"Case suffixes", postpositions and the Phonological Word in Hungarian

Abstract

In this paper I propose a new construction algorithm for the Phonological Word in Hungarian. Based on a detailed discussion of the differences between so-called 'postpositions' and 'case 'suffixes', I show that both types of adpositional elements are of the same morphosyntactic category, and that Phonological Word status depends not on an arbitrary division between affixes and syntactically free items, but on phonological properties of the respective adpositions: Bisyllabic adpositions form Phonological Words on their own, while monosyllabic adpositions are integrated into the Phonological Word of their lexical head. Generalizing this result, I argue that all functional elements of Hungarian traditionally called 'inflectional affixes' are syntactically independent functional heads integrated into the Phonological Word of a preceding lexical head because they are prosodically too small. I show that apparently bisyllabic inflectional affixes must either be decomposed into different markers or are underlyingly monosyllabic, and develop a ranking of optimality-theoretic alignment constraints implementing the construction algorithm for the Phonological Word in formal detail.

1. Introduction

Descriptive tradition and orthographic convention suggest that Hungarian has two different types of functional items corresponding to adpositions: case suffixes and postpositions. The main empirical evidence for this distinction (Kiss, 2002:185) is that case suffixes (1-a,b) undergo vowel harmony with the preceding head noun while postpositions (1-c,d) do not:[1]

(1)   Case suffixes and postpositions

    a. *a ház-**ban***   b. *a kert-**ben***   c. *a ház **alatt***   d. *a kert **alatt***

     the house-in   the garden-in   the house under   the garden under

     'in the house'   'in the garden'   'under the house'   'under the garden'

In this paper, I argue that case markers are part of the same Phonological Word (PWord) as their head nouns, but syntactically independent units, in other words they are postpositions. This claim is consistent with the independently motivated observation made in Nespor & Vogel (1986) that Hungarian vowel harmony is not operative on the morphosyntactic word, but on the PWord. However, it requires reconsideration of their definition of the PWord as a stem plus all following suffixes. I show that the crucial difference between "case suffixes" and other postpositions is phonological - "case suffixes" are monosyllabic while other postpositions are bisyllabic - and propose an optimality-theoretic analysis of PWords in Hungarian which predicts the observed differences.

The rest of the paper is organized as follows: In section 2, I introduce the analysis of the PWord in Hungarian proposed by Nespor & Vogel (1986). In section 3, I discuss common properties of and differences between case suffixes and postpositions, and conclude that the differences are purely phonological. Based on this observation, I propose a new definition of the PWord in Hungarian in section 4, which is formally implemented by the ranking of OT-constraints in section 5. Section 6 discusses another recent analysis of the case suffix/postposition dichotomy in Hungarian by Asbury (2005). Section 7 contains a short summary of the paper.

2.   The Phonological Word in Nespor & Vogel (1986)

Traditional descriptions of Hungarian state that the language exhibits vowel harmony at the word level. Thus the suffixes in (2) harmonize with the corresponding stems in backness and partially also in rounding (2-a). Harmony applies to inflection (2-a,b) and derivation (2-c) alike:

(2)   Examples for vowel harmony

     a. *ház-ak*   'houses'   *kert-ek*   'gardens'   *görög-ök* 'Greeks'
       house-PL   garden-PL   Greek-PL

     b. *lát-unk*   'we see'   *szeret-ünk* 'we love'   *küld-ünk* 'we send'
       see-1P   love-1PL   send-1PL

     c. *fá-tlan*   'treeless'   *szerencsé-tlen* 'unlucky'   *nő-tlen* 'wifeless'
       tree-less   luck-less   wife-less

Booij (1984) argues that the domain for vowel harmony is not the morphosyntactic, but the PWord. an assumption fully taken over, along with the details of Booij's data and analysis, in the monograph on prosodic phonology by Nespor & Vogel (1986, in the following: N&P), which I will use here as the basic reference point for this type of analysis. The crucial argument for relating vowel harmony to the PWord is the fact that prefixes and different stems in compounds fail to harmonize. In other words, prefixes (3-c,d) and stems (3-a,b) can be combined with stems without changes in vowel quality:[2,3,4]

(3)   Failure of harmony in prefixation and compounding

     a. *Buda-Pest*   'Budapest'   c. *oda-menni* 'to go there'
       Buda-Pest   there-go

     b. *könyv-tár*   'library'   d. *be-utazni*   'to commute in'
       book-collection   in-commute

N&P's analysis of these facts is based on the assumption that the PWord in Hungarian consists of a (morphologically simple) stem and (if suffixes are present) all suffixes following this stem. Thus all of the items in (4) are single morphosyntactic words, but only (4-a) and (4-b) form single PWords:

(4)   Prosodic structure of different morphological constructions

     a. Stem + inflectional Suffix   [*lát-unk*]ω

     b. Stem + derivational suffix   [*fá-tlan*]ω

     c. Prefix + stem   [*be*]ω- [*utazni*]ω

     d. Stem + stem compound   [*könyv*] ω- [*-tár*]ω

If vowel harmony is now restricted to the PWord in Hungarian, the different behavior of different morphological constructions follows. Case suffixes and postpositions seem to fit neatly into this analysis: If case suffixes are true suffixes, they should form a PWord with the stems to which they are attached, while postpositions are independent stems and form their own PWords:

(5)   Prosodic structure of case suffixes and postpositions

    a.   Stem + case Suffix   [*ház-ban*]ω

    b.   Stem + postposition   [*ház*]ω [*mellett*]ω

Again the vowel harmony facts follow straightforwardly from the restriction of vowel harmony to the PWord. This analysis is based on the assumption that the different phonological behaviour of case suffixes is a consequence of their different status in morphosyntax, and predicts that there should be substantial morphosyntactic differences between the two types of items. In the following section, I will show that this prediction is unwarranted.

3.   Properties of Case Suffixes and Postpositions

In this section, I discuss common properties of (section 3.1) and differences between case suffixes and postpositions (section 3.2). It will turn out that both types of lexemes behave identically with respect to syntax, and differ only in phonological behavior, providing strong evidence against assigning them to different morphosyntactic classes. Essential parts of the discussion are based on the excellent summary of research on the syntax of adpositional elements in Kiss (2002:184). Following Kiss, I will restrict the term "postposition" here to items behaving syntactically as *alatt,* 'below' in (1). Hungarian also has a class of items such as *együtt*, 'together' which are semantically similar to postpositions, but have different syntactic properties. These are called "postpositional adverbs" in the following and are used to highlight common properties of case suffixes and postpositions.

3.1.   *Common Properties of Case Suffixes and Postpositions*

While postpositional adverbs, such as *együtt*, 'together', combine noun phrases which are already case-marked (*együtt* requires nouns marked by *–val/-vel*, 'with'[5]), true postpositions and case suffixes combine with bare nouns without any previous case marking (highlighted here by '∅' on the noun):[6]

(6)   Combinatorial properties of adpositional elements

a. Case suffixes	b. Postpositions	c. Postpositional adverbs
János-∅-hoz	*János-∅ mellett*	*János-**sal** együtt*
János-∅-to	János-∅ next:to	János-with together
'to John'	'next to John'	'together with John'
János-sal**-hoz*	**János-**sal** mellett*	**János-∅ együtt*

Note that this property also sets case suffixes and postpositions apart from most prepositions in Indoeuropean languages which typically combine with case-marked NPs. A second property which unites case suffixes and postpositions is the fact that they always occur right-adjacent to the head noun. Thus a modifier such as *pontosan*, 'exactly' is impossible between the noun and the case suffix/postposition (7-a,b). Instead, it has to appear in front of the whole noun phrase. In contrast to this, modifiers of postpositional adverbs are always left-adjacent to the adverb and cannot precede the noun phrase (7-c):

(7)   Adjacency reqirements for case suffixes/postpositions

a. Case suffixes	b. Postpositions	c. Postpositional adverbs
pontosan János-**hoz**	*pontosan* János mellett	János-sal **teljesen** együtt
exactly János-to	exactly János next:to	János-with completely together
'exactly to John'	'exactly next to John'	'completely together with John'
*János-**pontosan**-hoz*	*János **pontosan** mellett*	***teljesen** János együtt*

This contrast suggests that case suffixes/postpositions form a phrase together with NPs while postpositional adverbs are actually verbal or clause-level modifiers.[7]

The third common property of case suffixes and postpositions is their agreement with pronominal heads. If case suffixes or postpositions combine with a pronoun, they agree in person and number with it (8-a,b). Again, this is not true for postpositional adverbs which remain uninflected in this environment (8-c):

(8)   Agreement with pronominal heads

a. Case suffixes	b. Postpositions	c. Postpositional adverbs
*te benn-**ed***	*te mellett-**ed***	*te vel-ed együtt-Ø*
you in-2sg	You next:to-2sg	you with-2sg together
'inside of you'	'next to you'	'together with you'
te ben-Ø	*te mellett-Ø*	*te vel-ed együtt-**ed***

On the other hand, agreement of case suffixes/postpositions is restricted to pronominal heads. If they combine with a full NP, agreement is not possible. Interestingly, this sets postpositional agreement apart from agreement in nominal possessor phrases which is structurally quite similar: In both constructions, the agreeing head is to the right of the agreement target which is unmarked for case and uses exactly the same agreement affixes. With the possessor construction, agreement is obligatory with pronouns *and* full NPs:[8],[9]

(9)   Non-agreement with full NPs

a. Case suffixes	b. Postpositions	c. Possessor noun phrase
*te benn-**ed***	*te mellett-**ed***	*a te kert-**ed***
you in-2sg	you next:to-2sg	the you garden-2sg
'inside of you'	'next to you'	'your garden'
Péter-ben-Ø	*Péter mellett-Ø*	*a Péter kert-**je***
Peter-in	Peter next:to	the Peter garden-3sg
'inside of Peter'	'next to Peter'	'Peter's garden'
*Péter-benn-**e***	*Péter-mellet-**e***	*a Péter kert-Ø*

Closely connected to the agreement data is the fact that both case suffixes and postpositions license pro-drop of pronominal arguments for all persons and numbers:

(10)   Pro-drop with case suffixes/postpositions

     a. Case suffixes   b. Postpositions   c. Postpositional adverbs

      Ø   *benn-ed*   Ø   *mellett-ed*   Ø   *vel-ed*   *együtt*

     (you) in-2sg   (you) next:to-2sg   (you) with-2sg together

     'inside of you'   'next to you'   'together with you'

Here there is no detectable contrast to postpositional adverbs since these require always case suffixes which independently license Pro-Drop.

      A final property case suffixes and postpositions share is that both undergo demonstrative concord. In Hungarian, NPs with a demonstrative always require the definite article. If the NP occurs with a case suffix or a postposition, these have to follow the article and after the head noun:

(11)   Demonstrative concord

     a. Case suffixes: *ah-hoz   a   fiú-hoz*   **az a fiú-hoz/*a-hoz a fiú*
                         that-to   the   boy-to
                         'to that boy'

     b. Postpositions: *az   alatt   a   fa   alatt*   **az a fa alatt/*az alatt a fa*
                         that under the tree under
                         'under that tree'

     c. Postpositional   *az-zal   a   fiú-val   együtt*   **az-zal együtt a fiú-val együtt*
       adverbs: that-with the boy-with together
                         'together with that boy'

Again, postpositional adverbs do not participate in this pattern. Thus *együtt* in (11-c) occurs only once.

3.2.   *Differences between Case Suffixes and Postpositions*

Apart from the different behavior with respect to vowel harmony, there are only two systematic differences between case suffixes and postpositions.[10] First, postpositions allow ellipsis under coordination of the postposition and the head noun while case suffixes do not:

(12)   Ellipsis of head noun

     a. Ellipsis of head noun with postpositions

      a   ház   előtt   és   a   ház   mögött   ➔   *a ház előtt és ~~a ház~~ mögött*
      the house before and the house behind
      'before and behind the house'

     b. Non-ellipsis of head noun with case suffixes

      a   ház-tól   és   a   ház-ból   ➔   **a ház-tól és ~~a ház~~-ból*
      the house-from:inside and the house-from:outside
      'from inside and from outside the house' (É.Kiss, 2002:184)

(13)   Ellipsis of adposition

      a. Ellipsis of postpositions
        a   ház   előtt   és a garázs előtt   ➔   *a ház ~~előtt~~ és a garázs előtt*
        the house before and the garage before
        'before the house and the garage'

      b. Non-ellipsis of case suffixes
        a   ház-nál   és a garázs-nál   ➔   **a ház-~~nál~~ és a garázs-nál*
        the house-at   and the garage-at
        'at the house and the garage' (É.Kiss, 2002:184)

Second, all case suffixes are monosyllabic, while all postpositions are bisyllabic, which can be seen from a full list of items for both classes:

(14)   Full listing of case suffixes and postpositions

Case suffixes		Postpositions	
-nak/-nek	dative	*alatt, alól, alá*	'under'
-ban/-ben	'in'	*mögött, mögül, mögé*	'behind'
-ból/-ből	'into'	*előtt, elől, elé*	'in front of'
-on/-en/-ön	'on'	*felett, felől, felé*	'above'
-ról/-ről	'from'	*között, közül, közé*	'between'
-ra/-re	'onto'	*mellett, mellől, mellé*	'besides'
-ná/-nél	'at'	*helyett*	'instead of'
-tól/-től	'from'	*miatt*	'because of'
-hoz/-hez/-höz	'to'	*nélkül*	'without'
-val/-vel	'with'	*szerint*	'according to'
		iránt	'towards'

Taken together, it seems that case suffixes and postpositions share much more properties than they have differences:

(15)   Summary of common properties and differences

Common Properties	Differences
Combinatorial Properties	Vowel Harmony
Adjacency Requirement	Syllable Number
Agreement with Pronominal Heads	Ellipsis
Licensing of Pro-Drop	
Demonstrative Concord	

Moreover, all common properties (the left column of (15) of case suffixes and postpositions are clearly syntactic properties, while the syllable number of items and the behavior with respect to vowel harmony are of

phonological nature. Thus case suffixes and postpositions converge in morphosyntax while they diverge in phonology. The only property for which this is not completely straightforward is the ability to license ellipsis. Ellipsis under coordination is a classical PF-phenomenon sensitive to both, syntactic and phonological information. Thus for an item like *-ban/-ben* , 'inside' in principle either the fact that it is a morphologically bound element, or its phonological shape could be responsible for the fact that it does not allow ellipsis. However, there is strong evidence that bound elements in Hungarian can be in principle involved in ellipsis. For example, the item *-ként* which is traditionally treated as a suffix and which cannot appear without a preceding head noun can be omitted in the first constituent of a coordinated structure:

(16)   Noun ellipsis with compounds and affixes

    a. *orvos- és   bába-képzés*
       doctor and midwife-education
       'doctors' and midwives' training'

    b. *feleség- és   anya-ként*
       wive   and mother-as
       'as wive and mother' (É.Kiss,2002:185)

While the details of ellipsis in Hungarian are still poorly understood, this means that the process is not restricted to free morphemes and more likely to be sensitive to phonological factors than to the affix/stem distinction.[11]

    Now, if case suffixes and postpositions differ only in phonological terms, the most straightforward analysis is to postulate only one morphosyntactic category for both, and to attribute the differences to phonological properties of the respective items. Indeed, there is one phonological difference between both classes which cannot be reduced to other morphosyntactic or phonological factors: the fact that postpositions have two syllables while case suffixes are monosyllabic. In the following, I will pursue the idea that all differences between the two classes can be derived from the syllable number of the respective items.

4.   Redefining the Phonological Word in Hungarian

The general proposal I make for the analysis of case suffixes and postpositions is summarized in (17):

(17)   Proposal for the analysis of case suffixes/postpositions
    a. Case suffixes and postpositions are syntactic heads of the same syntactic category
    b. Differences between both classes follow from the fact
       that case suffixes are monosyllabic and postpositions are bisyllabic

This proposal implies that at the morphosyntactic level there is only one class of elements comprising both, the items traditionally called case suffixes and those called postpositions. I will assume that this class is the functional nominal category *Kase* which projects phrases in syntax and selects DPs.[12] All differences between items of this category are attributed to phonological constraints which are ultimately based on the different phonological shapes of these items. The main argument for treating Kase markers as syntactically independent items is the fact that they are not restricted to be bound to noun stems. Thus with pro-dropped pronominal arguments, case suffixes and postpositions appear without a noun stem:[13]

(18)   Case suffixes/postpositions without nominal stem

    a. Case suffixes

    ∅   *benn-ed*   'inside of you'
    you in-2sg

    b. Postpositions

    ∅   *mellett-ed*   'next to you'
    you next:to-2sg

The crucial task for the discussion is hence to account for the vowel harmony and ellipsis facts without making recourse to two different morphosyntactic categories. Maintaining the idea that vowel harmony in Hungarian holds at the level of the PWord, the proposal by Nespor & Vogel repeated schematically in (19) is problematic since our working assumption is that both case suffixes and postpositions are syntactically independent elements.

(19)   Definition of the PWord in Hungarian (Nespor & Vogel, 1986):

    A PWord in Hungarian is either a. or b.

    a. a stem and any linearly adjacent string of suffixes

    b. any element not integrated into a PWord by a.

I propose to replace this by the following definition:

(20)   New definition of the PWord in Hungarian

    A Phonological Word in Hungarian is either a. or b.

    a. a lexical stem and any right-adjacent string of
       monosyllabic functional elements from the extended projection of the stem

    b. a minimally bisyllabic functional head.

This definition still refers to morphosyntactic criteria (the extended functional projection), but abandons the use of the affix/word distinction. To see how this works reconsider the examples from (5) repeated here as (21):[14]

(21)   Prosodic structure of case suffixes and postpositions

    a.   Stem + Case Suffix   [*ház ban*]ω
    b.   Stem + Postposition   [*ház*]ω [*mellett*]ω

Both *ban* and *mellett* belong to the extended functional projection of *ház*, but only *ban* forms a PWord with *ház* since it is monosyllabic. Since according to (20) functional heads not integrated into the prosodic structure of a lexical head form PWords on their own , *mellett* gets a separate PWord domain. The vowel harmony facts then follow just as in the approach of N&P. For the ellipsis data we can assume that ellipsis under coordination can only delete or strand PWords. Based on the discussion above, this seems to be a reasonable first approximation to the facts.

A potential problem for this analysis are inflectional suffixes (i.e., functional elements) which are bisyllabic, but nonetheless undergo vowel harmony. Examples of this type occur in Hungarian verbal inflection, where all suffixes undergo some form of harmony, but besides a majority of monosyllabic affixes, there are also bisyllabic ones. Notice that Hungarian has two types of verbal paradigms called subjective and objective, where the subjective one is used roughly with intransitive verbs and transitive verbs with indefinite objects, while the subjective forms are used with transitive verbs and definite objects.[15] (22) shows representative forms of the indicative present tense paradigms for both types of conjugation (*néz*, 'watch'; *fürdik*, 'wash'; *lát*, 'see'):

(22)   Indicative present tense paradigms for representative verbs

	subjective	objective	subjective	objective
1sg	*néz-ek*	*néz-em*	*fürd-öm*	*lát-om*
2sg	*néz-el*	*néz-ed*	*fürd-esz*	*lát-od*
3sg	*néz∅*	*néz -i*	*fürd-ik*	*lát-ja*
1pl	*néz-ünk*	*néz-zük*	*fürd-ünk*	*lát-juk*
2pl	*néz-tek*	*néz-itek*	*fürd-ötök*	*lát-játok*
3pl	*néz-nek*	*néz-ik*	*fürd-enek*	*lát-ják*

According to (20), bisyllabic affixes such as *-enek* and *-játok* should form independent PWords just as postpositions and should not undergo vowel harmony with the preceding verb stem. Nevertheless, *-játok* appears with the front variant *-itek* after front vowel stems (as in *néz-itek*), and *-anak* has the fronted version *-enek* as in *ért-enek*, 'they are of interest' (subjective conjugation).

However, at least for the objective paradigm there is independent evidence that the segmentation in (22) underanalyzes the data. Thus Bartos (1997, 2000) shows that syntactically the contrast between subjective and objective conjugation is actually the difference between a paradigm without object agreement and one with object agreement. Rebrus (2000) and Trommer (2003) argue using morphophonological and morphosyntactic evidence that the objective paradigms in Hungarian contain segmentable object markers, often zero, but standardly surfacing as *-i* with front vowel and as *-ja* with back vowel stems. The objective forms from (22) are hence to be analyzed as in (23), where each verb form has the structure Stem – object agreement – subject agreement:

(23)   Proper segmentation of objective verb forms

	objective	objective
1sg	*néz-∅-em*	*lát-∅-om*
2sg	*néz-∅-ed*	*lát-∅-od*
3sg	*néz-i-∅*	*lát-ja-∅*
1pl	*néz-z-ük*	*lát-j-uk*
2pl	*néz-i-tek*	*lát-já-tok*
3pl	*néz-i-k*	*lát-ják*

Crucially, under this analysis, all overt markers for subject and object agreement in objective verb forms are monosyllabic, and form a PWord with the preceding verb stem. One of the pieces of evidence for this segmentation is that all subjective and objective forms for the 2pl basically have the affix *-tok/-tek/-tök*, preceded by *-i* in *néz-i-tek*, and by *-já* in *lát-já-tok*.

Bisyllabic affixes in the subjective paradigm are more problematic because they cannot be segmented into more basic parts in any obvious way. However they all share a crucial property which sets them apart from postpositions: they exhibit a bisyllabic and a monosyllabic variant according to phonological context. Thus the 3pl marker is *-enek* after a cluster such as *rd* as in *fürd-enek*, but only *-nek* after a verb ending in a single consonant such as *z* as in *néz-nek*. This suggests that the definition in (20) must be slightly revised as in (24):

(24)   New definition of the PWord in Hungarian (revised)

        A Phonological Word in Hungarian is either a. or b.

        a. a lexical stem and any right-adjacent string of
           functional elements from the extended projection of the stem
           which have at least one monosyllabic variant

        b. a minimally bisyllabic functional head.

According to (24) *-enek* belongs to the PWord of a preceding stem because it has the monosyllabic variant *-nek*, while postpositions such as *mellett* do not because they are consistently bisyllabic. Thus in this version the definition of the PWord in Hungarian seems to be basically correct. Note however that this definition is intended here only as a descriptive means for the current discussion without any theoretical status. In the following section, I provide an optimality-theoretic analysis of the PWord in Hungarian which replaces this definition by a small set of optimality-theoretic alignment constraints.
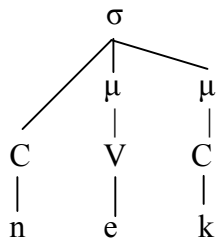

5.   An OT-Analysis

The following analysis shows that the approach to the PWord in Hungarian proposed in the last section can be implemented straightforwardly in technical terms, more specifically in Optimality Theory (OT; Prince & Smolensky, 1993).
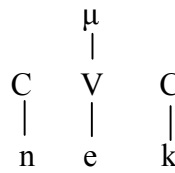
Most OT-constraints on the interface between morphosyntax and the PWord proposed in the literature require some type of correlation between the grammatical word and the PWord.[16] However, the notion of "grammatical word" itself is becoming more and more questionable in the light of recent developments in generative syntax and morphology (see Julien, 2002 and Trommer, 2004 for recent discussion), The boundaries of PWords in Hungarian seem to be crucially governed by constraints not related to the boundaries of grammatical words. Therefore, two of the three constraints I will assume here do not have direct counterparts in earlier work. Nonetheless, I think that the validity of these (or similar) constraints extends far beyond the Hungarian facts discussed here.

A basic precondition for the analysis is a formal means to differentiate between functional morphemes which are consistently bisyllabic (e.g. *közül,* 'between') and those which are variably mono- or bi-syllabic depending on the phonological context (e.g. the 3pl agreement marker *-(e)nek*). The latter class is a subclass of a larger group of items having initial vowels alternating with zero, a group also comprising markers alternating between a monosyllabic and a vowelless allomorph, such as the nominal plural marker *-(V)k* (cf. *ajtó-k*, 'doors' vs. *ház-ak*, 'houses'). My approach here will be based on the most explicit optimality-theoretic analysis of these affixes, the one by Stiebels and Wunderlich (1999, henceforth S&W).[17] S&W assume the segment structure model of Clements and Hume (1995), where consonants are represented as a root node linked to a c-place node (mediated by an oral cavity node ignored here), while vowels are represented by a root node which is linked to a vocalic node (via an oral cavity node and a c-place node). The prosodic structures of a consistently monosyllabic marker such as the dative suffix *-nek*[18] and of a consistently bisyllabic postposition such as *közül,* 'between' can then be represented as in (25) and (26) (where the structure (Root,c-place) is abbreviated as C, and the structure (Root,vocalic) is abbreviated as V). Underlyingly, i.e. in the lexical representations of these markers, root nodes are present for all segments, but moras are specified only for vowels:
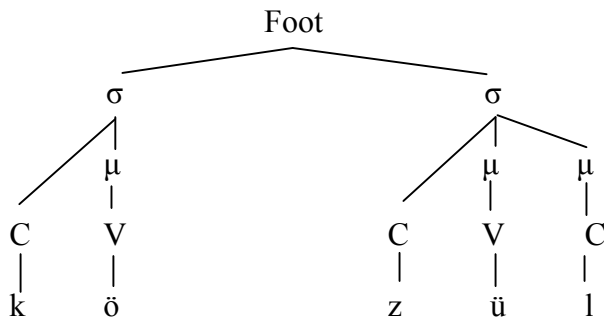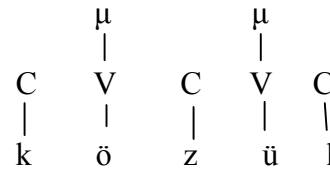
(25) a. Surface representation of –*nek*   b. Lexical representation of –*nek*

```
        σ
        /\
       μ   μ
       |   |
   C   V   C          μ
   |   |   |          |
   n   e   k      C   V   C
                  |   |   |
                  n   e   k
```
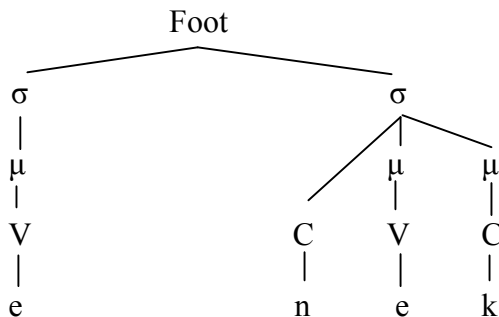
(26) a. Surface representation of *közül*   b. Lexical representation of *közül*

```
              Foot
             /      \
            σ        σ
           /|       /|\
          / μ      / μ  μ
          |        |    |
      C   V    C   V   C       μ           μ
      |   |    |   |   |       |           |
      k   ö    z   ü   l   C   V   C   V   C
                          |   |   |   |   |
                          k   ö   z   ü   l
```
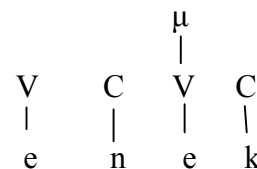
For affixes with a variable initial vowel, such as 3pl *-(e)nek*, S&W assume that they start with a vowel which underlyingly projects a root node, but not a mora:

(27) a. Surface representation of –*(e)nek*   b. Lexical representation of –*(e)nek*

```
              Foot
             /      \
            σ        σ
            |       /|\
            μ      / μ  μ
            |        |    |
            V    C   V   C              μ
            |    |   |   |              |
            e    n   e   k      V   C   V   C
                                |   |   |   |
                                e   n   e   k
```

This difference in lexical representation also leads to a subtle difference in surface representation. Thus for *közül* (26-a), both vowel moras are morphologically affiliated to the morpheme since they are already present in the lexical entry. On the other hand, in (27-a) only the vowel mora of the second syllable is affiliated to the morpheme –*(e)nek,* while the mora linked to the first vowel is inserted by phonology, and without any morphological affiliation. Assuming Consistency of Exponence (McCarthy & Prince, 19993a,b; van Oostendorp, 2005), morphological affiliation is never changed and also visible in surface structure. In the following, I will make use of this difference in the morphological representation of moras to distinguish variable affixes such as –*enek* from "truly" bisyllabic ones such as *közül*.

Before I turn to the positioning of PWords, I start with some basic assumptions about foot structure inside of PWords. A main indicator of foot structure is word stress. However, main stress in Hungarian seems to be assigned with respect to a prosodic constituent bigger than the PWord (Vogel, 1989),[19] and there is considerable disagreement in the literature on the existence, gradation and precise location of non-primary stress in Hungarian (cf. Siptár and Törkenczy, 2000:21ff and the references cited there for different views). As far as I can see, different views of the stress patterns and the corresponding foot structure are in principle

compatible with the following analysis of the PWord if low-level details in the implementation of the involved constraints are changed accordingly. For the sake of explicitness, I will assume the footing proposed by Kager (1995), where PWords are exhaustively footed by bisyllabic trochees (28), and only final syllables of PWords with uneven syllables number allow a monosyllabic foot. (28) shows the assumed foot structures for the corresponding examples in (29) indicating the stress patterns described by Kerek (1971). Stressed (head syllables) are marked by boldface:

(28)   Hungarian foot structure

        a. [σ σ]
        b. [σ σ] [σ]
        c. [σ σ] [σ σ]
        d. [σ σ] [σ σ] [σ]

(29)   Stress patterns according to the footing in (28)

        a. **bol**.dog   'happpy'
        b. **bol**.dog.**ság**   "happyness"
        c. **bol**.dog.**ta**.lan   "unhappy"
        d. **bol**.dog.**ta**.lan.**ság** "unhappiness"

This pattern of footing can be derived by the standard constraints in (30) (Kager, 1999) under the ranking in (31). Note that I write the directionality parameters of Generalized Alignment constraints such as Align (Ft,⇨,PWd,⇨) by arrows (where '⇨' = R(ight), and '⇦' = L(eft)) to enhance readability.

(30)   Constraints governing foot structure in Hungarian

RhType=T	Feet are trochaic
Parse-σ	Syllables are parsed into feet
Max-Ft-Bin	Feet consist maximally of two syllables
Align (Ft,⇨,PWd,⇨)[20]	The right edge of feet is right-aligned to the right edge of a prosodic word

(31)   Ranking: RhType=T, Parse σ, Max- Ft-Bin » Min-Ft-Bin » Align (Ft,⇨,PWd,⇨)

Note that Foot-Binarity is decomposed here following Everett (2003) into a minimality and a maximality constraint which are only sensitive to syllabic, but not to moraic binarity of feet. The minimality constraint is not included in the rankings because its potential effects already fall out from other constraints (Parse σ-and Align (Ft,⇨,PWd,⇨). The first three constraints are undominated and not crucially ranked with respect to each other. They are never violated in Hungarian. Align (Ft,⇨,PWd,⇨) is massively violated in optimal forms, but suppresses degenerate feet in even-numbered PWords because monosyllabic feet lead to additional foot boundaries inducing additional violations of the constraint (31-b,c):

(32)   Input: σ σ σ σ

		RhType=T	Parse σ	Max-Ft-Bin	Align (Ft,⇨,PWd,⇨)
☞	a. [σσ] [σσ]				**
	b. [σ][σ] [σσ]				***!,**
	c. [σσ][σ][σ]				**,*!
	d. [σ σ σ][σ]			*!	
	e. σ σ [σσ]		*!		
	f. [σσ] [σσ]	*!			**

In PWords with uneven syllable number, Align (Ft,⇨,PWd,⇨) has the additional effect that the single degenerate foot which gets inevitable by the higher-ranked constraints is located at the right word edge:

(33)   Input: σ σ σ σ σ

	RhType=T	Parse σ	Max-Ft-Bin	Min-Ft-Bin	Align(Ft,⇨,PWd,⇨)
☞ a. [σσ] [σσ] [σ]				*	*,***
b. [σσ][σ] [σσ]				*	**,***!
c. [σ] [σσ] [σσ]				*	**,***!*
d. [σσ] [σ σ σ]			*!		
e. [σσ] [σσ] σ		*!			
f. [σσ] [σ] [σ]	*!**				

To keep the candidate sets to be considered small in the following discussions, I will omit any candidates violating RhType=T, Parse-σ, and Max-Ft-Bin from considerations assuming that the constraints on PWord structure are ranked lower than these, but above Align(Ft,⇨,PWd,⇨).

These preliminaries allow now an analysis of the Hungarian PWord which is crucially based on the three alignment constraints in (34):

(34)   Constraints governing the PWord in Hungarian

Align(LEX, ⇦,PWd,⇦)	Align the left edge of lexical roots with the left edge of a PWord
Align(HdFoot, ⇦,PWd, ⇦)	Align the left edge of syntactic terminals corresponding to two lexically headed syllables with the left edge of a PWord
Align(PWd, ⇨,SD, ⇨)	Align the right edge of PWords with the right edge of a Spellout Domain

The first constraint, Align(LEX,⇦,PWd,⇦), a slightly different formulation of a constraint proposed in McCarthy & Prince (1993:112), expresses the exceptionless generalization that every lexical root in Hungarian

coincides with the beginning of a PWord. I assume that it is crucially undominated in Hungarian. Align(HdFoot,⇐,PWd,⇐) is responsible for formally distinguishing consistently bisyllabic functional elements from those with (potentially) less syllables. A lexically headed syllable is a syllable whose head (i.e. whose leftmost mora) is lexically (morphologically) affiliated. Thus postpositions such as *közül* correspond to two lexically headed syllables because the vowel moras of both syllables are present underlyingly, while case suffixes are monosyllabic, and variable terminal elements such as *-(e)nek* correspond to two syllables, but only one if them is morphologically affiliated. Terminals corresponding to two lexically headed syllables are called here "Head Feet" since they instantiate syntactic terminals (= syntactic heads) corresponding to canonical (bisyllabic) lexical feet.

The notion of 'syntactic terminal' employed in the formulation of the constraint includes the functional items traditionally called 'inflectional suffixes', but not derivational affixes since I assume - following Chomsky (1970) and Anderson (1992) - that morphology is partially in the lexicon and partially syntactic. Especially, I take it for granted that derivational morphology happens in the lexicon, while inflectional morphology is in the syntax or postsyntactic. Hence, I adopt the split morphology hypothesis in the form of weak lexicalism (cf. Spencer, 1991 and references cited there).

For the sake of concreteness, I assume that the distinction between lexical and syntactic closed-class elements is expressed by a minimal distinction of bar-levels in the sense of X-bar theory (Selkirk, 1982, DiSciulllo & Williams, 1987): Derivational affixes such as *–talan/-telen* have bar level -1, and project to level 0 only after combination with an appropriate complement, while all other morphemes have bar level 0. The notion of a syntactic terminal can then be defined as in (35):

(35) Definition syntactic terminal

An X^0 constituent α is a syntactic terminal **iff** it

a) is the lowest X^0 node in its projection line

b) is not immediately dominated by a node β which also immediately dominates any X^{-1} nodes

(36) shows representative examples of syntactic terminals according to this definition (in boldface). (36-a) is a bare noun, (36-b) a verb head-adjoined to T(ense) (as in *tanul-t*, '(s)he learned), (36-c) a compound, and (36-d) an adjective (*gond-talan*, 'careless') derived by the combination of the derivational affix *–talan*, and the noun *gond* ('thought). Note that the higher V^0 in (36-b) and the higher N^0 in (36-c) are not syntactic terminals since they are not the lowest X^0s in their projection lines, and N^0 in (36-d) is not a syntactic terminal because it is immediately dominated by a node (A^0) which immediately dominates a X^{-1} (A^{-1}):

(36)
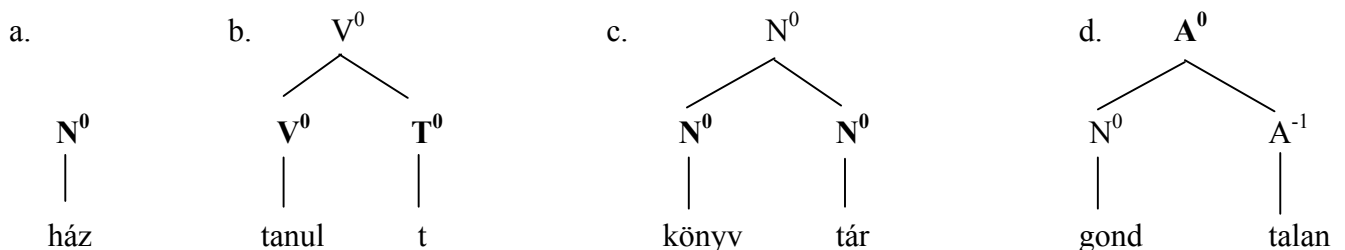
The third alignment constraint Align(PWd,⇒,SD,⇒) demands that the right edge of each PWord coincides with the right edge of a Spellout Domain (SD). Spellout Domains are morphosyntactic domains argued for in Trommer (2004) to be crucial for capturing crosslinguistic affix ordering generalizations and are defined as follows:

(37)   Definition of Spellout Domain

     a. Each lexical head L is a member of its own Spellout Domain.

     b. A functional head F is a member of the spellout domain of L iff it is a head of the

       extended projection of L and is string-adjacent to another member of L's Spellout Domain.

Here are three simple examples (Spellout Domains are indicated by boldface). (38-a) is a Kase phrase (KP) where *mellett* (K) takes a DP as a complement. The lexical head is *ház. A* and *mellett* are functional heads from its extended projection and string-adjacent to it. So the Spellout Domain is *a ház mellett*. In (38-b) the verb *néz* has moved to the tense head *-t* and the V-Tense complex has then moved to the agreement head Agr. The Spellout Domain of *néz* is *néz-t-él* since both are heads of the verb's extended projection, and *-t* is string-adjacent to *néz* and *–él* is string-adjacent to *-t* which we have already established as part of the Spellout Domain. *Te* is string-adjacent to *néz*, but not a head of its extended projection, so it is not part of its Spellout Domain. The same holds for *te* in (38-c). Here however, *te* separates *a* from the lexical head. Since *a* is not string-adjacent to *ház* or *-ad*, the only other members of the Spellout Domain, it is not part of the Spellout Domain of *ház* even though it is a head of its extended projection. Notice that details of syntactic analysis might be relevant for the definition of Spellout Domains (for example treating attributive adjectives as functional heads of the nominal extended projection or not substantially alters the relevant Spellout Domains for nouns). However it is irrelevant for the following discussion whether *ház* and *mellett* are in their base position as suggested in (38-a) or the order of both elements results from movement operations, since the crucial factor for establishing Spellout Domains is string adjacency.

(38)   Examples of Spellout Domains

     a. [[[**a**]$_D$ [[**ház**]$_N$]$_{NP}$]$_{DP}$ [**mellett**]$_K$]$_{KP}$

     b. [[te]$_{DP}$ [[[**néz**]$_V$ [**-t**]$_T$]$_T$ [**-él**]$_{Agr}$]$_{Agr}$ [[t$_i$]$_T$ [[t$_j$]$_V$]$_{VP}$]$_{TP}$]$_{AgrP}$

     c. [[a]$_D$ [[te]$_{DP}$ [[**ház**]$_N$]$_{NP}$ [**-ad**]$_{Poss}$]$_{PossP}$]$_{DP}$

Together with Align(LEX,⇐,PWd,⇐), Align(PWd,⇒,SD,⇒) has the effect that a PWord will consist of a lexical stem and all following functional elements, if no higher-ranked constraints intervene. Assuming that there are no symmetric counter-constraints making reference to the opposite edges of PWords (i.e., Align(LEX, ⇒,PWd, ⇒) and Align(PWd,⇐ ,SD, ⇐)), these constraints predict that functional elements following a stem tend to be interpreted phonologically as affixes (forming a unit with the stem), while functional elements preceding stems are more likely to be interpreted as independent items. This corresponds roughly to the often observed crosslinguistic preference of suffixation over prefixation (Cutler et al., 1985) .

     Let us now see how these constraints derive the correct boundaries of PWords in Hungarian. To be maximally explicit about morphosyntactic alignment in the tableaus, I will separate morphemes belonging to the same syntactic terminal by a dash ('-'), and morphemes constituting different syntactic terminals by '+'. Spellout domains are marked by continuous underlining. Thus the notation '<u>könyv</u>+<u>tár</u>' implies two syntactic terminals belonging to different Spellout Domains, '<u>a+ház</u>' two syntactic terminals of the same Spellout Domain, and '<u>gond-talan</u>', two morphemes of the same syntactic terminal and Spellout Domain. Since morphosyntactic alignment is the same for all candidates for a given input, these conventions will only be applied to the input itself to avoid crammed candidate representations. (39) shows how Align (LEX,⇐,PWd,⇐) imposes PWord structure on a word consisting of a single nominal root. (39-b) is excluded since the left edge of *ház* is not aligned to the left edge of a PWord and violates Align (LEX,⇐,PWd, ⇐):

(39)   *ház*, 'house'

Input: <u>ház</u>	Align (LEX,⇐,PWd, ⇐)	Align (HdFoot, ⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(ház)]ω				
b. (ház)	*!			

Basically, the same holds for compounds. Here Align(LEX, ⇐,PWd, ⇐) ensures two PWords for two lexical roots:

(40)   *könyv-tár*, 'library'

Input: <u>könyv+tár</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(könyv)]ω [(tár)] ω				
b. [(könyv) (tár)]ω	*!			
c. (könyv) (tár)	*!*			

The example in (41) with a (monosyllabic) inflectional suffix demonstrates the crucial role of Align(PWd,⇒,SD,⇒): *-nak* must be integrated into the PWord starting with the lexical stem (41-a) since leaving it without PWord structure (41-c) or assigning a separate PWord to it (41-b) leads to a PWord ([(lát)]ω) which is separated by one syllable from the right edge of the spellout domain and violates Align (PWd,⇒,SD,⇒):

(41)   *lát-nak*, 'they see'

Input: <u>lá^μt+ana^μk</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(lát nak)]ω				
b. [(lát)]ω [(nak)]ω			*!	
c. [(lát)]ω (nak)			*!	*
d. (lát) (nak)	*!			**

In *ért-enek*, 'they understand' the same affix appears in its bisyllabic form, and the front-harmonic variant   (-*enek* instead of –*anak*) indicates that it is part of the same PWord as the verb. Recall that –*anak/-enek* is not a HdFoot: It does not correspond to two lexically headed syllables since only the second mora of the output -e^μne^μk is also present underlyingly and lexically affiliated. Therefore (42-a) does not violate Align (HdFoot,⇐,PWd,⇐):

(42) *ért-enek*, 'they understand'

Input: $é^{\mu\mu}rt+ene^{\mu}k$	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(ér te) (nek)]ω				*
b. [(ér te)]ω [(nek)]ω			*!	
c. [(ér)]ω [(te nek)]ω			*!	
d. (ér) (te) (nek)	*!			**

While monosyllabic (and variable) functional elements following a lexical head of the same Spellout Domain are integrated into the same PWord the same is not true for items preceding a lexical head. The clearest example for this observation is the definite article preceding a noun as *a* in *a kert,* 'the garden'. While both items belong to the same spellout domain (cf. the discussion of (38-a), *a* does not undergo vowel harmony and does not form a PWord with *kert*. This follows from the assumed constraint system since no constraint requires that the left edge of spellout domains coincides with a PWord and Align(LEX,⇐,PWd,⇐) favors a PWord boundary at the left edge of the lexical root:

(43) *a kert*, 'the garden

Input: a+kert	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. (a) [(kert)]ω				*
b. [(a)]ω [(kert)]ω			*!	
c. [(a kert)]ω	*!			
d. [(a) (kert)]ω	*!			*
e. (a) (kert)	*!			**

A more intricate case are the so-called 'preverbs', which constitute the majority of functional elements preceding related lexical heads in Hungarian. Preverbs often seem to form a derivation-like unit with verbs semantically[21], but can be separated from the verb syntactically. For example, the preverb *meg* is written as one orthographic word together with the verb *néz* in (44-a) but as an independent word in the synonymous sentence (44-b), where it is separated from the verb by the finite auxiliary *akart*. Preverbs may even follow the verb under specific syntactic conditions such as negation or imperative clauses (45):

(44) Verb-adjacent and non-adjacent preverbs

   a. *János akar-t   meg-néz-ni   egy film-(e)-t*
      Janos want-PAST PERF-see-INF   a   movie-ACC

   b. *János meg   akar-t   néz-ni   egy film-(e)-t*
      Janos PERF want-PAST see-INF   a   movie-ACC
      'Janos wanted to see a movie.' (Farkas & Sadock, 1989:322)

(45)   Postverbal preverbs

    a. *Mari nem vág   fel*
     Mari not   cuts   up
    'Mari is not showing off.'

    b. *Vág-j   fel!*
     cut-IMP   up
    'Show off!' (Farkas & Sadock, 1989:319/320)

Just as article-noun combinations, preverb-verb combinations never undergo vowel harmony (cf. *be-zár*, 'close' and *át-tesz*, 'put over (to)'), but data such as (45) suggest that verb and preverb in this combination should form a PWord under the analysis proposed here since *fel* is a functional element following a lexical head. However É.Kiss (2002,58 ff.) provides convincing evidence from movement data that preverbs have phrasal properties syntactically and cannot be affixes (or heads) selecting for the verb. I follow É.Kiss's approach in treating preverbs as lexically selected complements of verbs, which implies that preverbs are not heads of the verb's extended projection and its Spellout Domain, and the alignment constraints predict that preverbs will never form a prosodic word with a corresponding verb, neither preverbally nor postverbally as shown in (46) and (47):[22]

(46)   *be-zár*, 'close' (with preverb *be*)

Input: be+<u>zár</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd, ⇨,SD,⇨)	Align (Ft,⇨,PWd,⇨)
☞ a. (be)+[(zár)]ω				*
b. [(be)]ω [(zár)]ω			*!	
c. [(be zár)]ω	*!			
d. [(be) (zár)]ω	*!			
e. (be) (zár)	*!			

(47)   *zár be*, 'close!' (with preverb *be*)

Input: <u>zár</u>+be	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd, ⇨,SD,⇨)	Align (Ft,⇨,PWd,⇨)
☞ a. [(zár)]ω (be)				*
b. [(zár)]ω [(be)]ω			*!	
c. [(zár be)]ω			*!	
d. [(zár) (be)]ω			*!	
e. (zár) (be)	*!			

Let us turn finally to case suffixes and postpositions. In the familiar example *a ház mellett*, *mellett* is a head-foot, so Align(HdFoot,⇐,PWd,⇐) requires a separate PWord for it. As before, *ház* receives a PWord of its own by the pressure of Align(LEX,⇐,PWd,⇐). Notice that the ranking of Align(HdFoot,⇐,PWd,⇐) above Align(PWd,⇨,SD,⇨) is crucial because otherwise candidate (48-c) with one PWord and vowel harmony for *mellett* would become optimal:

(48)   *a ház mellett*, 'next to the house'

Input: <u>a+ház+mellett</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. (a) [(ház)]ω [(mel lett)]ω			*	
b. (a) [(ház)]ω (mel lett)		*!	*	**
c. (a) [(ház) (mel lett)]ω		*!		*
d. (a) (ház) (mel lett)	*!	*		***

In the candidates for *a ház-ban, -ban* can either become an independent foot as in (49-b,c,d) or part of a binary foot together with *ház*. However, assigning a separate foot to *ban* leads to violation of Align(PWd,⇒,SD,⇒) as in (49-b,c). The only way to avoid this violation is to integrate *ban* into a foot and a PWord together with *ház*, which does not violate any of the relevant constraints:

(49)   *a ház-ban*, 'inside the house'

Input: <u>a+ház+ban</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. (a) [(ház ban)]ω				*
b. (a) [(ház)]ω [(ban)]ω			*!	*
c. (a) [(ház)]ω (ban)			*!	**
d. (a) [(ház)]ω (ban)	*!	*	*	**

Basically, the same result is obtained for forms with pro-dropped pronominal heads of postpositions (50) and case markers (51). While the empty pronoun is phonologically zero, it still leads to a left PWord boundary by Align(LEX, ⇐,PWd,⇐). The other alignment constraints again ensure that the following functional items are integrated into the same PWord:

(50)   ∅ *mellett-e*, 'beside of it'

Input: <u>∅+mellett+e</u>	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(∅ mel let) (t-e)]ω				*
b. [(∅ mel let)]ω [(t-e)]ω			*!	
c. [(∅ mel let)]ω (t-e)			*!	*
d. (∅ mel let) (te)	*!	*	*	**

(51)   ∅ *benn-e,* 'inside of it'

Input: ∅+benn+e	Align (LEX,⇐,PWd,⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(∅ ben ne)]ω				
b. [(∅ ben)]ω [(ne)]ω			*!	
c. [(∅ ben)]ω (ne)			*!	*
d. (∅ ben) (ne)	*!		*	**

The analysis of the corresponding form *rá* where the adposition *-ra/-re* and the agreement marker *–a/-e* merge into a single syllable is identical since Align(LEX,⇐,PWd,⇐) again enforces a PWord boundary to the left of the zero noun, and hence to the left of *rá,* while Align(PWd,⇒,SD,⇒) induces a right PWord boundary at the right edge of *rá.* Just as *benne*, *rá* is assigned the status of an independent PWord.

Recall now that, as argued in section 4, all items traditionally analyzed as inflectional suffixes are monosyllabic. However, this is not true for derivational suffixes, which unlike derivational prefixes (such as *be* in *be-zár*, 'close' from example (46)) must be part of the same PWord as the root since they undergo vowel harmony and can be bisyllabic. An example is the adjective-forming suffix *-talan/-telen*:

(52)   A Bisyllabic derivational affix

   a. *gond-**talan***   'careless'

   care-less

   b. *lélek-**telen***   'witless'

   soul-less

Assuming that derivational affixes form a syntactic terminal together with the root (or stem) to which they are attached, the proposed constraints derive the correct result. Note that the derivational suffixes are part of the Spellout Domain since they are part of the lexical head (the stem):
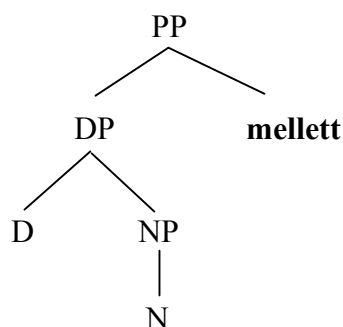
(53)   *lélek-telen*, 'wit-less'

Input: lélek-telen	Align (LEX,⇐,PWd, ⇐)	Align (HdFoot,⇐,PWd,⇐)	Align (PWd,⇒,SD,⇒)	Align (Ft,⇒,PWd,⇒)
☞ a. [(lé.lek)(te.len)]ω				
b. [(lé.lek)]ω[(te.len)]ω			*!	
c. [(lé.lek)]ω(te.len)			*!	
d. (lé.lek) (te.len)	*!			

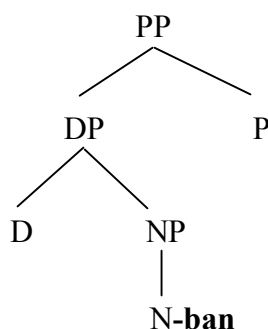## 6.   The Analysis of Asbury (2005)

Asbury (2005) provides a recent analysis of Hungarian adpositional elements which also largely equates case suffixes and postpositions. According to her analysis, both types of markers realize the syntactic category P (adposition). However, only postpositions result from the direct spellout of P (54-a), while case markers are affixes, indirectly realizing P by the mechanism of Alternative Realization (54-b), which allows to express a head alternatively by an affix on a lower head (Emonds, 1987):

(54)   Hungarian adpositions in Asbury (2005)

      a. **Postposition**   b. **Case Suffix**

```
        PP                                      PP
       /  \                                    /  \
      DP   mellett                            DP    P
     /  \                                    /  \
    D    NP                                 D    NP
          |                                       |
          N                                     N-ban
```

Apart from data discussed in section 3.2. Asbury (pp. 75-76) cites two additional pieces of evidence for assigning a different morphosyntactic status to case suffixes and postpositions. First, the adjective-forming suffix -*i* can be added to specific postpositions (55-a), but not to case suffixes (55-b):

(55)   Adjectivizing –*i* with postpositions and case suffixes

      a. *a   híd   mögött-**i**   út*   'the road behind the bridge'
         the   bridge behind-i   road

      b. **a   kert-ben-i   virág*   'the flower in the garden'
         the   garden-in-i   flower

Second, specific postpositions can be followed by the case suffixes -*ra* and -*ról*, while other case suffixes cannot:

(56)   -*ra* and –*ról* following other adpositions

      a. *három óra   után-ra*   'by after three o'clock'
         thee   hour   after-on

      b. **a   híd-on-ról*
         the bridge-on-from

Asbury attributes the restricted occurrence of -*i* to the generalization that derivational affixes such as -*i* cannot occur outside inflectional ones, while the distribution of -*ra* and -*ról* follows from a constraint against multiple case suffixes in the same morphological word.

     However, as Marácz (1989) notes, not all postpositions license -*ra*/-*ról* and -*i*-suffixation. Especially, *alá, alól* and *mögé* do not:[23]

(57)   Impossible combinations of *–ra/-ról* and postpositions

    a. **alá-ra*

       under-onto

    b. **mögé-ről*
       behind-from

This cannot be due to a semantic incompatibility of *-ra/-ról* and directional expressions since these can be affixed to specific adverbs with similar meaning:

(58)   Possible combinations of *–ra/-ról* and directional adverbs

    a. *a   híd-on   át-ra*   'to over the bridge'
       the bridge-on over-onto

    b. *a   híd-on   át-ról*   'from over the bridge'
       the bridge-on   over-from

There seem to be basically two possibilities: the ability to combine with *–i* and *–ra/-ról* depends on a yet unknown systematic property of the involved postpositions, or it is an idiosyncratic syntactic feature of these items. In both cases, it would not be the status of the relevant adpositions as syntactically free elements which accounts for their behaviour, but a different syntactic property.

    Even if it turns out to be necessary to capture the fact that monosyllabic adpositions never combine with *–i* and *–ra/-ról*, this can be achieved without recourse to their alleged status as affixes. Thus Asbury's constraint against multiple case affixes in a morphological word can be reformulated as a constraint against multiple monosyllabic adpositions in a spellout domain. In fact, attested identity avoidance phenomena seem often to invoke a combination of morphosyntactic and phonological criteria, e.g. the ban again multiple homophonous (or semi-homophonous) object clitics in Romance (Grimshaw, 1997) or the prohibition of more than one sibilant formative in English nouns (Yip, 1998). The special behaviour of *–i* can be interpreted as prosodic subcategorization for a (potential) prosodic word which is satisfied by bisyllabic adpositions as well as nouns and adverbs, but not by monosyllabic adpositions. Similar cases of functional elements selecting specific prosodic environments are comparative and superlative affixes in English (cf. e.g. Embick and Noyer, 2001), and possessive markers in Ulwa (McCarthy & Prince, 1993).

    On the other hand, as Asbury herself notes, assigning case suffixes and postpositions different morphosyntactic status makes it difficult to provide a unified account of demonstrative concord. Moreover, analyzing case suffixes as affixes makes it unexpected that they can occur without an overt base. To solve the latter problem, Asbury introduces two features for morphemes, [+/-H] which determines whether the morpheme can act as a host for affixation, and [+/-D] which states whether it must attach to a potential host inside the same phrase. Case suffixes are [+H+D], and postpositions [+H-D]. As far as I can see, these features would in effect obviate the need to invoke different representations for adpositions by alternative realization, but run into a different empirical problem: They predict counter to fact that case suffixes should form a morphological word and show vowel harmony with pronouns in forms such as the ones in (59):

(59)   Pronouns-case-suffix combinations

    a.   b.

    én nál-am   *ő nál-**a***

    I with-1sg   (s)he with-3sg

    'together with `me' 'together with him/her'

Asbury tries to solve this problem by assuming that Hungarian pronouns are specified [-H] and hence never take affixes. However, at least the third person pronoun *ő* allows regular plural and accusative affixes (cf. *ő–t*, 'him,her'; *ő-k*, 'they'; *ő-k-et*, 'them').

 Most crucially, Asbury has to assume arbitrary morphosyntactic features to distinguish case markers and postpositions, which ignores the clear correlation between phonological (bisyllabic vs. monosyllabic) shape and morphophonological behaviour of adpositional elements. Both problems can be avoided if case markers and adposition are differentiated on phonological ground instead of assigning them different morphosyntactic representations.

7. Summary

In this paper, I have shown that the different phonological behavior of case suffixes and postpositions in Hungarian can be derived from the different phonological shapes of the involved elements, and a small number of optimality-theoretic constraints. This analysis is superior to approaches attributing the phonological differences to different morphosyntactic characteristics of case suffixes and postpositions since these fail to account for the complete agreement of both with respect to morphosyntax, and the fact that the alleged case suffixes can occur without any overt nominal base. The Hungarian data suggest that the notion "grammatical word" might be ultimately unnecessary and misleading for a deeper understanding of the PWord which seem to be crucially connected to smaller morphological units (roots and terminal elements) and their phonological properties.

Notes

---

[1] All Hungarian examples in this paper are in Hungarian orthography which is close to IPA. Orthographic <sz> corresponds to /s/, <s> to /ʃ/, front vowels are indicated by umlaut (e.g. <ü> for /y/) and acute accent marks vowel length.

[2] N&P treat preverbal items such as *oda-* and *be-* as prefixes. However, this analysis is actually highly questionable since they can be separated from the verb to which they seem to be attached in specific syntactic environments. This problem is discussed in detail in section 5.

[3] It is well-known that a number of Hungarian affixes fail to undergo vowel harmony even though they arguably are in a prosodic position which normally makes harmony obligatory (cf. e.g.. Siptár and Törkenczy, 2000:63 ff.). While most of these affixes contain the so-called 'neutral vowels' *e* and *i* whose non-harmonizing behavior seems to be due to their special status in the Hungarian vowel systems, some of the non-harmonizing affixes contain other vowels (e.g. non-harmonizing *–kor* as in *egy-kor*, 'at one'). I think that the question of how to treat these exceptional items is orthogonal to the problem of the general structure of the harmony domain. Both, N&P's and my analysis make the (wrong) predictions that these morphemes should exhibit harmony.

[4] Unfortunately, there are only few independent phonological processes restricted to the Phonological Word in Hungarian, which might serve as additional evidence for identifying PWord boundaries. Main stress seems to be assigned with respect to a bigger prosodic domain (cf. the discussion in section 5). Vogel (1989) argues that a process palatalizing /n/ before /j/ also applies inside the Phonological Word, but this is largely irrelevant for the status of adpositions since no postpositions or case suffixes start with /j/. In section 4, I conclude tentatively that the possibility of ellipsis is also closely related to the PWord.

[5] The *v* in *-val/-vel* completely assimilates to preceding sibilants, as can be observed in *János-sal*.

[6] The only exception to the generalization that a noun cannot be followed by two adpositions are forms where the case markers *–ra/re* and *–ról/-ről* follow specific postpositions. This construction is discussed in section 6.

[7] The adjacency of postposition and noun follows largely from the fact that modifiers such as adjectives and quantifiers and also the definite article a always precede the head noun. The right-peripheral position

8 Agreement with full NPs is possible if the NP is moved out of the phrase. Again, positions and case suffixes behave alike in this respect. See Marácz (1986) and É.Kiss (2002:187).

9 As an anonymous reviewer notes, Bartos (2000), analyzes the suffix of possessed nouns (e.g. *–je* in *a Péter kert-je*) as a possession marker and assumes zero agreement for possessor noun phrases with full NPs. Since under both analyses the morphosyntax of adpositions and possessed nouns is similar, but not identical, it does not matter for the general point here which of the two analyses is adopted.

10 See section 6 for differences which only involve specific classes of postpositions and case suffixes.

11 Note that *-ként* is phonologically extremely heavy having a long vowel and a complex coda, and also fails to undergo vowel harmony as in *anya-ként.*

12 This category is suggested for case suffixes in Bartos (1999) and É.Kiss (2002).

13 É.Kiss (2002:188) claims that case markers and postpositions belong to different categories, but share the same morphosyntactic characteristics, and are both suffixes. However, in her analysis, the relevant "suffixation" is achieved by moving syntactically independent heads to the right of the noun head. Hence just as in the analysis proposed here, both types of items project their own phrases in syntax, and are not attached to nouns in the lexicon.

14 Syllable boundaries are marked here and in the following by spaces.

15 What counts as definite and indefinite here is a highly complex matter. See Bartos (1997, 1999, 2000) and É.Kiss (2002) for discussion.

16 E.g. GRWD=PRWD, and Align-L in Kager (1999).

17 A rule-based analysis of these affixes based on different structural assumptions can be found in Siptár and Törkenczy (2000).

18 Dative *–nek* also forms a quasi minimal pair with 3pl *–(e)nek* showing that the initial vowel of the latter cannot be an epenthetic vowel inserted by general phonological processes.

19 Vogel argues that this constituent is the clitic group (cf. also Nespor & Vogel, 1986). which roughly contains a PWord and adjacent clitic elements. I disregard positioning of main stress here since it seems not to be relevant for the phenomena at hand.

20 Align (Ft,⇨,PWd,⇨) is called All-Ft-Rt in Kager (1995).

21 Cf. combinations with intransparent meaning such as *be-csap*, 'cheat' from the preverb *be*, 'into' and the verb *csap*, 'strike' (Farkas & Sadock, 1989:320).

22 Note that *be* does not govern a Spellout Domain of its own since it is a functional, not a lexical head. Therefore PWord boundaries at the right edge of *be* induce violations of Align (Pwd,⇨,SD,⇨).

23 Marácz states the incompatibility of *-i*-affixation with *alá, alól* and *mögé* without giving concrete examples.

References

Anderson, Stephen (1992) *A-Morphous Morphology*. Cambridge: Cambridge University Press.

Asbury, Anna (2005) Adpositions as case realizations: Structures and Consequences. In *Leiden Papers in Linguistics* 2(3), Martin Salzmann and Luis Vincente (eds.), 69-92.

Bartos, Huba (1997) The Nature of Object Agreement in Hungarian. Proceedings of the 21st Annual Penn Linguistics Colloquium, 19-34.

Bartos, Huba (1999) Morfoszintaxis és interpretáció: a magyar inflexiós jelenségek szintaktikai háttere. Ph.D dissertation, Budapest: ELTE.

Bartos, Huba (2000) Az inflexiós jelenségek szintaktikai háttere. In *Strukturális magyar*

nyelvtan 1. *Mondattan,* Ferenc Kiefer (ed.), 653-763. Budapest: Akadémiai Kiadó.

Booij, Geert (1984) Neutral Vowels and the autosegmental analysis of Hungarian vowel harmony. *Linguistics* 22, 629-641.

Chomsky, Noam (1970) Remarks on Nominalization. In *Readings in English Transformational Grammar*, Roderick A. Jacobs and Peter S. Rosenbaum (eds.), 184-221. London: Ginn and Company.

Clements, George N. and Elizabeth V. Hume (1995) The internal organization of speech sounds. In *The Handbook of Phonological Theory*, John A. Goldsmith (ed.), 245-306. Cambridge MA: Blackwell.

Cutler, Anne and John A. Hawkins and Gary Gilligan (1985) The Suffixing Preference: A Processing Explanation. *Linguistics* 23, 723-758.

Anna Maria DiSciullo and Edwin Williams (1987) *On the Definition of Word*. Linguistic Inquiry Monograph. Cambridge MA: MIT Press.

Embick, David and Rolf Noyer (2001) Movement Operations after Syntax. *Linguistic Inquiry* 32(4), 555-595.

Emonds, Joe (1987) The Invisible Category Principle. *Linguistic Inquiry* 18, 613-32.

Everett, Daniel L. (2003) Iambic Feet in Paumari and the Theory of Foot Structure. *Linguistic Discovery* 2(1), 22-44.

Grimshaw, Jane (1997) The Best Clitic: Constraint Interaction in Morphosyntax. In *Elements of Grammar: A handbook of Contemporary Syntactic Theory*, Liliane Haegeman (ed.), 169-196. Dordrecht: Kluwer.

Julien, Marit (2002) *Syntactic Heads and Word Formation*. Oxford: Oxford University Press.

Marácz, László (1986) Dressed or naked: the case of the PP in Hungarian. In: *Topic, Focus and Configurationality,* Werner Abraham and Sjaak de Meij (eds.), 227-252. Amsterdam: John Benjamins.

McCarthy, John and Prince, Alan (1993a) Prosodic Morphology I: constraint interaction and satisfaction. Ms., University of Massachusetts, Amherst, and Rutgers University, New Brunswick.

McCarthy , John and Prince, Alan (1993) Generalized Alignment. *Yearbook of Morphology 1992*, 79-153.

Kerek, Andrew (1971) *Hungarian Metrics: Some Linguistic Aspects of Iambic Verse*. Bloomington: Indiana University.

É. Kiss, Katalin (2002) *The Syntax of Hungarian*. Cambridge University Press.

Nespor, Marina and Irene Vogel (1986) *Prosodic Phonology*. Foris Publications: Dodrecht.

van Oostendorp, Marc (2005) The Theory of Faithfulness. Ms., Meertens Institute, Amsterdam.

Rebrus, Péter (2000) Morfofonológiai jelenségek a Magyarban. In *Strukturális magyar nyelvtan 1. Mondattan,* Ferenc Kiefer (ed.), 763-949. Budapest: Akadémiai Kiadó.

Selkirk, Elisabeth (1982) *The syntax of words*. Cambridge MA: MIT Press.

Stiebels, Barbara and Wunderlich, Dieter (1999) Second stems in Hungarian nouns. *The Linguistic Review* 16, 253–294.

Trommer, Jochen (2003) Hungarian has no portmanteau agreement, In *Approaches to Hungarian* 9, Siptár, and Christopher Pinon (eds.), 285-302. Budapest: Akadémiai Kiadó.

Trommer, Jochen (2004) Distributed Optimality. PhD thesis, University of Potsdam.

Vogel, Irene (1989) Prosodic Constituents in Hungarian. *Acta Linguistica Hungarica* 39, 333-351.

Yip, M. (1998). Identity avoidance in phonology and morphology. In Morphology and its relation to morphology and syntax , Stephen G. Lapointe, Diane K. Brentari, and Patrick M. Farrell (eds.), 216–247.