Non-morphological sources and triggers of morphological change (WBCDL091)[1]

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to appear in the Wiley Blackwell Companion to Diachronic Linguistics (ed. by Adam Ledgeway, Edith Aldridge, Anne Breitbarth, Katalin É. Kiss, Joseph Salmons & Alexandra Simonenko)

Prefinal version (August 2023)

Abstract The interaction of morphology with the other components of grammar – phonology, syntax and semantics – through history often gives rise to morphological changes. At the phonology-morphology interface we discuss consonant alternations and vowel deletion in Russian (Slavic) that led to lexically-conditioned allomorphy and/or emergence of patterns of non-concatenative morphology, similarly to the history of German Umlaut. At the syntax-morphology interface we present a detailed study of the changes affecting spatial case suffixes and postpositions in Hungarian (Uralic); we also mention diachronic morphosyntactic changes from Romance and Mayan languages that yielded new TAM markers. These changes all involved a reanalysis of a syntactic structure into a morphological one. At the semantics-morphology interface, we discuss various changes in English that were semantically motivated. These include backformation patterns that were originally motivated by folk etymology and new patterns of derivational morphology that arose with the help of a metonymical shift.

Keywords: consonant alternation, vowel deletion, allomorphy, umlaut, non-concatenative morphology, TAM markers, postpositions, spatial cases, folk etymology, backformation, metonymical shift

1 Introduction

Broadly speaking, morphological change affects word structure. Since morphology has two main parts, word formation and inflection, the diachronic processes may involve the emergence of new word formation patterns or new inflectional morphology.

Morphology interacts with other components of grammar: phonology, syntax, and semantics. These interactions are observed on the synchronic level, but also over time they may give rise to diachronic changes that occur at the interface of morphology with these grammatical modules. As such these changes are all language-internal, as opposed to changes induced by language contact, for example. In this chapter we provide an overview of this kind of diachronic shifts. We distinguish between changes at the phonology-morphology, syntax-morphology and semantics-morphology interfaces. The discussion is couched in more traditional, descriptive terms. In the case of the diachronic processes at the syntax-morphology interface, we present not only the description of the relevant changes but also summarize a particular theoretical model in order to show how these changes can be accounted for. Specifically, the diachronic processes in question are approached in a generative syntactic framework. Thus, the use of different theoretical approaches to morphological change in the chapter provides a broader outlook on the topic. At the same time, we refrained from discussing morphological changes that could have been engendered by extra-linguistic phenomena, such as language contact, population movement, etc., as they deserve a separate in-depth discussion.

The chapter is structured as follows. In Section 2, we discuss certain phonological processes that had an impact on morphology, namely consonant alternation and vowel deletion in Slavic.

In Section 3, we zoom in on changes at the syntax-morphology interface by investigating the rise of postpositions and their morphologization into case suffixes in Uralic. In Section 4 we provide an overview of the interaction of semantics and morphology from a diachronic point of view. Section 5 concludes.

2 Phonology-morphology interface

By changes at the phonology-morphology interface we understand changes in morphology that originally resulted from an application of a regular phonological rule that has later become opaque; with the phonological rule no longer being applied and detectable by the speakers, the alternation is often treated as idiosyncratic allomorphy (see Carstairs 1987 and Embick 2010 on allomorphy in general). Frequently a consequence of this is that the sound change is then re-analyzed as a non-concatenative morphological means to derive a new word or a form. Thus, phonological changes may feed morphology.

One of the most well-known examples of such a change is the Umlaut alternation in German, for instance, in plural forms (*Hand – Hände*), comparatives (*arm – ärmer* 'poor' – 'poorer'), or diminutives (*Katze – Kätzchen* 'cat' – 'kitten'). Historically this resulted from applying a regular phonological rule, but in Modern German it is perceived as lexically-conditioned allomorphy. Furthermore, in some cases the change of a stem vowel is the only thing that distinguishes the two forms, and thus it is perceived by the speakers as a case of non-concatenative morphology: see e.g. *Mutter – Mütter* 'mother' – 'mothers', *Vater – Väter* 'father' – 'fathers'. For a detailed discussion of this phenomenon we refer the reader to Anderson (2015) and Trips (2017). In what follows we would like to consider two similar examples from Russian (Slavic) that are less often mentioned in the literature: consonant alternations that go back to the so-called first palatalization and vowel deletion.

2.1 Consonant alternations in Russian

In Modern Russian the velar consonants k, g and x occasionally alternate with the alveolo-palatal affricate č (IPA: tɕ) and the retroflex fricatives ž (IPA: ʐ) and š (IPA: ʂ), respectively. The alternation is most noticeable in verbal stems; consider, for instance, the series of verb forms in (1). It is also attested in some nominal forms, including, for example, diminutives: *reka* 'river' – *rečka* 'river.DIM', *muxa* 'fly' – *muška* 'fly.DIM', *noga* 'leg' – *nožečka* 'leg.DIM'. (For the sake of simplicity, throughout this section we present the words using the standard scientific transliteration and matching the standard orthography, and we use the acute accent to indicate the stressed syllable.)

(1) a. kri**č**át' kri**č**ú kri**č**íš
scream.INF scream.NONPST.1SG scream.NONPST.2SG

b. bé**g**at'/be**ž**át' be**g**ú be**ž**íš'
run.INF run.NONPST.1SG run.NONPST.2SG

c. plá**k**at' plá**č**u plá**č**eš
cry.INF cry.NONPST.1SG cry.NONPST.2SG

d. ma**x**át' ma**š**ú má**š**eš
wave.INF wave.NONPST.1SG wave.NONPST.2SG

e. slú**š**at' slú**š**aju slú**š**aješ
listen.INF listen.NONPST.1SG listen.NONPST.2SG[2]

Given these data alone, it is nearly impossible to identify the pattern and to come up with a single phonological rule that would capture the allomorphy, and speakers of Modern Russian may think of it as irregular alternations. However, examining the history of the Russian phonology and the sound changes in Proto-Slavic that laid the foundation for it provides a solution for the puzzle.

The consonant alternations between velars and fricatives/affricates illustrated above go back to the so-called **First Palatalization**. The original segment in such a series is the velar consonant (k, g, x). It was retained before a back vowel but underwent regressive palatalization when followed by a front vowel, such as *e/ē and *i/ī; the combinations of a velar and the palatal *j were likewise transformed (yielding, for instance, the NONPST.1SG verbal forms in (1) above). The shift undoubtedly happened in Proto-Slavic (also known as Common Slavic). Although there is no agreement in the literature on the exact time period, most researchers date the change to the 4th–7th centuries AD (Shevelov 1965; Šekli 2014; Greenberg 2016, i.a.). Opinions also vary as for how exactly the velars transformed into the new sounds; the shortest path with only one intermediate stage was advocated by Aleksey Shakhmatov, while, for instance, August Leskien and Samuil Bernstein argued for a more gradual transformation (see Bernstein 2005 for an overview).

Although the First Palatalization was regular and restricted to a specific set of contexts, as described above, with time it became obscured by subsequent sound changes. One of them was the shift of the long front vowel *ē into *a in Proto-Slavic. Compare, for instance, *kričat'* 'to scream' to *plakat'* 'to cry'. The infinitival suffix in the former included *ē, which later changed into *a. This *ē motivated the k-to-č shift. In contrast, the infinitive *plakat'* always ended with *a, hence the form did not change to **plačat'*. Another important change was the complete reduction of the extra-short front vowel *ĭ in the Post-Common-Slavonic period, which we will discuss in more detail in the next subsection. This resulted in č, ž and š appearing in front of a consonant, as in *rečĭka → *rečka* 'river.DIM', or at the end of the word, as in *plačĭ → *plač* '(the) cry'. In addition to this, many words borrowed to Russian or created later were adapted to follow a similar pattern by analogy, even if the change was no longer conditioned phonologically. Consider, for instance, such pairs in Modern Russian as *ždak* 'emery, abrasive' – *ždačka* 'sandpaper' and *kurlykat'* 'to coo' – *kurlyču* 'I coo'.

Another example showing that native speakers reinterpreted the original phonological rule in an attempt to attribute the alternation to a morphological change is the word *fl'ažka* 'flask'. According to Vasmer (2009), *fl'ažka* was borrowed to Russian from Polish, where *flaszka* is the diminutive of *flasza* 'flask'; the latter, in turn, can be traced back to the German *Flasche* 'bottle'. Interestingly, in Russian *fl'ažka* was reanalyzed by analogy with *nožka* 'leg.DIM' – *noga* 'leg', which resulted in the newly-coined word *fl'aga* 'flask'. Notice also that although *nožka* is pronounced with the voiceless retroflex fricative [ʂ] in front of [k], because of the assimilation with the following consonant, the underlying segment is voiced /ʐ/ (cf. *nožečka* 'leg.DIM') and this is still reflected in orthography. Mirroring this, the spelling of *fl'ažka* (pronounced with [ʂk]) mimics the g–ž alternation.

Finally, in some cases the consonant alternation between velars and fricatives/affricates can be said to have given rise to non-concatenative morphology. Consider, for instance, a productive pattern of nominalization. Deverbal nominals corresponding to the verbs in (1) are derived not by affixation but essentially by choosing a specific allomorph of the root:

(2) a. kri**č**-at kri**k**
scream-INF scream.VN
b. sluš-at' slu**x**
listen-INF listen.VN 'hearing, also gossip'

Although in this section we focused on the data from Russian, traces of the First Palatalization are found in other Slavic languages as well. For example, for Old Church Slavonic, we find alternations like in (3) (Schenker 1993: 68) with their counterparts in present-day Bulgarian (4):

(3) a. vlь**k**ъ vlь**č**e
wolf.SG.NOM wolf.VOC
b. bo**g**ъ bo**ž**e
god.SG.NOM god.VOC

(4) a. văl**k** văl**č**o
wolf.SG wolf.VOC
b. bo**g** bo**ž**e
god.SG god.VOC

Therefore we can conclude that the consonant alternation that was originally phonologically conditioned has turned into a case of lexically-conditioned allomorphy, and in some cases it can be viewed as a type of non-concatenative morphology. In the next subsection we present one further change of this kind.

2.2 Vowel deletion in Russian

Another case of seemingly arbitrary allomorphy with underlying phonological factors that are no longer recognized as such by the speakers concerns pairs of allomorphs that involve complete vowel deletion in one of them, also known in traditional grammars as *beglyje glasnyje* literally meaning: 'runaway vowels'. As illustrated in (5), the pairs of alternating phonemes are /o/–∅ and /e/–∅; most often the alternation is attested in roots, but it is also found in affixes.[3]

(5) a. s**o**n **sn**a
sleep.M.SG.NOM sleep.M.SG.GEN
b. d**e**n' **dn'**a
day.M.SG.NOM day.M.SG.GEN
c. m**o**x **mš**istyj
moss MOSS.ADJ
d. kis-**k**-a kis-**o**k-∅
cat.F-DIM-SG.NOM cat.F-DIM-SG.GEN
e. ruč-**k**-a ruč-**e**k-∅
arm.F-DIM-SG.NOM arm.F-DIM-PL.GEN
f. sapož-**o**k-∅ sapož-**k**-a
SOCK.M-DIM-SG.NOM SOCK.M-DIM-SG.GEN
g. nosoč-**e**k-∅ nosoč-**k**-a
SOCK.M-DIM-SG.NOM SOCK.M-DIM-SG.GEN
h. ra**z**-bit' raz**o**-brat'
DIST-beat DIST-take
i. **s**-bit' s**o**-brat'
PFV-hit PFV-take

Similarly to the consonant alternation discussed above, this vowel alternation is hard to describe in a systematic way based on the data from Modern Russian. The phonological process responsible for the o–∅ and e–∅ alternations is to be found in early Old Russian: it is the disappearance of reduced vowels, commonly referred to as *Padenije Redutsirovannyx* 'the Fall of

the Reduced [vowels]' dating to the 11th–13th centuries.

In Common Slavic most syllables were open. Historically, the roots and affixes listed in (5) contained one of the reduced or extra-short vowels *ŭ and *ĭ, indicated in writing by the back yer (ъ) and the front yer (ь), respectively. The two vowels disappeared at the beginning of the Old Russian period. The strong *ŭ and *ĭ became fully voiced and yielded /o/ and /e/, respectively, and the weak *ŭ and *ĭ were elided. In Proto-Slavic the strength of a vowel was determined in phonology according to a fixed set of parameters that was described by the Czech linguist Antonín Havlík in 1889 and is now known as Havlík's law. Word-final yers, yers followed by a non-reduced vowel in the next syllable, and yers followed by a strong yer in the next syllable were weak, while stressed yers and those followed by a weak yer in the next syllable were strong. This explains the variation in (5). For instance, *sŭnŭ → *son* (5a) had a weak yer in the final syllable and a strong stressed yer in the first syllable; in contrast, in the genitive form *sŭna → *sna* the stress shifted to the inflection thus weakening the initial yer, which was then dropped. Likewise, in *razŭ-bitĭ → *raz-bit'* (5h) the prefix ended with a weak yer because it was followed by a stressed vowel, as opposed to *razŭ-bĭrátĭ → *razo-brat'*, where the root began with a weak yer. As a result of this, in Modern Russian the prefix has two allomorphs: *raz* and *razo*.

Similarly to the consonant alternations, the vowel deletion can no longer be described as a single regular phonological rule. To a certain degree, however, it is perceived as a morphological rule as in Modern Russian /o/ and /e/ are often deleted based on the following affix. Thus, many words that were coined after the extra-short vowels had already disappeared have nevertheless been adapted to follow a similar pattern. Consider, for instance, the masculine nouns *tanec* 'dance.NOM' – *tanca* 'dance.GEN' and *amerikanec* 'an American' – *amerikanca* 'an American.GEN', where /e/ is dropped in front of the SG.GEN inflection, in parallel to *den' – dn'a* in (5b), or *šokolad-k-a* 'chocolate-DIM-SG.NOM' – *šokolad-ok-∅* 'chocolate-DIM-PL.GEN', where /o/ is inserted in the PL.GEN form by analogy with *kis-k-a – kis-ok-∅* (5d), etc.

Earlier in this section we observed that the Umlaut alternation in German and consonant alternations in Russian may give rise to non-concatenative morphological patterns. This is also true for vowel deletion, as shown in the pairs of verbs and derived nominals in (6).

(6)
a. **zv**át' z**ó**v
   call.INF call.VN
b. **čt**ít' počó**t**
   honor.INF honor.VN
c. vý**br**at' výb**o**r
   choose.INF choose.VN
d. **mst**it' m**e**st'
   avenge.INF revenge

Historically, the alternation in (6) is a result of the disappearance of weak yers, as described above. For example, *zvát'* ← *zŭvátĭ had two weak yers (in the final syllable and in the first syllable, both of which were deleted, while *zov* ← *zŭvŭ had one strong stressed yer, which became fully voiced, and one weak yer at the end of the word, which was dropped. However, in Modern Russian the change is perceived as being not phonologically conditioned but rather morphologically conditioned, i.e., characteristic of particular forms. Similarly to the consonant alternation discussed in the previous section, the insertion of a vowel regularly appears in deverbal nominalizations (see Pazelskaya 2009 on the direction of derivation in such pairs being indeed verb → noun).

The three case studies mentioned in this section – the Umlaut alternation in German, the consonant alternation in Russian (and broadly in Slavic), and the vowel deletion in Russian

– were used to illustrate language-internal changes at the phonology-morphology interface. We have shown that they can all be described as morphological phenomena, such as morphologically/lexically-conditioned allomorphy and the emergence of new non-concatenative patterns, which were originally driven by regular purely phonological rules that are no longer productive.

3 Syntax-morphology interface

In this section we will discuss changes at the morphology–syntax interface. It is received wisdom in the literature that new morphological elements may evolve from the reanalysis of syntactic structures: how morphologically independent units turn into bound ones. Textbook examples of this kind of reanalysis include the rise of verbal inflection from pronouns (see, e.g., Siewierska 1999; Fuß 2005) and the reanalysis of the Latin analytic construction with *habere* 'have' + infinitive into a future tense marker in Romance languages (Trips 2017; Fleischman 1982). A lesser-known example of the grammaticalization of a syntactic construction into a morpheme of the Tense/Aspect category can be found in Yucatec Mayan (Lehmann 2020). In this language the imperfective prefix *k-* goes back to the habitual construction that included an expression 'in this time span' (with the preposition possibly being omitted). It is attested in Colonial Yucatec Maya, which was documented in the Diccionario de Motul (1577) and the three grammars of Coronel (1620), San Buenaventura (1684) and Beltrán de Santa Rosa (1746).[4] The grammaticalization path of the IMPF *k-* from a phrasal modifier to a bound morpheme can be schematized as in (7), with the examples in (8) illustrating the stages of the change.

(7) *ti' lik* LOC this.span 'in this time span' (8a), (8b) → *lik* HAB (8c) → *lik* IMPF auxiliary (8d) → *k-* IMPF prefix (8e).

(8) a. kim-s-a'b-ih in yuum **ti' lik** u han-al
die-CAUS-PASS-COMPL ERG.1SG father LOC this.span ERG.3 eat-ICOMPL
'My father was killed while eating.' (Coronel)

b. **lik** u dzoc-ol a han-al ka ta-k-ech uaye
span ERG.3 end-ICOMPL ERG.2 eat-ICOMPL and come-SBJV-ABS.2.SG here
'when you have eaten, you should come here' (Motul)

c. **lik** in wen-el tamuk' in han-al
HAB ERG.1SG sleep-ICOMPL while ERG.1SG eat-ICOMPL
'I usually fall asleep while eating.' (Motul)

d. in kéban **lik** u-ok-t-ik.
ERG.1SG sin IMPF ERG.1SG-weep-TR-ICOMPL
'It is for my sins that I am crying.' (Coronel)

e. **K**=a wok-ol,
IMPF=2 enter-IMPF
'You are entering.' (Modern Yucatec Maya, elicited)

In what follows we would like to present a case study that the general audience is perhaps less familiar with, namely, the grammaticalization of adpositional elements in Uralic. Because of limitations of space we will focus on data from Hungarian; we refer the reader to Kittilä et al. (2022) and Grünthal (2022) and the references therein for a discussion of adpositions and case suffixes in Uralic.

Modern Hungarian utilizes different types of spatial elements, the traditional classification of which is into four groups: postpositions, case suffixes, adverbs and particles. Hegedűs (2014)

shows that all four types were already attested at the beginning of the written period (the oldest Hungarian texts are from the end of the 12th century) but underwent considerable changes. In this section, we will first present the changes on the level of observable data and will then summarize Hegedűs's (2014) theoretical analysis of the diachronic processes involved. We will zoom in on the changes related to postpositions and case suffixes; for other changes, such as grammaticalization via adjunction and the emergence of verbal particles we refer the interested reader to Hegedűs (2014). Specifically, we will discuss two types of change in the history of Hungarian: the first one involves the change of a noun into a postposition and the second involves the morphologization of a postposition into case suffix.

Let us begin with the former process. This is a syntactic change, but it plays a key role for the morphologization of postpositions into case suffixes. In Modern Hungarian, two groups of postpositions are distinguished: postpositions that take a case-less noun phrase and postpositions that take an oblique case-marked dependent; the former are often referred to as 'case-like postpositions' (see Dékány & Hegedűs 2021). Case-like postpositions often come in triplets with place, goal and source semantics (as we will see shortly, this is also common for spatial cases). In (9), the three postpositions may look like case-marked forms of *el-* 'front', but are argued to be morphologically non-decomposable synchronically, for reasons to be outlined below (Hegedűs 2014). Corresponding triplets are found in Old Hungarian, too. They are illustrated in (10).

(9) a. a ház előtt
the house front.at
'in front of the house'
b. a ház elé
the house front.to
'(to) in the front of the house'
c. a ház elől
the house front.from
'(from) in front of the house' [Modern Hungarian, Hegedűs 2014]

(10) a. uromc scine eleut
Lord.POSS.1PL face.POSS front.at
'before our Lord' (Funeral Sermon and Prayer)
b. nekyk elue
they.DAT front.to
'(to) before them' (Jókai C. 21)
c. ó orcaioc èlól
they face.POSS.3PL front.from
'from before their faces'[5] (Vienna C. 32)

Hegedűs (2014) discusses the history of the case-like postpositions. The place, goal and source semantics originate from the spatial suffixes attaching to them: *-t*, *-á/-é* and *-l* were reconstructed as the Proto-Hungarian locative ('in'), lative ('to(wards)') and ablative ('from') suffixes, respectively (see Korompay 1991: 287–288; Raun 1988: 558–560 on the cases in Proto-Uralic). This is why these postpositions express place, goal and source semantics in both Old and Modern Hungarian. However, as Hegedűs (2014) shows, the spatial elements in (10) had a very different syntactic behaviour from their Modern Hungarian counterparts in (9). Originally, elements like *el-* 'front' had nominal properties, which allowed them to participate in a possessive construction with the Ground-denoting (pro)nominal. The original structure, i.e., a possessive construction, that was still in use in Old Hungarian has been simplified in Modern Hungarian. Three pieces of evidence are presented in favour of this: (i) the case-marking of the possessor,

(ii) the agreement on the postposition, (iii) the distribution of reflexive anaphors; of which we discuss only the first. In both Modern and Old Hungarian, the possessor in a possessive noun phrase can be either unmarked or bear dative case. Similarly to the marking of possessors, some postpositions in Old Hungarian could combine either with unmarked or dative-marked nouns, as shown in (11a) and (11b), respectively. In the latter case, the postposition also showed possessive marking (which is analogous to the one found on possessed nouns). In other words, the construction exemplified in (11b) shows parallel behaviour to possessed noun phrases.

(11) a. zemey elewt
eye.POSS.3SG.PL front.at
'in front of his eyes' (Jókai C. 121)
b. baratok**nak** elewt**te**
brothers.DAT front.at.POSS
'in front of (the) brothers' (Jókai C. 84)

This is in sharp contrast with the syntactic behaviour of case-like postpositions in Modern Hungarian: they can only take a caseless noun phrase, not a dative-marked one (see Dékány & Hegedűs 2021 for detailed description). Moreover, no possessive marking is found on postpositions with nomimal dependents, as shown in (12a) (but see below on pronouns). Crucially, the strategy illustrated in (11b) for Old Hungarian is ungrammatical in Modern Hungarian, as shown in (12b). This provides strong support for the idea that the original possessive structure has been reanalyzed and that the spatial element has lost its nominal properties and has turned into a simple path- or place-denoting postposition in Modern Hungarian.

(12) a. a ház-ak előtt-(*e)
the house-PL front.at-POSS
'in front of the houses'
b. *a ház-ak-nak előtt-e / előtt
the house-PL-DAT front.at-POSS front.at
Intended: 'in front of the houses' [Modern Hungarian, Veronika Hegedűs, p.c.]

Further support for the idea that case-like postpositions originate from a possessive structure comes from the pronominal forms of these postpositions (see Dékány 2018 for extensive discussion). As shown above, the nominal dependents of case-like postpositions are unmarked in Modern Hungarian (12a). However, the simple juxtaposition of pronouns and case-like postpositions is ungrammatical (13a). Instead, there is obligatory possessive agreement on the postposition and the pronoun is optional (13b).

(13) a. *én előtt
1SG front.at
b. (én) előtt-em
1SG front.at-POSS:1SG
'in front of me'

In order to explain this unexpected behaviour of pronominal dependents, Dékány (2018) proposes that (13b) is still a possessive structure, with the pronoun being a possessor, which can be dropped. This also explains the obligatoriness of possessive agreement in (13b).[6]

The diachronic change can go a step further, namely, the place- or path-denoting postpositions can turn into semantic/oblique case suffixes. Synchronically, it is assumed for Hungarian that the difference between postpositions and case suffixes is morpho-phonological in

nature: suffixes, unlike postpositions, are monosyllabic and most of them show vowel harmony (front-back and, in some cases, roundedness) with the word they attach to (É. Kiss 2002; Asbury 2008; Dékány 2011, 2018; Dékány & Hegedűs 2021). The diachronic process of morphologization can be clearly observed in Hungarian.

Traditional historical grammars of Hungarian take three factors into account in order to determine whether a spatial element is a postposition or a case suffix: monosyllabicity, vowel harmony, and orthography (the spatial element is not written separately) (see Korompay 1991); formal analyses focus on the monosyllabicity and (to some extent) on the application of general phonological processes, such as vowel harmony (Hegedűs 2014). Based on these criteria, some of the spatial elements used in Modern Hungarian are argued to have been suffixes already in Old Hungarian, while others have undergone morphologization during this period. The relevant case for us is the triplet that comprises the inessive ('in(side)'), illative ('(in)to') and the elative ('from (inside)'). This triplet relates the Figure to the inside of the Ground object.[7] In Modern Hungarian, these are clearly suffixes: they are monosyllabic and show front-back vowel harmony, as shown in (14).

(14) a. a ház-ban, a terem-ben
the house-INE the room-INE
'in the house, in the room'
b. a ház-ba, a terem-be
the house-ILL the room-ILL
'into the house, into the room'
c. a ház-ból, a terem-ből
the house-ELA the room-ELA
'from the house, from the room' [Modern Hungarian]

In the Early Old Hungarian period, these elements were at different stages of becoming suffixal (Hegedűs 2014). The spatial element expressing place semantics was monosyllabic, but in the oldest text, the Funeral Sermon and Prayer, it did not harmonize (15): only the front vowel variant *-ben* is documented (Zsilinszky 1991). Forms already showing vowel harmony start to appear later during the Old Hungarian period: (16) is from the Jókai Codex. Based on these facts, Hegedűs (2014) argues that at this stage the locative element has undergone a change into an inessive suffix.

(15) a. paradisum**ben**
Paradise.in
'in Paradise'
b. gimils**ben**
fruit.in
'in fruit' (Funeral Sermon and Prayer)

(16) a. vezedelmes vilag**ban**
dangerous world.INE
'in dangerous world' (Jókai C. 4)
b. nagy tiztesseg**ben**
big honor.INE
'in great honor' (Jókai C. 12)

The illative and the elative suffixes are still bisyllabic in the earliest texts (17) but their form is beginning to get reduced: both longer and shorter forms are attested in the Jókai Codex (18). This variation suggests that the morphologization was not complete at this stage.

(17) ez homus vilag timnuce**beleul**
this false world prison_cell.POSS.out
'out of the prison cell of this insincere world' (Funeral Sermon and Prayer)

(18) a. paris**balol**
Paris.out
'from Paris' (Jókai C. 28)

b. ez felewl mondot lang**balol**
this above say.PTCP flame.out
'from the above mentioned flame' (Jókai C. 43)

c. az lang**bol**
the flame.out
'out of/from the flame' (Jókai C. 43)

d. ez vilag**bol**
this world.out
'from this world' (Jókai C. 62)

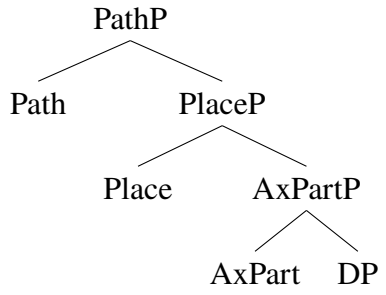
Thus, the Old Hungarian data clearly document the morphologization of postpositions into case suffixes, as evidenced by by the phonological attrition (in the case of the illative and elative) and the application of phonological processes like vowel harmony (in the case of the inessive).

Let us briefly discuss the earlier stages of the changes related to the inessive, illative and elative. These three case suffixes go back to Proto-Hungarian and are reconstructed from a spatial element, *bel, which inflected with case suffixes. Thus, the reconstructed forms are the following: *belen (postposition + Proto-Hungarian locative) for the inessive, *belé (postposition + Proto-Hungarian lative) for the illative, and *belől (postposition + Proto-Hungarian ablative) for the elative (Korompay 1991). (The same reconstructed root is also found in *bels-* 'inside part', *bél* 'gut', *belső* 'inner', which are still used in Modern Hungarian.) The emergence of these forms likely involved the reanalysis of a possessive construction, as summarized above for case-like postpositions. This means that the case-marked *bel likely participated in a possessive construction, similarly to what was illustrated for Old Hungarian *el-* 'front' in (11). Even though this cannot be supported with actual data from that period other than these reconstructed forms, we find evidence for this assumption by looking at the pronominal forms of the inessive, illative and elative cases. These forms, e.g., *benned* 'inside you', *beléd* 'into you' and *belőled* 'from inside you', still contain the original spatial element *bel (compare these pronouns to the form of the elative prior the phonological attrition in (18a)) and a possessive agreement marker (2SG *-(e)d* in the aforementioned forms).

Having presented the two changes on the descriptive level, let us turn to their theoretical analysis, following Hegedűs (2014). This analysis in couched in a generative syntactic framework; the diachronic changes are argued to be cyclical in the sense of van Gelderen (2009, 2016). Postpositions and case suffixes are analyzed by Hegedűs (2014) as adpositional elements or P heads in generative syntactic terms, their history is argued to follow a P(ostposition)-cycle. In order to understand how the two changes that took place in Hungarian can be viewed as cyclical changes, we need to get acquainted with the extended structure of spatial PPs, as depicted in (19) (see Jackendoff 1983; van Riemsdijk & Huybregts 2002; Svenonius 2006; Asbury 2008 and the contributions in Asbury et al. 2008 and Cinque & Rizzi 2010, among many others). In the generative syntactic literature, PPs are said to involve projections for place- and path-denoting elements (and it some analyses, for functional elements as well); furthermore, Path is argued to be projected on top of Place. Additionally, PPs may also host elements that are at the intermediate stage between nouns and adpositions based on their morphosyntactic properties.

For example, *front* as in *in front of the car* can be neither pluralized (**in fronts of the car*) nor modified (**in smashed-up front of the car*) (Svenonius 2006). Svenonius (2006) argues that these elements are hosted in a separate projection, Ax(ial)PartP.

(19) Extended structure of PPs



It has been observed that adpositions often grammaticalize from nominal elements. This diachronic change involves filling in the AxPart; later the element may lose its nominal properties completely, which results in the development of a new Place or Path head (see Waters 2009 on English). For Hungarian, Hegedűs (2014) proposes that the initial (historical) structure involved a possessive relation between the nominal denoting location and the Ground (DP). This was the first change that we discussed above: nouns like *el-* 'front' turned into AxPart heads and then into postpositions. As was shown above, these elements still had nominal properties in Old Hungarian, as the construction patterned with possessive noun phrases (11). It was also demonstrated that in Modern Hungarian, postpositions like *előtt* 'in front, before' no longer have nominal properties, and that the PP no longer resembles possessive constructions (12). This is because, as Hegedűs (2014) argues, the AxPart head has lost all of its nominal properties, and has become a Place or Path head and the erstwhile possessor has been reanalyzed as its complement.

Above, we discussed another type of change: the morphologization of postpositions into case suffixes. We already noted that spatial postpositions and case suffixes are argued to differ only morpho-phonologically in Hungarian; in syntactic terms they both fill Place or Path heads. Hegedűs (2014) argues that a further step in the P-cycle is when an independent postposition spelling out a Place or Path head turns into a case suffix. This change does not involve a change in the syntactic status of the spatial element – it is still a Path or Place head – only its morpho-phonological properties change. We have seen that the hallmarks of this morphologization include the phonological attrition of the elements, accompanied by the generalisation of certain (language-specific) morpho-phonological processes (e.g., vowel harmony).

Thus, the Hungarian data show a wide spectrum of diachronic changes in the PP domain. These changes start in syntax with the transition of a lexical element (a noun) into a functional head (AxPart) and later into a P head. Then, the change continues in morphology with the morphologization of the P heads. This picture is replicated in other Uralic languages (see Kittilä et al. 2022; Grünthal 2022 for a recent overview).

4 Semantics-morphology interface

In this section we discuss changes at the semantics-morphology interface. A productive morphological pattern may emerge as a result of backformation or folk etymology that has led to a semantic reanalysis and a new way to decompose a word. For example, the reanalysis of the word *hamburger* and the subsequent appearance of the word *burger*, which is productively used in many compounds, is plausibly a case of folk etymology (see Campbell 1986: 176; Trips 2017).

Originally, the word *hamburger* denoted a person from the city of Hamburg and was associated with the expression *Hamburger steak*, which referred to a kind of beef patty pan-fried with gravy, and *Hamburger sandwich*, that is, a sandwich with such a beef patty, both popular in the United States at the beginning of the 20th century. The short form *burger* appeared already in the 1930s, likely facilitated by the reanalysis of *Hamburger* as a compound *ham+burger*, and nowadays it is used productively in such words as *shrimpburger*, *cheeseburger*, etc. Another textbook example of this kind is the backformation of the now productive *-gate* ('a person or thing associated with a public scandal') from *Watergate*, which is used in *Monica-gate*, *Iran-gate*, etc. Similarly, *-athon* stems from the name of a long-distance race *marathon*, called so after a Greek city; it is now used productively in *hackathon*, *ideathon*, *readathon*, *jogathon*, etc., contributing the meaning 'an event marked by length' (Collins English Dictionary).

Semantico-morphological changes are often related to the notion of 'extra-grammatical/expressive morphology' (Zwicky & Pullum 1987; Mattiello 2013). Unlike so-called 'plain morphology' (regular affixation, templatic morphology, etc.), extra-grammatical morphology is less regular and often has expressive, playful associations. It ranges from truly idiosyncratic and sporadic coinages to more regular processes, such as blending (e.g., *breakfast* + *lunch* > *brunch*), acronym formation (e.g., *President of the United States* > *POTUS*), or expressive reduplication (e.g., *shm*-reduplication in English, *fancy-shmancy*). Ideophones (e.g., *bling bling*) also belong here, as well as truncations and clippings. The latter involves a morphological change (shortening) with the meaning being preserved, and can be exemplified by *laboratory* > *lab* or more complex cases, such as the word *gas*, as in *gas station*, *gas tank*, *gasless*. Originally, *gas* is a clipping from *gasoline*, but that itself comes from Cazeline, a brand of petroleum-derived lighting oil (possibly influenced by Gazeline, the name of an Irish competitor).

Backformation often facilitates the emergence of a new pattern of expressive morphology; consider, for instance, the *-athon* example mentioned above. To this can be added the backformation of *-kini* from *bikini*, based on the name of the Bikini Atoll, which made it possible to form *monokini*, *microkini*, and *tankini*. The reanalysis of the blend *workaholic* (*work* + *alcoholic*) lead to the derivation of *milkaholic*, *coffeeholic*, *sleepaholic*, and other similar words, with the newly-coined suffix *-(a)holic*. To the extent that many of these backformations have expressive connotations and are particularly common in newspaper language, they can be considered to be a type of extra-grammatical morphology.

The examples presented above demonstrate how a derivational morpheme can develop based on backformation and folk etymology. Often, however, a new derivational pattern of affixation emerges as a result of reanalyzing a lexical head. Specifically, a relational noun, which by its nature requires a nominal dependent, can become involved in syntactic compounding and subsequent morphologization. An example of such a change – namely, the rise of the suffixes *-hood*, *-dom* and *-ship* in English – is examined in detail in Trips (2009); in this section we would like to discuss *-hood*, and we refer the reader to the original work for more data. Building upon insights from Marchand (1969), Trips argues that the suffix *-hood* developed in three steps, as follows. The first stage dates to Old English, where *hood* was used as a free lexical root *hād* with the meaning 'person, status, office, rank'. As a relational noun, it required a noun phrase as its dependent (as in *archbishop/pope's status/office/rank*, etc.). The syntax of such combinations of noun + *hād* was then simplified with the first item no longer being inflected, which led to the second stage in the history of *hood*: Middle English *hōd* was used primarily in compounds. However, already in Middle English instances of complete morphologization were attested, whereby the compound structure lost its syntactic properties and *-hood* became a suffix. The morphosyntactic change was accompanied by a metonymical shift in the semantics of *-hood* based on its original salient meaning and it could now be used to refer to a state or a period of time (as in *childhood*). At

the final stage, that is, in Modern English, this item is used as a derivational morpheme with the broad meaning 'a state or condition' (*manhood*) and also 'a body of persons' (*priesthood*). Thus, the path can be summarized as follows: lexical element > (head of) compound > derivational morpheme, with the second step being accompanied by a semantic (metonymical) shift.

A similar morphologization path from a free lexical root to a bound morpheme via compounding conditioned by a metonymical shift in the meaning can be proposed, for instance, for the English suffix *-ful*, as in *grateful*, *eventful*, *resourceful*; see Sauer (1992); Dalton-Puffer & Plag (2000) for discussion. Originally, *full* referred to 'a container full of substance' (Marchand 1969). Expressions such as *barrels full of wine* are argued to have shifted to *barrelful(l)s of wine*; a metonymical shift then prompted the emergence of the bound *-ful* with the more abstract meaning 'full of, characterized by' (Dalton-Puffer & Plag 2000).

5 Conclusion

Morphology inevitably interacts with phonology, syntax, and semantics, and this interaction often leads to morphological changes, the development of allomorphy and the emergence of new derivational and inflectional patterns. In this chapter we presented an overview of such changes, focusing on each of the interfaces (phonology-morphology, syntax-morphology, and semantics-morphology) and highlighting the most commonly attested types of shifts.

We illustrated changes at the phonology-morphology interface with several examples of allomorphy that were originally phonologically conditioned but have later been reanalyzed as lexically-conditioned, after the phonological rule behind it became opaque. We began by mentioning a well-known example of German – the Umlaut alternations, and proceeded by discussing two phenomena found in Russian and other Slavic languages: the consonant alternation between velars and fricatives/affricates and the vowel deletion (i.e., the o/e–$\emptyset$ alternation). Historically, both resulted from applying a specific phonological rule, however in Modern Russian they are perceived as instances of irregular allomorphy. We further showed that in some cases these alternations went one step further and appear to have given rise to non-concatenative morphological processes.

Discussing the syntax-morphology interface, we investigated the behavior and history of postpositions and spatial case suffixes in Modern Hungarian (Uralic) to demonstrate how new bound morphemes may evolve from the reanalysis of syntactic structures. We also mentioned some examples of grammaticalization from other language families: specifically, the emergence of TAM markers in Romance and Mayan.

Finally, as for the semantics-morphology interface, most often such changes lead to the emergence of a new derivational pattern. The two commonly attested semantic triggers behind it are backformation or folk etymology and metonymical shift. We discussed both of these and illustrated them with examples from English.

Related Articles (See Also)

Article ID
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Notes

1. We would like to thank an anonymous reviewer for the valuable comments and suggestions. We are also grateful to Edith Aldridge, Katalin É. Kiss, Éva Dékány, Marcel den Dikken and Veronika Hegedűs for their feedback. This

research has been supported by grant NKFIH KKP 129921 of the National Research, Development, and Innovation Office of Hungary.

2. The glosses used in this chapter adhere to the Leipzig Glossing Rules with some additions: 1 = first person, 2 = second person, 3 = third person, ABS = absolutive, ADJ = adjective, CAUS = causative, COMPL = completive, DAT = dative, DIM = diminutive, DIST = distal, ELA = elative, ERG = ergative, F = feminine, GEN = genitive, HAB = habitual, ICOMPL = incompletive, ILL = illative, IMPF = imperfective, INE = inessive, INF = infinitive, LOC = locative, M = masculine, NOM = nominative, NONPST = non-past, PASS = passive, PFV = perfective, PL = plural, POSS = possessive, PTCP = participle, SBJV = subjunctive, SG = singular, TR = transitive, VN = deverbal noun, VOC = vocative.

3. In speech non-stressed /o/ is reduced to [a] and non-stressed /e/ is reduced to [i]. This change is regular and independent of the vowel/∅ alternation under consideration.

4. Colonial Yucatec Maya, 1516–1750, is the second stage in the history of Yucatec Maya, between Classical Maya and Modern Yucatec Maya.

5. The Old Hungarian examples and their English translations are from Hegedűs (2014), unless otherwise indicated. In some cases the glosses were slightly modified. No hyphenation is used in them in order to preserve the original orthography; the relevant morphology required for the understanding of the particular example is boldfaced.

6. Another example of personal pronouns in Modern Hungarian that preserves a morphosyntactic pattern from the earlier stages of the language is their accusative form that lacks the accusative suffix; see É. Kiss (2013) for a discussion.

7. Synchronically, Hungarian has ten spatial case suffixes; nine of them are organized along two dimensions (Dékány & Hegedűs 2021). The first dimension is related to the position of the Figure with respect to the Ground: whether it is located with respect to the inside, the surface, or the proximity of the Ground; this gives rise to cases distinguishing between 'in', 'on', and 'at' the Ground. The second dimension concerns whether the Figure is in motion – towards the Ground (goal semantics) or away from the Ground (source semantics) – or is stationary (place semantics). The tripartite division of spatial case suffixes into goal, source and location is also common in other Uralic languages (see Kittilä et al. 2022 for discussion).

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