Constructional profiles: What constructions tell us about the meanings of words

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Constructional Profiles

• A constructional profile is “the distribution of relative frequencies of constructions associated with a given word”

• There are about 70 constructions of the form “[(preposition) [noun]_{case}]” in Russian

• The null hypothesis is that all nouns should have equal frequency in all constructions

• But only about 6 (or fewer) constructions are needed to characterize a given noun

• (cf. similar findings by Karlsson 1985, 1986 and Arppe 2001, 2005)

• Example of constructional profile of vostorg ‘ecstasy’
Where the data come from

• Russian National Corpus (http://www.ruscorpora.ru) >120M words
• Biblioteka Maksima Moškova (http://lib.ru/) >600M words
• 500 sentences extracted and coded for use of preposition & case
Synonymy

- Hypothesis: Each word has a unique constructional profile
- Corollary: Words with similar meanings should have similar constructional profiles
- Hierarchical cluster analysis shows which constructional profiles are closest (closer synonyms) and which are further apart, using squared Euclidean distances based on constructional profile data
‘Sadness’ in Russian


- The constructions they appear in:
  - $v + \text{Acc} ‘\text{into}’$
  - $v + \text{Loc} ‘\text{in}’$
  - Inst: Agent
  - $s + \text{Inst} ‘\text{with}’$
  - $ot + \text{Gen} ‘\text{from}’$
  - (Direct Object)
  - (Other Constructions)

Graphs will show only these five, as percentages

Hierarchical Cluster Analysis is computed from all data
The ‘sadness’ nouns

• They can’t all be the same:
  
  Uxodiš’, i ja gljažu vsled tebe s grust’ju, no bez toski.

  ‘You leave and I watch you go with sadness<sub>grust’</sub>, but without sadness<sub>toska</sub>.’

• Dictionaries differ on how synonyms are grouped
‘Happiness’ in Russian

- likovanie, naslaždenie, radost’, sčastie, udovol’stvie, vostorg

- Antonyms are words that are virtually identical, but differ in one value

- ‘Happiness’ nouns focus on the same constructions in their constructional profiles as ‘sadness’ nouns

- Dictionaries differ widely in grouping of ‘happiness’ synonyms
‘Happiness’ Hierarchical Cluster

naslaždenie  radost'  udovol'stvie  likovanie  sčastie  vostorg
About the results...

- The results are statistically significant.
- For ‘sadness’ nouns: chi square = 730.35, and Cramer’s V = 0.305 which qualifies as a moderate effect (p<0.0001, df=30).
- For ‘happiness’ nouns: chi square = 774.6, Cramer’s V = 0.268 which qualifies as a moderate effect (p<0.0001, df=30).
Metaphor

- Constructional profiles reveal that emotions such as happiness and sadness in Russian are understood as
  - metaphorical holes or mires
  - metaphorical agents
  - metaphorical accessories (gestures)
  - metaphorical diseases
  - metaphorical sources
v + Acc ‘into’

Ja ţe ţivoj čelovek i, konečno, inogda vpadaju v unynie.
‘I am a living person, and, of course, occasionally fall into sadness.’
'It doesn’t occur to her that her spouse is suffering in sadness over the minutes of work and inspiration that he has lost.'
Inst: Agent

Кто из живущих, томимых унынием, не предавался такому перебору, не считал вариантов?

‘Who among mortals tormented by sadness, has not indulged in an inventory of all the things that didn’t happen in their life?’
– Kušaeš’ ty, kak svin’ja, – s grust’ju skazal kapitan.
‘--You eat like a pig’-- said the captain with sadness.’
"ot + Gen 'from': Healing from disease

Samoe lučšee lekarstvo ot xandry -- èto čtenie.

‘The best cure for sadness is reading.’
Podumajte, ètot čelovek umer ot melanxolii!

‘Just imagine, that person died of sadness!’
Constructional Profiles of Verbs

- The distribution of relative frequencies of constructions associated with verbs
- Constructional profiles show that near-synonyms can behave very differently
- Constructional profiles can show that the “empty” prefixes are not really empty
“Empty” prefixes?

When we have aspectual pairs such as *pisat’/napisat’* ‘write’, *morozit’/zamorozit’* ‘freeze’, *obedat’/poobedat’* ‘eat lunch’, it is assumed that the prefixes *na–*, *za–*, *po–* are “empty” (have no meaning).

Some verbs have several “empty” prefixes: *gruzit’* ‘load’ has the perfectives *nagruzit’, zagruzit’, pogruzit’* – are they synonyms?

Constructional profiles show that the verbs have different meanings and the prefixes are not empty.
Relevant constructions

• Acc names load (theme–object)
  Acc + na/v + Acc (nagruzit’ jaščiki na teležku ‘load the boxes onto the cart’)
  Acc (zagruzit’ ugoł’ budet problematično ‘it will be difficult to load the coal’)

• Acc names container (goal–object)
  - Acc + Inst (on nagruzil sanki proviziej ‘he loaded the sleds with provisions’)
  - Acc (nagruzili telegi i uexali v gorod ‘they loaded the carts and rode into town’)

• Data from Russian National Corpus
All non-passive forms

- gruzit'
- nagruzit'
- zagruzit'
- pogruzit'

Past passive participles

- gružen
- nagružen
- zagružen
- pogružen
About the results...

• Logistic regression shows a highly significant relationship between the construction and the following factors:
  – prefix
  – passive vs. active
  – reduced vs. full

• Correlational strength is 0.796

• Classificatory power: 88.5 % constructions are predicted correctly