Customisable dictionary-cum-corpus web-based tools

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Outline

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- Four main developments
  - Use of corpora and corpus-handling tools
  - Efficient integration of phraseology
  - Multiple access routes
  - Customisation
- Lexicographic projects at Louvain
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  - Louvain English for Academic Purposes Dictionary (LEAD)
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Introduction
Electronic lexicography used as an umbrella term to refer to the design, use and application of electronic dictionaries.

Electronic dictionaries are primarily human-oriented collections of structured electronic data that gives information about the form, meaning and use of words in one or more languages and is stored in a range of electronic devices (PC, handheld, web).
Effects of computer integration

- Often trivial: “electronic dictionaries are still fundamentally paper dictionaries on a microchip” (Weschler 2000)
- However, some recent dictionary projects show that the innovations afforded by the electronic medium can radically transform every single facet of dictionary design and use.
Four main developments
1. Use of corpora & corpus-handling tools (1)

- Use of corpora is revolutionising all language-related fields, in particular lexicography.
- Corpora are electronic collections of authentic texts assembled according to explicit design criteria.

- Used in lexicography at two levels:
  - **Dictionary design**: raw material which lexicographers mine and refine to produce rich lexical entries
  - **Dictionary use**: integral part of the electronic dictionary which users can mine for themselves
“A good corpus tool is key to a comprehensive lexicographic analysis – a corpus without a good tool to access it is of little use” (Kilgarriff & Kosem forthcoming)

Main functions of corpus tools:
- Concordance: words in context
- Collocations: co-occurring words
- Word sketches: lexical patterns
- Clusters: recurrent sequences
- Keywords: register-distinctive words
2. Efficient integration of phraseology (1)

- Phraseology can be loosely defined as “the study of the structure, meaning and use of word combinations” (Cowie 1994)

- Two main approaches (Granger & Paquot 2008):
  - Traditional approach: focuses on the most fixed and semantically opaque/figurative units (red tape, to spill the beans, to give in)
  - Quantitative approach: bottom-up corpus-driven identification of word partnerships identified on the basis of quantitative criteria.
    - Collocations: strong tea (rather than powerful tea)
    - Recurrent phrases: as far as I know, and that sort of thing, the extent to which, it is clear that
2. Efficient integration of phraseology (2)

- **Corpora** allow for the automatic extraction and automated analysis of the full spectrum of multiword units (MWUs).

- **Electronic dictionaries** allow for
  - inclusion of a much larger number of MWUs (no space restriction)
  - more efficient retrieval of MWUs
3. Multiple access routes

- “No matter how outstanding the contents of a dictionary, if the contents cannot be accessed in a quick and straightforward way, the dictionary de facto fails to be a good dictionary” (de Schryver 2003)

- Users have been “liberated from the straitjacket of the printed page and alphabetical order” (Atkins 1996)

- Improved accessibility
  - Wide range of search options: fuzzy search, incremental search, all text search, etc.
  - Efficient navigation within and beyond the dictionary thanks to hyperlinking
4. Customisation (1)

- For Atkins (1996), the real challenge of the computer age is “to look at the needs of dictionary users, of every language, and every walk of life, users as diverse as people themselves, and give them the kind of information they need for whatever they are using the dictionary for”.

Customisation: process which allows the dictionary to be adapted in function of users’ needs.

- Two types of system (Gamper & Knapp 2002)
  - Adaptable system: manual customization by the user
  - Adaptive system: automatic customization thanks to dictionary logs (i.e. the system adapts automatically to the user)
4. Customisation (2)

- Very few concrete realisations so far
  - Walraff (2009) deplores that lexicographers “invest a lot of hard work in things users don’t need or want”
  - de Schryver (2003) regrets that “methods to avoid swamping the user are still very much underdeveloped”.
Lexicographic projects at Louvain
1. Trilingual university terminology database

- Collaborative project between UCL and KULeuven (Prof. S. Verlinde)
- Set up a trilingual database of university-related terms to help academic and administrative staff
- Design a user-friendly web interface to access the terminology
University-related terminology

- Heavily localised (country, university)
  - Degree titles
  - Academic and administrative staff ranks
  - University structure (names of Faculties, Institutes, Central Services, etc.)
  - University life (*24 heures vélo, kot, kot à projet*)
Terminology extraction

- Compilation of corpora from university websites (UCL, KULeuven, British universities)
- **Automatic extraction** of university-specific terminology on the basis of the *keyword* method
  - Keywords = words (or clusters) that are statistically significantly more frequent in a given corpus compared to a reference corpus
  - Comparison of university corpora with large fiction corpora in the three languages
- Software used: *WordSmith Tools*
  
  [http://www.lexically.net/wordsmith/index.html](http://www.lexically.net/wordsmith/index.html)
<table>
<thead>
<tr>
<th></th>
<th>English keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>admission, calendar, certificate, curriculum, dean, doctorate, enrolment, requirements, supervisor, trainee</td>
</tr>
<tr>
<td>2</td>
<td>admissions office, advisory board, careers service, collaborative research, doctoral students, home university</td>
</tr>
<tr>
<td>3</td>
<td>course of study, full time students, students with disabilities, centre of excellence, available on request</td>
</tr>
<tr>
<td>4</td>
<td>higher education funding council, closing date for applications, at the discretion of, further details are available</td>
</tr>
<tr>
<td>5</td>
<td>arts and humanities research council, English as a foreign languages, on a part time basis, offers a wide range of</td>
</tr>
</tbody>
</table>
Translation

- In-house expertise
- Corpora and dictionaries
- Existing term banks and education websites (IATE, EURYDICE, ERIC, etc.)
- Advanced Google searches (ac.uk; edu)
Web interface

Base de données de terminologie universitaire UCL-K.U.Leuven
Database universitaire terminologie K.U.Leuven-UCL

Universitaire terminologie
Terminologie universitaire

- English > français/Nederlands
- français > English
- Nederlands > English

Tip van de dag
Question du jour

‘professeur’ peut-il être traduit en anglais par ‘professor’?
Meg ‘professor’ in het Engels vertaald worden door ‘professor’?

- oui, toujours/always, altijd
- oui, parfois/yes, soms
- non, jamais/nee, nooit

réponse/entwoord

Translation Assistant: vertaalhulp - aide à la traduction

tekst - texte:

ou

liste de mots - lijst woorden:

- fransais > English

Pour une aide professionnelle, contactez le Centre de traduction de Louvain.

Doorzoek het web
Explorer le web

Woordenboeken
Dictionnaires

- English
- Français
- Nederlands
118 mot(s)

Le règlement doctoral de l'Académie universitaire 'Louvain' détermine le cadre général dans lequel doivent se couler les cursus doctoraux des étudiants qui souhaitent obtenir le grade académique de docteur dans l'une des institutions universitaires membres de l'Académie. Il précise notamment que le grade académique de docteur s'obtient au terme d'un cursus doctoral à deux composantes obligatoires :

une formation scientifique au plus haut niveau, dite "formation doctorale" dans les termes du décret 'Bologne' et équivalent à 60 crédits, cette formation doctorale aboutit à la délivrance d'un certificat de formation à la recherche ;

des travaux de recherche relatifs à la préparation d'une thèse de doctorat, pour un minimum de 120 crédits.

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Analyse et affichage du texte réalisés en 1.19 secondes

| 9/12/2008 |

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FR recherche: partial matches and recurrent phrases
Key advantages

- **Flexibility**
  - Add, delete and/or correct dictionary entries; add usage notes
  - Add hyperlinks to relevant online resources

- **Quality control and customisability (dictionary logs)**
  - Green bullets: hits (currently c. 70%)
  - Red bullets: no entry in the database >> candidates for inclusion
  - Comments window: suggestions for improvement

- **Availability**
  - Freely available (restricted access for Translation Assistant and full list of partial matches)
2. **Louvain English for Academic Purposes Dictionary (LEAD)**

- Project funded by the Fonds National de la Recherche Scientifique (FNRS)
- Project director: Sylviane Granger
- Post-doctoral researcher: Magali Paquot
An integrated web-based tool to help non-native speakers write academic texts in English (Granger & Paquot 2010)

Targeted users:
- MA/PhD students who need to write term papers, reports, dissertations in English and non-native researchers who want to publish in international journals.
General academic vocabulary (EAP)

- Words that are frequent in a wide range of academic domains; used to express organizational functions (contrast, cause and effect, quoting, etc.): *contrast, define, factor, reason, significant, valid, arguably, consistently, in conclusion, i.e., etc.*

Domain-specific terms (ESP)

- Domain-specific verbs in computer science: *to boot, run, install, access, etc.*
General EAP words: a major source of difficulty for L2 English writers

- Meaning, position and punctuation, register, frequency
- Phraseological patterning
  - Collocations:
    - contrast strongly/sharply/markedly
    - close/striking/strong resemblance
    - yield results/information/insights
  - Recurrent phrases: as argued by, examined in more detail, it is reasonable to assume
L1 influence

Faux amis: *au contraire* vs. *on the contrary*

Calques:

- *prenons l’exemple de*: let’s take the example of
- *en ce qui concerne x*: as far as x is concerned
Relevance for translators

- An increasing number of translators have to translate into English as a second language (Kübler & Pecman forthcoming)
- Even native speakers of English may be influenced by the source text
- Dictionaries don’t help! Phraseological coverage is still very poor, especially in bilingual dictionaries
- Ongoing work: phrasing up bilingual dictionaries (Granger & Lefer 2012 & forthcoming)
Phraseology in translation corpus vs. bilingual dictionary

- Extraction of c. 6,000 frequent sequences of 2-5 words from a 1 million word French to English corpus (articles from Label France published by the French Ministry of Foreign Affairs)
- Selection of 425 sequences of high lexicographic interest (e.g. à cet égard, autant dire que, ou encore)
- Coverage of these sequences in Le Grand Robert & Collins (version 2.0)
Poor coverage of multiword units in bilingual dictionaries

<table>
<thead>
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<th>Category</th>
<th>Count (Percentage)</th>
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<tbody>
<tr>
<td>Headwords</td>
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</tr>
<tr>
<td>Sub-entry</td>
<td>226 (53%)</td>
</tr>
<tr>
<td>Example</td>
<td>113 (27%)</td>
</tr>
<tr>
<td>Absent</td>
<td>66 (15%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>425 (100%)</strong></td>
</tr>
</tbody>
</table>
Poor translations

- Example: **sur le plan de**
- Translation included in three electronic dictionaries (Roberts & Collins, Larousse, Hachette): **as far as x is concerned**
- Not one single occurrence in the *Label France* corpus!
LEAD: extraction of general academic vocabulary

- Automatic extraction of academic words
- c. 900 words (Academic Keyword List: Paquot 2010) organized into 26 rhetorical functions (contrast, conclude, illustrate, quote, etc.)
Native corpora of academic texts: typical EAP patterning

Learner corpora of academic texts: error prone words/phrases

- *International Corpus of Learner English (ICLE)* (Granger et al. 2009): advanced learners from 16 mother tongue backgrounds
LEAD: main features

- Rich description of academic words
- Integrated generic and L1-specific exercises (dictionary-cum-learning tool)
- Multiplicity of access modes
- Customisation (dynamic interface)
- Direct access to EAP/ESP corpora & corpus handling tool
Multiplicity of access modes

- **Word search**
  - The user thinks of a word or phrase but is not sure how to use it

- **Search by translation**
  - The user thinks of a word in his/her mother tongue but cannot find the English equivalent
  - Semi-bilingual dictionary

- **Search by function**
  - The user wants to express a particular function (e.g. contrast)
The Louvain EAP dictionary

<table>
<thead>
<tr>
<th>Adjectives</th>
<th>Adverbs</th>
<th>Conjunctions</th>
<th>Prepositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>contrary</td>
<td>by comparison</td>
<td>whereas</td>
<td>as against</td>
</tr>
<tr>
<td>contrasting</td>
<td>by contrast</td>
<td>while</td>
<td>as opposed to</td>
</tr>
<tr>
<td>different</td>
<td>conversely</td>
<td></td>
<td>by comparison with</td>
</tr>
<tr>
<td>differing</td>
<td>in comparison</td>
<td></td>
<td>contrary</td>
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<td>opposite</td>
<td>in contrast</td>
<td></td>
<td>in contrast to</td>
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<tr>
<td>reverse</td>
<td>on the contrary</td>
<td></td>
<td>in contrast with</td>
</tr>
<tr>
<td>unlike</td>
<td>on the other hand</td>
<td></td>
<td>unlike</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>versus</td>
</tr>
</tbody>
</table>
Customisability

- The content is automatically adapted to users’ needs in terms of
  - mother tongue background
  - discipline
LEAD home screen

- Discipline: business, linguistics, medicine
- Mother-tongue background: French, Dutch

The Louvain EAP dictionary

Please select a discipline:

Business

What is your mother tongue?

French

Send

Contact: Magali Paquot & Sylviane Granger

Links
- Centre for English Corpus Linguistics
- Intranet
- Lexicographer's corner
### Collocations

**source** *(n.)*

The first or original cause of something or the place where it begins:

> In France, taxation remained a perennial source of tension between the crown and its subjects.

- **Adj + source**
  - other, major, main, important, new, different, primary, secondary, only, various, possible, potential, alternative, single, significant, principal, useful

- **V + source**
  - provide, use, become, remain, identify, constitute, find, offer, need, suggest, consider, represent, locate, require, cite, examine, tap, create, remove, ignore, determine, check, trace

- **source + V**
  - provide, influence, suggest, contribute

However, like questions about the sources of resources, future research should seek to **identify** the sources or causes of EO. (BUS)

This study extends this line of research by taking a real options approach, which enables us to **identify** various sources of uncertainty surrounding venture capital investments and to examine how exogenous and endogenous uncertainties influence the timing of staged financing. (BUS)

By developing a procedure based on the GT for **identifying** alternative sources of response variance in cross-national research, our research offers an...
L1 customisation: error note

The Louvain EAP dictionary

according to

used to introduce what someone or something says:

**According to** the Chief Medical Officer, smoking is the biggest single cause of preventable premature death and ill-health in Scotland.

**According to** our records, you have exceeded our terms of settlement and your account is now overdue.

in line with:

**According to** the rules of the UK Charts, a recording counts as an ‘album’ if either it has more than four tracks or lasts more than 25 minutes.

Error note

Do not use **according to me** as a translation of **selon moi**. Use **in my opinion**.
Direct access to corpora

- Rationale
  - More examples of general academic words that are in the dictionary
  - Examples of words that are not in the dictionary
    - general academic words/phrases
    - domain-specific words/phrases
Corpus search module

- **CQPweb** (Hardie, 2009): open-source web-based corpus-handling tool

- **Corpora**: from the most general to the most specific
  - General: academic texts
  - Discipline-specific: medicine
  - Sub-discipline: cardiovascular medicine

- **Individualisation**: users can feed in their own corpora
Concordance of ESP term: surgery in medicine

MED018 02 various transfusion strategies. In a trial involving 147 pediatric patients undergoing cardiac surgery, a hematocrit of 21% during cardiopulmonary bypass was associated with a poor survival rate.

MED018 02 randomized trials involving adults who had vascular disease or who had undergone cardiac surgery showed decreased rates of organ dysfunction in patients receiving leukocyte-reduced red blood cell transfusions.

MED003 04 TRUCS (Treatment of Refractory Unstable angina in geographically isolated areas without Cardiologists) surgery, which did not report on the method of randomization. Two studies (11, 13) that could not be repaired with satisfactory functional and aesthetic results by conventional surgery.

MED007 01 We previously reported the initial results of a partial face transplantation that we performed in 2005:

MED016 01 duration. <abstract> Approximately half of all patients undergoing potentially curative surgery for colorectal cancer ultimately have a relapse and die of metastaic disease. This has led to efforts to develop new therapies that can improve outcomes. We report the results of the VICTOR trial of optimal regimens, which was designed to evaluate the effect of adjuvant chemotherapy on survival in patients with resected colorectal cancer.

MED001 04 of patients who had undergone potentially curative surgery for colorectal cancer. Recruitment for the VICTOR trial stopped in September 2004, when 600 patients had been randomized to one of the two study arms. A total of 3167 physicians in six specialties (anesthesiology, cardiology, family practice, general surgery, internal medicine, and pediatrics) in the United States participated in this study.

MED008 04 Background in critical care, 7 (25.0%) in internal medicine, and 6 (21.4%) in surgery. Surgeries were performed in 19 centers.

MED004 04 on persons with full or partial foot amputations, and patients who had undergone lower extremity surgery.

MED013 04 and each has characterized different anatomic or physiologic factors that might predispose a patient to a better or worse outcome. We also excluded non-English-speaking patients because investigators were not fluent in English.

MED016 01 Most exclusively in the orthopedic literature, where it was noted as a complication of surgery (6, 7), a hallmark symptom of ACL tear (8), or as a consequence of surgical procedures (e.g., coronary artery bypass grafting) during the follow-up period. A major adverse event was defined as an event that occurred in the hospital and was life-threatening, required specific medical or surgical intervention, or resulted in death or disability.

MED018 02 patients who had undergone surgery for colorectal cancer were enrolled in the study. A total of 3167 physicians in six specialties (anesthesiology, cardiology, family practice, general surgery, internal medicine, and pediatrics) in the United States participated in this study.

MED012 04 Inclusion criteria included persons with foot or leg amputations, and patients who had undergone lower extremity surgery.

MED013 04 We also excluded non-English-speaking patients because investigators were not fluent in English.

MED004 04 We also excluded non-English-speaking patients because investigators were not fluent in English.

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MED013 04 and each has characterized different anatomic or physiologic factors that might predispose a patient to a better or worse outcome. We also excluded non-English-speaking patients because investigators were not fluent in English.
Collocations of the noun *heart in medicine*

<table>
<thead>
<tr>
<th>No.</th>
<th>Word</th>
<th>Total no. in whole corpus</th>
<th>Expected collocate frequency</th>
<th>Observed collocate frequency</th>
<th>In no. of texts</th>
<th>Log-likelihood value</th>
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<tbody>
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<td>59</td>
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## Adjective collocations of the noun *firm* in business

There are 3,438 different words in your collocation database for "[word="firm.*"] & pos="N.*"]". (Your query "firm*_N_*" returned 2,709 matches in 43 different texts)

<table>
<thead>
<tr>
<th>No.</th>
<th>Word</th>
<th>Total no. in whole corpus</th>
<th>Expected collocate frequency</th>
<th>Observed collocate frequency</th>
<th>In no. of texts</th>
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Conclusion

“Dictionaries have at last found their ideal platform in the online medium” (Rundell forthcoming).

Lexicography “has reached a crossroads where it is difficult to develop further without a thorough rethink” (Bergenholtz et al. 2009)

The technology needed to design truly innovative tools is available but is not sufficiently used yet.

Need for multidisciplinary teams involving experts in
  - lexicography
  - translation (for multilingual tools)
  - corpus linguistics
  - IT
  - computer-aided language pedagogy (for learner-oriented tools)
Thanks for your attention!
References (1)


References (2)

References (3)