes outlined in section 2. We will argue that the changes in the syntactic positions were accompanied by changes in functional features, specifically by the loss of the [+dem] feature on the demonstrative element. This feature change was ultimately responsible for bringing about a new morphosyntactic paradigm. The analysis conforms to the Borer–Chomsky Conjecture as syntactic change is the result of feature changes on functional heads.

As described in sections 1 and 2, Hungarian relative pronouns at the initial stage do not differ from interrogative pronouns in their morphological shape: hence, a form such as *ki*, similarly to English *who*, corresponds both to an interrogative and a relative pronoun. However, this does not mean that they are one and the same element: they importantly differ in terms of their functional features – [+wh] versus [+rel] –, which match the relevant clause type. Building on Den Dikken & Dékány (2018), we propose that Old Hungarian interrogative and relative operators have two distinct layers. *Ki* ‘who’, *mi* ‘what’, etc. are operators which directly correspond to the lower layer, QP. This QP is embedded under a functional layer, FP, which specifies the [+wh] or [+rel] feature. That is, clause-typing features are encoded in the extended projection of the operator.

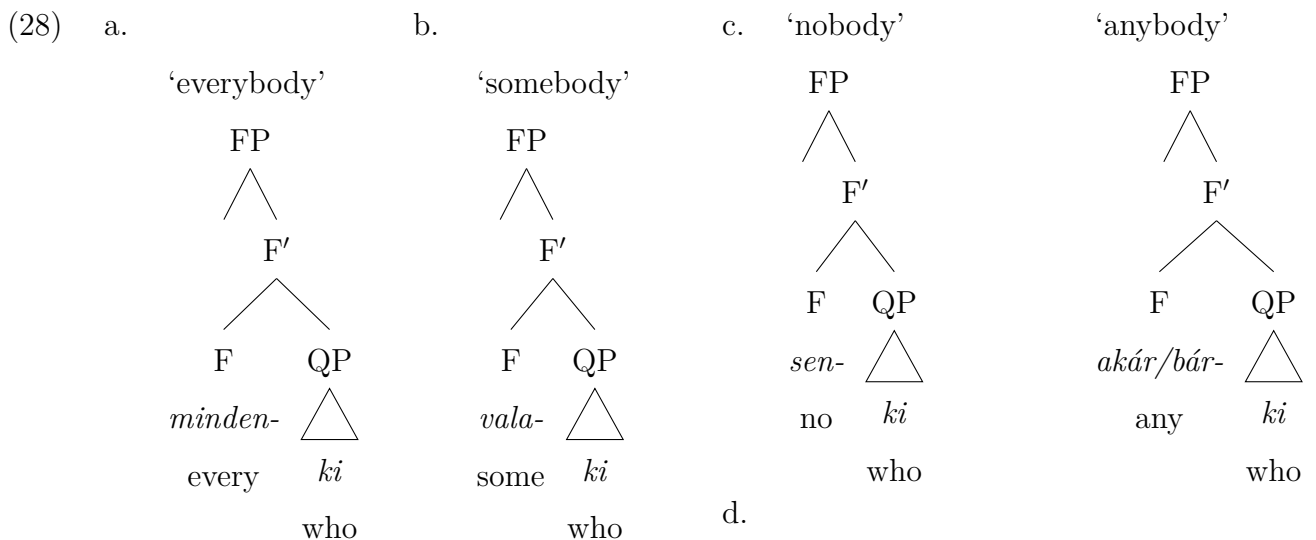


That *ki* ‘who’ (along with *mi* ‘what’, *mely* ‘which’, *hol* ‘here’ etc.) are general operators not inherently associated with the [+wh] or [+rel] feature is also shown by the fact that they appear in several different types of quantifiers.



- (27) a. universal quantifier  
*minden-ki* (lit. every-who) ‘everybody’, *minden-hol* ‘every-where’
- b. existential quantifier  
*vala-ki* (lit. some-who) ‘somebody’, *vala-hol* ‘some-where’
- c. negative existential quantifier  
*sen-ki* (lit. no-who) ‘nobody’, *se-hol* ‘no-where’
- d. free choice item  
*akár-ki/bár-ki* (both: lit. any-who) ‘anybody’, *akár-hol/bár-hol* both: ‘any-where’

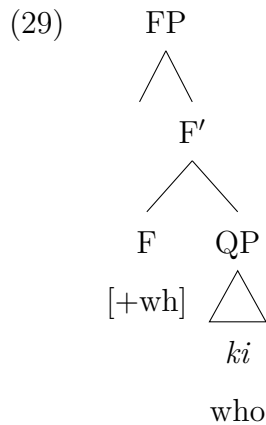
In these morphologically complex quantifiers the operator *ki* ‘who’, *mi* ‘what’, *mely* ‘which’, *hol* ‘here’ etc. is in QP (exactly as in (26)), while the universal, existential or free choice morpheme is in a functional projection above QP. For expository purposes, we represent them in the F head, leaving open the possibility that some (or all) of these morphemes may be in [Spec, FP] instead.



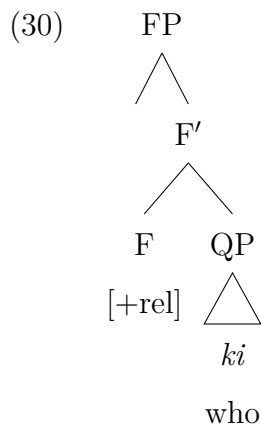
These morphologically complex units provide additional motivation for the FP layer, as the FP projection can be filled overtly, not only covertly. Similar bi-partite structures have been proposed for Japanese and Old English *wh*-based quantifiers and relative pronouns in Watanabe (1992; 2004) and Watanabe (2009), respectively.<sup>9</sup>

<sup>9</sup>Note that these constructions apply to *wh*-based relative pronouns. As Bacskai-Atkari (2019), examining West-Germanic relative clauses, suggests, demonstrative-based relative pronouns and *wh*-based relative pronouns differ in terms of their internal structure, resulting in differences in their behaviour. The same applies to zero relative pronouns co-occurring with complementizers. The reason why the FP

The structure of the interrogative pronoun is illustrated in (29) below:



As can be seen, the feature [+wh] is encoded in the F head, while the QP itself is underspecified. The structure given in (29) is valid for interrogative pronouns both in Old Hungarian and in subsequent periods. The structure of the initial relative operators in Old Hungarian is illustrated in (30):

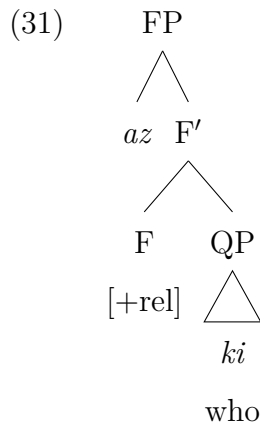


Again, the clause-typing feature, in this case [+rel], is located in the F head.<sup>10</sup> The representation projected in the *wh*-based relatives under scrutiny is that the quantifier is not specified as a relative element in itself. It follows that the proposed structure is not intended as a universal schema for all relative pronouns but rather as a configuration that is backed up by various languages on independent grounds.

<sup>10</sup>Relative and interrogative pronouns also differ in their structural position: interrogatives are in the structural focus position, while relative pronouns are higher, linearly preceding the focus (cf. Horvath 1986, Kenesei 1994, É. Kiss 2002: Chap. 10, Kántor 2008, Lipták 2015, Bacskai-Atkari 2018). As a reviewer suggests, it is possible that the general operator (*ki* ‘who’, *mi* ‘what’, etc.) is merged with a [+wh] or a [+rel] head in different positions in the clause.

resentation holds for Old Hungarian relative pronouns but obviously not for present-day Hungarian ones, which contain an *a-* prefix. Comparing (26) to (30), it should be obvious that the QP is the same in both constructions, while the clause-typing feature is carried by the F head. Naturally, this also accounts for why quantifiers can readily act both as interrogative pronouns and as relative pronouns in many languages: the same underspecified QP can be taken as a complement by both of the relevant F heads.

At the stage represented by (30), the demonstrative element is still in the matrix clause. The first step of reanalysis is when the demonstrative was reanalysed as part of the relative clause. As the demonstrative corresponds to a phrase-sized projection, its reanalysis into the relative clause targeted the [Spec, FP] position of the relative marker, which is a phrase position. Consider:

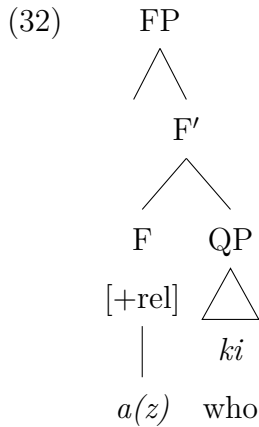


In this case, the F head is still empty but the specifier contains an overt demonstrative element. We are going to return to the question why and how the demonstrative was reanalysed into the FP; for the time being, let us concentrate on the further consequences of this reanalysis step.

The demonstrative was reanalysed from a phrase in [Spec, FP] into a functional head located in F. This change was accompanied by phonological changes, that is, the assimilation or the loss of word-final *-z*.<sup>11</sup> The representation is given below:

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<sup>11</sup>It is interesting to note here that the distal demonstrative *az* ‘that’ underwent a similar change in the DP as well. Proto-Uralic had no definite article, and many Uralic languages still do not have such an article. Early Old Hungarian already had a definite article, but it was used only in a limited range of contexts. The use of the article spread into more and more contexts throughout the Old and Middle Hungarian periods (Egedi 2014). What is important for our purposes is that the definite article, *a(z)* ‘the’, also grammaticalized from the distal demonstrative *az* ‘that’, when the demonstrative was reanalyzed from a [Spec, DP] element to a D head. For details, see Egedi (2014). Like the reanalysis from a



The change from specifier to head is a well-known syntactic change and is summarized by the Head Preference Principle of Van Gelderen (2004: 11, 17), reformulated as a principle of feature economy by Van Gelderen (2009: 157): it is preferable for an element to be a head than to be a phrase. Essentially, the change described here is guided by transparency in terms of language acquisition: given that there is only one overt element in the FP, language learners can either assume a sequence of an overt specifier and a zero abstract functional head, or they can assume that there is in fact only a functional head lexicalized by the overt element itself.

Naturally, the lack of loss in terms of lexical features on the wh-REL element (the QP), as described in section 3.1, is essential: the entire FP would have been absent from the construction if the relative operator had been reanalyzed as a C head. The FP provided not only an empty specifier position but also an empty head, as the FP layer responsible for encoding the [+rel] feature contained no phonologically visible material. With the change from (30) to (31) and ultimately to (32), the ambiguity resulting from the surface-identity of the strings produced both by (26) and (30) disappeared, rendering unambiguous syntactic paradigms. This is again in favour of transparency since a one-

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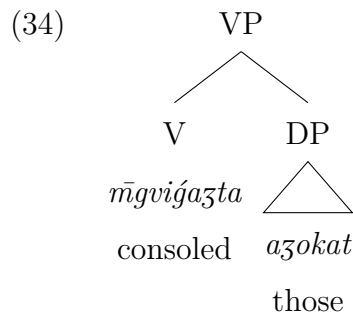
[Spec, FP] element to an F head, this syntactic change was also accompanied by a phonological change: while the distal demonstrative retained an invariable form, *az*, the definite article developed two allomorphs over time: *az* is used when the next word begins with a vowel, and *a* appears when the next word starts with a consonant. (As we have seen in section 2, the relative prefix that stems from the demonstrative started out as *az*, for a while its consonant could undergo assimilation to the word-initial consonant of the wh-Rel, and finally the *z* was completely lost, leading to an invariant *a*-relative prefix in modern Hungarian.)

The two grammaticalization processes are slightly different regarding their outcome in the sense that within the DP, *az* retained its original use as a demonstrative in addition to the newer article function, but within the FP, *az* cannot appear in [Spec, FP] any longer.

to-one relationship between surface string and underlying structure is possible.

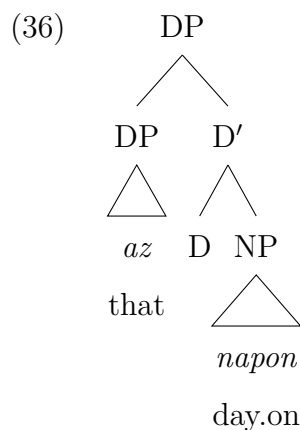
Let us now return to the question of why and how the demonstrative was reanalyzed into the relative clause. As mentioned above, the demonstrative is a phrase-sized projection: specifically, it corresponds to a DP and has the following features: [+N], [+dem], [+def]. In a nominal position, see (33), this DP occupies an argument position by itself, see the representation in (34).

- (33) *m̄gviǵaʒta*                      **aʒ-ok-at**  
 consoled.3SG.DEF.OBJ DEM-PL-ACC  
 ‘(he) consoled those’  
 (Munich Codex 26vb; ca. 1466)



By contrast, in a determiner function in adnominal position, see (35), it occupies the [Spec, DP] position of the head noun, see the representation in (36).

- (35) Es lezen **az** napon  
 and will.be DEM day.SUP  
 ‘and [the following] will happen on that day’  
 (Vienna Codex 235, the middle of the 15th century)



The change from a regular demonstrative element in the matrix clause to the F head

involved changes in the syntactic position and changes in terms of features. At the beginning, the demonstrative was equipped with both a [+dem] and a [+def] feature, in accordance with its status as an ordinary demonstrative. We can see this from the fact that as a matrix object, the demonstrative triggers definite agreement on the verb, see e.g. (33). The [+dem] feature makes the demonstrative deictic in its function. As described by Rooryck (2003) in his study on Dutch demonstratives, proximal and distal demonstratives differ in their feature specification: while proximal demonstratives are equipped with the feature [location: proximate], distal demonstratives are underspecified in having merely a feature [location: ].<sup>12</sup> He argues that the underspecified nature of distal demonstratives makes them suitable for their reanalysis of relative pronouns, too. For our purposes here, it is important to note that the matrix demonstrative in relative constructions points to the relative clause, which crucially differs from a genuine demonstrative uses where the demonstrative points to a non-linguistic antecedent, and the abstraction of the demonstrative use in this respect ultimately lead to the weakening and eventual loss of the [+dem] feature. This process was facilitated by the fact that the demonstrative appeared in an uninflected form.

With the loss of this feature, however, the demonstrative was no longer interpreted as an anaphor for the relative clause or the relative pronoun but rather part of it. Specifically, it was interpreted as a modifier of the original relative pronoun (QP), resulting in a construction structurally similar to the cases where an uninflected demonstrative served as a modifier to a lexical noun (see the relevant data in section 2). This step was probably accompanied by some phonological weakening, which continued even after the demonstrative was already in [Spec, FP], leading to the phonological reduction of the demonstrative manifested by assimilation and subsequent degemination, as well as the loss of the original *-z* ending.

A further change affects the loss of the [+def] feature. This feature is interpretable on

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<sup>12</sup>The [+dem] feature merely specifies that the element is demonstrative: it differs from the definiteness feature, as also demonstrated by the fact that a definite article is [+def] but [-dem]. In the analysis of Rooryck (2003), the location feature can be present on non-demonstrative elements as well, including interrogative elements, e.g. Dutch *wat* ‘what’, which is underspecified – [location: ] – just like the distal demonstrative *dat* ‘that’, both contrasting with the proximal demonstrative *dit* ‘this’, specified as [location: proximate]. The relation between the locative feature and the demonstrative feature is not immediately relevant to the purposes of this paper and will not be addressed further.

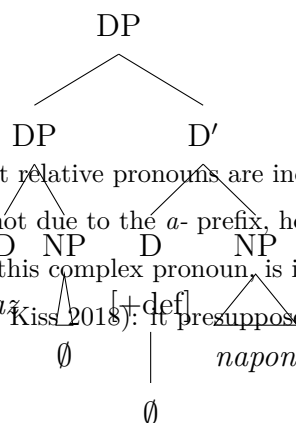
a demonstrative element and does not need to be checked off against a functional head. The F head itself was not specified for this feature (relative pronouns being indefinite) and hence the [+def] feature of the element in the specifier could easily be lost. The loss of the [+def] feature is shown by the fact that if the relative pronoun is the object of the relative clause, it does not trigger definite agreement on the verb. Cf. the relative pronoun object and the indefinite agreement in (37) with the genuine demonstrative object and the definite form of the same verb in (38).<sup>13</sup>

- (37) *teged a-mi-t te-het-z*  
do.SBJV.2SG DEM-what-ACC do-POSSIB-2SG  
‘do what you can do’  
(Bod Codex 8r, the first half of the 16th century)

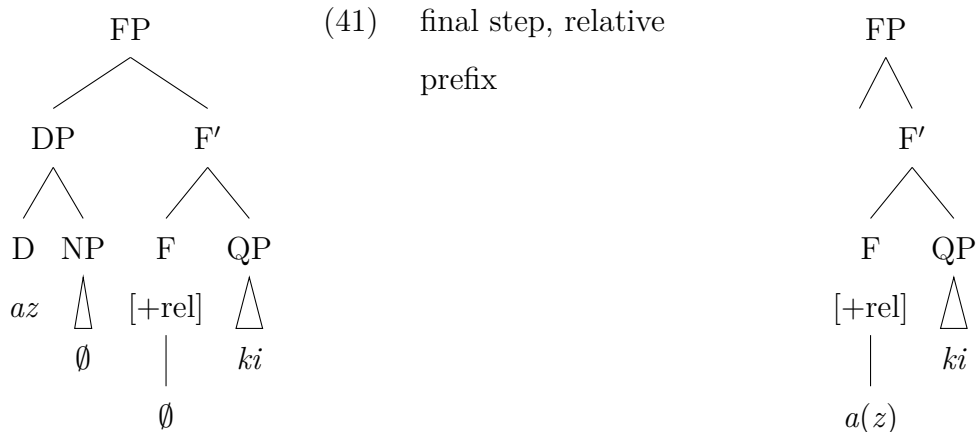
- (38) *De ha az-t tez-ed*  
but if DEM-ACC do-2SG.DEF.OBJ  
‘but if you do that’  
(Jordánszky Codex XIII/b, 1516–1519)

Once this feature loss happened, the original demonstrative could be reanalyzed as the F head itself, in line with the Head Preference Principle outlined above. At this stage, speakers reinterpreted the original demonstrative as the marker of [+rel]. The change from D to F is clearly an instance of grammaticalization as it was triggered by feature loss and involved a change into a more functional category. Note that the reanalysis from a D head to an F head was fostered by the fact that the D head appeared without an overt NP complement. That is, while a string such as *a-ki* ‘DEM-who’ corresponded to an underlying sequence of a D head (*a(z)*) + a null NP + a null F head + a QP (*ki*), as in (40), language learners ultimately reinterpreted this sequence as that of an overt F head (*a-*) + a QP (*ki*), as in (41).

- (39) adnominal DEM (40) first step of reanalysis



<sup>13</sup>One exception to the generalization that relative pronouns are indefinite is *amelyik* ‘which’. The definite interpretation of *amelyik* ‘which’ is not due to the *a-* prefix, however: the interrogative *melyik* ‘which’, which ultimately forms the basis of this complex pronoun, is itself exceptionally definite. This is because it bears the *-ik* partitive suffix (É. Kiss 2018): it presupposes the existence of a set and picks a subset of this set.



Hence, the change in the category of the demonstrative element (from D to F) was accompanied by a matching change regarding its complement (from NP to QP), which was possible because the NP was not phonologically visible.

Naturally, the changes described here ultimately led to the emergence of a new morphosyntactic paradigm: relative operators regularly differ from their interrogative counterparts in that the former but not the latter contain the *a-* prefix, which historically derives from the original matrix demonstrative element. As mentioned before, this resulted in a more transparent paradigm regarding the QPs in question since the distinction between interrogative and relative pronouns is morpho-phonologically marked and neither of the surface strings is surface-ambiguous.

## 4 Conclusion

This paper examined the historical development of Hungarian relative operators, showing how the loss of certain features resulted in a distinctive morphosyntactic paradigm of relative operators, in line with the Borer–Chomsky Conjecture. Hungarian is particularly interesting in this respect because it has morphologically complex relative pronouns consisting of an original demonstrative element and an operator phonologically identical to its interrogative operator counterpart. The Hungarian pattern is thus crucially different from e.g. Germanic languages, where the relative pronoun or complementizer derives either from a demonstrative or from an interrogative pronoun but not from both at the same time. We argued that the emergence of this pattern was possible in the first place because in Hungarian, contrary to English, the reanalysis of *wh*-operators into relative operators preceded the reanalysis of the matrix demonstrative



pronoun, and since *wh*-based relative operators did not grammaticalize into complementizers, the only way for the demonstrative to be reanalyzed into the [Spec,CP] position was via cliticization onto the *wh*-based relative pronoun. Apart from the fact that the original *wh*-based relative operator did not lose its lexical features and was not grammaticalised into a functional head, an important prerequisite concerned feature loss regarding the original matrix demonstrative pronoun. We proposed that the demonstrative lost its original demonstrative and definiteness features, [+dem] and [+def], and became unspecified for this feature. The relevant changes took place during the Old Hungarian period (ca. 9–16th centuries) and the various stages of feature loss are reflected by morphophonological changes, too, providing ample empirical evidence for the syntactic changes proposed in this paper. Hence, our proposal provides an analysis of a typologically peculiar pattern based on generally established principles of syntactic changes, particularly regarding the role of feature changes in grammaticalization.

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