Scalar adverbs and focus

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1. Introduction

Positive adverbs of degree, manner, and frequency, and their negative counterparts occupy different word order positions in the Hungarian sentence. Whereas positive adverbs are adjoined to the predicative phrase (a PredP), negative adverbs undergo focus movement, landing in Spec,FocP. This chapter aims to reveal what motivates the obligatory focussing of negative predicative adverbs. It will be claimed that the constraint forcing these adverbs into focus position is semantically motivated. The adverbs of degree, manner, and frequency in question are all scalar elements. The basic meaning of a scalar element *n* is 'at least *n*'. It will be argued that in the negative domain of bidirectional scales the 'at least *n*' interpretation leads to a semantic anomaly, hence it must be blocked. It can be blocked by the focussing of the scalar element, owing to the 'exhaustive identification' function of structural focus.

The chapter is organized as follows. Section 2 presents the Hungarian facts to be accounted for. Section 3 examines the word order and interpretation possibilities associated with numerical modifiers, the simplest kind of scalar elements, showing that they have an 'at least *n*' reading out of focus, and an 'exactly *n*' reading in focus. Section 4 explains why the „at least *n*' interpretation is regarded as the basic meaning of scalar elements, and under what condition pragmatic implicature can supplement it with an upper bound. Section 5 examines the word order position and interpretation of scalar elements in the negative domain of bidirectional scales. Section 6 discusses why focussing obligatorily changes the 'at least *n*' reading to 'exactly *n*'. Finally, section 7 extends the generalizations to gradable adverbs.

2. The problem

One of the oldest problems of Hungarian syntax, challenging linguists for more than 130 years (see e.g. Arany 1873) is why positive adverbs of degree, manner, and frequency, and their negative counterparts occupy different word order positions; why positive adverbs are followed by a 'particle, V' string, whereas negative adverbs must be followed by a 'V, particle' order. For example:

(1)a. *János **nagyon** el- fáradt*. 　(2)a.**János **alig** el- fáradt.*

　　John   very.much PRT got.tired 　　　John barely PRT got.tired

　　'John got tired very much.' 　　　　　'John barely got tired.'

b.*_János **nagyon fáradt el**._   b. _János **alig fáradt el**._

Positive adverbs of manner and frequency, unlike positive adverbs of degree, can occur in both word order patterns. Negative adverbs of manner and frequency, similar to negative adverbs of degree, must be adjacent to the V:

(3)a. _János **jól   meg-oldotta** a   feladatot._   (4)a.*_János **rosszul meg-oldotta** a   feladatot._
    John well PRT solved the problem   John   badly   PRT solved the problem
    'John solved the problem well.'   'John solved the problem badly.'
  b. _János **jól oldotta meg** a feladatot._   b. _János **rosszul oldotta meg** a feladatot._

(5)a. _János **gyakran el-   késik**._   (6)a.*_János **ritkán   el-   késik**._
    John   often   PRT late.is   John   seldom PRT late.is
    'John is often late.'   'John is seldom late.'
  b. _János **gyakran késik el**._   b. _János **ritkán késik el**._

   The generative syntactic research of the past decades has not found an explanation for the mystery represented by (1)-(6), either; it has merely provided a more precise formulation of the problem. Positive adverbs preceding the particle verb, e.g. those in (1a), (3a), and (5a), have been analyzed in É. Kiss (2002, 2007, 2008) to be adjoined to the predicate phrase (a PredP). The immediately preverbal slot occupied by negative adverbs, e.g. those in (2b), (4b), and (6b), on the other hand, has been identified as a structural focus position. Though negative adverbs appear to be closer to the verb, they have turned out to be farther out in the left periphery; they occupy the specifier of a Focus Phrase (FocP), a projection proposed by Brody (1990, 1995). The Foc head cannot directly merge with PredP; PredP must first project a so-called Non-Neutral Phrase (NNP), presumably a realization of Rizzi's (1997) FinP (cf. Olsvay 2000 and É. Kiss 2008). The V raises into the NN head, crossing the verbal particle in Spec,PredP. Compare:

(7) a. _János nagyon   el-   késett._
    John very.much PRT late.was
    'John was late very much.'

  b.   TopP

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        Spec      PredP
        János
               nagyon    PredP

                      Spec      Pred'
                       el
                            Pred        VP
                           késett
                                   ̶J̶á̶n̶o̶s̶  ̶k̶é̶s̶e̶t̶t̶  ̶e̶l̶
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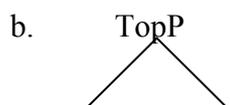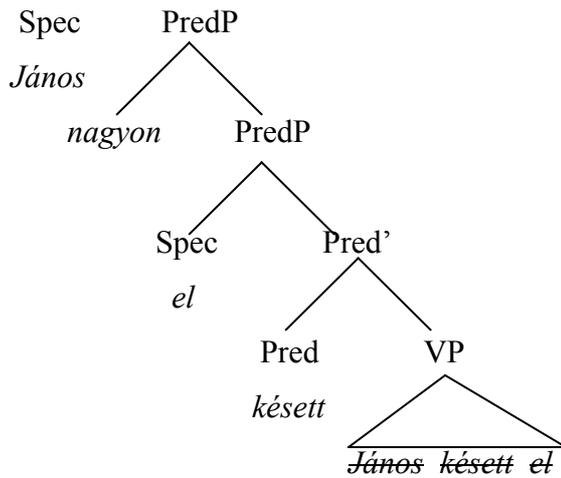
(8)a. *János ALIG késett   el.*

   John   barely late.was PRT

   'John was barely late.'

b.   TopP

       Spec   FocP
       János
              Spec   NNP
              alig
                   NN   PredP
                  késett
                        Spec   Pred'
                         el
                              Pred   VP
                             ̶k̶é̶s̶e̶t̶t̶
                                      ̶J̶á̶n̶o̶s̶ ̶k̶é̶s̶e̶t̶t̶ ̶e̶l̶
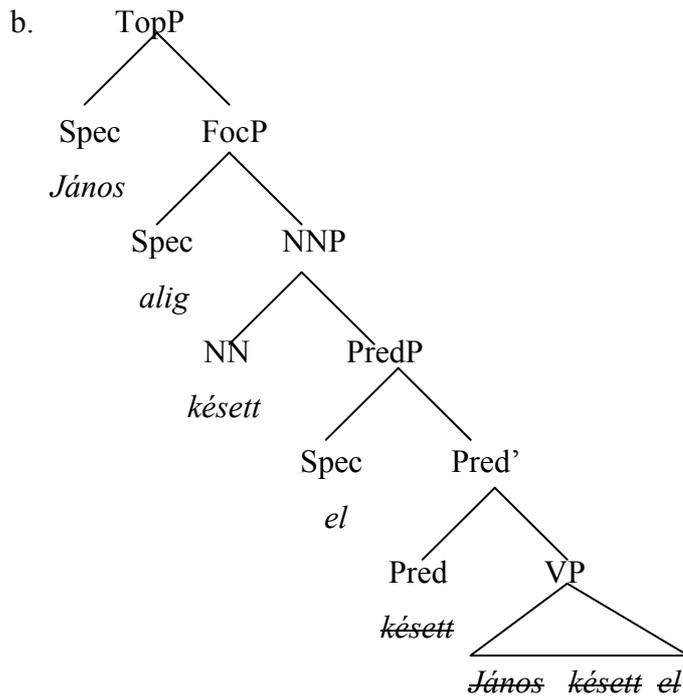
Whereas a negative adverb of degree, manner, or frequency is ungrammatical either in Pred-P-adjoined position or in vP-adjoined position (see (9a,b)), it can stand postverbally if and only if the clause contains a preverbal focus (see (9c)). This distribution of grammaticality follows if (9c) contains two FocPs subsuming two NNP projections, with the V moved into the higher NN head. (For further evidence, see É. Kiss (1998)).

(9)a.*[TopP Jánosᵢ [PredP alig [PredP meg-értett€ⱼ [vP tᵢ tⱼ amit mondtam]]]]

  b.*[TopP Jánosᵢ [PredP meg-értette ⱼ [vP alig [vP tᵢ tⱼ amit mondtam]]]]

  c. [FocP *JÁNos* [NNP *értette*ᵢ [FocP **ALIG** [NNP' tᵢ [PredP tᵢ]]]]]]

    'It is only two subjects that John teaches RARELY.'

Assuming these structures, the primary research question is why negative adverbs of degree, manner, and frequency must be moved into Spec,FocP. The distribution of their positive counterparts raises a further question: why positive adverbs of degree – unlike positive adverbs of manner and frequency – cannot be focussed.

    Whereas positive adverbs of degree and manner can only be adjoined to PredP, positive adverbs of frequency can also have scope over, and be adjoined to, the focus projection. (This fact has a semantic reason: whereas adverbials of degree and manner can only modify events, mapped on PredPs in syntax, adverbs of frequency are semantically compatible also with the exhaustive identification expressed by focus constructions.)

(9) [TopP *János* [FocP **gyakran** [FocP *csak KÉT TÁRGYAT* [NNP *tanít*ᵢ [PredP tᵢ]]]]]

     John   often   only two subjects   teaches

  'It is often only two subjects that John teaches.'

If a negative adverb of frequency is intended to take scope over a focus, another NNP and another FocP must be generated for it – see (10a). In (10b) the negative adverb of frequency occupies the lower one of the two focus positions. In the case of FocP iteration, the V moves through the lower NN and Foc heads into the higher NN:

(10)a. [TopP *János* [FocP **RITKÁN** [NNP *tanít*ᵢ [FocP *csak KÉT TÁRGYAT* [NNP tᵢ [PredP tᵢ]]]]]]

       John   rarely   teaches   only two subject

    'RARELY does John only teach TWO SUBJECTS.'

  b. [TopP *János* [FocP *csak KÉT TÁRGYAT* [NNP *tanít*ᵢ [FocP **RITKÁN** [NNP' tᵢ [PredP tᵢ]]]]]]

    'It is only two subjects that John teaches RARELY.'

As was already noticed in the 19th century, noun phrases modified by *sok* 'many, much' pattern with positive adverbs, whereas noun phrases modified by *kevés* 'few, little' pattern

with negative adverbs as regards their word order possibilities. *Sok* phrases are presumably adjoined to PredP via Q-Raising. Compare:

(11)a. *János* [PredP **sok   feladatot** [PredP *meg-oldott*]]

       John   many problem-ACC   PRT solved

       'John solved many problems.'

   b. *János* [FocP **SOK FELADATOT** [NNP *oldott* [PredP *meg*]]]

       'It was many problems that John solved.'

(12)a.*János [PredP **kevés feladatot** [PredP *meg-oldott*]]

       John   few   problems   PRT solved

   b. *János* [FocP **KEVÉS FELADATOT** [NNP *oldott* [PredP *meg*]]]

       'It was few problems that John solved.'

Traditional Hungarian grammars call positive adverbs and *sok* phrases, occurring in a PredP-adjoined position, „inclusive" expressions, and negative adverbs and *kevés* phrases, restricted to focus position, exclusive expressions. It is the syntactic behavior of exclusive expressions that is perplexing; what needs to be explained is what property of exclusive expressions is responsible for their obligatory focussing. It will be claimed that the property interacting with focus function is their scalar nature (see Ernst (2002), who calls adverbs of degree, manner, and frequency gradable adverbs).

   As a first step of understanding the correlation between the syntactic placement possibilities and the interpretations of scalar elements, let us examine the behavior of their simplest and most transparent kind, numerical modifiers.

3. The position and interpretation of numerically modified expressions
Numerically modified expressions can appear both adjoined to PredP, in the position of inclusive expressions, and in Spec,FocP, the position of exclusive expressions, and in the two positions they are associated with slightly different interpretations. Compare the following Hungarian examples and their English paraphrases:

(13)a. *János* [PredP **két doboz cigarettát** [PredP *el- szívott   máma*]]

       John   two packet cigarette   PRT smoked today

     'John has smoked two packets of cigarettes today.'

b. *János* [FocP ***KÉT DOBOZ CIGARETTÁT*** [NNP *szívott* [PredP *el máma*]]]

    'It is two packets of cigarettes that John has smoked today.'

(14)a. *János* [PredP ***15 palacsintát*** [PredP *meg-eszik*]]

    John   15 pancakes   PRT eats

    'John eats 15 pancakes.'

b. *János* [FocP ***15 PALACSINTÁT*** [NNP *eszik* [PredP *meg*]]]

    'It is 15 pancakes that John eats.'

Whereas in the (a) sentences, instantiating the inclusive word order pattern, *két doboz cigarettát* means 'at least two packets of cigarettes', and *15 palacsintát* means 'at least 15 pancakes', in the exclusive (b) sentences *két doboz cigarettát* means 'exactly two packets of cigarettes', and *15 palacsintát* means 'exactly 15 pancakes'. In fact, the interpretation 'at least *n*' is not restricted to the PredP-adjoined position. A numerical modifier *n* is understood as 'exactly *n*' only in focus position; it means 'at least *n*' everywhere else, e.g. in VP-internal position – see (15a) and (16a):

(15)a. [PredP *Van **két fiam***]   *mégis magam seprem a   havat.*

          are   two son-1SG still   myself   sweep-I the snow

    'I have two sons, still I sweep the snow myself.'

b. [FocP ***KÉT FIAM*** [NNP *van*]] *mégis magam seprem a havat*.

    'TWO SONS I have, still I sweep the snow myself.'

(16)a. *János* [PredP *haza-visz   **félmillió**   **forintot** havonta*]

    John   home takes half-a-million forint   monthly

    'John takes home half a million forints a month.'

b. *János* [FocP ***FÉLMILLIÓ FORINTOT*** [NNP *visz* [PredP *haza havonta*]]]

    'It is half a million forints that John takes home a month.'

(15a) can also be said by a person who has three sons, but one of them does not live at home any longer. (15b), on the other hand, would be false in this situation. Similarly, (16a) is true and (16b) is false if John takes home 550 000 forints a month.[1]

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[1] According to a reviewer, the numerical expressions in (15b) and (16b) do not have an 'exactly *n*' reading if the numeral is destressed. I disagree with this judgment, and so do the informants I asked. (15b) means 'I have

A numerical modifier *n* in topic position can also be interpreted as 'at least *n*'. The following sentences remain true if John took home 550 000 forints and if he eats 16 pancakes.

(17)a. [TopP ***Félmillió   forintot*** [FocP *csak EGYSZER* [NNP *vitt   haza János*]]]

        half-a-million forint-ACC only once   took home John

    'Half a million forints, John has earned only ONCE.'

  b. [TopP ***15 palacsintát*** [FocP *csak JÁNOS* [NNP *eszik meg a   családban*]]]

       15 pancake-ACC only John   eats PRT the family-in

    '15 pancakes, only JOHN eats in the family.'

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exactly two sons', and (16b) means 'John earns exactly half a million forints' also if the numerals are presupposed and destressed, i.e., if (15b) appears in a context like (i), and (16b) appears in a context like (ii):

(i) A: [FocP *Két LÁNYOD   van*]?
        two daugher-2SG are
     'Is it two DAUGHTERS that you have?'
  B: *Nem*, [FocP *Két FIAM   van*]
    no   two son-1SG are
    'No, it is two SONS that I have.'

(ii) A: *János* [FocP ***félmillió   FORINTOT*** [NNP *visz* [PredP *haza   havonta*]]]?
     John   half-a-million forint-ACC   takes   home monthly
     'Is it half a million FORINTS that John takes home a month?'
  B: *Nem*, [FocP ***félmillió   EURÓT*** [NNP *visz* [PredP *haza   havonta*]]]
        half-a-million euro-ACC   takes   home monthly
     'No, it is half a million EUROS that John takes home a month.'

The reviewer presumably had a discourse of the following type in mind:

(iii) A: *János* [PredP *haza-visz   **félmillió   forintot** havonta*]
      John   home takes half-a-million forint   monthly
      'John takes home half a million forints a month.'
  B: *Tévedsz. János* [FocP ***félmillió EURÓT*** [NNP *visz* [PredP *haza havonta*]]]
      'You are wrong. It is half a million EUROS that John takes home a month.'

The sentence uttered by B in (iii) does not seem to be a regular focus construction. It is a corrective version of the sentence uttered by A, in which the constituent to be corrected is moved to Spec,FocP, but the interpretation of the original sentence is preserved. In corrective sentences, the constituent to be corrected is merely highlighted in Spec,FocP, without assuming a regular focus interpretation. E.g. an existential quantifier of the *vala-* 'some-' type is barred from Spec,FocP because its meaning is incompatible with the exhaustive identification associated with focus – see (iv); still it must appear in focus position if it represents a correction, as in (v):

(iv)*[FocP *Valakit   * [NNP *vettem   észre*]]
      somebody-ACC   noticed-I PRT
    'It was somebody that I noticed.'

(v) A: [PredP *Észre-vettél   valamit*]?
        PRT noticed-you something-ACC
    'Have you noticed something?'
  B: *Nem.* [FocP *ValaKIT   * [NNP *vettem   észre*]]
    no   something-ACC   noticed-I PRT
    'No. It was someBODY that I noticed.'

A postverbal numerically modified expression tends to be understood as 'exactly *n*' if the sentence also contains a preverbal focus. Obviously, such sentences are analyzed to involve an iterated focus projection, with the postverbal numerically modified expression also occupying Spec,FocP:

(18)a. [FocP *JÁNOS* [NNP *szív*$_i$ [FocP ***KÉT DOBOZ CIGARETTÁT*** [NNP t$_i$ [PredP *el* t$_i$ *naponta*]]]]]
      John   smokes two packet cigarette   PRT daily
   'It is John who smokes TWO PACKETS OF CIGARETTES a day.'
  b. [FocP *PÉTERNEK* [NNP *van*$_i$ [FocP ***KÉT FIA*** [NNP t$_i$ [PredP t$_i$]]]]]
      Peter-DAT   is   two son-3SG
   'It is Peter who has TWO SONS.'

On the basis of examples (13)-(18), we can formulate the following generalization:

(19) In natural language, a numerical modifier *n* means 'at least *n*' – unless the numerically modified expression is in focus position, where *n* means 'exactly *n*'.

The meaning difference between focussed and non-focussed numerically modified expressions is even more transparent under negation. Compare:

(20)a. [PredP *Nincs **két fiam***]
       isn't   two son-1SG
   'I don't have two sons.'
  b. [NegP *Nem* [FocP ***KÉT FIAM*** [NNP *van*$_i$ [PredP t$_i$]]]]
        not   two son-1SG   is
   'It is not two sons that I have.'

(21)a. *János* [NegP *nem* [NNP *visz*$_i$ [PredP *haza* t$_i$ ***félmillió   forintot*** *havonta*]]]
     John   not   takes   home half-a-million forint   monthly
   'John doesn't earn half a million forints a month.'
  b. *János* [NegP *nem* [FocP ***FÉLMILLIÓ FORINTOT*** [NNP *visz*$_i$ [PredP *haza* t$_i$ *havonta*]]]]
   'It is not half a million forints that John earns a month.'

(20a) expresses that 'the number of my sons is less than two', and (21a) expresses that 'John takes home less than half a million forints a month', i.e., a negated 'at least *n; n* or more' means 'less than *n*'. (20b), on the other hand, can be true whether the number of my sons is more or less than two. (21b), too, can be true whether John earns more or less than half a million forints. That is, a focussed numeral *n*, when negated, is understood as 'a number other than *n*'. (The focus is associated with an existential presupposition, hence (20b) cannot mean that I have no sons, and (21b) cannot mean that John does not earn anything.)

The observation that numerical modifiers elicit an 'at least *n*' interpretation out of focus, and an 'exactly *n*' interpretation in focus position, can also be extended to indefinite numerals. Compare:

(22)a. *János* [PredP *félre-tett **néhány/pár   forintot**] így el tud menni nyaralni.*
       John   aside put some/couple forint   so   off can go   vacation-INF
       'John has put aside some/a couple of forints, so he can go on vacation.'

   b.%*János* [PredP *félre-tett **néhány/pár   forintot**] így nem tud el-menni nyaralni.*
       John   aside put some/couple forint   so   not can off go   vacation-INF
       'John has put aside some/a couple of forints, so he cannot go on vacation.'

(23)a.%*János* [FocP ***NÉHÁNY/PÁR   FORINTOT*** [NNP *tett félre*]] *így el tud menni nyaralni.*
       John   some   /couple forint   put aside so off can go   vacation-INF
       'It is some/a couple of forints that John has put aside, so he can go on vacation.'

   b. *János* [FocP ***NÉHÁNY/PÁR FORINTOT*** [NNP *tett félre*]] *így nem tud el-menni nyaralni*.
       'It is some/a couple of forints that John has put aside, so he cannot go on vacation.'

The non-focussed *néhány forint/pár forint* 'some forints/a couple of forints' evokes the 'at least *n*'; '*n* or more' reading expected, hence (22a) is meaningful as an understatement, whereas (22b) is incomprehensible. The focussed *néhány forint/pár forint* in (23), on the other hand, does not allow an upward extending interpretation; it is understood to mean literally 'some forints/a couple of forints', a sum too small to finance one's vacation.

Sok 'many, much' phrases have already been shown by Szabolcsi (1997) to be interpreted differently in focus and in prefocus positions. In prefocus position, a quantified noun phrase has been claimed to be understood as a witness set, picking out a suitably restricted set referent and checking its members for some property. A focussed quantified noun phrase, on the other hand, has been claimed to involve a counting operation on the property denoted by

the rest of the sentence. From the present perspective, the former reading corresponds to the 'at least n' reading of definite numerals. The 'counting' interpretation of a focussed *sok* phrase, on the other hand, is similar to the absolute, non-extendable reading of definite numerals. Compare:

(24)a. *Pál is* [PredP **sok   könyvet** [PredP *ajándékba kapott   a   szüleitől*]][2]

    Paul too   many book-ACC   present-for received the parents-his-from

    'Paul, too, received many [of his] books from his parents as a present.'

    b. *Pál is* [FocP **SOK KÖNYVET** [NNP *kapott*ᵢ [PredP *ajándékba* tᵢ *a szüleitől*]]]

    'As for Paul, too, it was many books that he received from his parents as a present.'

The phrase *sok könyvet* 'many books' in (24a) is interpreted on a scale constituted by Paul's books ordered according to their origin. It has an upward extendable interpretation; it can also be associated with a scalar value that is close to – or even coincides with – the highest degree of the scale (the sentence can also be true in a situation in which the number of the books that John received from his parents as a present is close to, or identical with, the total number of his books). The *sok* 'many' phrase of (24b), on the other hand, evokes no scale and no upward extendable interpretation; the sentence simply expresses that the books that John received from his parents as a present are many in number.[3]

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[2] The subject *Pál* is modified by the particle *is* 'also' so as to prevent *sok könyvet* 'many books' from being analyzed as a topicalized referential expression. Noun phrases modified by *is* occupy a post-topic quantifier position in the Hungarian sentence.

[3] The upward extendability illustrated in (25a) is obviously a kind of monotone increase. A determiner is called left monotone increasing if increasing the extension of the noun phrase it modifies does not alter the truth of the given sentence. *Sok* 'many, much' is regarded as a left monotone increasing quantifier. Cf.

(i) *Sok   külföldi vendég érkezett.* →
   many foreign guests   arrived
(ii) *Sok   vendég érkezett.*
    many guests arrived

If the foreign guests arriving are many in number, all the guests arriving (with the locals included) must also be many in number, so (ii) is a consequence of (i). However, this kind of monotonicity characterizes the 'counting' meaning of *sok*. The upward extendability of scalar elements is a kind of left monotone increase that is different from the monotonicity illustrated in (i)-(ii) – because the extension of the noun phrase modified by the scalar element is increased along a given scale. The two types of monotonicity may have opposing directions in the case of one and the same determiner. For example, *legtöbb* in *Legtöbb diák vonattal érkezettl* 'Most students arrived by train' is left monoton decreasing in the usual sense ((iv) does not follow from (iii)), and, at the same time, it allows the upward extension of its interpretation along the scale of students.

(iii) *Legtöbb diák   vonattal érkezett.* ⚹>
   most   students by-train arrived
(iv) *Legtöbb elsős   diák   vonattal érkezett.*
   most   first-year students by-train arrived

4. Scalar implicature

In the semantics of natural languages it is a widely held view that the interpretation 'at least *n*' represents the basic meaning of numerical modifiers – see Horn (1972), Levinson (2000), and Kadmon (2001), among others. Consider the following example:

(25) John has lifted 100 kilos.

This sentence is true whether John has lifted 100, 101, 150, or 200 kilos. After all, one cannot lift 200 kilos without also lifting 100 kilos. The possibility of an upward extendable interpretation is a consequence of the nature of scales; it follows from the fact that degree *n* of a scale marks a section of the scale that forms a subsection of every higher degree of the given scale, as well. That is, the observation in (19) goes back to the following generalization:

(26) The meaning of a scalar element *n* in natural language is 'at least *n; n* or more'.

What requires an explanation is why, nevertheless, a sentence like (25) usually implicates that John has lifted at least and at most 100 kilos, i.e., exactly 100 kilos. As has been shown in connection with definite and indefinite numerals alike, the 'at least' component of their meaning is obligatorily blocked in focus position. This fact will be derived below from the exhaustive identification function of structural focus. A different question is why a numeral *n* is often interpreted as 'exactly *n*' also when it is not focussed. In the case of non-focussed scalar elements, the presence or absence of the 'at most' meaning component seems to be pragmatically conditioned. Compare:

(27)a. Who can enter the competition?
　　b. Anybody that has lifted 100 kilos.
(28)a. What is his best result?
　　b. He has lifted 100 kilos.

In (27b) the expression *100 kilos* marks the lower bound of a set of possible scalar values; in (28b), on the other hand, it is understood to mark exactly 100 kilos. The interpretation

associated with (27b) corresponds to the basic ('at least *n*') meaning of scalar elements; it is the interpretation of (28b) that also involves an upper bound ('at least *n* and at most *n*'). Because of its pragmatic motivation, the 'at most *n*' component has been analyzed as an implicature (a so-called scalar implicature – see Horn (1972)). Scalar implicatures are derived from Grice's Maxim of Quantity (1967/1975), which requires speakers to make their contribution as informative as is necessary for the current purposes of the exchange. (27b) serves the purpose of marking the lower bound of the scalar values that qualify an athlete to enter a competition – hence no scalar implicature is evoked. The exchange in (28), on the other hand, serves the purpose of specifying an athlete's best result; hence the speaker is sufficiently informative only if he/she provides an exact scalar value.

This theory of numerical indefinites has actually been questioned recently – by Horn himself in his recent studies (1992, 1996), as well as by Geurts (2006) and Breheny (2007), among others. They have put forth theories in which the 'exactly *n*' interpretation of numerals is primary, and the 'at least *n*' interpretation is derived. Breheny (2007) derives the 'at least' reading from the 'exactly' reading by pragmatic reasoning. Geurts (2006) distinguishes the quantifier and the predicate senses of a numeral, the former associated with an 'exactly' interpretation, and the latter associated with an 'at least' interpretation. The two readings are related by type-shifting rules. The Hungarian data surveyed appear to be incompatible with these views; they clearly support the traditional analysis going back to Horn (1972) and Kadmon (2001).

5. Scalar modifiers in the negative domain of bidirectional scales

Kevés könyv 'few books' is apparently a scalar expression of the same type as *sok könyv* 'many books', involving an indefinite numerical modifier. Nevertheless, both its word order possibilities and its interpretation possibilities are more constrained than those of *sok könyv*. Compare with (24a,b):

(29)a.*_Pál   is_ [PredP **kevés könyvet** [PredP *ajándékba   kapott   a   szüleitől*]]
          Paul too   few   book-ACC   present-for received the parents-his-from
    b. *Pál is* [FocP **_KEVÉS KÖNYVET_** [NNP *kapott*ᵢ [PredP *ajándékba* tᵢ *a szüleitől*]]]
        'As for Paul, too, it was few books that he received as a present from his parents.'

Unlike *sok könyvet* 'many books' in (24a), *kevés könyvet* 'few books' cannot be adjoined to PredP via Q-Raising (see 29a); it is obligatorily focussed (see 29b). Accordingly, it cannot be

associated with the upward extending interpretation of PredP-adjoined quantified expressions; *kevés könyvet* cannot be understood as 'few books or more'; (29b) can only mean that the books that John received from his parents as a present are few in number.

For Hungarian speakers, *few books* and *many books* represent opposite values in the lower and upper domains of one and the same scale. This type of scale is different from the unidirectional, increasing scale of, say, positive integers; it is a bidirectional scale, proceding from a central point into a positive and a negative direction. For Horn (1972; 1989:231), quantitative scales are defined by entailment: P_j outranks P_i on a given scale iff a statement containing an instance of the former unilaterally entails the corresponding statement containing the latter. A bidirectional scale is not a scale of this type (it is not a „Horn scale"); a statement involving a value in the positive domain of the scale does not entail a corresponding statement involving a value in the negative domain of the scale. Although *few books* could, in principle, denote a subpart of the denotation of *many books,* the bidirectionality of the scale blocks this interpretation; receiving many books from one's parents is the opposite of receiving few books from them. HenceHence the interpretation of *kevés könyvet* 'few books' is not extendable upwards; the statement *John received few books from his parents as a present* is not true in a situation in which he received many books from them.

Unidirectional negative scales actually can be treated similarly to positive scales. We only have to reverse the perspective; in their case, the lower scalar values entail the higher ones (if one has a debt, i.e., if one has -100 000 forints, he also has -50 000 forints). Problems only arise in the negative domain of bidirectional scales. That is:

(30) The 'at least *n*'; '*n* or more' reading of a scalar modifier in the negative domain of a bidirectional scale leads to a semantic anomaly.

Consequently, in the negative domain of bidirectional scales, the upward extending interpretation of scalar values must be prevented; an 'exactly *n*' reading is needed. Hungarian provides a grammaticalized means of blocking the upward extending interpretation: the focussing of the scalar expression. Hence

(31) a scalar expression denoting a negative value in a bidirectional scale must be focussed.

Interestingly, *kevés* 'few, little' does have a counterpart with an upward extendable reading: *egy kevés* 'a few, a little'. *Egy* 'an, one' turns *kevés* into a positive numeral, representing a low degree of a unidirectional scale. Compare:

(32)a. *János* [FocP **KEVESET** [NNP *tudott a   vizsgán*]] *ezért   nem engedtem át.*

    John   little   knew the exam-at therefore not let-I-him through

    'John knew little at the exam, terefore I didn't let him pass.'

  b.%*János* [PredP *tudott* **egy keveset** *a vizsgán*]   *ezért   nem engedtem át.*

    John   knew a   little   the exam-at therefore not let-I-him through

    'John knew a little at the exam, therefore I didn't let him pass.'

(33)a.%*János* [FocP **KEVESET** [NNP *tudott a vizsgán*]] *ezért   át-   engedtem.*

    John   little   knew the exam-at therefore through let-I-him

    'John knew little at the exam, therefore I let him pass.'

  b. *János* [PredP *tudott* **egy keveset** *a vizsgán*]] *ezért   át-   engedtem.*

    John   knew a   little   the exam-at therefore through let-I-him

    'John knew a little at the exam, therefore I let him pass.'

6. Scalar elements and focus

The correlation between the 'at least *n*' or 'exactly *n*' interpretation of a numeral, and the discourse function of the numerically modified expression has already been noticed by Fretheim (1992), and van Kuppevelt (1996), among others. Fretheim observed that the interpretation of a numerical modifier *n* in Norwegian is related to the stress of the modified expression. If *n* is part of an unstressed, contextually given, salient expression, *n* means 'at least *n*'. Otherwise, *n* is understood as 'exactly *n*'. A crucial observation of Fretheim is that the so-called scalar implicature, supplementing the meaning 'at least *n*' with the upper bound 'and at most *n*' under appropriate pragmatic conditions, can only be evoked by a contextually given, topical numerically modified expressions. In the case of a focus, the upper bound is obligatory, which indicates that it cannot be a mere pragmatic implicature.

Van Kuppevelt (1996) extended Fretheim's claims to scalar elements other than numerals. Similar to Fretheim, van Kuppevelt argues that the 'exactly *n*' reading of a focussed scalar expression is not a weak pragmatic implicature but a semantic entailment. Actually, van Kuppevelt uses the term *satisfactory comment* instead of *focus*. He establishes the information structure of a sentence by questions. A satisfactory comment is (the non-presupposed part of)

a uniquely determining answer to an explicit or implicit question. An answer which leaves open the possibility of alternatives (to be eliminated by a further subquestion) does not count as a satisfactory comment. Compare:

(34)a. *Mennyit   keres János?*

　　　 how.much earns John

　　　 'How much does John earn?'

　　b. [PredP *Keres **egy félmilliót**   havonta*]

　　　　 earns a   half-million monthly

　　　 'He earns half a million a month.'

　　c. [FocP ***EGY FÉLMILLIÓT*** [NNP *keres havonta*]]

　　　　 'It is half a million that he earns monthly.'

The answer in (34b) does not give an unambiguous answer to (34a) because it does not restrict the number of alternatives to one. The amount that John earns can only be established by a further question-answer pair; thus (34b) does not count as a satisfactory comment. (34c), on the other hand, provides a clear-cut, precise reply to (34a), with the focussed *egy félmilliót* functioning as a satisfactory comment. A satisfactory comment, restricting the number of possible answers to one, also narrows down the reading 'at least *n*' to '*n*'.

　　Facts of Hungarian support and elucidate van Kuppevelt's generalization. They make it clear that the 'exactly *n*' reading of scalar elements is a concomitant of their identificational focus function, which is associated with a fixed (immediately preverbal) structural position in the Hungarian sentence.[4]

　　The structural focus of Hungarian plays the same semantic role that has been assigned to the English pseudo-cleft focus by Higgins (1973) and to the German and Swedish cleft focus by Huber (2000). It functions as a specificational predicate, predicated of the open sentence constituted by the rest of the clause (the NNP, with a silent copy of the topic included). Thus a focus construction like (35a) has the logical structure in (35b):

(35)a. *János* [FocP ***15 PALACSINTÁT*** [NNP *evett ~~János~~ meg*]]

　　b. [Subject *amit János meg-evett*] [Predicate *15 palacsinta*]

　　　　 what John ate　　　　 [is] 15 pancakes

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[4] As was discussed in connection with example (10), the 2nd, 3rd etc. focus of a multiple focus construction surfaces postverbally because of V-movement through the intermediate NN and Foc heads into the highest NN.

In the theory of Higgins (1973) and Huber (2000), the open sentence that the focus is predicated of determines a set, and the focus specifies the referential content of this set, providing an exhaustive list of its members and excluding similar alternatives not belonging into it. In the case of scalar expressions, the excluded alternatives are the scalar values other than that denoted by the focussed phrase. For example, in the case of (35) the set of things eaten by John is identical with the scalar value consisting of 15 pancakes, and the excluded alternatives are the rest of the scalar values, e.g. those consisting of 14 pancakes, 13 pancakes, 16 pancakes, 17 pancakes, etc. A focussed *15 palacsinta* cannot be understood as a set of pancakes including 15 pancakes or more because focussing excludes the alternatives other than 15 pancakes. The impossibility of the upward extention of the scalar value is a consequence of the focus meaning; therefore, it need not be blocked by a special constraint.

As suggested by Fretheim (1992) and van Kuppevelt (1996), the upper bound imposed on the reading of a focussed scalar element is more than a pragmatic implicature; it is a semantic entailment (that of focus function) – for it cannot be deleted under any pragmatic conditions. (35a) is false in a situation in which John ate 16 or 17 pancakes, no matter what the circumstances are. This claim is not contradicted by focus constructions of the following type:

(36)a. *János* [$_{FocP}$ ***15-NÉL TÖBB PALACSINTÁT*** [$_{NNP}$ *evett meg*]]

    John   15-from more   pancake   ate   PRT

    'It is more than 15 pancakes that John has eaten.'

  b. *János* [$_{FocP}$ ***15 PALACSINTÁT*** [$_{NNP}$ *evett meg*]], *sőt   többet.*

    John   15 pancakes   ate   PRT   in.fact more

    'It is 15 pancakes that John has eaten; in fact, it is even more.'

In the case of (36a), the set of things eaten by John is specified as a set of pancakes with a cardinality larger than 15. No upward entailment is involved; the focussed scalar value itself contains an indefinite numeral expression meaning 'larger than *n*'. In (36b) the speaker has corrected himself.

7. Scalar adverbs

The adverbs of degree, manner, and frequency whose positive and negative counterparts display the opposing word order behavior illustrated in (1)-(6) all have scalar meanings. Ernst

(2002) calls them gradable adverbs. Kiefer (1964) attributes to them a [+contrast] feature, encoding the intuition that they come in pairs representing opposite values in the positive and negative domains of a bidirectional scale. It is adverbs in the negative domain of bidirectional scales that are obligatorily focussed.

   Being scalar elements, these adverbs are subject to the generalizations formulated in (26), (30) and (31). Thus a scalar adverb of degree, manner, or frequency denoting a scalar value *n* means 'at least *n*' – owing to the fact that section *n* of the given scale also represents a subsection of the higher values of the same scale. In case a pair of adverbs establishes a bidirectional scale (e.g. *nagyon* 'very much' – *alig* 'barely', *szépen* 'beautifully' – *csúnyán* 'uglily', *gyakran* 'frequently' – *ritkán* 'rarely'), the adverb denoting a scalar value in the negative domain of the scale resists this kind of upward extending interpretation. On a bidirectional scale, a positive scalar value does not entail a negative one, e.g., *very much* does not entail *barely*, *beautifully* does not entail *uglily*, and *frequently* does not entail *rarely* – hence *barely* cannot be understood as an understatement for *very much*, *uglily* cannot be understood as an understatement for *beautifully*, and *rarely* cannot be understood as an understatement for *frequently*. The upward extending interpretation of these adverbs must be blocked, and it is blocked by their obligatory focussing.

   Let us examine examples (1)-(6) in pairs.

(37)a. *János* [PredP **nagyon** [PredP *el-   fáradt*]]   (38)a.*János* [PredP **alig** [PredP *el-   fáradt*]]
     John   very.much   PRT got.tired   John   barely   PRT got.tired
     'John got tired very much.'   'John got barely tired.'
   b.**János* [FocP ***NAGYON*** [NNP *fáradt el*]]   b. *János* [FocP ***ALIG*** [NNP *fáradt el*]]

Alig 'barely' and *nagyon* 'very much' can be considered to denote opposing values on a bidirectional scale marking different degrees of John's tiredness. *Nagyon*, representing a value in the positive domain of the scale, allows an upward extending interpretation; thus (37a) can also be true if John was not simply tired but was tired to death. In the case of *alig* 'barely', the upward extension of the scalar value could yield a value in the positive half of the scale, in the domain of *nagyon* 'very much'; however, this must be avoided because 'John being barely tired' and 'John being very tired' cannot be true in the same situation. Presumably that is why *alig* must be moved to focus position, where it is interpreted as 'exactly to the degree *barely*'.

The question has been raised why *nagyon* 'very much' – unlike other types of inclusive expressions – cannot be focussed. The reason must be that the meaning of *nagyon* inherently lacks an upper bound.[5]

Consider again the examples with manner adverbs:

(39)a. *János* [PredP ***jól*** [PredP *meg-oldotta a feladatot*]]

      John   well   PRT solved the problem

      'John solved the problem well.'

   b. *János* [FocP ***JÓL*** [NNP *oldotta* [PredP *meg a feladatot*]]]

(40)a.*János [PredP ***rosszul*** [PredP *meg-oldotta a feladatot*]]

      John   badly   PRT solved the problem

      'John solved the problem badly.'

   b. *János* [FocP ***ROSSZUL*** [NNP *oldotta* [PredP *meg a feladatot*]]]

Rosszul 'badly' and *jól* 'well' are considered to be located in the negative and positive domains of one and the same bidirectional scale. *Jól*, belonging to the positive domain, allows the extension of its meaning upwards, to the top of the scale. (39a) can be used felicitously also if John has solved the problem perfectly. The meaning of *rosszul*, on the other hand, cannot be extended upward; *rosszul* obviously cannot be used if John has solved the problem well. Therefore, *rosszul* must be moved to focus position, where the upward extension of its meaning is blocked.

Jól 'well' can not only be adjoined to PredP but can also be focussed, and in these two structural positions it is associated with somewhat different interpretations:

(41)a. *János* [PredP ***elég jól*** [PredP *ki-töltötte a tesztet*]]

      John   quite well   in filled   the test

      'John filled in the test quite well.'

   b. *János* [FocP ***ELÉG JÓL*** [NNP *töltötte* [PredP *ki a tesztet*]]]

The semantic difference between the two word order variants is that the meaning of *elég jól* can be extended upwards in (41a), whereas it is associated with an upper bound in (41b). This difference becomes relevant in a context of the following type:

(42)a. *János* [PredP ***elég jól*** [PredP *ki-töltötte a   tesztet*]]; *100-ból   100 pontot ért   el.*

    John   quite well   in filled   the test   100-from 100 point achieved PRT

    'John filled in the test quite well; he scored 100 points out of 100.'

   b.?*János* [FocP ***ELÉG JÓL*** [NNP *töltötte ki a tesztet*]]; *100-ból 100 pontot ért el.*

    'John filled in the test quite well; he scored 100 points out of 100.'

   A number of adverbs, for example, *csúnyán* 'uglily', *ijesztően* 'frighteningly', are ambiguous between a negative manner reading and a positive degree reading. As predicted, they occupy different positions under the degree and manner interpretations:

(43)a. *Jánost* [PredP ***csúnyán*** [PredP *meg-verték*]]

    John-ACC   uglily   PRT beat-they

    'John was badly beaten.'

   b.*Jánost [FocP ***CSÚNYÁN*** [NNP *verték* [PredP *meg*]]]

(44)a.*János [PredP ***csúnyán*** [PredP *ki-vasalta   az inget*]]

    John   uglily   PRT ironed the shirt

    'John ironed the shirt uglily.'

   b. *János* [FocP ***CSÚNYÁN*** [NNP *vasalta* [PredP *ki az inget*]]]

In (43) *csúnyán* 'uglily' is a synonym of *nagyon* 'very much'; it represents a value in the positive domain of a scale of degrees. It has an upward extendable reading: (43a) can also be true in a situation in which John has been beaten almost to death. As shown by (43b), *csúnyán*, similar to other positive adverbs of degree, cannot be focussed. In (44), on the other hand, *csúnyán* represents a value in the negative domain of a bidirectional scale of manners. In accordance with generalizations (30)-(31), this value cannot be extended upwards;

therefore, the manner-denoting *csúnyán* must be moved to focus position, where its reading is associated with an upper bound.[6]

The generalizations in (30)-(31) also apply to adverbs of frequency. *Gyakran* 'frequently' and *ritkán* 'rarely' are understood to represent opposing values in the positive and negative domains of the same scale of frequencies:

(45)a. *János* [PredP **gyakran** [PredP *el- késik az iskolából*]]
     John   often   PRT late.is the school-from
     'John is often late from school.'
    b. *János* [FocP **GYAKRAN** [NNP *késik* [PredP *el az iskolából*]]]

(46)a.*János [PredP **ritkán** [PredP *el- késik az iskolából*]]
      John   rarely   PRT late.is the school-from
     'John is rarely late from school.'
    b. *János* [FocP **RITKÁN** [NNP *késik* [PredP *el az iskolából*]]]

The positive/inclusive *gyakran* occupies a PredP adjoined position in (45a), where it is associated with an upward extendable interpretation; it is true also if John is late every day. *Gyakran* can also be focussed, as shown in (45b). *Ritkán* 'rarely' in (46) must not be interpreted as the lower bound of a set of upward extending scalar values. Its obligatory focussing prevents this interpretation.

The following pairs of examples seem to contain scalar temporal adverbs, suggesting that adverbs other than those of degree, manner, and frequency may also display the kind of scalar behavior observed above. In fact, the adverbs involved, *korán* 'early' and *későn* 'late' are exceptional among temporal adverbs; apparently, the grammar of Hungarian speakers categorizes them as manner adverbs, the synonyms of *pontosan* 'punctually' and *pontatlanul* 'unpunctually'. Compare:

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[6] Interestingly, positive and negative manner adverbs under a subject-oriented interpretation behave identically; they occupy a pre-FocP position. Cf.

(i) *A küldöttek   okosan* [FocP *JÁNOST választották meg elnöknek*]
  the representatives cleverly   John-ACC elected   PRT president
  'The representatives cleverly elected John president.'
(ii) *A küldöttek   ostobán* [FocP *JÁNOST választották meg elnöknek*]
  the representatives stupidly   John-ACC elected   PRT president
  'The representatives stupidly elected John president.'

(47)a. *János* [PredP ***korán*** [PredP *meg-érkezett*]]   (48)a.*János [PredP ***későn*** [PredP *meg-érkezett*]]

       John   early   PRT arrived   John   late   PRT arrived

       'John arrived early.'   'John arrived late.'

     b. *János* [FocP ***KORÁN*** [FocP *érkezett meg*]]   b. *János* [FocP ***KÉSŐN*** [NNP *érkezett meg*]]

Interestingly, *korán* 'early', meaning '*n* length before the expected time', represents the positive value and *későn* 'late', meaning '*n* length after the expected time', represents the negative value on the scale of times they define. It is in the case of *korán* that the length of *n* can be extended at will. Whether we arrive at 1 minute, 10 minutes, or 100 minutes before the beginning of a show, we arrive early. In the case of *későn* '*n* length after the expected time', on the other hand, we cannot extend the length of *n* proceding backwards in time, as sooner or later we reach the time of the beginning of the show and the scalar values corresponding to *korán* 'early'. That is why the upward extending interpretation of *későn* must be blocked by its focussing.

8. Summary

The Minimalist Program aims to build a syntax model in which operations and constraints are either the manifestations of general computational principles, or represent interface requirements. In line with this endeavor, this paper has found the motivation for the the different word orders of positive and negative gradable adverbs, more precisely, for the obligatory focussing of negative gradable adverbs, in the conceptual-intentional system.

    The different word order behavior of inclusive and exclusive adverbs of degree, manner, and frequency has been traced back to the fact that they have a scalar meaning. According to generalizations (26), (30) and (31), a scalar expression *n* is interpreted in natural language as 'at least *n*'; '*n* or more' – unless *n* is moved to focus position, where it is understood as 'exactly *n*'. The exhaustive identification function associated with the Hungarian preverbal focus position, excluding all the alternatives but the one denoted by the focussed constituent, blocks the upward extending of interpretation. In the case of scalar elements in the negative domain of a bidirectional scale, among them negative scalar adverbs, the upward extending interpretation leads to a semantic anomaly, which can be avoided by the focussing of *n*.

    Scalar adverbs marking a value in a positive scalar domain can also be focussed. In focus position, the readings 'to *n* degree the least', 'in *n* way the least', 'at least *n* times', 'with at least *n* frequency' are changed to 'to exactly *n* degree', 'in exactly *n* manner', 'at exactly *n* times', 'with exactly *n* frequency'.

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