

Focus-feature and *wh*-feature in the light of pied-piping behavior in Hungarian

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Abstract

This paper presents the findings of two experiments on pied-piping by a prenominal adjunct in Hungarian focus- and *wh*-constructions. According to Webelhuth (1992) and Cable (2010), pied-piping from adjunct islands is prohibited. The results of the experiments, however, suggest that not only is it possible in Hungarian for the pied-piper to be embedded inside an adjunct island but the embedding of the pied-piper and the movement itself are unrestricted in focus-construction. Pied-piping shows a similar picture in *wh*-constructions with the restriction that the *wh*-element has to be discourse-linked for pied-piping to be allowed.

Keywords: pied-piping, adjunct-islands, focus-feature, *wh*-feature, Hungarian

1. Introduction

This paper presents the findings of two experiments on pied-piping by a prenominal adjunct in Hungarian focus- and *wh*-constructions. Pied-piping is a syntactic operation in which a phrase triggers movement of a larger phrase containing it. This movement is considered to be a rescue strategy in most languages, when movement of the word/phrase is not allowed for an independent grammatical reason, dragging along the phrase containing it can rescue the structure from being ungrammatical. Pied-piping is generally considered acceptable in Hungarian as in (1) and in English as well (2).

- (1) [Milyen színű szoknyát] vettél az ünnepségre?
Which color skirt-ACC bought the celebration.for
'What color skirt did you buy for the celebration?'
- (2) a. [Which book] did you buy in the store?
b. [Whose brother's book] did you take by mistake?

The motivation for the experiments was provided by data in previous literature that presented pied-piping and the lack thereof as an empirical argument against the existence of a syntactic focus-feature (Horváth 1997, 2010).

- (3) a. * *az ital, amit követelő vendégektől fél a pincer t*
 the drink which-ACC demanding guests fear-3SG the waiter
 ‘the drink customers demanding which the waiter is afraid of...’
- b. * *Mit követelő vendégektől fél a pincer?*
 what-ACC demanding guests fear-3SG the waiter
 ‘Customers demanding what is the waiter afraid of?’
- c. *BARACKPÁLINKÁT követelő vendégektől fél a pincer.*
 apricot-brand-ACC demanding guests fear-3SG the waiter
 ‘It is customers demanding APPRICOT BRANDY that the waiter is afraid of.’

The structural similarities between *wh*- and focus-constructions prompted the investigation of pied-piping in both constructions. The research questions of the experiments were the following:

Q1: Is pied-piping permissible in *wh*-constructions and focus-constructions?

Q2: Is discourse-linking a factor in the availability of pied-piping?

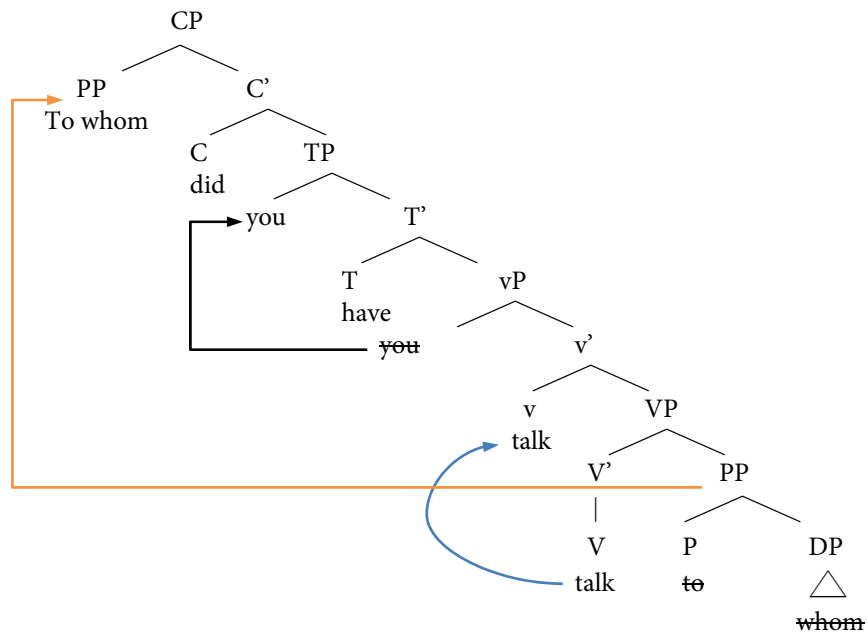
In this paper I present two experiments on pied-piping in Hungarian. First, I will introduce two important accounts of pied-piping; Weibelhuth (1992) attributing the availability of pied-piping to a structural position, and Cable (2010) attributing the availability of pied-piping to the existence of Agree between a Q-operator and a Q-feature on the *wh*-phrase. Then I will turn to the theoretical background of Hungarian focus and *wh*-constructions (section 3). Then I will briefly introduce discourse-linking and the motivation for including discourse-linking as a factor in the experiments (section 4). After that, I will present the experiments and their results (section 5), and give a tentative proposal based on the results of experiments (section 6). Finally, I will conclude (section 7).

2. Two accounts of pied-piping

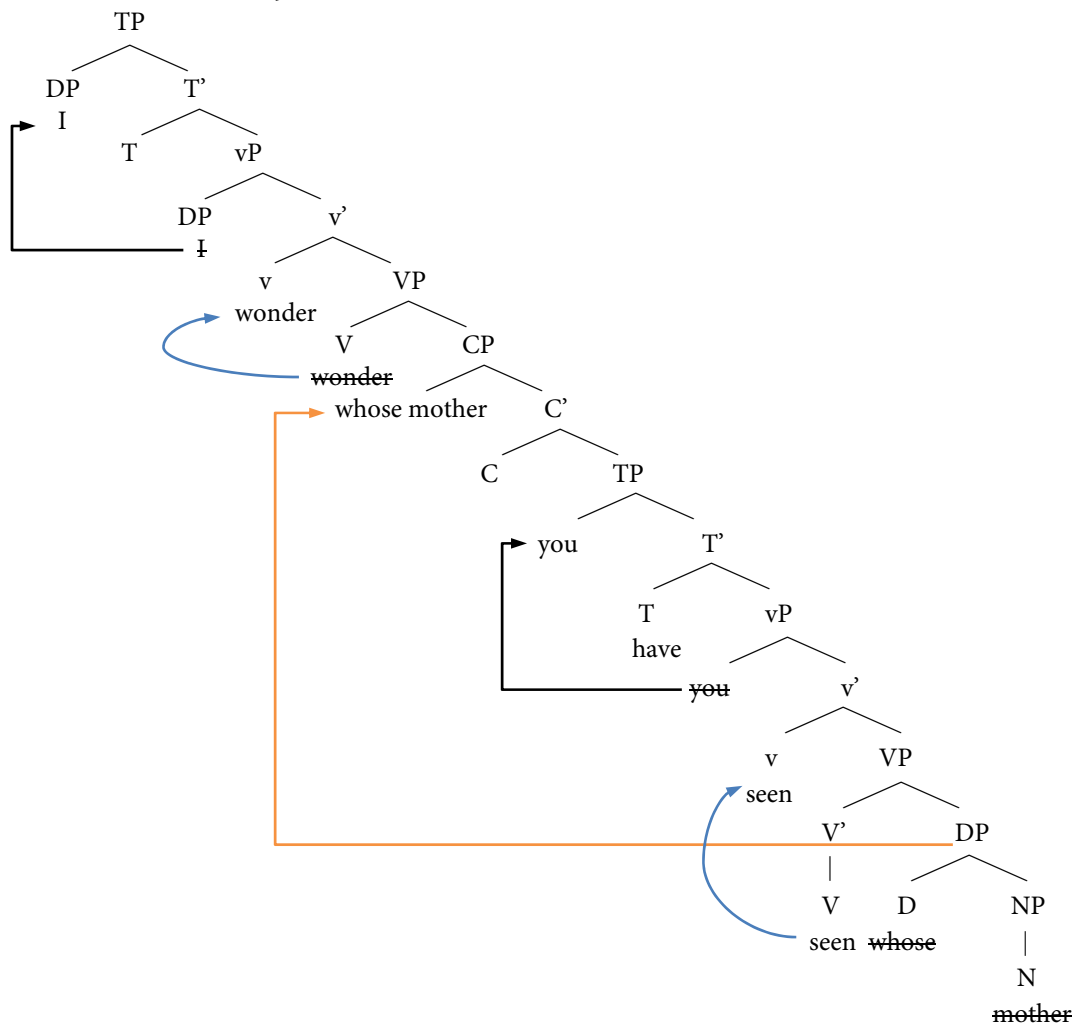
Weibelhuth (1992) discusses pied-piping in Germanic languages. His theory of pied-piping involves feature percolation and theta theory: features can percolate from certain positions to the maximal projection and this enables the constituent to undergo pied-piping. He distinguishes the positions in a given phrase by their ability to act as a pied-piper of the phrase: specifiers and heads are pied-pipers, while complements and adjuncts are not. Weibelhuth claims that it is not only feature percolation that counts. The theta-criterion dictates that theta marked arguments can only be in the derivation once – as the theta-criterion demands that a theta-marked position must be a part of a chain containing exactly one argument. Theta-marked positions in his theory are exactly the positions from which constituents cannot undergo pied-piping. This means that complements and modifiers/adjuncts are theta-marked and therefore cannot be pied-pipers of a given phrase. Whereas specifiers and heads of a phrase are not theta-marked, they are pied-pipers for the phrase.

- (4) a. * I wonder [give a talk where] John will t.
 b. * I wonder [the party where] John will enjoy t.

- (5) a. [To whom] did John talk?
 b.



- c. I wonder [whose mother] you have seen.
 d.



- (6) Given a phrase XP,
 a. the head X and the specifier YP are pied-pipers for XP;
 b. complements of X and modifiers (adjuncts) are not pied-pipers for XP.

Webelhuth claims that the *wh*-element has to move to the specifier position of the phrase to be able to percolate its feature to the topmost node.

Webelhuth (1992) claims that PP pied-piping is obligatory in German in questions, but it is optional in English. However, it is problematic in both languages as it does not fit the otherwise observable pattern. Compare (7) and (8).

- (7) a. *Mit wem hat Hans gesprochen?*
 With whom has Hans spoken
 'With whom has Hans spoken?'
 b. **Wem hat Hans gesprochen mit?*
 Whom has Hans spoken with
- (8) a. *To whom did John talk?*
 b. *Who(m) did John talk to?*

Webelhuth (1992) brings examples from all Germanic languages showing that it is possible for a PP to be pied-piped in all of them. He does not discuss the optionality of pied-piping in all the languages. This fact leads him to modify his generalization in a way that would yield the required result. He claims that the ability to pied-pipe a phrase is connected to the antecedent being in a theta-marked position or not.

- (9) The antecedent of a constituent in a theta marked position is not a pied-piper.

Cable (2010) challenges the existence of pied-piping as a syntactic operation. One of the most crucial distinctions is between pied-piping as a syntactic operation (10) and pied-piping structures (11).

- (10) Pied-Piping:
 Pied-piping occurs when the operation that targets the feature of a lexical item L applies to a phrase properly containing the maximal projection of L (L^{\max}).
- (11) Pied-Piping: Structure:
 A pied-piping structure is one where a phrase properly containing a maximal projection of a *wh*-word (or related operator) has undergone movement typically associated with that operator.

Cable (2010) investigates interrogative sentences and pied-piping in questions. He assumes a Q operator on the lexical items that move and a QP projection in the CP domain. The QP is projected by a phonologically zero Q particle that attracts the lexical item bearing the Q feature. Q is the same operator and feature as *wh* was earlier.

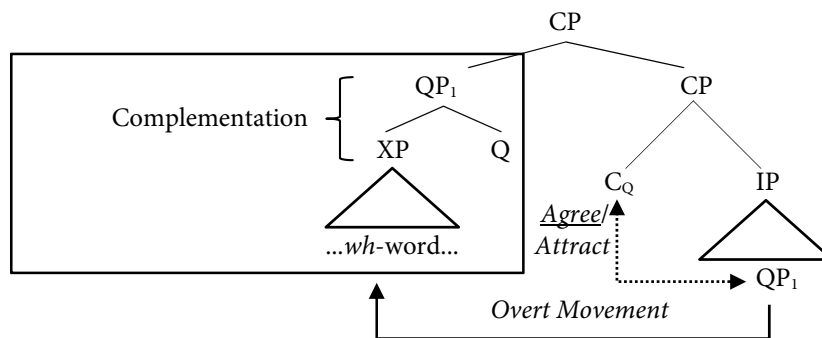


Figure 1: QP and Pied-piping (Cable 2010:567)

Cable (2010) argues that there are two types of languages depending on agreement: limited pied-piping languages (12) and non-limited pied piping languages (13).

- (12) Limited Pied-Piping Languages:
A language where a *wh*-word cannot be dominated in a phrase pied-piped by either an island or a lexical category.
- (13) Non-limited Pied-Piping Languages
A language where a *wh*-word can be dominated by an island or a lexical category.

Limited pied-piping languages are the ones where there is an Agree relationship between the Q particle and the lexical item bearing the Q-feature. Agreement must be in a sense local in Cable’s analysis as well. There cannot be anything between the Q particle and the Q-feature bearing element in the spec of QP (Figure 2).

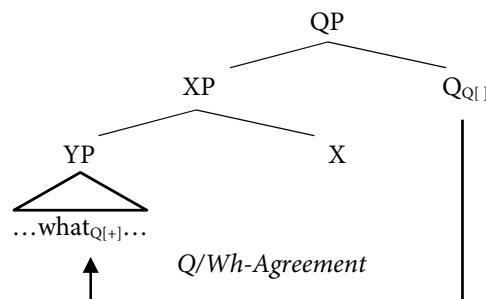


Figure 2: Q Agreement in English (Cable 2010:583)

As it can be seen in Figure 2, local agreement is established between the Q-feature and the Q-particle.

- (14) The QP Intervention Principle
A QP cannot intervene between a functional head F and a phrase selected by F.

Agreement can be blocked if the *wh*-word is embedded in a lexical category deeper in the structure. Cable (2010) assumes a Strong Phase Impenetrability Condition, which means that there can be no agreement relationship between the Q particle and heads in separate Spell-Out domains (Figure 3). Thus constructions like (15) are ill-formed.

(15) **[A fish that is how big] did you buy?*

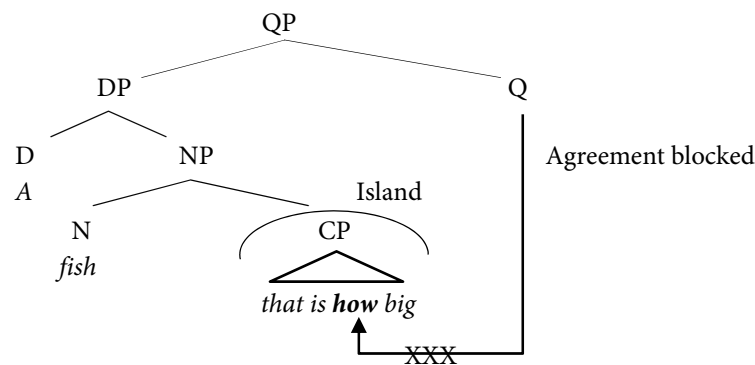


Figure 3: Strong Phase Impenetrability Condition (Cable 2010:585)

3. Focus-movement in Hungarian

As we already saw above, there are languages that have a designated position in a sentence for given information structural functions. Focus is connected to an operator that takes scope over some constituents – it can be narrow, one XP in its domain; or it can be wide, taking a whole predicate in its domain (see in (16)).

- (16) a. [_{TopP} Pétert [_{Predicate} [_{Focus} JÁNOS] mutatta be Marinak]].
 Peter-ACC John introduced VM Mary-to
 ‘As for Peter, it was John who introduced him to Mary.’
- b. [_{TopP} János [_{Predicate} [_{Focus} PÉTERT] mutatta be Marinak]].
 John Peter-ACC introduced VM Mary-to
 ‘As for John, it was Peter that he introduced to Mary.’
- c. [_{TopP} Pétert [_{Predicate} [_{Focus} MARINAK] mutatta be János]].
 Peter-ACC Mary-to introduced VM John
 ‘As for Peter, it was to Mary that John introduced him.’

The focus is a prepositional operator that can be preceded by Topic Phrase(s). The focus position in Hungarian was first defined as identificational (Kenesei, 1986). The phrase that is moved to this position picks out one referent from a set and identifies it. Horváth (1981) observes the difference between focused and topicalized phrases and formulates a FOCUS-Parameter for every language giving two options for [+focus]-feature (as in (17)).

- (17) FOCUS-Parameter:
- a. [+FOCUS]: a feature associated freely with any category – deriving the English type languages, that is, Focus in-situ
 - b. the grammaticalized version of the [+FOCUS] feature: an intrinsic part of the feature-matrix of a category, namely V – meant to derive the Hungarian-type, structurally limited, instantiations of focus

This FOCUS-Parameter combines with a Locality Condition on Feature-Assignment – stating that any feature-assigning category must be adjacent to the phrase receiving the feature – can account for the two surface realizations of Focus described in (17). The focus of a sentence is a semantic function identifying a set of items that are exhaustively identified (as in (18)).

(18) The function of focus

The focus represents a proper subset of the set of contextually or situationally given referents for which the predicate phrase can potentially hold; it is identified as the exhaustive subset of this set for which the predicate phrase holds.

This exhaustive identification holds only for structural focus, that is, the immediately pre-verbal position in the structure. Szabolcsi (1981) proposes a test for exhaustivity: whatever one moves to the structural focus position is not exhaustively identified if the subset of the predicate phrase is a logical consequence.

- (19) a. *János PÉTERT ÉS ZOLTÁNT mutatta be Marinak.*
 John Peter-ACC and Zoltan-ACC introduced VM Mary-to
 ‘As for John, it was Peter and Zoltan that he introduced to Mary.’
 b. *János PÉTERT mutatta be Marinak.*
 John Peter-ACC introduced VM Mary-to
 ‘As for John, it was Peter that he introduced to Mary.’

As it can be seen in (19), (19b) is a logical consequence of (19a), thus (19b) is not an exhaustive identified set, it cannot be exhaustive focus. If we want to interpret the focus exhaustively, then we cannot follow (19a) with a statement of (b), because (19b) does not state exhaustively, who John introduced to Mary. However, if the follow-up sentence (20b) contradicts the predicate in the previous statement (20a), then the focus was exhaustive in it.

- (20) a. *János PÉTERT mutatta be Marinak.*
 John Peter-ACC introduced VM Mary-to
 ‘As for John, it was Peter that he introduced to Mary.’
 b. *Nem, Zoltánt is bemutatta neki.*
 no Zoltan-ACC also introduced to.her
 ‘No, he also introduced Zoltan to her.’

(É. Kiss 2002:79)

Exhaustive identification, however, does not always contrast with a closed set of alternatives. There are examples where the focus alternates with an open set of items, and hence contrast is not there (as in (21)).

- (21) a. *A magyar rapszódákat LISZT FERENC írta.*
 the Hungarian rhapsodies-ACC Liszt Ferenc wrote
 ‘As for the Hungarian rhapsodies, Ferenc Liszt wrote them.’
 b. *Liszt Ferenc 1886-BAN halt meg.*
 Liszt Ferenc 1886-in died VM
 ‘As for Ferenc Liszt, it was in 1886 that he died.’

(É. Kiss 2002:80)

The Hungarian pre-verbal focus exclusively exhaustively identifies the set of items it refers to. Szabolcsi (1981, 1983) argues that non-individual-denoting predicates can move to the structural focus position (as in (22)).

- (22) a. *János OROSZ LÁNYT vett feleségül.*
 John Russian girl-ACC took as.wife
 ‘As for John, it was a Russian girl that he married.’

- b. Péter OKOS LÁNYT akart feleségül venni, nem SZÉPET.
Peter smart girl-ACC wanted as.wife to.take not beautiful-ACC
'As for Peter, it was a smart girl that he wanted to marry, not a beautiful one.'
- c. János FOKOZATOSAN értette meg a problémát.
John gradually understood VM the problem-ACC
'As for John, it was gradually that he understood the problem.'

(É. Kiss 2002:80)

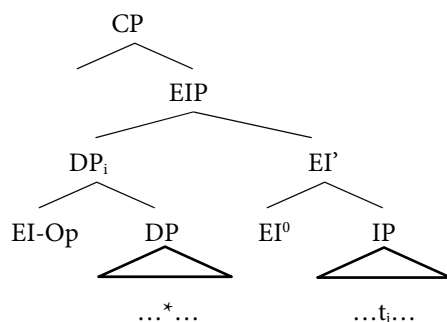
To sum up, there are reasons to believe that there is a syntactic focus feature in Hungarian that correlates to an exhaustive reading in semantics, and there is a designated, unique syntactic projection corresponding to this discourse function. In what follows, I will present an alternative theory of focus-movement that claims that exhaustive identification is in fact done by an operator in Hungarian (Horváth 1997, 2000, 2005, 2007, 2010).

3.1. Focus-movement is operator movement

Another theory of focus-movement that does not involve a syntactic focus-feature is Horváth (1997 et seq). Horváth (1997) claims that focus-movement is not triggered by a syntactic feature on the focused element, rather there is an operator responsible for the semantics related to focus, that is, responsible for the exhaustive identification reading attached to structural focus in Hungarian. She assumes that there is an operator which she calls EI-Op (Exhaustive Identification Operator) that is attached to a phrase that is associated with the focus interpretation and moves to the CP domain by operator movement. There might be a focus feature on the lexical word that bears main stress – as it is possible in the case of a bigger XP to stress any element inside it.

Horváth (1997 et seq) claims that the operator, EI-Op bearing a feature [EI] is attached to the focused phrase, and it moves up to the CP domain, where an Exhaustive-Identification Phrase is projected. The movement is triggered by feature-checking, but instead of the lexical element checking its focus-feature, it is the (phonetically vacuous) operator that needs to check its EI-feature (as in (23)).

(23) The structure for EI-Op movement: (the asterisk indicates the position of main stress)



(Horváth 2010:1361)

Horváth (2005) suggests that the prosodic focus can be any constituent contained in the phrase that the EI-Op attaches to (as in (24)).

- (24) a. [EI-Op [MARI Pesten lakó fiát]] hívták fel t.
 Mary-NOM Pest-on living son-hers-ACC called-3PL up
 ‘They called up [MARY’S son living in Pest].’
- b. [EI-Op [Mari PESTEN LAKÓ fiát]] hívták fel t.
 Mary-NOM Pest-on living son-hers-ACC called-3PL up
 ‘They called up [Mary’s son LIVING IN PEST].’
- c. [EI-Op [Mari Pesten lakó FIÁT]] hívták fel t.
 Mary-NOM Pest-on living son-hers-ACC called-3PL up
 ‘They called up [Mary’s SON living in Pest].’

(Horváth 2005:21)

Horváth (1997 et seq) presents a contrast with respect to the restrictions on pied-piping corresponding to movement types. She brings the examples as evidence against a syntactic focus feature. She claims that strong syntactic features cannot pied-pipe a phrase, when the feature-bearing element is embedded inside a pre-nominal adjunct while it is unrestricted with focus-movement, or rather EI-Op movement (as in (25)).

- (25) a. * *az ital, amit követelő vendégektől fél a pincer t*
 the drink which-ACC demanding guests fear-3SG the waiter
 ‘the drink customers demanding which the waiter is afraid of...’
- b. * *Mit követelő vendégektől fél a pincer?*
 what-ACC demanding guests fear-3SG the waiter
 ‘Customers demanding what is the waiter afraid of?’
- c. *BARACKPÁLINKÁT követelő vendégektől fél a pincer.*
 apricot-brandy-ACC demanding guests fear-3SG the waiter
 ‘It is customers demanding APPRICOT BRANDY that the waiter is afraid of.’

Horváth claims that the insensitivity of focus to pied-piping is due to the fact that the operator is situated outside the phrase, and thus, Agree between the [EI]-feature and the EIP in CP is not blocked by the ph(r)ase boundary.

To sum up, the structural focus position is associated with an exhaustive semantic reading that can be accounted for in various ways according to the above-mentioned theories. The existence of the syntactic focus-feature has been questioned by several authors (Horváth 1997, 2000, 2005, Zubizarreta1998 among others). Those theories suggest a discourse related feature or operator to account for the exhaustive reading of focus. One of the main goals of this paper is to experimentally test the behavior of the focus-construction in pied-piping, which can hopefully shed some light on the nature of the focus-feature and provide further evidence for one approach or the other.

3.2. *Wh-movement in Hungarian*

Hungarian is a *wh*-fronting language, which means that the interrogative pronoun or phrase must move to a position that is structurally high to check its [wh]-feature. *Wh*-phrases target a position in the CP domain, the same position of focused elements – that is, *wh*-phrases move to FP, as they bear the feature [+focus] additionally to the [wh]-feature (among others Horváth 1986, É. Kiss 2002). É. Kiss (2002) considers *wh*-phrases to be inherently focused, hence they

move to FP¹. The reason for *wh*-phrases having a [+focus]-feature as well is that they require an exhaustive answer (as in (26)). The role of exhaustive identification is associated with focus in Hungarian.

- (26) a. **János* [_{AspP} *be mutatott kit Marinak*]?
 John VM introduced whom Mary-to
 ‘Whom did John introduce to Mary?’
 b. *János* [_{FP} *KIT_i [VP *mutatott be t_i Marinak*]]?*

If there is a focus and a *wh*-phrase in the same sentence then only one of them can move to the specifier of FP, and that has to be the *wh*-phrase (see (27)).

- (27) a. **CSAK PÉTERT látta KI*?
 only Peter-ACC saw who
 ‘Who saw only Peter?’
 b. *KI látta CSAK PÉTERT*?
 who saw only Peter-ACC
 ‘Who saw only Peter?’

The *wh*-phrase has to move to spec, FP presumably for semantic reasons – the *wh*-phrase is only interpreted as a question if it combines with a [+focus]-feature and moves to the specifier of FP (to check its features). The focus in the case of (27) has been marked by the phrase *csak* ‘only’, which is a focus particle in Hungarian. It can elicit the focus reading without having to occupy the specifier of the focus projection, FP. There can even be two *csak*-phrases and a *wh*-phrase in a sentence (as in (28)).

- (28) a. *MELYIK FÉLÉVBEN [VP *kapott CSAK HÁROM LÁNY CSAK KÉT TÁRGYBÓL JELEST*]*?
 which term-in received only three girl only two subject-from A+
 Reading 1: ‘In which term was it only three girls who received an A+ only in twosubjects?’
 Reading 2: ‘In which term was it only in two subjects that only three girls received an A+?’
 b. *MELYIK FÉLÉVBEN [VP *kapott CSAK KÉT TÁRGYBÓL JELEST CSAK HÁROM LÁNY*]*?
 which term-in received only two subject-from A+ only three girl
 Reading 1: ‘In which term was it only in two subjects that only three girls received an A+?’
 Reading 2: ‘In which term was it only three girls who received an A+ only in two subjects?’

In the case of a sentence as in (28), in which there are two *only*-phrases and a *wh*-phrase, the *wh*-phrase moves to the specifier position of FP overtly, and the two *only* phrases stay inside the VP. The fact that both readings are available with both word orders proves that the *only*-phrases stayed in-situ inside the flat VP and they mutually c-command each other, hence their relative scope with respect to each other is equal. That is, the scope of the *only*-phrases can inform us about the structural positions they take inside the clause, if there was a fixed order one taking scope over the other, it would suggest that one is in a higher – maybe adjoined – position inside the clause. The inner structure of the verb phrase is flat/non-hierarchical in

¹ The Focus Phrase first was labeled FP (Brody 1990a), referring to the fact that it is a functional projection and later was more specifically labeled FocP (É. Kiss 1998).

Hungarian, and thus the constituents inside the VP mutually c-command each other. Scope taking is governed by c-command – the constituent XP that c-commands another constituent YP takes scope over it. YP can take scope over XP if it moves covertly to a higher position in LF, which is not the case in (28).

As stated above, Horváth (1986) assumes that every *wh*-word that moves up to C has to bear a [+focus] feature. She makes this claim based on the fact that the movement of the *wh*-phrase triggers the inversion of the verb modifier and the verb (as in (29))– just like in focus.

- (29) a. [_{TopP} A *huzat* [_{FP} *MELYIK SZOBA ABLAKAIT törte be*]]?
the draft which room's windows-ACC broke in
'The windows of which room did the draft break?'
- b. [_{FP} *MELYIK SZOBA ABLAKAIT torte be a huzat*]?
which room's windows-ACC broke in the draft
'The windows of which room did the draft break?'
- c. **Melyik szoba ablakait a huzat* [_{AspP} *be törte*]?
which room's windows-ACC the draft in broke

Embedded questions in Hungarian contain the same interrogative pronoun, but they are introduced with the complementizer *hogy* 'that' (30). É. Kiss (2002) argues that in embedded questions a need arises for a separate ForceP projection as the [+/- *wh*]-feature has to be encoded somewhere in the structure, and the complementizer *hogy* 'that' usually does not have a [*wh*]-feature.

- (30) *János meg kérdezte*, [_{CP} *hogy* [_{TopP} *Pétert* [_{FP} *ki mutatta be Marinak*]]].
John VM asked that Peter-ACC who introduced VM Mary-to
'John asked who introduced Peter to Mary.'

(É. Kiss 2002:99)

To sum up, *wh*-phrases in Hungarian have to be moved out of VP to a structurally higher position in the CP domain (e.g. CP, FocP, ForceP). The movement of the *wh*-phrase is either triggered by a focus-feature on the *wh*-phrase or by some other morpho-syntactic requirement. This morpho-syntactic feature can be [*wh*]-feature or as Cable (2010) suggests there is a Q-operator that attaches to the phrase that bears a [*wh*] feature. Q has its own feature that it needs to check in the CP domain, that is why it moves to CP.

4. Discourse Linking

Discourse-linking has been considered in connection with *wh*-movement since Pesetsky (1987). It has been observed that there is a difference among *wh*-phrases with respect to the availability of movement out of syntactic islands. Pesetsky (1987) claims that discourse-linked *wh*-phrases ask a question about something that is part of a set of referents, which are pre-established in the discourse or are part of shared knowledge. That is, the entity the *wh*-word poses a question about has a set referent in the discourse.

- (31) [Which boy] did you invite to the party?

Discourse-linking is important in cases when the *wh*-element should move out of a syntactic island. Syntactic islands can be grouped into different categories based on their ability to allow movement out of the island. There are weak islands and strong islands: weak islands allow *wh*-phrases to move out of their boundary, while strong islands prohibit any type of movement out of them.

As it can be seen in (32), movement out of an island is acceptable when the *wh*-word is discourse-linked, whereas the non-discourse-linked *wh*-word ‘*how*’ cannot be moved out of the embedded question.

- (32) a. Which book did John wonder [whether to read ___]?
 b. *How did John wonder [whether to read a book ___]?

Discourse-linking is an important part of the experiments presented in this paper. I take discourse-linking as a feature of phrases. A discourse-linked phrase has a referent in a set that is known or part of some common knowledge of the speakers. In this way, I take *wh*-phrases to be either discourse-linked – the ones that have set referents in the discourse, or non-discourse-linked – the ones such as ‘*how*’ and ‘*why*’, which are open as to the possible referents in discourse. It is unconventional to call phrases that are non-interrogative non-discourse-linked, however, I believe that the phrases answering a non-discourse-linked *wh*-phrase can be considered non-discourse-linked. In the experiments presented in the next section, I put focused phrases into the discourse-linked and non-discourse-linked group based on what type of *wh*-phrase they answer.

5. Experiments

The following experiments were created to answer the following research questions:

- Q1: Is pied-piping permissible in *wh*-constructions and focus-constructions?
 Q2: Is discourse-linking a factor in the availability of pied-piping?

A starting point of these experiments was a set of examples given by Horváth (1997) as a proof for the non-syntactic nature of the focus-feature by contrasting the pied-piping behavior presented in *wh*-movement triggered by a syntactic feature and focus-movement. However, a pilot study conducted earlier suggested that pied-piping might be acceptable in *wh*-constructions as well. I conducted two experiments, one that contained pied-piping by *wh*-expression embedded in a prenominal adjunct (Experiment 1) and one where pied-piping was triggered by the focused element embedded in a prenominal adjunct (Experiment 2).

5.1. Experiment 1 – WH

This experiment was based on the pilot study. Based on feedback on the experiment, I decided to change the target sentences. The number of factors was reduced to make a 2×2 design. This made for less statistical comparisons and a stronger statistical model.

5.1.1. Method

5.1.1.1. Subjects

30 adult Hungarian native speakers participated in the experiment. The majority of the participants were students of the University of Debrecen.

5.1.1.2. Procedure

The experiment was built and run in IbeX Farm (www.spelout.net). The subjects were presented with the target sentences one by one on the screen. The link to the experiment was sent out via email, and every subject did the experiment online. This experiment was an Acceptability Judgment Task, the subjects had to judge each sentence on a 7-point Likert-scale.

5.1.2. Materials

In this experiment there were only sentences containing pied-piping in *wh*-construction. We tested pied-piping by a *wh*-phrase embedded in a prenominal adjunct. We investigated pied-piping by non-discourse-linked *wh*-phrases (as in (33)), and pied-piping by discourse-linked *wh*-phrases (as in (34)). The *wh*-phrase was embedded inside a DP that had a definite determiner on the left edge of the phrase. The baseline sentences were neutral sentence containing no movement inside the embedded clause. The target sentences involved *wh*-pied-piping in the embedded questions. The questions are embedded under predicates that require an embedded interrogative clause, such as: *megkérdeztem* ‘I asked’, *nem tudom* ‘I don’t know’, *fogalmam sincs* ‘I have no clue’ and *érdeklődtem* ‘I inquired about something’. There were 32 target sentences: 8 without pied-piping with an expression that can be considered to have no specific referent/set of referents, 8 with pied-piping by a non-discourse-linked *wh*-phrase; 8 sentences without pied-piping containing an expression that can be considered to be discourse-linked in the sense that it has a specific referent associated with it, 8 corresponding sentences with pied-piping by discourse-linked *wh*-phrases. In each condition, the sentences without pied-piping served as baseline sentences to the ones with pied-piping. The 32 target sentences were divided into two lists – one list contained either the baseline or the pied-piping version of the pairs.

(33) Baseline (DP in post-verbal position):

- a. *Azt hallottam, hogy az HBO filmet forgatott a tömeggyilkosságért letartóztatott bűnözőkről tavaly.*
 that heard-1SG that the HBO film.ACC shot-3SG the mass.murder.for incarcerated criminals last.year
 ‘I heard that the HBO was shooting a movie about the criminals incarcerated for mass murder last year.’

Pied-piping: ... [DP D [NP [WH_{obl} participle] N_{acc}] V VM ADV

- b. *Nem tudom, hogy a miért letartóztatott bűnözőkről forgatott filmet az HBO tavaly.*
 not know-1SG that the why incarcerated criminals shot-3SG film.ACC the HBO last.year
 ‘I don’t know the HBO shot a movie about the why incarcerated people.’

(34) Baseline (object in post-verbal position):

- a. *Úgy tudom, hogy az építészkamara kizárta a
so know-1SG that the architect.union banned-3SG the
kartonpapírból készített modelleket a tervpályázatból.
cardboard.out.of made models.ACC the plan.tender.from*
'I believe the architects union has banned the models made of cardboard from the tender.'

Pied-piping: ... [DP D [NP [WH_{obl} participle] N_{acc}] V VM ADV

- b. *Fogalmam sincs, hogy a miből készített modelleket
my.clue not that the what.out.of made models.ACC
zárta ki az építészkamara a tervpályázatból.
banned VM the architects.union the plan.tender.from*
'I have no clue as to made out of what models the architects union has banned from the tender.'

5.1.3. Results

Preliminary statistical analysis of the data shows a tendency for degradation rather than a clear difference between the baseline and target sentences. The results were analyzed with linear mixed models – however, the model fitting needs further tests to find the best model that fits the data. Figure 4 shows the results of the experiment.

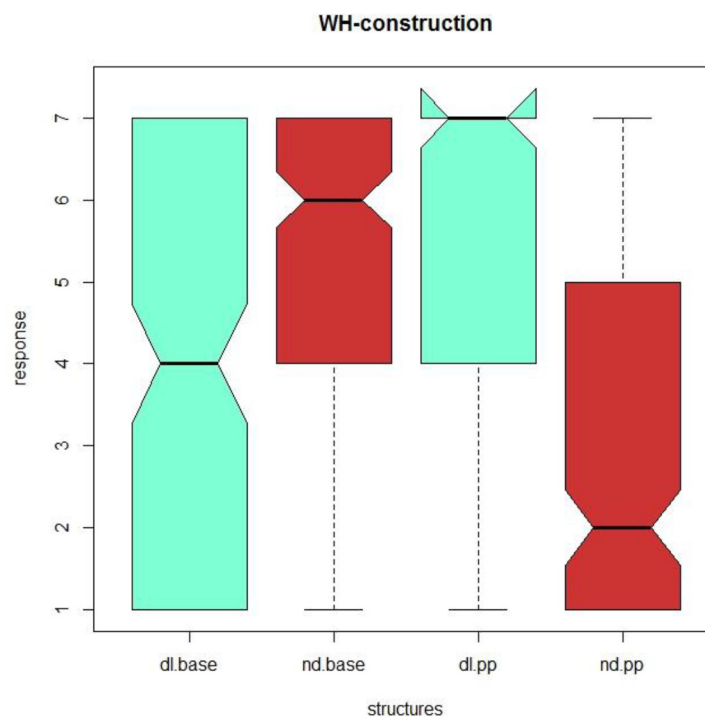


Figure 4: Pied piping in *wh*-movement

As it can be seen in Figure 4, pied-piping is acceptable when the pied-piper is a discourse-linked *wh*-phrase, whereas pied-piping is unacceptable when the pied-piper is a non-discourse-linked *wh*-phrase.

5.2. Experiment 2 – FOC

In this experiment we tested pied-piping by focus structures. This experiment, just like the one above, is a separate test to make sure that the subjects do not award low points for the structures because their working memory is full and they cannot pay attention to the task.

5.2.1. Method

5.2.1.1. Subjects

The experiment was done by 32 adult native Hungarian speakers, most of whom attend the University of Debrecen.

5.2.1.2. Procedure

The experiment was built and run in IbeX Farm (www.spellout.net). The experiment was an Acceptability Judgment Task, in which the subjects judged the sentences on a 7-point Likert-scale.

5.2.2. Materials

There were 48 test sentences altogether: 32 target sentences and 16 filler sentences. The number of filler sentences is only half of the target sentences because the target sentences were divided into two lists – hence each list contained 32 test sentences – 16 target and 16 filler sentences. The target sentences contained 16 discourse-linked expressions (as in (35)) and 16 non-discourse-linked expressions (as in (36)). It might seem unusual to classify expressions that are not *wh*-phrases into discourse-linked and non-discourse-linked groups. However, the way I understand discourse-linking it means that there is a (set of) specific referent(s) that the expression is associated with. This way, phrases that are not associated with such sets are considered non-discourse-linked. From the 32 (16/16) target sentences half of them did not contain movement, that is, the object DP stayed in-situ in its post-verbal position. In the target sentences with pied-piping, the pied-piper is embedded in a focused constituent and it undergoes movement to the pre-verbal focus-position.

(35) Baseline (DP in post-verbal position):

- a. *Azt hallotta, hogy a biztosító megvédi a téglából épített épületeket tetőbeázás esetén.*
 that heard-1SG that the insurance.company VM.protect-3SG the
 brick.from built buildings.ACC roof.leaking case.in
 ‘I heard that the insurance company protects buildings made of brick in the case of a roof leak.’

Pied-piping: ...[[FOC_{obj} participle] N_{ACC}] NP V VM ADV

- b. *Furcsálltam, hogy csak a téglából épített épületeket védi*
 weird-1SG that only the brick.from built buildings.ACC protect-3SG

meg a biztosító tetőbeázás esetén.
 VM the insurance.company roof.leaking case.in
 ‘I found it weird, that it was only the building made of brick that the insurance company protects in the case of a roof leak.’

(36) Baseline (DP in post-verbal position):

a. *Azt hallottam, hogy az ételkritikus megdicsérte a magyarosan fűszerezett ételeket a múlt heti cikkében.*
 spiced dishes.ACC the last week article.his.in
 ‘I heard that the food critic praised the dishes made with Hungarian-style spices in his article last week.’

Pied-piping: ...[[FOC_{obl} participle] N_{ACC}] NP V VM ADV

b. *Csodálkoztam, hogy csak a magyarosan fűszerezett ételeket dicsérte meg az ételkritikus a múlt heti cikkében.*
 surprised-1SG that only the Hungarian-style spiced dishes.ACC
 praised-3SG VM the food.critic the last week article.his.in
 ‘I was surprised that it was only the dishes made with Hungarian-style spices that the food critic praised in his article last week.’

5.2.3. Results

Three subjects had to be excluded from statistical analysis since they did not use the scale appropriately – they used only one value of the scale to all test items. The results show that pied-piping is acceptable in focus movement. Although there are specific items that some subjects rated lower than expected, the degradation is not refined enough to show in statistical analysis. The results were analyzed by linear mixed models, and show no significant difference between the baseline and the target condition (see Figure 5).

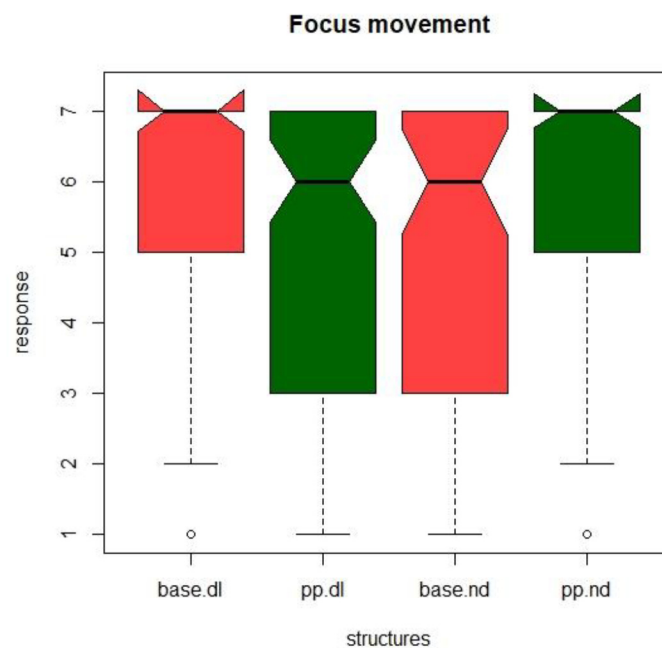


Figure 5: Pied-piping in focus-movement

The diagram shows that pied-piping is acceptable in the discourse-linked and non-discourse-linked conditions as well. As mentioned above (in section 4), discourse-linking means that the focused phrase is an answer to either a discourse-linked or a non-discourse-linked *wh*-phrase.

6. Discussion

6.1. Focus-feature

Pied-piping in Hungarian focus-structures is assumed to be unrestricted (Horváth 2000, 2005). The experiments conducted throughout this research seem to support the idea of the unrestricted nature of pied-piping in focus-constructions. The pilot study followed an experimental practice in which the baseline sentences themselves already contained focus-movement – that is, the baseline sentence already was of a type of structure that is different from a neutral sentence. This design was changed in the experiments presented here: baseline sentences were constructed which did not have any type of movement in them. The results of that did not give statistically significant degradation in the non-discourse-linked condition, however, the ratings were lower than what we found in the pilot studies. These results might suggest that the focus-feature is not encoded in syntax, only in prosody and semantics/pragmatics. As the presence of a syntactic feature makes pied-piping less acceptable, we assume that the acceptability of pied-piping in focus constructions is a result of the lack of a syntactic focus-feature.

6.2. Wh-feature

The experiments have confirmed that pied-piping by a pre-nominal adjunct in *wh*-movement is as acceptable as it is in focus-movement. (cf. Horváth 2000) These results suggest that the *wh*-feature is similar in its nature to the focus-feature: neither feature acts as a trigger for syntactic movement in Hungarian. This finding could be accounted for by theories of *wh*-movement in languages where the *wh*-elements move to a designated position in the sentence that assume that there is a separate operator (a Q operator) that is responsible for the semantics and the syntactic reordering of interrogative sentences, such as Cable (2010). The picture, however, is not that clear in Hungarian.

6.3. Proposal

The results of the experiments paint an interesting picture regarding the pied-piping behavior of Hungarian. Though pied-piping seems to be unrestricted in focus-movement, it seems to be split in two regarding *wh*-movement. Pied-piping by a discourse-linked *wh*-element is unrestricted similarly to focus- (2010) we can argue that there are two different types of *wh*-elements in Hungarian: (i) discourse-linked *wh*-phrases that do not need to Agree (Figure 6), and (ii) non-discourse-linked *wh*-phrases that do need to Agree (Figure 7).

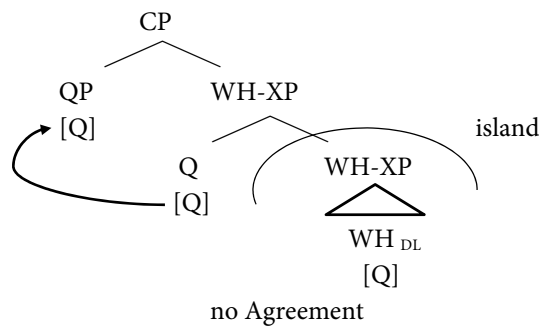


Figure 6: No Agreement between *wh*-word and Q head

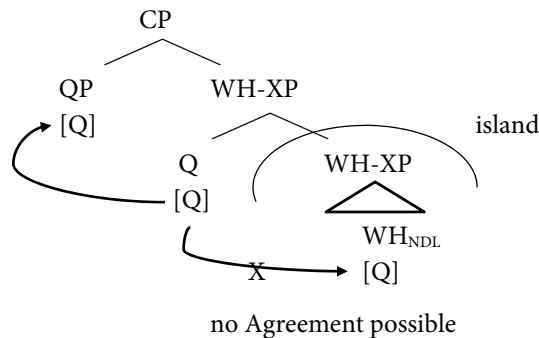


Figure 7: Agreement needed but blocked

7. Conclusion

This paper presented two experiments investigating pied-piping by prenominal adjuncts in Hungarian. Section 2 gives an overview of two relevant theories on pied-piping. Section 3 presents the literature background on Hungarian focus-movement and *wh*-movement. Section 4 introduces discourse-linking. Section 5 presents the experiments and the results of the two experiments. It also contains a tentative proposal for the pattern drawn by the results of the experiments. Based on the results we can claim that the focus-feature in Hungarian is inactive with respect to syntax. It might be active in prosody and it is active in semantics. The case of the *wh*-feature is more complicated. The nature of the *wh*-element makes a difference in its ability to allow pied-piping. Syntactic Agreement is necessary for non-discourse-linked *wh*-phrases between the Q-head and the *wh*-element, while discourse-linked elements do not need to establish an Agree relationship with the Q head.

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