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Affixation, back-formation, or both?

A corpus-based study on the multiple motivation of Hungarian compound verbs

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Introduction

Hungarian compound verbs

- *teszt-vezet-és* ‘test drive’ > *teszt-vezet* ‘test drive’
- test-drive-NLZR test-drive

vezetés$_N$: vezet$_V$ :: teszt-vezetés$_N$: teszt-vezet$_V$

- *ülő-sztrájk* ‘sit-in’ > *ülő-sztrájk-ol* ‘sit in’
- sitting-strike sitting-strike-VBLZ

sztrájk$_N$: sztrájkol$_V$ :: ülő-sztrájk$_N$: ülő-sztrájkol$_V$

- *párt-polit-ika* ‘party politics’ > *párt-polit-izál* ‘engage in party politics’
- party-polit-NLZR party-polit-VBLZ

politika$_N$: politizál$_V$ :: párt-politika$_N$: párt-politizál$_V$

- *szoknya-vadász* ‘skirt-chaser’ *szoknya-vadász-ik* ‘skirt-chase’
- skirt-hunter skirt-hunter-3SG

vadász$_N$: vadász(ik)$_V$ :: szoknya-vadász$_N$: szoknya-vadász(ik)$_V$

The issue: uncertainty of bases

mozgás-érzékel-ő ‘motion detector’ >
motion-detect-NML

mozgás-érzékel ‘detect motion’
motion-detect

mozgás-érzékel-és ‘motion detection’ >
motion-detect-NMLZ

jel-tolmács-ol-ás ‘sign language interpreting’ >
sign-interpreter-VBLZ-NMLZ

jel-tolmács-ol ‘interpret sign language’
sign-interpreter-VBLZ

jel-tolmács ‘sign language interpreter’ >
sign-interpreter

The issue: uncertainty of bases

mozgás-érzékel-ő ‘motion detector’ > ?‘use a motion detector’
motion-detect-NML

mozgás-érzékel ‘detect motion’
motion-detect

mozgás-érzékel-és ‘motion detection’ > ?‘do motion detection’
motion-detect-NMLZ

jel-tolmács-ol-ás ‘sign language interpreting’ > ?‘do sign language interpreting’
sign-interpreter-VBLZ-NMLZ

jel-tolmács-ol ‘interpret sign language’
sign-interpreter-VBLZ

jel-tolmács ‘sign language interpreter’ > ?‘act as a sign language interpreter’
sign-interpreter

Theoretical prerequisites

- In a network-based modell, distinct base words or even back-formation and affixation are not mutually exclusive.

- The new derivate might be based on a larger analogical pattern

$(S)N_1 : (S)N_2 : (S)V :: (C)N_1 : (C)N_2 : (C)V$
$érzékelő_N : érzékelés_N : érzékel_V :: mozgás\text{-}érzékelő_N : mozgás\text{-}érzékelés_V : mozgás\text{-}érzékel_V$
$tolmács_N : tolmácsolás_N\ tolmácsol_V :: jel\text{-}tolmács_N : jel\text{-}tolmácsolás_N\ jel\text{-}tolmácsol_V$

- Frequency as an indicator: if there is no significant difference between the frequencies of possible nominal compounds, there is no need to make an either-or decision, the structure of words may be multiply motivated

Booij & Audring 2018; Booij 2023; Hathout & Namer 2019

Question and goal

- How typical/frequent back-formation and multiple motivation is for compound verbs with *-l* verbalizer?
    - *ülő-sztrájk-ol* ‘sit in’, *jel-tolmács-ol* ‘to interpret sign language’

- Investigation of frequency patterns

    - The potential base words with *-Ás* and *-Ó* nominalizers (from which the verb can be explained by back-formation)
        - *jel-tolmács-ol-ás* ‘sign language interpreting’ > *jel-tolmács-ol* ‘to interpret sign language’

    - N-N compounds without nominalizer (in which case we can assume affixation)
        - *jel-tolmács* ‘sign language interpreter’ > *jel-tolmács-ol* ‘to interpret sign language’

Data and method

Data

- Corpus: a dependency-parsed, cleaned version of the **Hungarian Gigaword Corpus** (Oravecz et al. 2014)

- Target of the study: compound verbs containing the derivational suffix ***-Ol***
  (where O = *o, e, ö, á, é*)

- The problem: these verbs are **not explicitly annotated** in the corpus
  → identifying them required an iterative, heuristic search

Identifying the compound verbs

- A set of heuristics to extract candidate *-Ol* verbs:
  ≥ 8 chars; ends in -Ol; POS = VERB; no detailed emMorph analysis (Novák et al. 2016)

- Strip the -Ol ending to recover the potential **base form**,
  e.g. *lábjegyzetel* ‘write footnotes’ → *lábjegyzet* ‘footnote’

- Correct truncated stems,
  e.g. *fájlcserél* ‘exchange files’ → *fájlcsere*, not **fájlcser*

- Analyse base forms with **emMorph**; keep only **nominal compounds**
  (✗ *felragacs* lit. ‘up-goo’, ✓ *vendégszerep* ‘guest role’)

- Result: **536 items**, small enough to be **checked manually**

Building the dataset

- For each compound verb, manually add its corresponding ***-Ás*** and ***-Ó*** derivatives, giving the full paradigm:
- *díszcsomag* ‘gift box’ (N)
  díszcsomagol ‘gift-wrap’ (V)
  díszcsomagolás ‘gift wrapping’ (-Ás)
  díszcsomagoló ‘gift-wrapper’ (-Ó)

- Retrieve the **token frequency** of these lemmas from the corpus

- **Result**: a frequency-annotated dataset of compound verbs and their nominal counterparts
  → the input for the frequency analysis that follows

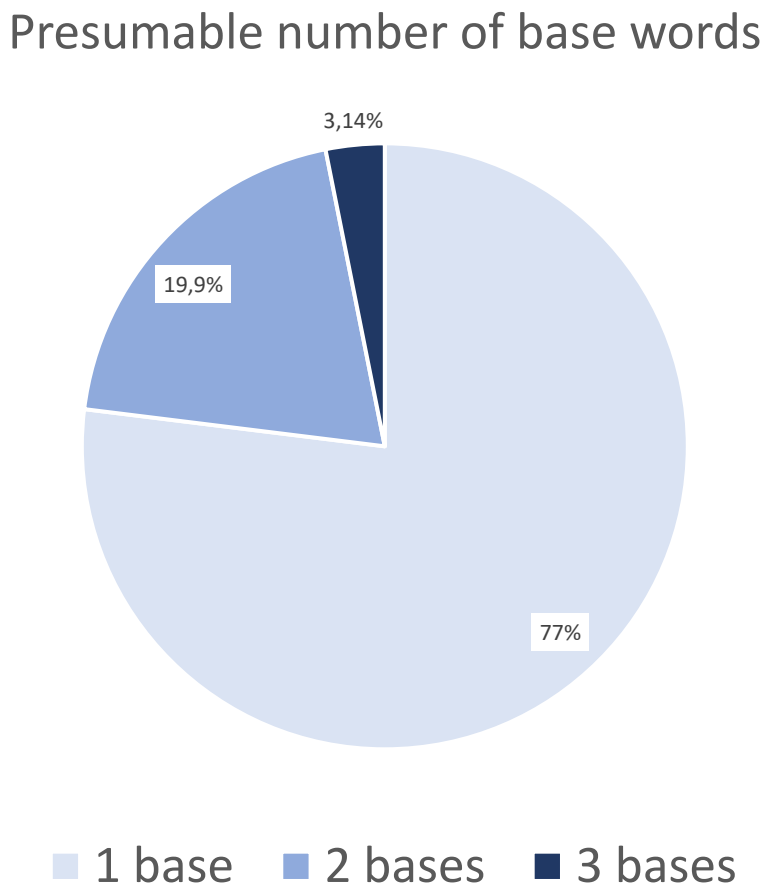
Results

Presumable number of bases

Noun 1 without an affix	Verb with the *-l* suffix	Noun 2 with the *-Ás* nominalizer	Noun 3 with the *-Ó* nominalizer
1. ND 2. (relatively) few data 3. (relatively) large amount of data = base!	191 types 580 tokens 121 hapaxes	1. ND 2. (relatively) few data 3. (relatively) large amount of data = base!	1. ND 2. (relatively) few data 3. (relatively) large amount of data = base!

- An average of 1.24 base words in the sample

Multiple motivation is neither common nor exceptional for the compounds with *-l* verbalizer

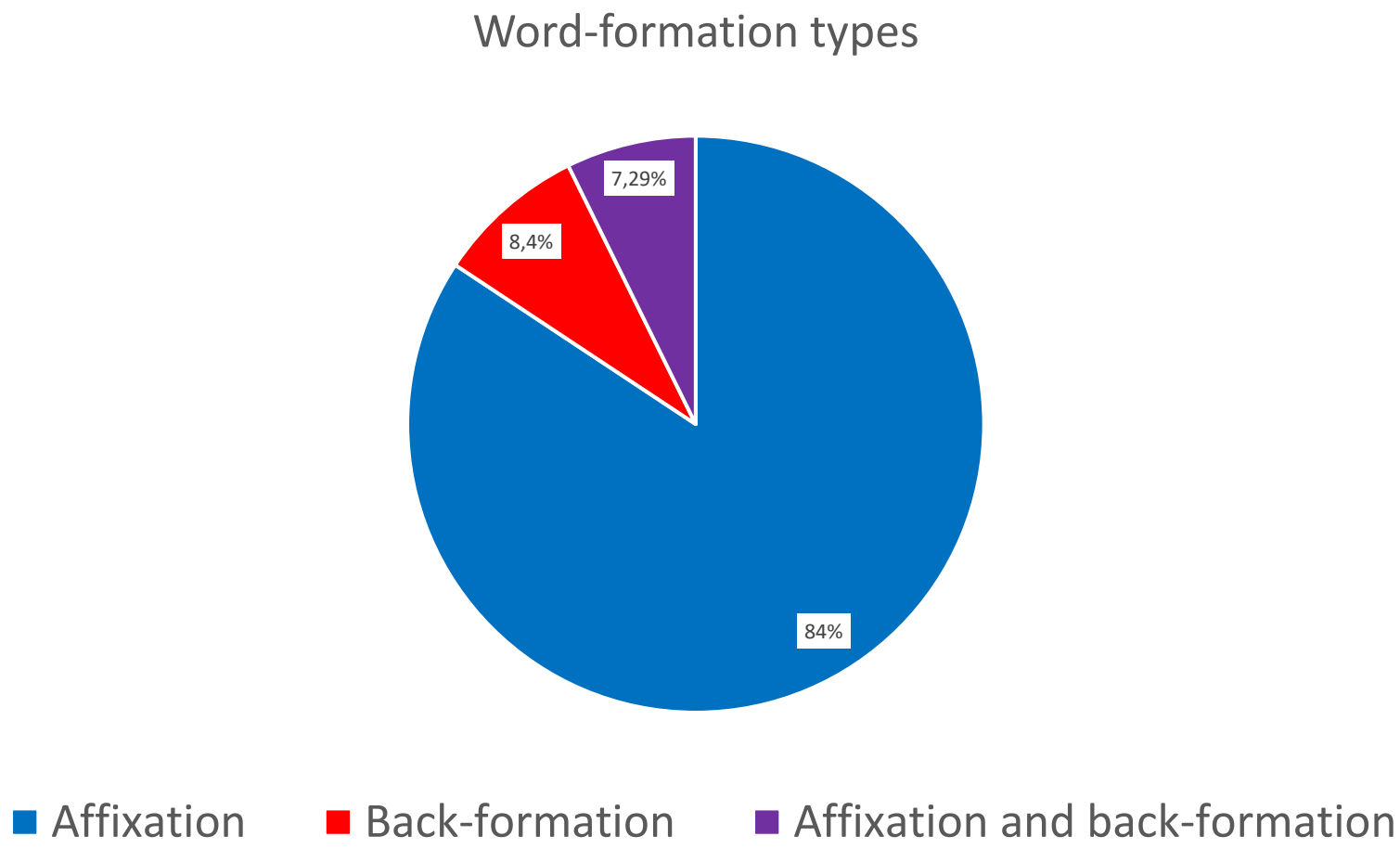


Distribution of presumable bases

Number of bases	Noun 1 without an affix	Verb with the -l suffix	Noun 2 with the -Ás nominalizer	Noun 3 with the -Ó nominalizer
1	Base	X		
1		X	Base	
1		X		Base
2	Base	X	Base	
2	Base	X		Base
2		X	Base	Base
3	Base	X	Base	Base

- All three nominal constructions occurred as single bases, and examples were found for all their combinations

Distribution of word-formation processes



Possible correlations

1. Token frequency of verbs ↔ Multiple motivation

2. The number of the attested corresponding nouns was higher for more frequent verbs
   - 121 verbal hapaxes – 145 nouns 1.198 noun/verb
   - 70 verbal non-hapax – 96 nouns 1.371 noun/verb
   - Mann-Whitney U test: U=3521, z=2.23, p=0.026, r=0.16

- More common compound verbs serve as bases themselves, thus increasing the number of their corresponding nouns.

jel-tolmács$_{331\ \text{tokens}}$ ‘sign language interpreter’ > *jel-tolmács-ol* ‘interpret sign language’
sign-interpreter sign-interpreter-VBLZ

jel-tolmács-ol ‘interpret sign language’ > *jel-tolmács-ol-ás*$_{18\ \text{tokens}}$ ‘sign language interpreting’
sign-interpreter-VBLZ sign-interpreter-VBLZ-NMLZ

> *jel-tolmács-ol-ó*$_{2\ \text{tokens}}$ ‘sign language interpreter’
sign-interpreter-VBLZ-NMLZ

Summary

- How typical/frequent back-formation and multiple motivation is for compound verbs with *-l* verbalizer?

- Multiple motivation is neither common nor exceptional for the Hungarian compounds with *-l* verbalizer
  - Some compound verbs had three presumable bases (equally conventional corresponding nouns)
  - In some cases, there was no reason to exclude either back-formation or affixation

- Uniformly viewed concatenative and non-concatenative morphological operations can be effectively examined within the same network of morphological relations.

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Thank you for your attention!