

Notes on Focalization in Hungarian

Seizo ISHIOKA

0. Introduction

In this article, which is couched within the Government and Binding framework, we will deal mainly with the difference between *wh*-movement and focalization in Hungarian. As shown in (1a,b), the focalization of multiple non-*wh* maximal projections is excluded, while that of multiple *wh*-phrases is allowed.¹⁾

- (1) a. * "János "Marit szereti (Puskàs 1992:(61))
 John-NOM Mary-ACC love-PRES
 b. "kinek "mit hozott János? (ibid.:(43b))
 who-DAT what-ACC bring-PAS John-NOM
 ' what did John bring to whom? '

Generally it is assumed that *wh*-phrases, which are inherently focussed items (Piñón 1993), are to move to the focus position and that focalized elements are subject to the same movement pattern. However, the above assumption seems to be contradictory to the observation made in (1a,b) which makes it clear that it is possible for multiple *wh*-phrases to move to the focus position. In sum, it seems necessary to postulate that *wh*-phrases and non-*wh* maximal projections are focalized in a dissimilar way. It will ultimately be suggested that this dissimilarity is reduced to the different feature transmission processes with which these focalized elements (*wh*-phrases and non-*wh* phrases) are supposed to be provided.

The paper is organized as follows: section 1 presents the outline of Puskàs (1992), especially with respect to the Hungarian sentence structure and focalization; in section 2, we offer a methodology which seems to properly account for the difference in (1a,b) with the definition system adopted in this paper; in section 3, we deal with the behavior of so-called reduced complements in relation to negation, showing that it is indispensable to make a rigorous distinction between two types of sentences (that is, level stress sentences and eradicating stress sentences); in the last section, we will make an elementary survey of

some problematic cases which seem at first sight to be at variance with the hypotheses set up in the article (with a tentative solution to the contradiction).

1. Hungarian Sentence Structure and Focalization (Puskàs 1992)

In parallel with Puskàs (1992), we assume the following Hungarian sentence structure (to be partially modified below):



In (2), C takes as a complement FP headed by a functional head F^0 , assigned the feature [+focus], which in turn selects an IP complement. As indicated by the arrows, the verb moves first to I^0 , where it acquires the features tense and agreement, realized morphologically on the verb. Furthermore it raises on to F^0 , where it receives the feature [+focus]. Thus it is now possible for the verb to assign the feature involved to Spec FP when the latter position is filled with lexical material. The feature [+focus] will be actualized as an eradicating stress at PF.

It is now crucial to determine the trigger of V^0 's movement to F^0 . According to Puskàs, the assignment of an eradicating stress is directly related to F^0 [+focus]. In order to offer the evidence of the movement to F^0 , Puskàs cites the following examples in (3), clarifying the fact that the verb itself receives an eradicating stress (in her term, a primary stress) and mentioning that only when the Spec FP is filled with no lexical XP can the feature not be assigned and is preserved by the verb with the result of the feature realized on it as a primary stress. So as to attain this effect, Puskàs argues, the verb has to be moved to F^0 at PF.

(3) a. 'János "Màriàt szereti (Puskàs 1992:16a) ²⁾

John-NOM Mary-ACC love-PRES

'As for John, it is Mary that he loves '

b. "Màriàt szereti János (ibid.:16b)

'It is Mary that John loves '

c. "Szereti János Màriàt (ibid.:17b)

'John does love Mary ' 'What John actually does is to love Mary '

However, Puskàs herself notes, without any comments on it, that the stress assigned in (3c) is weaker than that assigned to NP (Màriàt) in (3a-b) (p.148). This, we believe, indicates that stress assignment to the zero category (V^0) is activated in a way different from that to maximal projections moved to Spec FP. Specifically we assume that F and a focalized maximal projection are assigned the maximal feature [+focus] at D-Structure and

that the [+focus] maximal projection has to move to the checking domain of the zero category endowed with the same feature.³⁾ On the other hand, stress assignment to V^0 , which seems to be a default case, applies only if there is no maximal projection given the maximal feature [+focus] (detailed discussion will be given in section 2).

We will turn to Puskàs' (1992) explanation of the difference in (1a,b). As is the case with Piñón (1993) and Kiss (1981, 1986), she identifies the feature [+focus] with the feature [+wh] through the fact that wh-phrases are assigned an eradicating stress in Spec FP. Puskàs assumes that in multiple wh-movement, one wh-phrase moves to Spec FP, in contrast to the others left-adjoining iteratively to FP (the same is true in multiple focalization). See the structures in (4a,b) corresponding respectively to (1a,b):

- (4) a. [_{FP} "János_i [_{FP} "Marit_j [_{F'} szereti [_{IP} [_{I'} t_v [_{VP} t_v t_j t_i]]]]]]]
 b. [_{FP} "kinek_i [_{FP} "mit_j [_{F'} hozott [_{IP} [_{I'} t_v [_{VP} János t_v t_j t_i]]]]]]]?]

Then how is it that wh-phrases adjoined to FP can get the feature [+focus]? She argues that these phrases acquire the feature by a process similar to the negative concord interpretation in West Flemish (Haegeman and Zanuttini 1991; Haegeman 1995), which process she calls "focus factorization". That is, these adjoined wh-phrases and the wh-phrase in Spec FP constitute an operator chain with a unique focus. The chain can only consist of wh-operators (1b), while such a chain cannot be obtained by adjunction of non-wh phrases (1a). Thus, (4a) will be rejected for failing to meet the focus requirement.

Clearly Puskàs' way of accounting for the difference in (1a,b) is quite ad hoc, since she does not explicate why the focus factorization cannot apply in multiple focalization of non-wh phrases. In section 2, we will offer a less ad hoc explanation of the difference in (1a,b), specifically proposing that wh-phrases and non-wh focussed phrases are provided with two different maximal features, [+wh,+focus] and [+focus], respectively, and F^0 co-occurring with a wh-phrase (more generally F^0 in interrogative sentences) is assigned [+wh,+focus], F^0 co-occurring with a non-wh focussed phrase being assigned the feature [+focus].

2. A New Explication

We assume that a wh-phrase is provided with the maximal feature [+wh,+focus] in its base position in addition to the postulation that F co-occurring with the wh-phrase is also assigned the same feature. Likewise, it is assumed that a non-wh focussed phrase is given the maximal feature [+focus] with the same feature assigned to F dominating the phrase involved.

Along with Contreras (1991) who deals with the parallel Spanish data, I (precisely, Agr) can be parametrized with respect to the feature [\pm lexical], with Hungarian and Spanish marked positive and English and French, for instance, marked otherwise. Consequently, Hungarian I^o has the maximal projection identified with I', thus with no Specifier position. In parallel with Contreras (1991) who modifies Rizzi's (1990) Relativized Minimality in which three types of potential antecedent governors are assumed: X^o, A-Specifier and A'-Specifier, by adding a fourth type of potential governor, namely, Adjunct, we define Relativized Minimality (henceforth, Extended Relativized Minimality) as shown in (5) (with (6) being hypotheses as to the transmission of the features ([+focus],[+wh,+focus]) assigned to F^o) : ⁴⁾

(5) Extended Relativized Minimality (ERM):

X antecedent-governs Y only if there is no Z, Z (X^o, A-Specifier, A'-Specifier, and Adjunct which is strictly adjacent to and in the same adjunction direction as X) such that

- (a) Z is a typical potential antecedent-governor for Y, and
- (b) Z c-commands Y and does not c-command X.

(6) Hypotheses:

- (a) In the Focalization of wh-phrases, F^o, assigned the maximal feature [+wh,+focus] obligatorily transmits the component [+wh] to I^o.
- (b) In the Focalization of non-wh phrases, F^o, assigned the maximal feature [+focus], obligatorily transmits the same feature to I^o. ⁵⁾

Now we are in a position to elucidate the difference in (1a,b). In (1a), the feature [+focus] is transmitted to I^o, so that a non-wh phrase with the same maximal feature has to move through the checking domain (that is, left-adjointed position of I') (see the derivation of (1a,b) in (7a,b), respectively).

- (7) a. [FP "János_i [FP "Marit_j [F' szereti [I' t_j' [I' t_j' [I' t_v [VP t_v t_j t_i]]]]]]]]
 b. [FP "kinek_i [FP "mit_j [F' hozott [I' t_v [VP János t_v t_j t_i]]]]]]? ⁶⁾

The above derivation is rejected by Empty Category Principle (ECP), since the intermediate trace (t_j') constitutes an ERM barrier, making it impossible to fulfill the antecedent government for the traces (t_j', t_i). On the other hand, in the focalization of a wh-phrase, in which only the component [+wh] of the feature [+wh,+focus] is transmitted from F^o to I^o, the wh-phrases (kinek_i, mit_j) do not have to move through the checking domain of I^o. Thus, there is no offending trace to be found in (7b) (= (1b)) as far as ECP is concerned. Needless to say, the other requirement for a trace, i.e., that of head government, is fulfilled by adopting the following definition:

- (8) Head Government: X head– governs Y iff
- (i) a. X is a head
 - b. X m– commands Y
 - (ii) X= { [\pm V, \pm N], C, F, and I (Agr and T) }
 - (iii) a. no barrier intervenes
 - b. Extended Relativized Minimality is respected.

The same line of reasoning which properly accounts for (1a,b) seems to reject the following examples in which there are a wh–phrase and a non–wh phrase focussed at the same time, and the features [+wh] and [+focus] are transmitted to I^0 , thus making it necessary for the wh–phrase to pass through the checking domain of I^0 :

- (9) a. * "mit "János látott? (Puskàs 1992:14c)
 what–ACC John– NOM see– PAS
 b. * "János "mit látott?

The ungrammatical status of (9a) is in sharp contrast to the grammatical status of (10a), in which NP (Réka) is focalized together with the movement of the adjunct miért ("why") ((10b) being the derivation of (10a)):

- (10) a. "miért "Réka sirt? (Puskàs 1992: fn.29)
 why Reka– NOM cry– PAS
 ‘ why is it Reka that cried? ’
 b. [FP "miért_i [FP "Réka_j [F' sirt [I' t_j' [I' [I' t_v [VP t_j t_v] t_i]]]]]]]?

This contrast can be accounted for by postulating that the adjunct miért ("why") is generated in the right–adjoined position of I'. In (10b), the adjunct, located in the right–adjoined position of I', is within the checking domain of I^0 , even though the features [+wh] and [+focus] are transmitted to I^0 , and so does not have to adjoin to the same I^0 . In sum, (10a) contains no offending trace, thus being judged grammatical. The same line of reasoning will properly explain the difference in the following examples:

- (11) a. "miért mondta János hogy sirt Réka? (Puskàs 1992: fn.29)
 why say– PAS John– NOM that cry– PAS Réka– NOM
 ‘ why did John say that Réka cried? ’
 b. "miért "János mondta hogy sirt Réka? (ibid.)
 ‘ why is it John who said that Réka cried? ’

In (11a), the adjunct (miért), which is moved to the matrix Spec FP, can question either the main or the embedded clause. However, in (11b), the existence of János in Spec FP blocks the construal of the embedded clause (ECP violation). The question of the matrix subject (János) is the only interpretation. As pointed out in Puskàs (1992: fn.29), when

miért is not in Spec FP (examples (10a) and (11b)), it cannot have scope over the whole sentence (i.e., it does not c-command IP); it can only be construed with the NP it precedes (constituent question). Though detailed discussion is in order, we will tentatively assume that unlike the other wh-phrases, at its final movement stage the adjunct (miért) has to left-adjoin to a focussed element which is moved to Spec FP, thus c-commanding only the focussed element, not IP. On the other hand, in (11a), the adjunct is moved to the matrix Spec FP, thus, c-commanding the entire IP.

3. Level Stress vs. Eradicating Stress

To begin with, it is crucial to distinguish two types of Hungarian sentences, that is, neutral sentences and corrective ones. The former types exhibit level stress pattern (12a–b), while the latter are shown in (12c–d), in which there is what we refer to as an eradicating stress ("), i.e. a main stress which eliminates all subsequent (level) stresses, and thus cannot be followed by any more main stress:

- (12) a. 'Péter 'meg-várta [_{VP} 'Marit a 'klubban] (Kálmán et al. 1986:(3))
 Peter–NOM RC–wait for–PAS Mary–ACC at the club
 ' Peter waited for Mary at the club '
 b. * 'Péter 'várta [_{VP} 'meg 'Marit a 'klubban]
 c. 'Péter "meg-várta [_{VP} Marit a klubban] (Kálmán et al. 1986:(1))
 ' what Peter actually did was to wait for Mary at the club '
 d. 'Péter "Marit várta [_{VP} meg a klubban] (ibid.:(2))
 ' It is Mary that Peter waited for at the club '

In (12), meg is one of the reduced complements (RCs), which constitutes a kind of complex verb together with V.⁷⁾ It is to be noted that RC cannot appear within VP, that is, it obligatorily moves to a preverbal position, which we assume to be Spec FP as postulated in the literature (e.g., Kiss 1986; Kenesei 1986; Puskás 1992 among others). However, in neutral sentence negation, RC remains within VP, as shown in (13) (the negative marker X⁰ (nem) in Hungarian is obligatorily preverbal, that is, the marker is adjoined to the verb complex in F⁰ due to the fact that nem ([+neg]) has to be checked in F⁰ with the maximal–zero feature [+neg] assigned):⁸⁾

- (13) a. 'Mari 'nem fordította 'le a 'cikket] (Piñón 1993:(2c))
 Mary–NOM NEG translate–PAS RC the article–ACC
 ' Mary did not translate the article '
 b. * 'Mari 'le 'nem fordította [_{VP} a 'cikket]
 c. 'Péter "be nem rúgott (Szabolcsi 1981: (52))
 Peter RC (in) NEG kick–PAS
 ' Peter did not get drunk by any means '

It is to be noted that nem+V⁰ is assigned an level stress. The difference in (12a,b) and that in (13a,b) will be accounted for by setting up the following hypotheses:

(14) Hypotheses for Hungarian:

- (a) RC and F⁰ co-occurring with it are facultatively assigned the feature [+focus], also in level stress sentences.⁹⁾
- (b) In a level stress sentence containing RC in it, the derivation in which neither the maximal feature [+focus] nor the maximal-zero feature [+neg] is checked is rejected.
- (c) The derivation in which both an element in F⁰ and an element in Spec FP are assigned a main (eradicating or level) stress is rejected.

Given the hypotheses in (14a–c), the differences in (12a,b) and (13a,b) can properly be accounted for. (12b) is judged to be ungrammatical, since neither the maximal feature [+focus] nor the maximal-zero feature [+neg] is checked. (13b) is rejected by hypothesis (14c), since RC (le) and F⁰ (nem fordította) are both given a main stress, while in (13a) SpecFP is empty and the maximal-zero feature is properly checked. In contrast to (13b), (13c), an eradicating stress sentence, is predicted to be grammatical, since an eradicating stress eliminates all subsequent main stresses, thus without contravention of the stress assignment limitation (hypothesis (14c)).

The same line of reasoning will correctly explain the eradicating stress sentences in (12c–d) and the following ones (detailed discussion being omitted):

- (15) a. "ki fordította le a cikket? (Piñón 1993: (5a))
 who– NOM translate– PAS RC the article– ACC
 ‘ who translated the article? ’
 b. * "ki le– fordította a cikket? (ibid.: (5b))

4. Problems and Concluding Remarks

In this final section, we will discuss extraction of wh–phrases from subordinate clauses. First we will comment on Puskàs’ (1992) explanation of wh–extraction from embedded clauses, such as (16) and (17):¹⁰⁾

- (16) (Puskàs 1992: fn.20; (49a); (49c); (49d)))
 a. "kinek "mit akarsz hogy mondjunk?
 who– DAT what– ACC want– PRES that say– SUBJ
 ‘ what do you want (hope) that we say to whom? ’
 b. 'Réka nem tudta hogy 'Péter "kinek "mikor "mit hozott
 Réka– NOM NEG know– PAS that Peter– NOM who– DAT when
 what– ACC bring– PAS

- ‘ Reka didn’t know what Peter had brought when to whom ’
- c. ‘Réka "mit_i nem tudta hogy [_{FP} t_i [_{FP} mikor [_{FP} mit [_F hozott Péter]]]]?’
- ‘ what didn’t Reka know to whom Peter had brought when? ’
- d. * ‘Réka "kinek_i "mit_j nem tudta [_I t_i [_I t_j [_I Φ hogy mikor hozott Péter]]]]?’
- (17) (Puskàs 1992: (63a); (63b))
- a. "kinek_i nem tudod hogy [_{FP} t_i [_{FP} mit [_{FP} hogyan [_F mondjál]]]]?’
- who– DAT NEG know– PRES that what– ACC how say– SUBJ
- ‘ to whom don’t you know what you should say how? ’
- b. * "hogyan_i nem tudod hogy [_{FP} t_i [_{FP} kinek [_{FP} mit [_F mondjál]]]]?’
- ‘ how don’t you know what to say to whom? ’

She postulates that this type of extraction is possible only through the embedded Spec CP, arguing that just one wh–phrase can be extracted from the embedded clause (notice that she assumes Relativized Minimality formulated by Rizzi (1990), not ERM) . From this it follows that (16d) is predicted to be ungrammatical, in contrast to (16b–c). On the other hand, the contrast in (17a,b) clearly reveals an instance of argument–adjunct asymmetry. She adopts the analysis in Rizzi (1990), in which, in the case of an argument bearing a referential index, e.g. kinek ("to whom"), antecedent government requirement can be replaced by Binding between the argument wh–operator and its trace (variable). Thus, (17a) will be predicted grammatical with respect to ECP. However, the adjunct wh–phrase (hogyan) does not bear a referential index, so the binding relation applied above cannot hold and the identification of the variable can be fulfilled only by antecedent government. Because of the embedded Spec FP constituting a RM barrier, (17b) is ruled out by ECP.

Clearly Puskàs’ explanation fails in accounting for (16a), which will be ruled out according to her analysis. In our framework, (16a) will be predicted to be grammatical just as (1b) is, in contrast to (16c–d) and (17a–b) which are ruled out because of ECP violation. It is assumed that in (16c–d) and (17a–b), the matrix V selects C ° [+wh,+focus], which is, in turn, transmitted successively to F ° and I ° . The above problem will be overcome by postulating the following hypotheses, as in Ishioka (1995):

- (18) Hypothesis: Binding instead of antecedent government is confined to a long distance argument wh–phrase in the movement stage within the embedded CP.
- (19) Hypothesis: The whole feature [+wh,+focus] assigned to the matrix F ° is transmitted to I ° when the matrix V selects CP (e.g. indicative CP) in which I ° bears the feature [+tense] independent of the matrix tense feature.

In (16a), the matrix V is subcategorized for a Subjunctive CP in which the feature [+tense] is dependent on the matrix tense feature in I ° . Consequently the wh–phrases [kinek, mit] do not have to move via adjoining to I ° , since only the component [+wh] of

the feature [+wh,+focus] of the matrix F^0 is transmitted to I^0 (thus leading to the grammaticality of (16a)). On the other hand, in (16d), the wh-phrases (kinek, mit) obligatorily move through the checking domain of I^0 , since the feature [+wh,+focus] assigned to the matrix F^0 is transmitted to I^0 (Hypothesis (19)). However, this derivation, in which the wh-phrase (mit) constitutes an ERM barrier, will be rejected by ECP. The derivation of (17b) in which the adjunct wh-phrase (hogyan) is a long distance wh-phrase is ruled out by ECP, since the wh-phrase (kinek) forms an ERM barrier and replacement of antecedent government by Binding does not apply (Hypothesis (18)). In contrast to (17b), (16c) and (17a) which contain an argument element as a long distance wh-phrase will be predicted to be grammatical.

Other things being equal, so far as ECP is concerned, our line of reasoning will predict the following examples to be grammatical (to be checked elsewhere):

- (20) a. "kinek "mit nem tudod hogy hogyan mondjál?
 who-DAT what-ACC NEG know-PRES that how say-SUBJ
 b. 'Réka "hogyan (nem) tudta hogy mit hozott Máriának Péter?
 Réka how (NEG) know-PAS that what-ACC bring-PAS Mary-DAT Peter-NOM

The present study is just the beginning of further study on the subject, and, needless to say, the hypotheses built up in this article remain to be refined.

Notes

- 1) At the beginning of focussed elements we position the mark ("), which indicates an eradicating stress. Similarly, elements assigned a level stress (which is to be explicated below) are indicated by the mark (').
- 2) NP (János) in (3a) is in the topic position. The detailed discussion of the concrete location of a topicalized element and the process of topicalization (moving strategy or base-generation) are beyond the scope of this article.
- 3) It is necessary to distinguish between the zero feature [+focus] and the maximal feature [+focus]. The former is a strong morphological feature, like the features [+tense] and [+agreement], which have to be deleted via checking at PF, thus forcing the verb to move to F^0 (Chomsky 1992), while the latter maximal feature [+focus] does not delete even after checking. It is tentatively assumed that the checking of the zero feature assigned to a head is the verb's left adjunction to the head. The checking domain of the maximal feature assigned or transmitted to a X^0 category is the Spec position of the zero category or the adjoined position of the maximal projection (XP or X'). Furthermore, it is assumed that elements move through Spec XP, or otherwise via the left-adjoined position of the maximal projection (XP or X') when Spec XP is filled with some element or there exists no Spec position. In the case of a wh-phrase moving upwards, with left-adjoined position of FP and Spec FP filled with wh-phrases Y and Z, respectively, the moving wh-phrase left-adjoins to Y in order to avoid ECP violation (this possibility is confined to the final movement stage of the wh-phrase while in an intermediate movement stage, the moving wh-phrase left-adjoins to FP).

- 4) In this article, we assume the conjunctive definition of proper government (Empty Category Principle (ECP)). We refer to a barrier by the definition in (5) as an ERM barrier. Government is defined by m-command, not by c-command.
- 5) Also in Ishioka (1995), much the same line of reasoning is applied to the Spanish focalization and wh-movement.
- 6) Thus, we assume that in Hungarian, wh-phrases do not occupy Spec CP, but Spec FP.
- 7) See Kiss (1986; 1987) for other types of RC.
- 8) This maximal-zero feature is like the maximal feature in that the feature checked is not deleted, and is like the zero feature in that it conforms to the checking pattern of the zero feature. It is assumed that the sentence negative nem is generated as the head of NegP which, in turn, is in sisterhood of I⁰ (Puskàs 1992).
- 9) In level stress sentences, it is assumed that the feature [+focus] is transmitted to I⁰.
- 10) The derivations are those postulated by our framework (to be elucidated later). See fn. (3) for the location of kinek in (16b).

References

- Brody, Michael (1995) Lexico-Logical Form, A Radically Minimalist Theory. MIT Press, Cambridge.
- Chomsky, Noam (1992) "A Minimalist Program for Linguistic Theory." MIT Occasional Papers in Linguistics 1.
- Contreras, Heles (1991) "On the Position of Subjects." Rothstein, S. (ed.) Syntax and Semantics 25.
- Haegeman, Liliane (1995) The Syntax of Negation. Cambridge University Press, Cambridge.
- Haegeman, Liliane and Raffaella Zanuttini (1991) "Negative Heads and the Neg Criterion." The Linguistic Review 8, 233–251.
- Horváth, Julia (1986) FOCUS in the Theory of Grammar and the Syntax of Hungarian. Foris, Dordrecht.
- Ishioka, Seizo (1995) "A Note on Spanish Wh-Movement, in Relation to Topicalization and Left-Dislocation." Linguistic Society of West Japan NIDABA 24, 56–65.
- Kálmán, L., G. Prószéky, Á. Nádasdy, and C. Kálmán (1986) "Hocus, Focus, and Verb Types in Hungarian Infinitive Constructions." Abraham, Werner and Sjaak de Meij (eds.) Topic, Focus, and Configurationality. John Benjamins, Amsterdam.
- Kenesei, István (1986) "On the Logic of Word Order in Hungarian." Abraham, Werner and Sjaak de Meij (eds.) Topic, Focus, and Configurationality. John Benjamins, Amsterdam.
- Kiss, Katalin E. (1981) "Structural Relations in Hungarian, A Free Word Order Language." Linguistic Inquiry 12/2, 185–213.
- Kiss, Katalin E. (1986) "The Order and Scope of Operators in the Hungarian Sentence." Abraham, Werner and Sjaak de Meij (eds.) Topic, Focus, and Configurationality. John Benjamins, Amsterdam.
- Kiss, Katalin E. (1987) Configurationality in Hungarian. Reidel, Dordrecht.
- Piñón, Christopher (1993). "SigmaP and Hungarian." WCCFL 11, 388–404.
- Puskàs, Genoveva. (1992) "The Wh-Criterion in Hungarian." Rivista di Grammatica Generativa 17, 141–186.
- Rizzi, Luigi (1990) Relativized Minimality. MIT Press, Cambridge.
- Szabolcsi, Anna. (1981) "The Semantics of Topic-Focus Articulation." Groendendijk et al. (eds.) Formal Methods in the Study of Language. Mathematisch Centrum, Amsterdam.