

The interaction between morphological and phonological domains in Polish

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The goals of the talk:

- 1/ To discuss the details of morphology/phonology interaction in Polish with a special focus on the domain of the word;
- 2/ To propose an Optimality Theoretic analysis based on alignment and correspondence constraints;
- 3/ To argue that the Polish facts are motivated by general principles of speech perception and recognition on the one hand and general principles of language usage and change (especially grammaticalization processes) on the other hand.

- (1) A complex word structure in Polish

za - mraz - ark - a

zamrażarka ‘freezer-nom.’

DER-ROOT-DER-INFL

Prosodic hierarchy (e.g. Selkirk 1984, 1986, Nespor and Vogel 1986, Inkelas and Zec 1990):

Syllable < Foot < Prosodic Word < Phonological Phrase < Intonational Phrase < Utterance

The evidence of compounds as well as prefixed words points out that Polish phonology distinguishes between a larger word-size domain and an inner, smaller domain (cf. 2) and does not completely obey the Strict Layer Hypothesis (cf. 3).

- 2) Polish domains of the “word” size (after Kraska-Szlenk 2003/1995)

Phonological Word (Pword) \approx “small” Prosodic Word

Morphological Word (Mword) \approx “big” Prosodic Word

Prosodic Unit (Punit) \approx Clitic Group

- (3) Polish version of Strict Layer Hypothesis (Selkirk 1984):

a/ [... [... [X]_{Pword} ...]_{Mword} ...]_{Punit} (not necessarily exhaustive parsing)

b/ [X]_{Punit} [X]_{Punit}]_{Pphrase} (necessarily exhaustive parsing)

(4) Examples of different structures within Punit:

a/	[[załóž] _{Pword} my] _{Mword=Punit}	załóžmy ‘let’s dress’
b/	[[załóž] _{Pword=Mword} mu] _{Punit}	załóž mu ‘dress him’
c/	[nad[aktywność] _{Pword}] _{Mword=Punit}	nadaktywność ‘hyperactivity’
d/	[[latyno] _{Pword} [amerykański] _{Pword}] _{Mword=Punit}	latyno-amerykański ‘Latin American’

The smallest domain of Pword is meant to provide cues for root and inflectional suffix boundaries and is predicted by unviolable constraints in (5).

(5) Pword alignment constraints

a/ Al-Rt(L): Align {Root, L, Pw, L}

The left edge of every root has to be aligned with the left edge of a Pword.

b/ Al-Infl(R): Align {Infl, R, Pw, R}

The right edge of every inflectional suffix has to be aligned with the right edge of a Pword.

The left-edge Pword boundary due to the constraint in (5a) has consequences for syllabification of the prefixed words, which is best noticeable in cases when a prefix ends in a consonant and the following root starts with a vowel.

(6) underlying /C-V/ at the prefix-root juncture

a/	nad-aktywność	[nad.ʔa...]	‘hyperactivity’
b/	z-obligować	[zʔɔ.bli...]	‘to oblige’
c/ cf.	owad-ami	[ɔ.va.da.mi]	‘insects-instr.’

Another phenomenon that we can observe at the prefix-stem juncture is optional place assimilation between similar consonants, while stem internally such assimilation is obligatory.

(7) underlying /z-tʃ/ or /z-f/

a/	ś-ciemnieć	[stʃi...] ~ [tʃtʃi...]	‘to become dark’
b/	s-czernieć	[stʃɛ...] ~ [ʃtʃɛ...]	‘to become black’
c/	ściana	[tʃtʃa...] * [stʃa...]	‘wall’
d/	szczeniak	[ʃtʃɛ...] * [stʃɛ...]	‘puppy’

The right edge of the Pword is responsible for the final devoicing of obstruents before a pause and before another word beginning with a vowel or a sonorant (in Warsaw dialect). The hortative marker in (8a) exhibits a mixed behavior: of a clitic w. r. t. devoicing (cf. 8b) and of an affix w. r. t. stress (cf. 8c).

(8) Pword final devoicing: underlying /z/ in all examples

a/	załó[ʃ]my	[[załóʒ] _{Pword} my] _{Mword=Punit}	σ(σ́)σ ‘let’s dress’
b/	załó[ʃ]=mu	[[załóʒ] _{Pword=Mword} mu] _{Punit}	(σ́)σ ‘dress him’
c/	podłu[ʒ]ny	[podłuʒny] _{Pword=Mword=Punit}	σ(σ́)σ ‘elongated’

The evidence of proclitics shows that some of them constitute Pword domains (because we observe final devoicing) and some do not.

(9) Different Pword status of proclitics

a/	underlying /uv/ ‘that-masc.’	(cf. ova ‘that-fem.)		
	ów=eksperyment	[uf.ɛk...]	(σ̀)σ(σ́)	‘that experiment’
b/	underlying /nad/ ‘over’	(cf. nade ‘over’)		
	nad=aktywnością	[nad.ʔa...]	(σ̀)σ(σ́)	‘over activity’

(10) Mword alignment constraints

a/ Al-Pref(L): Align {Pref, L, Mw, L}

The left edge of the utmost prefix must be aligned with the left edge of a Mword.

b/ Al-Suf(R): Align {Suf, R, Mw, R}

The right edge of the utmost suffix must be aligned with the right edge of the Mword.

The most characteristic feature of the Mword domain is the stress pattern; especially, the presence of the main foot at the right edge of the word, which, together with the aforementioned sandhi effects, provides very strong prosodic cues for speech segmentation and proper identification of a meaningful unit created by a morphosyntactic word. Constraint in (11) is needed to account for the behavior of lexical words as opposed to that of clitics and components of compounds. (A detailed OT analysis of the Polish stress pattern can be found in Kraska-Szlenk 2003, where a family of foot structure constraints accounts for the stress placement and a family of “grid” constraints accounts for relative stress prominence – this last issue will be ignored here.)

(11) Prosodic status of Mword (LexWord=PrWord, Prince and Smolensky 1993)

Mword ⊃ Foot: Every Mword must have a foot aligned within its edges.

(12) Partial (top) ranking of metrical structure constraints

Trochee, Mword ⊃ Foot, Al-Mword(R) >> Foot-Bin >> Parse-Syllable >> Al-Foot(L)

- (13) Difference in prosodic status between Mword and Pword (w. r. t. Foot-Binarity)
- a/ $[\sigma]_{\text{Mword}}[\sigma]_{\text{Mword}} > (\sigma)(\sigma)$ kup dom ‘buy a house’
- b/ $[[\sigma]_{\text{Pword}}[\sigma]_{\text{Pword}}]_{\text{Mword}} > (\sigma\sigma)$ dwutakt ‘two-stroke engine’
- c/ cf. $[[\sigma(\sigma\sigma)]_{\text{Pword}}[(\sigma\sigma)\sigma(\sigma\sigma)]_{\text{Pword}}]_{\text{Mword}}$ latyno-amerykański ‘Latin American’

(14) Difference in prosodic status between Mword and Pword (w. r. t. Parse-Syllable)

- a/ compound: $[(\sigma\sigma)(\sigma+\sigma)]_{\text{Mword}}$ graniastół ‘prism’
- b/ clitic group: $[[\sigma(\sigma\sigma)]_{\text{Mword}}\sigma]_{\text{Punit}}$ kupiliby ‘they would buy’

The largest domain of Prosodic Unit is different from the two smaller domains, since it does not result from alignment constraints, but is enforced by exhaustive parsing of a larger domain, that of Prosodic Phrase.

(15) Punit constraints

Parse-Punit: Every utterance has to be parsed into Punits

Punit \supset Mword: Every Punit has to contain a Mword within its edges

Punit = Mword (violable): edges of Punit and Mword must coincide

In the case of high frequency and lexicalization, Pword and Mword boundary effects are not found, as illustrated by minimal pairs of usual, non-lexicalized phrases and their lexicalized counterparts, memorized and processed as single units.

(16) Lexicalization: syllabification differences:

- a/ w ogóle (tych faktów) ‘in the generality (of these facts)’
 $[w[ogóle]_{\text{Pword}=\text{Mword}}]_{\text{Punit}}$ $[v\text{?o}.gu.l\text{e}]$
- b/ w ogóle ‘at all’
 $[wogóle]_{\text{Mword}=\text{Punit}}$ $[v\text{o}.gu.l\text{e}]$
- c/ zobaczyć ‘to see’, cf. obaczyć ‘to see’ (obs.), baczyć ‘be careful’ (obs.)
 $[z\text{o}.ba.t\text{ʃ}it\text{ɛ}]$ $*[z\text{?o}.ba.t\text{ʃ}it\text{ɛ}]$
 $[zobaczyć]_{\text{Pword}=\text{Mword}}$ $*[z[o[baczyć]]_{\text{Pword}}]_{\text{Mword}}$
- d/ poduszka ‘pillow’
 $[poduszka]_{\text{Mword}=\text{Punit}}$ $[p\text{o}.du\text{ʃ}.ka]$
 pod uszka ‘under ears-dim.’
 $[pod[uszka]_{\text{Mword}}]_{\text{Punit}}$ $[p\text{o}d.\text{?u}\text{ʃ}.ka]$

(17) Lexicalization: stress differences (Rubach & Booij 1985:315, Kraska-Szlenk 2003:41)

a/	<u>na dwór</u> królowej		‘to the queen’s <u>court</u> ’
	<u>na wieś</u> napadli Tatarzy		‘Tartars attacked the <u>village</u> ’
	$[\sigma[\sigma]_{Mword}]_{Punit}$	>	$\sigma(\acute{\sigma})$
b/	wyszedł <u>na dwór</u>		‘he went outside’
	wyjechał <u>na wieś</u>		‘he went to the countryside’
	$[\sigma\sigma]_{Mword=Punit}$	>	$(\acute{\sigma}\sigma)$

A similar process of boundary deletion, but involving grammaticalization, is illustrated in (18): a peculiar set of verbal subject markers, sometimes referred to in the literature as “floating inflexion”, exhibit a mixed behavior between enclitics and suffixes.

(18) Gradient grammaticalization: clitic > suffix

a/	singular forms: penultimate stress (as in affixed words)
	$[\sigma(\acute{\sigma}-\sigma)]_{Mword}$ robilem ‘I did’

b/	plural forms: penultimate stress (as in affixed words)
	$[(\grave{\sigma}\sigma)(\acute{\sigma}-\sigma)]_{Mword=verb}$ robiliśmy ‘we did’

or: antipenultimate stress (as in cliticized words)

	$[[\sigma(\acute{\sigma}\sigma)]_{Mword=verb}\sigma]_{Punit}$ robiliśmy ‘we did’
	$[[\sigma(\acute{\sigma}\sigma)]_{Mword=non-verb}\sigma]_{Punit}$ dlaczegośmy ‘why+1 pl.’

The pattern of proclitic groups is shown in (19). With the exception of monosyllabic and disyllabic host which must contain a foot within their edges, there is always an initial foot at the left edge of Punit, required by a relatively high constraint of the alignment type. This foot is enforced at the cost of “breaking” the foot structure of the host word, as we can see in examples (19d) or (19e). In very long words, as in (19f) or (19g), with the exception of this initial foot, there is no usual leftward orientation of feet; instead the secondary stress maximally matches the stress of these words in their isolated form, i.e. without a clitic.

(19) Stress pattern in proclitic groups

a/	$\sigma=(\sigma)$	do=psa	‘to a dog’
b/	$\sigma=(\sigma\sigma)$	do=kota	‘to a cat’
c/	$(\sigma=\sigma)(\sigma\sigma)$	do=kobiety	‘to a woman’
d/	$(\sigma=\sigma)\sigma(\sigma\sigma)$	do=profesora	‘to a professor’
e/	$(\sigma=\sigma)(\sigma\sigma)(\sigma\sigma)$	do=Kanadyjczyka	‘to a Canadian’
f/	$(\sigma=\sigma)\sigma(\sigma\sigma)(\sigma\sigma)$	do=Amerykanina	‘to an American’
g/	$(\sigma=\sigma)\sigma(\sigma\sigma)\sigma(\sigma\sigma)$	do=Nikaraguańczyka	‘to a Nicaraguan’

Problem with intermediate stress placement w. r. t. Parse-Syllable and AI-Foot(L):

Why not exhaustive parsing $*(\sigma=\sigma)(\sigma\sigma)(\sigma\sigma)$ and leftward alignment $(\sigma=\sigma)(\sigma\sigma)\sigma(\sigma\sigma)$?

Solution 1: a derivational analysis (including DOT)

Solution 2: a correspondence-based analysis.

(20) Stress pattern in enclitic groups: always a foot at the right edge of Mword

Solution 1: unviolable alignment constraint AI-Mword-(R)

Solution 2 : a correspondence-based analysis.

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