Using Wmatrix: corpus analysis and comparison tool

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MELC workshop
10<sup>th</sup> January 2014
Session Outline

11:00 – basic introduction
11:15 – hands-on
  – explore manifesto data, key words and domains
12:00 – hands-on with MELC data
  – Patients and Professionals interviews
12:30 – Break for lunch
  – Room A87
Wmatrix main points

• Web-based (c.f. BNCweb, CQPweb)
• You can load your own (English) data
• Incorporates main methods in corpus linguistics toolbox
  – frequency lists, concordances, key words, collocations, n-grams (coming back in 2014)
• Adds two levels of linguistic annotation (NLP or computational linguistics methods)
  – POS tagging, Semantic field tagging
• Novelty
  – key domain analysis, semantic collocations
### Semantic tags
(aka domains, fields, categories)

<table>
<thead>
<tr>
<th></th>
<th>A General and abstract terms</th>
<th>B The body and the individual</th>
<th>C Arts and crafts</th>
<th>E Emotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Food and farming</td>
<td>G Government and public</td>
<td>H Architecture, housing and the home</td>
<td>I Money and commerce in industry</td>
</tr>
<tr>
<td>K</td>
<td>Entertainment, sports and games</td>
<td>L Life and living things</td>
<td>M Movement, location, travel and transport</td>
<td>N Numbers and measurement</td>
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<tr>
<td>O</td>
<td>Substances, materials, objects and equipment</td>
<td>P Education</td>
<td>Q Language and communication</td>
<td>S Social actions, states and processes</td>
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<tr>
<td>T</td>
<td>Time</td>
<td>W World and environment</td>
<td>X Psychological actions, states and processes</td>
<td>Y Science and technology</td>
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<td>Z</td>
<td>Names and grammar</td>
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cleaner
concentrate
congestion
conservative
cost
council
cut
democrat
democrats
dental despite
diagnoses
deliberate
education
energy
environmental
executive
faired
farming
food
for example
former
government
governments
green
hand
guarantee
high-quality
in instead
of
it
job
letters
liberal
long-term
lords
make sure
manifesto
ministers
n't
oppose
parliament
pay
plans
pollution
power
principles
prisoners
promises
prop
red tape
replacing
richest
rural
save
Scotland
secretary
seriously
shadow
sizes
skeleton
チーム

Wmatrix compare frequency lists
My folders | Tag wizard... | Switch to Advanced Interface | Help | Feedback

Key domain cloud

Business: Selling
Degree: _Boosters
Evaluation: _Inaccurate
Evaluation: _Bad
Evaluation: _Authentic
Exceed: _waste
Failure
Farming & _Horticulture
Frequent
Government
Green_issues
Hindering
Money: _Debts
Money: _Cost
Moneys: _Affluence
### Key words

<table>
<thead>
<tr>
<th>Word</th>
<th>Llidm words</th>
<th>Llidm frequency</th>
<th>Labour words</th>
<th>Labour frequency</th>
<th>O/U score</th>
<th>LK</th>
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<td>of</td>
<td>143</td>
<td>4.26</td>
<td>6.65</td>
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<td>139</td>
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<tr>
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<td>4.26</td>
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<tr>
<td>or</td>
<td>48</td>
<td>1.55</td>
<td>or</td>
<td>48</td>
<td>4.26</td>
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<td>1.46</td>
<td>phrases</td>
<td>44</td>
<td>4.26</td>
<td>6.65</td>
</tr>
</tbody>
</table>

### Text or reference corpus

**Text**

NEWS

**Word frequency list**

- the: 351
- of: 143
- a: 221
- and: 153
- to: 139
- in: 134
- io: 123
- be: 83
- for: 81
- phrase: 69
- that: 67
- which: 66
- are: 64
- by: 60
- words: 57
- x: 53
- no: 50
- or: 48
- phrases: 44

**Keywords**

1. the
2. of
3. a
4. and
5. to
6. in
7. io
8. be
9. for
10. phrase
11. that
12. which
13. are
14. by
15. words
16. x
17. no
18. or
19. phrases
Log-likelihood (LL)

- Wizard online at:
  - http://ucrel.lancs.ac.uk/llwizard.html
- Spreadsheet also available for download

- Also see:
  - http://corpora.lancs.ac.uk/sigtest/
Wmatrix version 3
Practical one

• 2005 general election
  – Liberal Democrat party manifesto
  – Labour party manifesto

• 2010 general election
  – manifestos for all three main parties
  – TV debates (need to be converted from PDF)

• Aims:
  – To help you understand the basic Wmatrix features
  – To give you some awareness of the semantic tagset

• (Option) Use your own data!
Open two web-browser windows

• Both URLs linked from Wmatrix home page:
  – http://ucrel.lancs.ac.uk/wmatrix/

1. Wmatrix tutorial
  – http://ucrel.lancs.ac.uk/wmatrix/tutorial/

2. Wmatrix tool:
  – http://ucrel.lancs.ac.uk/wmatrix3.html
  – Login details:
    • Username:
    • Password:
• http://ucrel.lancs.ac.uk/wmatrix/tutorial/

• On your own or in small groups:
  – **Read** tutorials A and B (the actions are already done)
  – **Do** tutorial C (key words, key domains and concordances)

• Advanced users:
  – Tutorial D (advanced data analysis) on your own or in small groups
  – Suggested timings:
    • Steps D.3 and D.4 (10 minutes)
    • Spend most of your time from step D.5 onwards (remainder of the hour)

• Notes:
  – you can use your own data and your own username if you have them
  – Ask questions anytime
  – Keep going until the end of the hour
New and planned features

- CrossTabs
- Concordance
  - highlighting and filtering by context
  - concgrams-style
- Collocations and semantic collocations
- N-grams and C-grams
  - Aka clusters, lexical bundles
  - Faster implementation (L-gram)
  - http://code.google.com/p/lgram/
- Visualisations
  - Collocation Network Explorer (CONE)
- Replace indexing system
  - much larger corpora
- Other languages ...
Practical two

• MELC data
  – MELC_CC_PatientsInterview
  – MELC_CC_ProfessionalsInterview

• Aims
  – To explore and compare the two datasets using the techniques that you have learnt so far

**To Do:** Switch to the advanced interface and compare the texts using key words and key domains methods
References

• Useful background reading (keyness, annotation and MWE):


• Wmatrix, CLAWS and USAS websites:
  – [http://ucrel.lancs.ac.uk/wmatrix/](http://ucrel.lancs.ac.uk/wmatrix/)
  – [http://ucrel.lancs.ac.uk/claws/](http://ucrel.lancs.ac.uk/claws/)
  – [http://ucrel.lancs.ac.uk/usas/](http://ucrel.lancs.ac.uk/usas/)


Further reading

- Further reading (mostly key words related).