Scope marking with adjunct clauses: new arguments for Dayal's approach

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1. Introduction

Since the early 1980's, scope marking (or *partial wh-movement*) is on the generative research agenda for many languages, including German (van Riemsdijk 1983), Romani (McDaniel 1989), Hindi (Mahajan 1990), Hungarian (Marácz 1990, Horvath 1995), just to mention the most well-studied ones. In this paper I present new data from the realm of scope marking constructions in a couple of languages, first of all, Hungarian.[1] The data to be presented here have high theoretical significance, as they provide primary and unambiguous evidence of Dayal's (1994, 2000) *indirect dependency* analysis for scope marking.

The empirical novelty supporting Dayal's treatment of scope marking constructions comes from constructions involving embedded adjunct clauses: relative and noun-associate clauses, which, similarly to well-studied cases of argumental embedded clauses in languages with scope marking, can license embedded *wh*-items with matrix interpretation. It will be shown that unlike argumental embedded clauses, which in principle can lend themselves to various analyses, the newly discovered adjunct scope marking can only be analysed along the lines of Dayal's proposal.

The article is structured in the following way. Section 2 introduces scope marking constructions from a bird's eye view and lists the characteristic properties of these constructions, with a section on Hungarian scope marking in particular. The novel data will be introduced on the basis of Hungarian in section 3. Section 4 provides a brief crosslinguistic overview on the availability of similar data in other languages. The theoretical impact as well as the subsequent analysis of adjunct scope marking data will be handled in section 5. It will be shown that no existing account apart from Dayal (1994, 2000) could account for these data. Section 6 summarizes the findings.

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2. Scope marking phenomena: properties and explananda

2.1. Properties of scope marking

As illustration of scope marking, consider a run-of-the-mill example for this sentence type from German together with the answer it triggers:

(1) **Was**$_1$ denkt sie [*wen*$_1$ Fritz t$_1$ eingeladen hat]?
what thinks she whom Fritz invited has
'Who does she think Fritz invited?'

(1A) Anna.
'Anna.'

As (1) illustrates, scope marking involves a bi-clausal structure, with one *wh*-item in each clause. The *wh*-item in the matrix clause is referred to as the *scope marker* (represented in bold), and the one in the embedded clause as the contentful *wh*-phrase (in italics).

A question like (1) is at first sight equivalent to a question with long *wh*-extraction (as the translation also indicates), which shows that in the particular example in (1), the matrix *wh*-item (*was*) is a placeholder element, while the embedded *wh*-item (*wen*) is what the question is about.[2] Looking at scope marking constructions crosslinguistically, the following properties appear to characterize them:

(2) *Characteristic properties of scope marking constructions*

(i) There is a scope marker *wh*-item in the superordinate clause.
(ii) Any *wh*-item can occur in the embedded *wh*-position (*who, why, which concept, how many unripe coconuts*, etc).
(iii) The answer given to a scope marking question specifies the embedded *wh*-item (cf. ex. (1A)).
(iv) Scope marking is unbounded; scope markers are usually spelled out in every intermediate clause, as illustrated in (3):

(3) **Was** denkt sie [**was** Hans gesagt hat [*wen* Fritz eingeladen hat]]?
what thinks she what Hans said has whom Fritz invited has
'Who does she think Hans said Fritz has invited?'

(v) The embedded clause hosting the contentful *wh*-item cannot be a *selected* question (matrix predicates like *ask* are not allowed), cf. (4):

(4) ***Was** fragt sie [$_{<+wh>}$ *wen* Fritz eingeladen hat]?
what asks she whom Fritz invited has
(lit.) 'Who does she ask Fritz invited?'

[2] More detailed investigation (Herburger 1994, Lahiri 2002) shows that the parallel with long extraction is not absolute.

Properties (i)-(v) will come handy in section 3, where new instances of scope marking constructions will be identified with the help of these.[3]

Scope marking phenomena present theoretically interesting puzzles that are not easy to explain. The most important one of these concerns the syntactic and interpretive relation between the scope marker and the embedded question word. Under the general assumption that only *wh*-items with matrix scope get answered, the fact that the embedded *wh*-item in scope marking constructions is filled in by the answer suggests that the embedded *wh*-item has matrix scope. However, its overt position does not reflect this: it is found in the embedded clause. Various solutions have been proposed to resolve this issue, arguing either for LF-raising of the embedded *wh*-item or the whole embedded clause (via expletive replacement) or for an underlying semantic mechanism that ensures matrix scope for the embedded question. The details of the various proposals will be spelled out in section 5.

2.2. Hungarian scope marking: the standard data

Hungarian scope marking constructions fall into two basic types: *sequential* and *subordinated* scope marking constructions. Sequential scope marking is the most frequently occurring type of scope marking among native speakers. According to my survey, about 25% of Hungarian speakers prefer these constructions to subordinated ones. Sequential scope marking involves two juxtaposed, prosodically and syntactically autonomous clauses, whose order is freely reversible. For illustration, see (5a) and (5b):

(5) a. **Mit** gondolsz? *Ki* nyeri a versenyt?
what-ACC think-2SG who win-3SG the competition-ACC

b. *Ki* nyeri a versenyt? **Mit** gondolsz?
who win-3SG the competition-ACC what-ACC think-2SG
'What do you think? Who will win the competition?'

The most frequent predicates ocurring in the "matrix" clause of these constructions are: *gondol* "think", *tud* "know", *hall* "hear", *mond* "say", *szeretne* "would like", *akar* "want", *számít* "count on", *ajánl* "recommend", *javasol* "advise", *jósol* "predict".

Subordinated scope marking differs from non-subordinated ones in that it clearly involves syntactic subordination. In Hungarian embedded argumental clauses subordination is indicated by the presence of *hogy* "that", a finite complementizer (available both in
indicative and interrogative clauses). As expected, the order of the clauses is not reversible in this case:

[3] Other properties that characterize scope marking constructions, which I do not further discuss in this paper, are subject to variation across languages. In German or Hungarian, for example, the scope marker *wh*-item is overtly fronted, while in Hindi, it can also stay in-situ. Similarly, yes/no questions are fine in the embedded clause in Hindi, but not in German or Hungarian. Factive verbs can be matrix predicates in Hindi and to some extent in Hungarian, but never in German.

(6) a. **Mitől** fél Mari, hogy *ki* lesz az igazgató?
what-FROM fear-3SG Marithat who be-FUT.3SG the director
(lit.) 'What does Mari fear that who will be the director?'
b. *Hogy *ki* lesz az igazgató, **mitől** fél Mari?
that who be-FUT.3SG the director what-FROM fear-3SG Mari

A typical answer to the scope marking question in (6a) is (6A):

(6A) **Attól**, hogy Péter.
that-FROM that Péter-NOM
'(Mari fears that it will be) Péter.'

The characteristic intonation pattern of (6a) is shown in (6'):

(6') | '**Mitől** fél Mari | □ hogy `*ki* lesz az igazgató? |[4]

Unlike in sequential scope marking, yes/no questions are not allowed in subordinated scope marking. The matrix clause can be negated to some extent, subject to individual variation and choice of the predicate. Subordinated scope marking can occur in many environments. Both response-stance and non-stance predicates can take part in this pattern: *elfelejt* "forget", *emlékezik* "remember", *észrevesz* "notice", *rájön* "find out", *megbán* "regret", *említ* "mention", *fél* "fear", *megesküszik* "swear", *megakadályoz* "block", (*meg)jósol* "predict", *kihirdet* "make public". Similarly, predicates taking subject clauses: *zavar* "bother", *kiderül* "turn out" occur with this pattern.

Hungarian scope marking constructions as noted by Horváth (1995, 1997, 1998, 2000) occur both with argumental (object and subject) embedded clauses as well as with adverbial ones. Subject and adverbial clauses are illustrated in (7) and (8):

(7) **Mi** zavarta Marit [hogy *kinek* telefonáltál]?
what bothered-3SG Mari-ACC that who-DAT phoned-2SG
(lit.) 'What bothered Mari that you phoned whom?'
(7A) **Az**, hogy Péternek.
that that Péter-DAT
'That I phoned Péter.'
(7') | '**Mi** zavarta Marit | □ hogy `*kinek* telefonáltál | ?
(8) **Miért** vagy dühös [mert *kivel* találkoztál]?
what-FOR be-2SG angry because who-WITH met-2SG
(lit.) 'Why are you angry because you met whom?'
(8A) **Azért**, mert Péterrel.
that-FOR because Péter-WITH
'Because I met Péter.'
(8') | '**Miért** vagy dühös | □ mert `*kivel* találkoztál | ?

[4] Symbols are taken from Varga (2002): | = edge of intonational phrase; □ = pause; ` = full fall major stress; ' = half-fall major stress

The common property characterizing both argumental and adverbial embedded clauses in scope marking constructions is the occurrence of a pronominal associate *az* "that" in declarative contexts (i.e. the answer pattern) and *mi* "what" in interrogative contexts, the latter functioning as the scope marker.

3. New cases of scope marking: adjunct clauses embedded under NP/DPs in Hungarian

The previous section concerned itself with the various types of scope marking constructions that have hitherto been mentioned in the previous literature. The present section shows that subordinate scope marking has a much wider empirical base than previously recognized: it occurs with relative and noun-associate clauses as well, which have NP/DP scope markers. These will be introduced in sections 3.1. and 3.2. in turn.

3.1. Scope marking with relative clauses

Relative clauses in Hungarian can be headed relatives or free relatives. The type of relative clauses that are important for purposes of illustrating scope marking data are the headed restrictive relatives, which can be either headed by a pronominal *az* "that" as in (9) or by a full NP/DP as in (10). Note that both relatives are extraposed, which is indicated by coindexation:

(9) [$_{DP}$ **Az** [t_i]] megy át a vizsgán [aki 20 pontot szerez]$_i$.
that go-3SG PV the exam-ON who-REL 20 point-ACC score-3SG
'The person who scores 20 points passes the exam.'

(10) [$_{DP}$ **Az a diák** [t_i]] megy át a vizsgán
that the student go-3SG PV the exam-ON
[aki 20 pontot szerez]$_i$.
who-REL 20 point-ACC score-3SG
'The student who scores 20 points passes the exam.'

When scope marking occurs with relative clauses, we find two *wh*-elements: the embedded relative clause contains a *wh*-item and the head of the relative clause must be or must contain a *wh*-phrase. In these examples we are dealing with two questions: the matrix question ranges over individuals (*ki* "who" or *melyik diák* "which student") and the embedded question ranges over the number of points (*hány pontot* "how many points-ACC"). For illustration, consider the following examples with their corresponding answers.

(11) [$_{DP}$ **Ki** [t_i]] megy át a vizsgán [aki *hány pontot* szerez]$_i$?
who go-3SG PV the exam-ON who-REL how many point-ACC score-3SG
(lit.) 'Who$_i$, who$_i$ scores how many points, passes the exam?'
(intended) 'How many points does one have to score to pass the exam?'

(11A) [$_{DP}$ **Az** [t_i]] [aki *20 pontot* szerez]$_i$. /*Mari.

that who-REL 20 point-ACC score-3SG /Mari
'Who(ever) scores 20.' /'Mari.'

(12) [$_{DP}$ **Melyik diák** [t_i]] megy át a vizsgán
which student go-3SG PV the exam-ON
[aki *hány pontot* szerez]$_i$?
who-REL how many point-ACC score-3SG
(lit.) 'Which student$_i$, who$_i$ scores how many points, passes the exam?'
(intended) 'How many points does a student have to score to pass the exam?'

(12A) [$_{DP}$ **Az a diák** [t_i]] [aki 20 pontot szerez]$_i$. /*Mari.
that the student who-REL 20 point-ACC score-3SG / Mari
'The student who scores 20 points.' / 'Mari.'

As we can see, the interpretation of these questions is clearly reflected by the particular answers they trigger: the answer necessarily has to specify the embedded question, i.e. the number of points that need to be scored for passing the exam. An answer naming particular individuals who pass the exam is not satisfactory.

The intonation contour (at least one of the possible intonation contours) of these complex constructions is parallel to that of argumental subordinated scope marking constructions, as was illustrated in (6'/7'/8') above:

(11'/12') | '**Melyik diák/'ki** megy át a vizsgán, | □ aki `*hány pontot* szerez? |

The constructions in (11)-(12) comply with all criteria we identified in (2) as defining properties of scope marking. There is a scope marker (*ki, melyik diák*; property (i)); the choice of the embedded *wh*-phrase is free (property (ii)); the question is answered by providing a value for the embedded *wh*-item (property (iii), cf. (11A),(12A)). The relation is unbounded, it can involve multiple layers of embedding (property iv):

(13) **Melyik diák** megy át a vizsgán, [aki ***milyen könyvből*** tanul
which student go-3SG PV the exam-ON who-REL what book-FROM study-3SG [amit *ki* írt]]?
what-REL.ACC who wrote-3SG
(lit.) 'Which student$_i$, who$_i$ studies from what kind of book$_j$, that$_j$ who wrote, passes the exam?'

The ban on selected interrogative subclauses (property (v)) is satisfied vacuously, since relative clauses are never selected to be interrogative. In fact, they can never contain a *wh*-item in any construction except in the construction under investigation here. If the matrix clause was not an interrogative clause, the relative clause would fail to license a question:

(14) ***Az** megy át a vizsgán [aki *hány pontot* szerez]?
that go-3SG PV the exam who-REL how many point-ACC score-3SG
(lit.) 'Who(ever) scores how many points, passes the exam.'

The matrix interrogative clause has to comply with one requirement: the *wh*-phrase in it has to either correspond to the *head* of the embedded relative clause or ask for a property that is also spelled out in the relative clause. The following two examples illustrate these points:

(15) ***Hány diák**$_i$ megy át a vizsgán
how many student go-3SG PV the exam-ON
[aki$_i$ *hány pontot* szerez]?
who-REL how many point-ACC get-3SG
(lit.) 'How many students$_i$, who$_i$ score how many points, pass the exam?'

(16) **Kinek**$_i$ **a diákja** megy át a vizsgán,
who-DAT the student-POSS.3SG go-3SG PV the exam-ON
[aki$_i$ *hány pontot* szerez]?
who-REL how many point-ACC get-3SG
(lit.) 'Whose$_i$ student$_j$, who$_{i/*j}$ scores how many points, passes the exam?'
(intended) 'How many points does a teacher have to score to pass a student?'
/'*How many points does a student have to score to pass the exam?'

In (15) we see that although the matrix and the embedded *wh*-phrases are identical in meaning (*hány* "how many"), the sentence fails to be interpretable, because the relative clause is not construed as a numeral modifier of students. In (16), the relative clause has to be interpreted as a modifier over the smallest *wh*-phrase, *kinek* "who-DAT", and not the larger phrase *kinek a diákja* "whose student-NOM", even though the resulting meaning is pragmatically unlikely. This shows that in case the matrix *wh*-phrase can be found in a referentially independent larger NP/DP, the relative clause in scope marking has to associate with the smallest *wh*-phrase possible, as a scope marker.

To summarize, this section showed beyond doubt that the constructions in (11)-(12) instantiate an example of scope marking, namely scope marking with an adjunct embedded clause. The semantic and intonational properties of these clauses are exactly parallel to well-established cases of scope marking with argumental embedded clauses. The scope marker is (or is found within) the head of relativization, and the embedded clause is contained inside the relative clause. The answer necessarily has to fill in the embedded *wh*-variable.

3.2. Scope marking with noun-associate clauses

In Hungarian, the behaviour of relative clauses in scope marking is fully paralleled by adjunct noun-associate clauses in Hungarian. Noun-embedded clauses have been argued to be of two kinds: arguments or adjuncts (Kenesei 1992). Scope marking with adjunct noun-associate clauses are grammatical for all speakers of Hungarian, while argumental embedded clauses show some variation: many informants found them just as good as adjunct embedded clauses; several of them, however, found them degraded or ungrammatical. Therefore, in the following I concentrate on adjunct noun-associate clauses only.

Scope marking with noun-associate adjunct clauses is exemplified in (17):

(17) **Milyen üzenetet**$_i$ kapott Péter [hogy *hova* kell mennie]$_i$?
what message-ACC got-3SG Péter that where need go-INF-3SG
(lit.) 'What message, that he has to go where, did Péter get?'

(17A) Péter **azt az üzenetet**$_i$ kapta
Péter that the message-ACC got-3SG
[hogy a rendőrségre kell mennie]$_i$
that the police-TO need go-INF-3SG
'Péter got a message that he has to go to the police force.'

Just like with relative clauses, the matrix *wh*-phrase is a "what kind" question that asks for the same kind of property that is also expressed by the embedded clause. As far as intonation is concerned, these sentences are most frequently pronounced with the same intonation contour as argumental or relative clauses above:

(17') |'**Milyen üzenetet** kapott Péter | □ hogy `*hova* kell mennie? |

(17) also complies with all criteria for scope marking listed in (2) above: namely (i) there is a scope marker (*milyen üzenetet* "what message-ACC"); (ii) the choice of the embedded *wh*-phrase is free; (iii) the required answer specifies the embedded *wh*-phrase. The unbounded nature of the construction (property iv) is illustrated in (18):

(18) **Milyen üzenetet** kaptál, [hogy ***melyik állítást*** ellenőrizzük
what message-ACC got-2SG that which claim-ACC check-IMP-1PL
[hogy *melyik üzem* nyereséges]]?
that which factory profitable
(lit.) 'What message, that we should check which claim, that which factory is profitable, did you get?'

The nominal with which the embedded clauses are associated has to be a "what kind" *wh*-phrase in each clause. The ban on selected <+wh>-clauses (property v) is complied with as well. If the embedding noun requires a question, like the noun *kérdés* 'question', scope marking is unavailable:

(19) ***Milyen kérdéssel** foglalkoztak [$_{CP+wh}$hogy *mire* kell a pénz]?
what question-WITH dealt-3PL that what-ON need the money
(lit.) 'What question, that they need the money for what, did they discuss?'

It appears then that adjunct noun-associate clauses, just like relative clauses, are capable of hosting a *wh*-phrase with matrix interpretation as long as the nominal they are associated with is a "what kind" *wh*-expression. In other words, these constructions show the same properties as standard cases of scope marking, and therefore should be considered as such.

4. The crosslinguistic scene of adjunct scope marking

The adjunct scope marking data presented in the previous section are not unique to Hungarian. My initial investigations about a small set of other languages, among which both languages with and without scope marking revealed that adjunct-type scope marking constructions are found in a *subset* of the languages that have standard argumental scope marking constructions.

The languages under investigation were Moroccan Arabic, Bavarian, Mandarin Chinese, Danish, Dutch, English, Finnish, Flemish, Frisian, German, Greek, Hindi, Italian, Japanese, Serbian, Slovenian, Spanish. Out of these languages, adjunct scope marking constructions parallel to the Hungarian facts occur in Frisian and in some Slavic languages (Serbian and Slovenian).[5,6] These languages are known to have subordinate scope marking (see Hiemstra 1986 for Frisian, and Golden 1995, Stepanov 2000 for Slavic). The following two examples illustrate noun-associate clauses in Frisian (20) and Slovenian (21) respectively:

(20) **Wat** boadskip hast krigen, *wêr*'tst hinne moatst?
what message have-2SG got where-that-2SG to must
(lit.) 'What message, where do you have to appear, did you get?'

(21) **Kakšno sporočilo** si dobil, *kam* da moraš iti jutri?
what message aux get-PTC where that must go tomorrow
(lit.) 'What message, where do you have to appear, did you get?'

Scope marking with relative clauses is illustrated in the following examples. (22) is a Frisian and (23) is a Slovenian case. It is also visible in these examples that while the examples above with noun-associate clauses involve overt *wh*-movement to Spec,CP, the *wh*-phrases in relative clauses stay in situ:

(22) ?**Hokker studint** komt dertroch, dy't *hoefolle punten* hat?
which student comes through REL-that how-many points has
(lit.) 'Which student, who scores how many points, passes the exam?'

(23) **Koji student** prolazi ispit, koji dobije *koliko poena*?
which student passes exam which gets how many points?
(lit.) 'Which student, who scores how many points, passes the exam?'

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[5] An exception to this generalizaiton is Japanese, which does not exhibit standard scope marking constructions, but still allows for *wh*-items in relative clauses and noun-associate clauses (Naoki Fukui, Akira Watanabe, pc.) of the scope marking type discussed in this paper:

(i) anata-wa [$_{NP}$ [doko-ni ikeba ii ka] to-yuu doo-yuu messeezi]-o uketorimasita-ka?
you-top where-to go should Q that which message-ACC received Q
'Which/what kind of message did you get, where do you have to go?'

Note, however, that at least to some speakers, (i) sounds "redundant", compared to the more natural (ii), in which an in-situ *wh*-expression is found in an CNP island, a grammatical stategy for arguments (Lasnik and Saito 1984):

(ii) anata-wa [$_{NP}$ [doko-ni ikeba ii ka] to-yuu messeezi]-o uketorimasita-ka?
you-top where-to go should Q that message-ACC received Q
'Did you receive a message as to where you should go?'

[6] The Frisian data are based on the judgements of Siebren Dijk, Willem Visser and Henk Wolf; the Slovenian ones on the judgements of Franc Marušič, Tatjana Marvin and Rok Žaucer.

Unlike Frisian and Slovenian, German and Hindi do not seem to have adjunct scope marking (ex. (24/25) and (26/27) respectively):[7,8]

(24) ***Welcher Student** besteht die Prüfung, der *wieviele Punkte* erzielt?
which student passes the exam who how many points achieves
(lit.) 'Which student, who scores how many points, passes the exam?'

(25) ***Was für eine Nachricht** hast du bekommen, *wo* du erscheinen musst?
what for a message have you got where you appear-INF must
(lit.) 'What message, where do you have to appear, did you get?'

(26) ***kaun-saa chaatra** [jo kitne points haasil kar-egaa] prize jiit-egaa?
which student REL how-many achieve do-Fut win-FUT
(lit.) 'Which student, who scores how many points, will win the prize?'

(27) ***unhone** kaun-sii afvaah failaa dii [ki *kaun* garbhvati hai].
they which rumor spread that who pregnant is
(lit.) 'Which rumour, who is pregnant, did they spread?'

Even languages in which adjunct scope marking is ruled out as an ordinary interrogative allow for these constructions to be used in special contexts, most frequently as echo questions or in the special context of quiz-questions, like the following English example:

(28) Which actor, who was nominated for Oscar for which film in 1965, died in 1980?

Adjunct scope marking therefore seems to be a crosslinguistically well-attested phenomenon.

5. The analysis of adjunct scope marking

Scope marking constructions have been analysed along the lines of two general apporaches: the *direct* and the *indirect* dependency approaches. The two approaches differ in the kind of relationship they ascribe to the embedded *wh*-item and the matrix scope marker. In the direct dependency, the embedded *wh*-item directly replaces the scope marker at LF, thereby gaining matrix scope. The indirect dependency approaches argue that there is no direct link between the scope marker and the embedded *wh*-expression, but there is a *syntactic* or a *semantic* link between the scope marker and the embedded clause. In this section I briefly sketch each approach and show whether or not it suits the newly discovered cases of Hungarian scope marking. As it turns out,

[7] While adjunct scope marking is clearly ungrammatical in Hindi, German has noun-associate adjunct scope marking constructions which are quite acceptable for some speakers:

(i) ?Was ist dein Rat, wen wir um Hilfe bitten sollten?
what is your advice who we for help ask should
(lit.) 'What is your advice, whom should we ask for help?'

[8] The German examples are due to Anne Breitbarth, Agnes Jäger, Peter Gallmann, Kleanthes Grohmann, Martin Salzmann, Chris Reingtes, Kristina Riedel, Kathrin Würth; the Hindi ones to Rajesh Bhatt and Veneeta Dayal.

the direct dependency approach or the indirect syntactic dependency approach cannot account for these. The only feasible account is the *semantic indirect* dependency account. I conclude this section by sketching the analysis of adjunct scope marking, extending Dayal's analysis.

5.1. Direct dependency approach

According to the advocates of the *direct dependency* approach (van Riemsdijk 1983, McDaniel 1989, Cheng 2000, among others) the embedded *wh*-item is directly linked to the matrix *wh*-item in the syntax and semantics, via LF-expletive replacement of the sort well-known from *there*-expletive constructions. The scope marker is an expletival placeholder for the embedded *wh*-item in the main clause:

(29) S-str $[_{CP+wh}$ **was** $[_{CP-wh}$ *wh-phrase* $[_{IP} \ldots t_i \ldots]]]$
LF $[_{CP+wh}$ *wh-phrase* $[_{CP-wh}$ t_i $[_{IP} \ldots t_i \ldots]]]$

The general unavailability of this approach to the cases of Hungarian scope marking under discussion can easily be seen from the fact that these constructions constitute islands for extraction (CNPC):

(30) *Hány pontot$_i$ megy át a vizsgán [aki t_i szerez]?
how many points-ACC go-3SG PV the exam-ON who-REL score-3SG
(intended) 'How many points does one have to score to pass the exam?'

The same has been noticed about subject clauses and adverbial clauses as well (Horvath 1995): scope marking, unlike long extraction, is possible across subject and adjunct islands (CED-effects). This militates against an analysis in terms of LF-long extraction.

5.2. The syntactic indirect dependency approach

In contrast to the direct dependency approach, the *indirect dependency* approaches posit an indirect relationship between the *wh*-items: it is argued that the scope marker is directly linked to the whole embedded clause.

There are two types of ideas about what provides the link between the scope marker and the embedded clause: in some analyses the link is syntactic, in others it is semantic in nature. In this section I briefly review the syntactic accounts. Apart from Mahajan (1990) and Fanselow & Mahajan (2000), the extant analysis of Hungarian, Horvath (1995, 1997, 1998, 2000), belongs to this type of approach as well. In the following short exposition, I am only concerned with Horvath's analysis.

In Horvath's analysis, the scope marker is a (*wh*-)pronominal anticipatory pronoun, generated in A-position (AgrP in Horvath 1997); associated with the embedded CP proposition, bearing the case that is assigned to the CP and which the CP cannot carry due to the case resistance principle (Stowell 1981). In scope marking constructions, just as in any case of clausal subordination, the subordinated CP needs to "meet"

its case before the end of the derivation (to satisfy Full Interpretation). To achieve this, the CP has to adjoin the sentential pronominal at LF:

(31) $[_{CP}\ [_{FocP}\ \textbf{\textit{mi}}_{+case}\ [_{AgrP}\ t_j$ LF $[_{CP}\ [_{FocP}\ \textit{wh-phrase}_i\ [_{IP}\ldots\ t_i\ \ldots\ ]]]\ ]]]$

The LF movement step of clausal pied-piping is futher restricted to cases where the embedded CP and the sentential expletive *match* in *wh*-features.[9]

The right interpretation of scope marking constructions (i.e. a meaning similar to long *wh*-questions) comes about due to the LF CP-movement step to the matrix explative, the result of which is that the whole embedded CP, and in that the embedded *wh*-item acquires matrix scope:

(32) $[_{CP+wh}\ [_{CP+wh}\ wh_{i+wh}\ [_{C'}\ C_{-wh}\ [_{IP}\ \ldots\ t_i\ \ldots]]]$**-mi** $[_{AgrP}\ t_j\ \ldots]\ ]$

Although other syntactic indirect approaches are slightly different in their technical apparatus, the treatment of the matrix *wh*-element as a sentential expletive is inherent and crucial to all of them.

This is also the very reason why these accounts do not suit the newly presented data of adjunct scope marking. Adjunct scope marking does not lend itself to any analysis along the syntactic indirect dependency line of approach. As these accounts are crucially based on an *expletive replacement* step, they need to assume that the scope markers are *expletives*. While this is certainly an a priori possible stand for the analysis of embedded clauses that combine with a uniform pronoun *mi* "what", it is not an option for relative and noun-associate clauses for the simple fact that these are *never* associated with expletival elements. The scope markers in these constructions are not (*wh*-)expletives, but full-blown argument NP/DPs, with a lexical meaning of their own. Therefore, an analysis in terms of expletive replacement by the embedded CP at LF is not tenable:

(33) $[_{CP}\ [_{FocP}\ \textbf{\textit{melyik diák}}_i\ [_{DP}\ t_i\ [_{CP\text{-}wh}\ \text{aki}\ [_{FocP}\textit{hány pontot}_i\ [_{IP}\ldots\ t_i\ \ldots\ ]]]]\ ]]$ LF

Note that this is true even if expletive replacement is taken to be *adjunction* of the embedded CP to the matrix pronominal. Such an adjunction step would be totally unmotivated in the case of relative and noun-associated embedded clauses, as these clauses, being adjuncts, are not in need of case.

In the next section I turn to the only account that can handle the newly found cases scope marking: Dayal's (1994, 2000) indirect dependency.

[9] The scope marker is a <+wh> item, which then requires the embedded clause to have a matching <+wh> feature as well. This <+wh> feature will have to come from the embedded *wh*-item (through percolation), since in scope marking constructions the embedded clause is never selected to be a question (see (4) above), and consequently it does not possess any inherent <+wh>-feature. After <+wh>-feature transmission from the *wh*-item onto the embedded CP, the *wh*-item looses its *wh*-hood, and its operator nature. As a "disarmed" *wh*-item, it does not cause any violation of the *Wh*-criterion.

5.3. The semantic indirect dependency approach (Dayal 1994, 2000)

The *semantic* type of *indirect dependency* approach (Dayal 1994, 2000), argues for an underlying *semantic* link between the scope marker and the embedded clause.[10] The scope marker in this account is a standard argumental *wh*-phrase, which quantifies over propositions. The embedded clause, a full-blown question, restricts the domain of propositions that the scope marker quantifies over.

In the presice semantics, Dayal follows Hamblin (1973) in taking questions to denote the set of possible answers to them. *Wh*-expressions are existential quantifiers whose restriction is either implicit or provided by some overt restriction. The matrix propositional variable *wh*-expression can only be restricted by a question (due to their semantic type). For illustration, consider the example in (34):

(34)	**Mitől**	fél	Mari,	hogy	*ki*	lesz	az igazgató?
	what-FROM	fear-3SG	Mari	that	who	be-FUT.3SG	the director
	(lit.) 'What does Mari fear that who will be the director?'						

This question has the following logical representation: λp∃q[p a proposition & p=^fear(Mari,q)]. Dayal assumes that quantification is always restricted in natural languages, thus also with quantification over propositions. The overt or covert restrictor of the matrix propositional quantifier can be represented by a variable *T:* λp∃q[T(q) & p=^fear(Mari,q)]. The meaning of the embedded clause is λp∃x [p= ^will-be-director (x)], which can be made the restrictor *T* in the interpretation of the matrix question. The end result is: λp∃q[∃x [q= ^will-be-director (x)] & p=^fear(Mari,q)]. In an informal paraphrase, (34) denotes the following question: "what proposition p, such that p is a possible answer to 'who will be the director?' is such that Mari fears p?" Possible answers to the question "who will be the director" are propositions like *Péter will be the director; Anna will be the director; Hugo will be the director*. From this set of propositions, (34) asks for the one that Mari fears.

The above sketched analysis suits adjunct scope marking like a glove: as we have seen, in this language scope marking does not only occur with standard sentential subordination, but also with other types of embedding, where an expletive—associate relationship is completely out of the question, as relative and noun-associate clauses do not combine with expletives, but with lexical NPs/DPs. Furthermore, their role is exactly as described by Dayal's account: to provide a restriction over the NP/DP they modify. The next section spells this out in more detail.

[10] Allowing for the option that there is also a *syntactic* link between them as well. The syntactic relation between the matrix *wh*-item and the embedded clause can range from a loose juxtaposition to a real syntactic dependency. Crucial to this analysis is the treatment of sentential pronominals as full arguments, which follows the spirit of a number of syntactic proposals (Rosenbaum 1967, Bennis 1986, É.Kiss 1987, Torrego & Uriagereka 1989, Müller 1995, Moro 1997, Stepanov 2000) and the analysis of the embedded clause as a syntactic adjunct, a semantic *restrictor* over the matrix argument nominal.

5.4. The analysis of adjunct scope marking constructions: extending Dayal's approach[11]

As the previous section has shown, Dayal's account can neatly accommodate the adjunct scope marking data due to its "unorthodox" view on standard scope marking data, which identifies the scope marker—embedded clause relationship as that between a restricted item and a restrictor. The full proposal, however, does not straightfowardly carry over to the adjunct scope marking data. To cover these data, in what follows I extend Dayal's proposal in two directions. One being the type of question asked by the matrix *wh*-expression, the other being what specifications can be provided by the embedded *wh*-clause. In this section I briefly outline an extended Dayal-type semantic analysis for adjunct scope marking. The discussion will be kept at an informal level and is merely meant to sketch the outlines of a possible semantic analysis.

5.4.1. Relative clauses

In scope marking with relative clauses, an example of which is repeated here from above, the relative clause serves as a restriction on the matrix *wh*-phrase:

(35) **Ki**$_i$ megy át a vizsgán [aki$_i$ *hány pontot* szerez]?
who go-3SG PV the exam-ON who-REL how many point-ACC score-3SG
(lit.) 'Who$_i$, who$_i$ scores how many points, passes the exam?'
(intended) 'How many points does one have to score to pass the exam?'

The difference between these constructions and standard argumental scope marking as treated in Dayals' analysis (see previous section) is that in (35) the main question is not about propositions, but about *properties* of individuals. That is, the matrix question introduces existential quantification over properties. What kind of properties these are is specified by the relative clause, which denotes a *set* of properties under this account. In (35), the property is identified as a property that characterizes individuals in terms of how many points they score. For this analysis to go through we have to assume that the embedded question denotes a set of (individual) *properties*, and not the usual set of *propositions* (for a similar proposal concerning scope marking with adverb clauses (cf. (8) above), see Sternefeld 2002). With this assumption in mind, the meaning of the matrix question can be represented as in (36):

(36) the set of properties Q such that there is a natural number n and Q is the property of an individual x scoring n points

Relative clauses in scope marking have the syntax of extraposed relatives. The head NP/DP and the relative clause are generated together in the base, followed by an ex-

[11] This section heavily builds on help I received from Malte Zimmermann on the semantic representation of adjunct scope marking. Thanks also to Ede Zimmermann for illuminating discussion.

traposition step of the relative clause. Evidence for generating the relative next to its syntactic head comes from reconstructions facts:[12]

(37) *Melyik embert vitték (ők_i) kórházba, akit a fiúk_i hol találtak?
which man took-3PL they hospital-INTO REL-whom the boys where found-3PL
(lit.) 'Which man did the boys take into hospital, the one they found where?'

As we can see, BT-C is violated if the relative extraposed from objects position contains an R-expression and the subject pronoun is coindexed with it. This provides unambiguous evidence to the effect that the relative clause is base-generated together with the matrix *wh*-expression.

5.4.2. Noun-associate clauses

The semantics underlying adjunct scope marking with noun-associate clauses is slightly different from that of relative clauses. Noun-associate clauses represent the intermediate case between standard, argumental scope marking and that with relative clauses as spelled out in the previous sections. As in the case of relative clauses, the questions is about an (individual) property, namely a property of nouns with a *propositional* content. The nouns occuring in these constructions (*message, claim, order* etc.) are nouns which associate with propositions that spell out their *content*. The propositional property of the given noun is specified by the denotation of the embedded question, which is, just like in the standard case, is a set of propositions.

Thus an example like (38) repeated from above has the following informal semantic representation:

(38) **Milyen üzenetet** kapott Péter [hogy *hova* kell mennie]?
what message-ACC got-3SG Péter that where need go-INF-3SG
(lit.) 'What message, that he has to go where, did Péter get?'

(39) the set of propositions p such that there is a proposition q, with q element of the set of propositions of the kind 'Péter has to appear at x', and p = Péter got a a message with propositional content q

How the embedded proposition can be construed as a property of an entity is far from trival. This, however, is not a problem that is specific to the analysis presented here. It concerns all noun-associate clause relations with or without a *wh*-item in the associated clause.

The syntactic account of relative clauses in the previous section carries over in all relevant respects to adjunct noun-associate clauses (base-generation together with the noun, followed by an extraposition step). As noun-associate clauses have been

[12] A further argument comes from the fact that their adjacency can be tolerated in overt syntax, too:

(i) (?)?**Ki** [aki *hány pontot* szerez] megy át a vizsgán?
who who-REL how many point-ACC score-3SG go-3SG PV the exam-ON
(lit.) 'Who, who scores how many points, passes the exam?'

argued to be clausal adjuncts (Stowell 1981, Grimshaw 1990, Kenesei 1992, 1994), these can be treated in the same way as relative clauses for our purposes.

6. Summary

This paper introduced hitherto unidentified scope marking constructions from Hungarian, Frisian, and Slovenian, and showed that these involve complex questions embedding adjunct clauses, namely noun-associate and relative clauses. It was shown that these constructions provide primary evidence for a Dayal-type indirect dependency analysis, and that a proposed extension of this analysis can account for these data in full.

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