

Pedro A. Fuertes-Olivera*

Designing Online Dictionaries of Economics: Two Opposing Views

Abstract

This paper supports the argument that a dictionary of Economics in the broad sense of the word is any information tool that contains structured data - e.g. dictionary articles, outer texts, hyperlinks, etc. – which can be used for retrieving information on economic concepts, economic language, economic instructions, and/or economic operations. Some of these are on the Internet and are accessed by individuals for concrete consultation in one or more situations. This definition is based on the tenets of the *Function Theory of Lexicography*, the theoretical construction initiated at the Aarhus School of Business in the 1990s which has since worked on the theory and practice of dictionaries (Bergenholtz/Tarp 2002, 2003, 2004; Tarp 2008; Fuertes-Olivera/Tarp 2014). This has resulted in a specific approach to dictionary making, which is identified in this chapter as a *lexicography-based approach*. On the other hand, some scholars espouse a different view, which is basically rooted in the theories and methods of (Applied) Linguistics (Rundell 2012a) and identified here as a *linguistics-based approach*. Both views are discussed and illustrated in relation to three specific issues: (a) the concept of a dictionary of Economics; (b) the sources of lexicographic data used in different dictionaries of Economics; (c) access to data and data presentation in several online dictionaries of Economics.

1. Introduction

Lexicographical works concerning economics (exclusively or not) are a motley set of objects. (...) The distinction between these kinds of works in practice is rather fuzzy. (Besomi 2011: 4)

During the discussions taking place at the *International Symposium on Dictionaries of Economics*, arranged by the Centre for Lexicography at the Aarhus School of Business and Social Sciences on November 13-15, 2013, participants agreed on four main ideas. Firstly, the interdisciplinary vocation and co-operative spirit of lexicography give support to the academic analysis of “economics lexicography”, i.e. the set of academic activities concerned with the theory and practice of dictionaries of Economics, or reference works that deal with Economics regardless of the specific and highly varying content and name they may have (cf. Besomi 2011 and this volume).

Secondly, the design and compilation of high quality dictionaries of Economics calls for the active presence of lexicographers and subject field experts, who must work side by side on the dictionary project. This will ensure the appropriate handling of lexicographic data, e.g. a restriction of the meaning of the term to a particular economic context. Example (1) shows the definition of **expected loss** in the context of credit analysis. It goes without saying that a proper definition of this concept will only be possible as a result of a sound knowledge of the subject field. This idea is often unnoticed (e.g. Kilgarriff’s (2012) lapses regarding the definition of **deemed cost** in the *English accounting dictionary*), which has led to confusion regarding the nature of specialised lexicography, cf. Rundell (2012a):

* Pedro A. Fuertes-Olivera
University of Valladolid and Velux Visiting Professor 2011-2012
Centre for Lexicography
Department of Business Communication
School of Business and Social Sciences
University of Aarhus
pedro@tita.emp.uva.es

expected loss

In the context of credit analysis, the expected loss is the calculated loss risk in connection with lending. The expected loss is calculated as the exposure in monetary value in case of default multiplied by the default probability multiplied by (one minus the recovery probability).

Example 1. Article from the *English accounting dictionary*

Thirdly, the influence of the Internet is so pervasive that the real challenge today “is to continue producing high-quality Dictionaries of Economics adapted to the specific needs of specific target users in specific contexts, while simultaneously filling the many gaps in terms of so far partially or totally unsatisfied user needs.” (Tarp, this volume) For instance, designing the lexicographic database in a specific way (Bergenholtz 2011) as well as using existing Internet technologies (Bothma 2011) can result in the design of a new generation of online dictionaries that aim to favour personalisation (i.e. customisation or profiling), e.g. the *Accounting Dictionaries* or *Diccionarios de Contabilidad* (c.f. Bergenholtz/Nordahl; Nielsen).

Fourthly, the debate on the status of lexicography as an independent academic science or as part of Applied Linguistics should be abandoned. Lexicography can only be considered an independent academic discipline which has long since proven its interdisciplinary vocation and cooperative spirit towards all areas of human activity, cf. Fuertes-Olivera/Tarp (2014). For instance, nobody can confidently argue that a definition such as example (2), taken from the *Oxford Dictionary of Economics* (Myles, this volume), can be crafted by using the ideas and methods of (Applied) Linguistics:

ability to pay

The principle that any tax should fall on those who can afford to pay. In practice, taking account of ability to pay means that tax payments increase with the observed income or assets of taxpayers. In principle, earning capacity should also be taken into account. The main objections to the ability to pay criterion are that earning capacity is unobservable, and that taxing income reduces the incentive to work. However, the collection of taxes from those who cannot afford to pay is unpopular, expensive, and sometimes impossible. Ability to pay is an alternative to the benefit principle under which only those who benefit from any given public expenditure should be taxed to pay for it. The government requires tax revenue to pay for public goods and income redistribution. Given the level of revenue necessary to run a modern society, use of the ability to pay criterion for taxation seems inevitable.

Example 2. Article from the *Oxford Dictionary of Economics*

This paper highlights some of the ideas connected with the debate on the status of lexicography. It presents the underlying assumptions defended by both the linguistics-based and the lexicographic-based approaches (Section 2). It also indicates some of its main differences regarding three key elements: (a) the concept of specialised dictionary, e.g. the online dictionary of Economics (Section 3); (b) sources of data, i.e. a description of the synthesis and analysis phases used when designing, say, online dictionaries of Economics (Section 4); and (c) access to data and data presentation in certain online dictionaries of Economics (Section 5). A final conclusion summarises the main ideas discussed.

2. The Linguistics-based Approach and the Lexicographic-based Approach

In their analysis of specialised online dictionaries, Fuertes-Olivera/Tarp (2014) indicate that lexicographers designing specialised dictionaries are mainly split into two camps. On the one side there are lexicographers who argue that specialised lexicography is basically a sub-discipline of Applied Linguistics, and therefore describe the process of making dictionaries as a craft or art rooted in traditions and methodologies of linguistics. Rundell (2012a), for instance, cites *DiCo-Info* as a dictionary that uses Mel’čuk’s concept of lexical functions in its design and compilation.

Rundell's stance is very weak for several reasons, which will be discussed in Sections 3, 4 and 5 (below). For this introduction, suffice it to say that *DiCoInfo* does not use a methodology which can be replicated when the aim of the lexicographer is to write specialised dictionaries in a short period of time and at an affordable cost, c.f. Fuertes-Olivera/Tarp (2014). The compilation of *DiCoInfo* started almost 20 years ago, and it is still basically a prototype after so many years of work: it contains only 1,000 articles in French and around 700 in English (Pimentel et al. 2012: 180). This situation is even more dramatic insofar as *DiCoInfo* deals with computing and the Internet, two fields where developments are so fast that any information tool employed must be completed in one or two years and be updated almost on a weekly basis.

In the other camp are those lexicographers who claim that lexicography is an independent academic science, e.g. those such as Tarp (2008, 2012b) who follow Buhr/Klaus' (1971) concept of science: a science is a system of knowledge growing out of social practice and developing on an ongoing basis, comprising an acknowledgment of the most important properties, causal connections and legal considerations of nature, society and philosophy.

Advocates of this second approach, e.g. proponents of the *Function Theory of Lexicography* (Bergenholtz/Tarp 2002, 2003, 2004; Tarp 2008; Fuertes-Olivera/Tarp 2014), view lexicography as an independent academic discipline, i.e. one with its own theories and methods for designing real and working specialised dictionaries that must meet users' needs and be completed in a rather short period of time and with limited resources. Dictionaries such as the *Accounting Dictionaries*, *Diccionarios de Contabilidad*, and the *Oxford Dictionary of Economics*, illustrate the adequacy of this approach. For instance, the *Diccionarios de Contabilidad* describe around 7,000 terms, were completed in three years and are updated every three months, usually by the addition of approximately 300 new terms and modifications, both conceptual and linguistic ones. For instance, the EU has adopted several new accounting standards that will be in operation in January 2014. These modifications are already included in these dictionaries.

Some of the main differences between these two approaches are highlighted below in relation to the concept of specialised dictionary, the sources of lexicographic data used, and the philosophy underlying access to data and data presentation.

3. Dictionaries of Economics

The linguistics-based approach to lexicography typically describes the process of designing dictionaries in terms of language-related matters (Rundell 2012a, b). Rundell (2012a: 57), for example, claims the salient issues in lexicography to be the following:

- corpus design, and the appropriate use of corpus data
- the relationship between lexicography and NLP
- the nature of word senses, and their relationship with syntactic and other contextual features
- the effectiveness of different approaches to defining
- the lexicographic treatment of multiword expressions
- the automatic extraction of lexical data from corpora

The above issues form the core of lexicography for linguistics-based lexicographers; they also give support to two related assumptions concerned with the concept of *dictionary* they espouse. The first assumption is that lexicography is basically concerned with language in use:

Function theory, it transpires, has little to say about what many of us see as the core task for lexicographers: analysing the evidence of language in use in order to identify what is likely to be relevant to dictionary users. (Rundell 2012a: 60)

The second assumption claims that reference works such as 'dictionary', 'specialised dictionary', 'encyclopaedia', 'glossary', 'lexicon', 'term bank', 'terminological knowledge base', 'ontology', etc., are ontologically different, although they acknowledge that it is almost impossible to present their differences in practice (Rundell 2012a).

I believe that the above assumptions cannot be supported for several reasons (c.f. Fuertes-Olivera/Tarp, Chapter 2). Suffice it to say here that all reference works, no matter whatever they are called, are ontologically the same: they are tools that aim to meet users' needs for specific consultation in a fast, straightforward manner. Hence, all reference works contain lexicographic data that has been *specifically* selected for satisfying concrete user needs, and utilise technologies or innovations that can help potential users to access the lexicographic data both quickly and in a way which is easy to understand.

The existence of different names for the same tool is not connected with its ontological status but with advertising practices or traditions. From a scientific point of view, differences relate solely to the fact that there are different users in different situations. This has led lexicography-based scholars to argue that all reference works are basically the same and, therefore, typically use *dictionary* as an umbrella term to refer to any reference work, regardless of whatever specific name such a tool is known by. This position is supported theoretically and empirically.

From a theoretical point of view, lexicography-based scholars have shown that all reference works contain different types of lexicographic data, i.e. much more than language data; these have been selected with the aim of satisfying users' needs for concrete and quick consultation. Such a view is supported historically. Tarp/Bothma (2013: 223), for instance, indicate that in 1704 John Harris published *Lexicon Technicum: or, an Universal English Dictionary of Arts and Sciences* where he “expressed a holistic vision of dictionaries as reference works not only dealing with words, among them the “terms of arts”, but also the substance of these arts, i.e. the crafts and sciences as they were developed in the early 18th century.” As a consequence, they have defended the view that lexicography is ontologically related with Information Science, not with Linguistics:

Lexicography is an integrated part of the social and information science paradigm and refers to the interdisciplinary discipline concerned with the study, design and development of functional tools aimed solely at the gratification of human information needs and problems. The distinctive feature of lexicographic tools is the triangulation of three interrelated sets of social, logical, and semiotic parameters, corresponding respectively to the following dimensions of the tool: user, access and data

Social parameters are in every single case determined by the systematic identification of the specific information problems, needs and profiles of the potential user of the information tool. The social parameters are decisive for both the functional genesis (communicative, cognitive, operative and interpretative functions) and the gratifying use of the information tool.

Semiotic parameters are in every single case determined by such data selection and presentation that ensures gratifying extraction of information in accordance with the specific problems, needs and profiles of the potential user. Data are by nature of a semiotic kind and consist of verbal and non-verbal signs. The most frequently used symbols in data selection and presentation are words.

Logic parameters are in every single case determined by such structures, modes, indices, algorithms and computing technologies that ensure gratifying access to data in accordance with the specific problems, situations, needs and profiles of the intended user. (Leroyer 2011 [2013]: 129)

From an empirical point of view, Besomi (2011, and this volume) has analysed around 650 reference works dealing with Economics, and has concluded that they comprise a motley set of objects that form a continuum where only those situated at the extremes are easily discernible:

Lexicographical works concerning economics (exclusively or not) are a motley set of objects. As we shall see below..., they include a wide range of sizes, purposes, languages, editorial histories and intended audiences. And they have different names: we have dictionaries, encyclopaedias, encyclopaedic dictionaries, lexica, vocabularies and glossaries, which correspond to different kinds of reference works. The distinction between these kinds of works in practice is rather fuzzy. Several of them – both of general scope and specifically addressed to economics or the social sciences – actually carry more than one of these denominations in their title. In practice, the spectrum of the reference works concerning economics and related disciplines [...] forms a continuum [...]. (Besomi 2011: 4)

In a similar vein, Fuertes-Olivera/Tarp (2014) have studied 16 exemplars of online specialised information tools. These have names such as *dictionary*, *glossary*, *Database Information System*,

thesaurus, *term bank*, *terminological database*, *terminology knowledge base*, and *ontology*. The 16 reference works were subjected to a scrutiny that involved 10 basic criteria: (a) author's view; (b) functions; (c) access routes; (d) use of Internet technologies; (e) use of a lexicographical approach; (f) production costs; (g) information costs; (h) updating; (i) participation of domain experts; and (j) process of data selection used. Fuertes-Olivera & Tarp's analysis showed that the differences among them were mostly concerned with their theoretical stance and not with the name given to them. Briefly, the use of different names for referring to information tools is a practice which should be discarded, as it can confuse users and cannot be supported either experimentally or theoretically.

Lexicography-based scholars have concluded that all reference works dealing with Economics are dictionaries of Economics, i.e. information tools that contain structured data - e.g. dictionary articles, outer texts, hyperlinks, etc. – which can be used for retrieving information on economic concepts, economic language, economic instructions, and/or economic operations. Some of them are on the Internet and are accessed by individuals for concrete consultation in one or more user situation. The following sections deal with some of these online dictionaries.

4. Sources of Data in Online Dictionaries of Economics

Most lexicographers employ the concept of corpus as this term is described, used and analysed in Corpus Linguistics. In general, Corpus Linguistics deals with sampling, selection of texts, corpus-based versus corpus-driven analyses, copyrights and privacy, annotation, automatic retrieval, and the use of the Web as a corpus. Handbooks and manuals on Corpus Linguistics – e.g. McEnery / Hardie (2012) – continue to claim that corpora are electronic collections of authentic language data that are selected according to special criteria – e.g. social, geographical, language, etc. – with the aim of uncovering patterns of meaning, use, or other social characteristics peculiar to one or more author, genre, text type, or period of time in history, etc.

Corpus Lexicography identifies corpus data as samples of social practice, which “are playing an increasing role in today's lexicography, both upstream, as raw material which lexicographers mine and refine to produce rich lexical entries, and downstream, as an integral part of the electronic dictionary to which users have direct access and which they can mine for themselves.” (Granger 2012: 3) This quote signals the importance of corpora in lexicography today. However, its importance is viewed differently by the two approaches I am discussing in this chapter.

Linguistics-based lexicographers, e.g. Hanks (2012a, b), Kilgariff/Kosem (2012), Paquot (2012), and Rundell (2012a, b), among others, have explained their conviction that the role of corpora has become so essential that no lexicographic project can be designed without regularly using at least one corpus during the analysis or synthesis phases, i.e. when the dictionary team mine relevant forms of evidence that provide lexicographic raw materials (analysis) and select and present the information extracted from these (synthesis) (Rundell 2012a, quoting Atkins 1993). It seems that they take it for granted that a corpus, e.g. one of economic texts, designed and built according to the criteria expounded in Corpus Linguistics, will allow lexicographers to translate the extracted corpus data into dictionary articles. For instance, the *Oxford Business English Dictionary for learners of English* has used a 50 million word corpus of business texts in its compilation. In its Preface, it is mentioned that corpus data were used for offering examples of real language and for including frequency labels: they indicate the 1,000 most frequent words in their corpus. These “are marked with a star to show that they are particularly important in Business English. These are words that are frequent on our business corpus and are essential in most areas of business or combine with many others to make compounds.” (Parkinson 2005: v) In addition, Parkinson also indicates that the compilers “have been advised by teachers of Business English and by people involved in the world of business.”

The above quotes show that the ideas defended by linguistics-based lexicographers are misguided. Even in a dictionary such as *Oxford Business English Dictionary for learners of English*

corpus data is only used for three tasks: (a) attaching frequency labels to some lemmas; (b) crafting examples; (c) indicating certain language patterns. These tasks are somewhat peripheral in specialised lexicography. In other words, Parkinson is implying that key practices, e.g. crafting definitions such as example (2), attaching grammar data and translated texts (example, 4, below), adding cultural remarks (example 4, below), or offering proscriptive remarks, etc., can *only* be done if an expert and a lexicographer are working side by side. A corpus, then, is an auxiliary tool in specialised lexicography that can be used for several lexicographic tasks, basically if an expert is also present. This is the view expounded by advocates of the function theory of lexicography, who base it on their experimental work, both as lexicographers – e.g. Fuertes-Olivera/Tarp's (2014) description of the design, compilation, and updating of the *Accounting Dictionaries* – and meta-lexicographers, i.e. when they analyse existing dictionaries of Economics, as shown below.

On closer inspections, the *Oxford Business English Dictionary for learners of English* does not reveal itself as a prototypical exemplar of specialised lexicography; instead, it is a learner's dictionary that mainly targets Business students. This may have an important lexicographical consequence: only some very specific dictionaries of Economics, e.g. the *Oxford Business English Dictionary for learners of English*, can use corpus data in the synthesis and analysis phases with a high degree of confidence. Most dictionaries of Economics need different sources of data, as I will show below.

The *Oxford Business English Dictionary for learners of English* contains around 12,000 articles devoted to terms taken from several business/economics sub-domains: *accounting, commerce, e-commerce, economics, finance, human resources, insurance, information technology, law, manufacturing, marketing, production, property, the stock exchange, mathematics and statistics, trade, and transport*. In other words, the dictionary covers around 800 lemmas of each sub-domain, and targets intermediate to advanced students of Business English. Both the number of lemmas covered by the sub-domain and the targeted users indicate that this dictionary offers *only* a general view of business; it does not detail the facts and language of the subject field which other possible users such as experts or translators will need in different situations, including, maybe, that of a cognitive nature. For instance, the word **method** is marked with a star and an indication of 5 multi- word terms that are used in *accounting*: **accrual method, declining balance method, depreciation method, diminishing balance method, and double-declining balance method**. These figures contrast with the word **method** compiled in the *Accounting Dictionaries*: these devote 125 articles for covering the facts and language of the different accounting methods used in the sub-domain of *accounting*.

As a conclusion, contrary to what Rundell and his colleagues claim, an analysis of the *Oxford Business English Dictionary for learners of English* indicates that corpus data can only be used in the presence of an expert, basically for documenting certain peripheral lexicographic data, e.g. frequency labels, and for describing very basic terms and concepts. Hence, corpus data are not really suitable for compiling specialised dictionaries. This may explain why *DiCoInfo* offers so few dictionary articles, and why many terminological projects do not result in real dictionaries but in prototypes:

The internet has allowed the compilation of new types of information tools, for example, the so-called terminological knowledge bases. These are proliferating around the world, especially because they obtain public money easily, although most of them do not deliver much. For instance, around 90 per cent of the terminological dictionary projects funded by Spanish R+D funding agency are still *prototypes* after several years of continuous and generous funding. (Fuertes-Olivera 2013: 337)

A possible explanation of this dismal situation is that the use of the concept of corpus for lexicographic purposes, e.g. for uncovering patterns of meaning or usages, can obviously only be achieved if scholars working with corpora have adequate training for interpreting the facts and language retrieved through concordances, keywords, and other corpus tools for lexicographers (Kilgarriff/Kosem 2012). For instance, if lexicographers want to use corpus data to compile a dictionary of Economics, they can only carry out their work with a certain degree of confidence if

they also have (some) knowledge of economics. Without such knowledge, it will be very difficult for a lexicographer to encounter the facts and language necessary for compiling a real dictionary of Economics, especially one that aims to cover very specific terms, such as those that form the backbone of most economic sub-domains; the latter are mainly multi-word terms that are formed by adding other words to a basic term and are not frequent. For instance, in Spanish accounting, around 5,000 of the 7,000 Spanish lemmas selected in the *Diccionarios de Contabilidad* (more than 70% of the lemmata) contain between three and fourteen orthographic words (half of which have between three and five words) (Fuertes-Olivera/Tarp 2014).

The lexicography-based approach argues in favour of a different source of data. Advocates of this approach maintain that the “analysis” phase must always be conducted in the presence of experts in the field, who may document their analysis with whatever means they consider suitable; typically, this entails mining appropriate specialised texts and indicating the scope of meaning and range of facts for each term selected. In other words, instead of relying on social criteria for compiling a specific corpus, advocates of the lexicography-based approach support the use of any text that offers *relevant* data. They are not interested in patterns, but in data that are *directly* connected with the function(s), the subject field and the level of competence of the intended user (Tarp 2008; Fuertes-Olivera/Nielsen 2011 and 2012). Applying the concept of *relevance* requires taking into consideration the specific characteristics of the lexicographic project and the best methodology for translating its design into a working dictionary in two to three years’ time, in accordance with the resources used in the project and its specific characteristics regarding users’ needs, user situation and affordable means. Regardless of the merits of Mel’čuk’s concept of lexical functions or other linguistic criteria, the real fact is that the *DiCoInfo* project described so far (e.g. L’Homme et al. 2012; Pimentel et al. 2012) has not resulted in a working dictionary after more than 20 years’ work on it. Bothma/Tarp (2012) concur with this view:

In lexicography, relevance theory as outlined and illustrated above, provides an elegant theory to understand relevance as a complex phenomenon that may have a profound influence on lexicographers’ analysis of users’ information needs. Users’ information needs are paramount for lexicographers to decide what data are to be shown to the user in any given usage situation, as is evident from function theory (and even general lexicographic practice). Relevance theory implies that lexicographers have to make an even more in-depth study of the users of their products to enable them to understand exactly what may influence a user to use or not use a specific dictionary and to ensure that the lexicographic offering presents to the user only the required data to solve the user’s information need in a given situation — no more and no less. If lexicographers understand that there are multiple relevances that may influence a user’s judgment they may be able to design the underlying databases and filtering mechanisms in such a way that the end product provides the ideal solution for every user in every usage situation. This requires additional research in both metalexicography and lexicographical practice, especially at the level of database design and the design of filtering mechanisms. (Bothma/Tarp 2012: 106)

From a practical point of view, the concept of relevance demands that *any work* concerned with the design of specialised dictionaries, e.g. online dictionaries of Economics, must be accomplished by a team in which several experts participate (supposing that there is no single person with all the necessary skills and knowledge): experts in Economics, lexicography, Information Science, etc. The validity of this proposal is shown in the compilation of the *Accounting Dictionaries* or *Diccionarios de Contabilidad*, a set of specialised online dictionaries that are the result of a joint project involving teams from the Centre for Lexicography at Aarhus University in Denmark, and the International Centre for Lexicography at the University of Valladolid in Spain. Around 30 recent publications explain the workings of the team and their progress, from the original design in 2003 to its current transformation into *Model T Ford dictionaries* (Tarp 2011 [2013]), i.e., ones “whose “articles and visualised lexicographic data are adapted to the various functions displayed by the dictionary, frequently assisted by different types of interactive options where the users may define themselves and the activity for which they need information.” (Fuertes-Olivera/Tarp 2014: 16).

These dictionaries contain between 7,000 and 8,000 dictionary articles in three different languages: Danish, English and Spanish. Their lexicographical data were (and are) taken from four

main sources: (a) existing dictionaries; (b) accounting texts, typically manuals, handbooks, legislation and institutionalised texts; (c) the Internet; (d) an in-house corpus of around 3 million words. These sources can be used with confidence: experts in accounting work side by side with the rest of the team, a methodology that saves time and resources and allows the team to complete the accounting lexical database for each language in around 30 months and to update it every three months on average (Nielsen/Fuertes-Olivera 2013).

The *Accounting Dictionaries* and *Diccionarios de Contabilidad* are oriented at three Danish and Spanish user groups: (1) translators and language staff; (2) accounting experts and semi-experts; and (3) students and laypersons interested in Danish, English, and Spanish accounting matters. The above users can consult lexicographic data when they are reading, writing and translating accounting texts (i.e. in communicative situations) and/or gaining *some* knowledge of accounting (i.e. in a cognitive situation).

The four data sources were used in the “analysis” phase in order to provide the lexicographic raw materials of accounting, that is, the facts and language involved. Furthermore, this phase is a support for and depends on the “synthesis” phase. To put it in a more straightforward way, the compilation of any specialised dictionary in a brief period of time and at an affordable cost requires the synthesis and analysis phases to occur simultaneously and both phases to be carried out by individuals with the appropriate knowledge. Hence, relying *exclusively* or *mainly* on corpus lexicography is not advisable in specialised lexicography, although it cannot be denied that progress is being made in this field of research, e.g. (semi-) information retrieval and (semi-) automatic term extraction (Vintar 2010; Fuertes-Olivera 2012a).

The theory and practice involved in the compilation of these dictionaries (see Fuertes-Olivera / Tarp 2014, for a detailed description) shows convincingly that the design of specialised dictionaries, e.g. online dictionaries of Economics, must rely on specialised texts selected and consulted in terms of the concept of lexicographic relevance previously referred to. This method of operation is supported by several findings, of which three are sufficient for this chapter:

1. Relevance-based dictionaries, such as the *New Palgrave Dictionary of Economics Online*, the *Oxford Dictionary of Economics*, and the *Accounting Dictionaries*, to name just a few, are superior in terms of lexicographic quality to corpus-based or corpus-driven dictionaries of Economics. For instance, example (4) is much more precise than example (3), which offers a circular definition; example (4) does not use symbols, unlike example (3); example (4) includes more use contexts than example (3); example (4) indicates that **depreciation** applies to tangible assets, cultural information that is absent from example (3); example (4) cross-refers users to intangible assets (they are *amortised*), also key cultural information which is absent from example (3):

de.preci'ation method *noun* [c]

(Accounting) any of the methods used to calculate the **depreciation** of an asset over the time it is expected to be in use: *Which depreciation method would you use if you were trying to minimise taxes?*

→ ACCELERATED DEPRECIATION

Example 3. **depreciation method** in the *Oxford Business English Dictionary for Learners*

depreciation method *noun*

<a depreciation method, the depreciation method, depreciation methods>

Definition

The depreciation method is the policy applied by an enterprise for gradually writing down a tangible asset and allocating the cost over its useful life.

Collocations

- the choice of depreciation method
- the depreciation method used

- the selected depreciation method

Example

- The enterprise claimed that the depreciation method used for investments on fixed assets did not reasonably reflect the costs associated with the production and sale of the product concerned.

See also

amortisation method

Example 4. **depreciation method** in the *English Accounting Dictionary*

2. Relevance-based dictionaries usually deal with the needs of several types of users in several usage situations, whereas corpus-based or corpus-driven dictionaries typically aim at learners and describe only basic terms, i.e. those that are frequent regardless of their relevance and interest for potential users. For instance, a user working with an accounting text will find the description of 125 *accounting methods* given in the *English accounting dictionaries* more telling than a description of the five terms given in the *Oxford Business English dictionary for learners of English*. Hence, this second type of dictionaries does not try to offer a description of a broad subject field, but rather an analysis of its frequent terms, typically fewer than 1,000; e.g. the *LEAD* dictionary (Paquot 2012).
3. Relying on any source whatsoever offers more and better possibilities than depending only or mainly on corpus data. The Internet offers more and better data when it is used confidently, that is, if experts scrutinise relevant specialised texts during the “analysis” and/or “synthesis” phase(s). Consequently, the way ahead is dependent on working with Internet searches that are knowledge restricted, something that only a real expert can do with confidence, at least in terms of affordable time and cost variables.

To sum up, the criticism directed at advocates of the *function theory of lexicography*, or the Aarhus School of Lexicography (e.g. Rundell 2012a; Kilgarriff 2012), is not supported either theoretically or practically: specialised dictionaries designed according to the theoretical criteria expounded by the latter *always* rely on the joint work of experts and lexicographers, who analyse the data taken from real texts and synthesise this in accordance with their expert knowledge. In other words, advocates of the function theory are not against corpus evidence, but rather they are against corpus lexicography as a catch-up concept that must always be employed no matter which dictionary is being designed and whatever dictionary data is to be included. Hanks (2012a) seems to concur with this view:

Word meaning in natural language- a natural, biological phenomenon- must be distinguished from the stipulated meanings of scientific concepts. Meanings of scientific concepts accrue from centuries and even millennia of scientific research. (Hanks 2012a: 420)

Hanks’ quote apparently implies that we cannot use the same methodology for dealing with general words and specialised terms. Hence, my final claim is that both the analysis and synthesis phases must be based on *relevant criteria* rather than on *frequency*, which is the view defended by linguistics-based lexicographers.

5. Access to Data and Data Presentation in Online Dictionaries of Economics

The advent of electronic lexicography, particularly e-lexicography, has had a deep impact on access routes and data presentation. Both lexicographic elements are related and current research on them is basically concerned with the following [c.f. Haß/Schmitz 2010, Granger/Paquot 2010, 2012, Fuertes-Olivera/Bergenholtz 2011 [2013], Fuertes-Olivera/Tarp 2014, Jackson 2013, Kosem/Kosem 2011, Kosem et al. 2013, Heid 2012]:

- “new relations”, e.g. links to corpus data where users can mine the data for themselves (Heid et al. 2012); also, links to Internet homepages, multimedia contents, etc. (Bergenholtz/

- Bergenholtz 2011; Sánchez/Cantos 2011; Fuertes-Olivera 2012b; Tarp 2012a);
- hybridisation (Hartmann 2005), i.e. the disappearance of lexicographic typologies, such as the compilation of “dictionary-cum-writing-aid tools” (Paquot 2012);
 - the process of locating data, including the adoption of more natural dictionary styles, e.g. eliminating symbols, abbreviations, and so on (Heid 2011; (Verlinde 2011);
 - the process of automating some lexicographic processes, both in dictionaries for Natural Language Processing (Ye et al. 2012) and for individuals (Rundell 2012b);
 - the influence of user input, especially the development of collaborative lexicography (Fuertes-Olivera 2009; Meyer/Gurevich 2012).
 - The use of Internet technologies for lexicographic purposes, particularly the following (Bothma 2011):
 - *data filtering*, i.e. techniques used to show only part of the data contained in the lexicographic database;
 - *access to supplementary data*, e.g. links to external texts (Heid et al. 2012), indices and abstracts (Lew 2011), annotation devices and reuse of data (Bothma 2011);
 - *establishment of online communication* between lexicographers and users, i.e. users commenting on the dictionary data and offering feedback, e.g. Bergenholtz (2011);
 - *shortening the access route* (Bothma/Prinsloo 2013);
 - *providing dynamic solutions*, usually by differentiating between dictionary and database with the aim of offering users the possibility of retrieving different data in each consultation depending on the specific usage situation in which the search takes place (Nielsen/Almind 2011; Bergenholtz 2012].

What emerges from a review of the above literature is that the two approaches discussed here also advocate differing philosophies regarding data access and data presentation. I will discuss these in turn, with examples taken from online dictionaries of Economics.

5.1. Linguistics-based Approach: More and Better Structured Data

Linguistics-based lexicographers suggest offering more and better structured data, i.e. the type that is subjected to fine-grained linguistic description; for instance, the use of lexical profiling software, which is a technology that “reliably identifies the salient syntactic constructions and lexical combination characteristic of a particular word.” (Rundell 2012b: 28). A so-called “typologiser” (Rundell/Kilgarriff 2011) is one of the solutions adopted: this system “automatically assigns labels to words and senses”, typically by “comparing a word’s profile in a carefully-defined sub-corpus with its behaviour in the lexicographic corpus as a whole, in order to retrieve information about its stylistic, regional, or domain preferences.” (Rundell 2012b: 28)

Rundell’s solution works fairly well with *acidification*, the example Rundell uses in his defence of corpus lexicography. Rundell (2012a: 62) claims that the analysis of this word “supplies valuable information about (*inter alia*) the nouns that typically premodify it, the verbs that frequently have it as an object, and other nouns with which it often appears in an ‘and/or’ relationship.” Similar methodologies are defended by the compilers of *DicSci*, an online learner’s dictionary of verbs in science (Alonso et al. 2011). To the best of my knowledge, this is a dictionary prototype that as yet cannot be evaluated on account of its still being on the drawing board.

I believe that the above proposal has two main drawbacks regarding the design of online specialised dictionaries of Economics. One of them is that it says nothing about the facts. As in the previous section, linguistic descriptions such as the one for *acidification* are of little interest, if any at all, when describing the facts of a subject field or the characteristics of many multi-word terms.

The second drawback is that the decisions adopted typically result in hybrid products, e.g. the “dictionary-cum-thesaurus-plus-advertisements-plus-teaching materials” *Macmillan dictionary*. An analysis of this reference works shows that it uses a type-ahead search, a search system sug-

gesting “a list of hits after typing a certain number of characters (Lew 2012: 351). For example, typing “balan” retrieves terms that can be used in Economics: **balance**; **balance of payments**; **balance of power**; **balance of trade**; **balance out**; **balance sheet**; **balance something out**; **balance the budget books**; **balance up**, and **balanced**. Clicking on **balance the budget books** results in the following:

- some of the above search strings are not retrieved, whereas others retrieve them in a very unsystematic way. For instance, **balance the budget books** is not retrieved, whereas two synonymous phrases – **balance the budget** and **balance the books** – are retrieved but are not identified as synonyms, which obliges users to take the risk of deciding by themselves;
- the retrieved phrases are connected with a sense of **balance** that is not registered in the dictionary entry; this likewise means that users need to “guess the meaning” by themselves;
- users can expand their search by clicking on “more”. This retrieves related synonyms or related words, but there is no indication regarding the kind of relationship between the former search string and the second one. Hence, users have to risk making their own choice, e.g. are **account** and **accounts** the singular or plural of the same concept? This lexicographic data is absent from the dictionary entry and is not easily “guessed” from the lexicographic data offered (example 5):

account NOUN

a detailed record that a business keeps of the money it receives and spends in a particular period of time

accounts NOUN

the part of an organization that keeps records of the money it receives and spends

Example 5. articles from the *Macmillan Dictionary*

As far as I know, the “more and better structured data” philosophy is still in its infancy, and cannot be recommended for designing dictionaries of Economics for three main reasons. Firstly, it does not address the facts of Economics or the language characteristics of most of the multi-word terms that form the common stock of economic vocabulary. Secondly, users are expected to make many decisions, which is not to be recommended from a lexicographic point of view (Trap-Jensen 2010; Bergenholtz 2011; Gouws 2011). Thirdly, it typically results in cramped dictionary homepages, where the presentation of the lexicographic data hampers users’ decisions, e.g. in the *Macmillan Dictionary*:

1. The ‘dictionary’ and ‘thesaurus’ definition of a term, e.g. **balance sheet**, is the same. Why does it differentiate between them?
2. The lexicographic data is “engulfed” by advertisements, language games, social networks buttons, proposals for collaborative lexicography and for taking part in competitions. What are the aims of all these “new” possibilities?
3. The “more” buttons on the thesaurus webpage retrieves related terms that are not properly described (c.f. example 5). What is the objective of such data if users cannot use them with confidence?

5. 2. Lexicography-based Approach: Less is More

The “less is more” philosophy focuses on the problem of *information overload* that accompanies the advent of e-lexicography, i.e. the problems users face when they have to collect an amount of data that is so vast they cannot convert it into information; this leads them either to abandon the consultation process before it is totally finished (*information death*) or to suffer bouts of psychological anxiety, as they are unsure of the reliability and quality of the data encountered (*information stress*). Lexicographers championing the “less is more” philosophy offer solutions that are

based on a joint evaluation of users' needs in specific situations as well as the resources and technologies at the lexicographers' disposal. Their primary objective is simply to guide users towards the specific data needed in the usage situation. The *New Palgrave Dictionary of Economics Online* illustrates the workings of this philosophy, which is suitable for *Palgrave* users.

The *New Palgrave Dictionary of Economics Online* is a cognitive-oriented online dictionary that permits an in-depth study of one or more subject fields, depending on the conception of Economics as a single or a multi-field area. The data is reliable and matches the functions and needs of its targeted users, experts and would-be experts, e.g. students in this field.

The online version is a sequel to a well-known and professionally-acclaimed printed dictionary of Economics. It has kept pace with Internet technologies, especially those that save time and facilitate the consultation process:

- There are two search systems, one general and one advanced. The latter allows users to restrict the search string to “field search” – e.g. searching in the “full text”, “bibliographies”, “article titles”, “contributors”, “abstracts” and “keywords” –, to “edition” – e.g. searching all editions, a particular edition, or a particular year – and to “topic area” – e.g. searching “in “microeconomics”, “Macroeconomics and Monetary Economics”, etc. In other words, this search system guides the user towards the specific needs they may have at the time of searching.
- Each article has a Table of Content and a scroll bar for moving up and down, i.e. use is made of *adaptive representation* (Tarp 2012a). Hence, users can move to the part of the article they are more interested in at a particular moment, something very convenient in cognitive dictionaries dealing with a deep study of a subject field.
- Each article has the “download citation” functionality, which automatically translates the dictionary article to a reference list crafted as “RIS”, “text”, “CSV” or “BibTex”. This functionality saves a lot of time and is of great help in typical cognitive situations such as documenting a lecture.

The *Palgrave*, as well as the *Accounting Dictionaries* and the *Oxford Dictionary of Economics*, are exemplars of the lexicography-based approach presented in this paper. In my view, this philosophy is more suitable than the “more and better structured data” for three main reasons. Firstly, it is based on the function(s) and specific user need(s) in specific usage situations. In other words, it is convenient for dealing with facts, language, instructions, etc., associated with online dictionaries of Economics. Secondly, it saves time, as it always guides users to the information required. Thirdly, the homepage is clean and friendly, perhaps because the dictionaries constructed according to this philosophy are not free: they are accessed through subscription and consequently do not need to “sell” their homepages by means of advertisements, games, etc. For example, the presentation of the *Spanish accounting dictionary* highlights the following:

1. Users can access four search buttons – *recepción*, *producción*, *encontrar un término*, and *conocimiento*. Each offers different data, i.e. that adapted to the usage situation prompting the consultation. Even if users are unsure about the search, they can look for “tips”, e.g. “cos + “ will retrieve concepts, parts of texts, etc. where the search string is to be found, thereby helping them in such a situation.
2. The homepage is clean; hence, the dictionary articles are easily accessed.
3. Users can also access supplementary materials, e.g. advertisements and “information buttons”, i.e., buttons that explain the characteristics of the dictionary (the outer texts of printed dictionary). This access is achieved by clicking on a hyperlink, which does not affect the presentation of the dictionary data.

6. Conclusion

This paper has addressed the design of online dictionaries of Economics supported by two opposing views: the linguistics-based and the lexicographic-based approaches.

The linguistics-based view is mainly championed in British lexicographical circles, which defend the design of online dictionaries of Economics with the same theoretical and practical arguments that they typically use when presenting English dictionaries for learners of English. This approach is usually identified as corpus lexicography, and rests on three main assumptions: (i) the only specialised dictionary of Economics is of a very restricted communicative type, e.g. the *Oxford Business English Dictionary for Learners*; (b) corpus data must be the main source of data to be used in both the “analysis” and the “synthesis” phase (Rundell, 2012a); (ii) the more and better structured data included the better the result; e.g. they claim that the synthesis phase must mainly reside in linguistic analysis, thus advocating a very restricted view of the concept of Economics dictionary: only certain communicative-oriented dictionaries are dictionaries of Economics.

The lexicographic-based view is by and large the one put forward by advocates of the *function theory of lexicography*, or *Aarhus school*. They defend a broader concept of dictionary of Economics, i.e. any information tool that can be employed when users need information on economic concepts, economic language, economic instructions and economic operations. They also claim that the analysis and synthesis phases must be based on the principle of lexicographic relevance, defending the view that the sources of data to be included and its analysis is the joint responsibility of several experts; these are involved in selecting, analysing and presenting such data so as to assist their potential users in various extra-lexicographical situations. Within this same framework, advocates of the function theory also make their case for designing lexicographic databases equipped with technologies that allow users to retrieve exactly the amount of data they need in each particular situation. This usually translates into the preparation of dictionary homepages where data are presented in a way which is both user-friendly and which facilitates retrieval.

7. Acknowledgments

Thanks are due to the Spanish Ministerio de Economía y Competitividad and the Junta de Castilla y León for financial support (Grant FF12011-22885 and VA-067A12-1), also to Professors Henning Bergenholtz and Sven Tarp, and to Associate Professors Sandro Nielsen and Patrick Leroyer for their comments on a previous draft. I myself am responsible for any remaining mistakes.

8. Bibliography

8.1. Dictionaries

Accounting dictionaries = Sandro Nielsen/Lisa Mourier/Henning Bergenholtz 2014: *Accounting dictionaries*. (A series of various interconnected Danish, Danish-English, English, and English-Danish dictionaries). Odense: Ordbogen.com.

Diccionario de Contabilidad = Pedro A. Fuertes Olivera/Pablo Gordo Gómez/Marta Niño Amo/Angel de los Rios Rodicio/Angeles Sastre Ruano/Sven Tarp/Marisol Velasco Sacristán and Sandro Nielsen/Lise Mourier/Henning Bergenholtz 2014: *Diccionario de Contabilidad* (A series of various interconnected Spanish, Spanish-English, and English-Spanish dictionaries). Hamburg: Lemma.com.

DiCoInfo = L’Homme, Marie-Claude et al. 2013: *DiCoInfo*. <http://olst.ling.umontreal.ca/cgi-bin/dicoinfo/search.cgi?ui=en&mode=terme&lang=fr&prec=exact&equi=1&rq=>

Lexicon Technicum = John Harris 1704: *Lexicon Technicum: or, an Universal English Dictionary of Arts and Sciences: Explaining Not Only the Terms of Art, but the Arts Themselves*. London: D. Brown, J. Walthoe, J. Knapton, B. and S. Tooke, D. Midwinter, B. Cowse, T. Ward, E. Symon, E. Valentine, and J. Clark.

McMillan Dictionary = Rundell, Michael (ed.) 2013: *MacMillan English Dictionary*. <http://www.macmillandictionary.com/>

New Palgrave Dictionary of Economics = Steven N. Durlauf/Lawrence E. Blume (eds.) 2008: *The New Palgrave Dictionary of Economics*. Basingstoke, New York: Palgrave Macmillan.

Oxford Business Dictionary = Parkinson, Dilys, assisted by Joseph Noble 2005: *Oxford Business English Dictionary for Learners of English*. Oxford: Oxford University Press.

Oxford Dictionary of Economics = John Black/Nigar Hashimzade/Gareth Myles 2013: *Oxford Dictionary of Economics*. Oxford: Oxford University Press.

8.2. Other literature

Alonso/Millon/Williams 2011 = Araceli Alonso, Chrystel Millon and Geoffrey Williams 2011: Collocational networks and their application to an e-advanced learner's dictionary of verbs in science (DicSci). In Iztok Kosem and Karmen Kosem (eds.), *Electronic lexicography in the 21st century: New applications for new users*. Ljubljana: Institute for Applied Slovene Studies, 12-22.

Atkins 1993 = B.T.S. Atkins 1993: Theoretical lexicography and its relation to dictionary-making. In *Dictionaries: Journal of the Dictionary Society of North America* 14, 4-43.

Bergenholtz 2012 = Henning Bergenholtz 2012: Concepts for monofunctional accounting dictionaries. In *Terminology* 18 (2), 243-263.

Bergenholtz/Gouws 2010 = Henning Bergenholtz and Rufus H. Gouws 2010: A new perspective on the access process. In *Hermes, Journal of Language and Communication in Business* 44, 103-127.

Bergenholtz/Tarp 2002 = Henning Bergenholtz and Sven Tarp 2002: Die moderne lexikographische Funktionslehre. Diskussionsbeitrag zu neuen und alten Paradigmen, die Wörterbücher als Gebrauchsgegenstände verstehen. In *Lexicographica* 18, 253-263.

Bergenholtz/Tarp 2003 = Henning Bergenholtz and Sven Tarp 2003: Two opposing theories: On H.E. Wiegand's recent discovery of lexicographic functions. In *Hermes, Journal of Linguistics* 31, 171-196.

Bergenholtz/Tarp 2004 = Henning Bergenholtz and Sven Tarp (2004): The concept of 'dictionary usage'. In Cay Døllerup (ed.), *Worlds of Words. A tribute to Arne Zettersten*. Special Issue, *Nordic Journal of English Studies* 3 (1), 23-36.

Besomi 2011 = Daniele Besomi (ed.) 2011: *Crises and cycles in economic dictionaries and encyclopaedias*. London, New York: Routledge.

Bothma 2011 = Theo J.D. Bothma 2011: Filtering and adapting data and information in an online environment in response to user needs. In Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 71-102.

Bothma/Prinsloo 2013 = Theo J.D. Bothma and Daan J. Prinsloo 2013: Automated dictionary consultation for text reception: a critical evaluation of lexicographic guidance in linked Kindle e-dictionaries. In *Lexicographica* 29, 165-198.

Bothma/Tarp 2012 = Theo J.D. Bothma and Sven Tarp 2012: Lexicography and the relevance criterion. In *Lexikos* 22, 86-108.

Buhr/Klaus 1971 = Manfred Buhr and Georg Klaus (eds.) 1971: *Philosophisches Wörterbuch. Band 1-2*. Berlin: Das europäische Buch.

Fuertes-Olivera 2009 = Pedro A. Fuertes-Olivera 2009: The function theory of lexicography and electronic dictionaries: WIKTIONARY as a prototype of collective multiple-language internet dictionary. In Henning Bergenholtz, Sandro Nielsen and Sven Tarp (eds.), *Lexicography at a Crossroads: Dictionaries and Encyclopedias Today, Lexicographic Tools Tomorrow*. Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien: Peter Lang, 99-134.

Fuertes-Olivera 2012a = Pedro A. Fuertes-Olivera 2012a: Lexicography and the Internet as a (Re-)source. In *Lexicographica* 28, 49-70.

Fuertes-Olivera 2012b = Pedro A. Fuertes-Olivera 2012b: On the usability of free Internet dictionaries for teaching and learning Business English. In S. Granger & M. Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 399-424.

Fuertes-Olivera 2013 = Pedro A. Fuertes-Olivera 2013: E-lexicography: The continuing challenge of applying new technology to dictionary making. In Howard Jackson (ed.), *Bloomsbury Companion to Lexicography*. London/New Delhi/New York/Sydney: Bloomsbury Academic, 323-340.

Fuertes-Olivera/Bergenholtz 2011 = Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.) 2011, *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum.

Fuertes-Olivera/Nielsen 2011 = Pedro A. Fuertes-Olivera and Sandro Nielsen 2011: The dynamics of terms in accounting: What the construction of the *Accounting Dictionaries* reveals about metaphorical terms in culture-bound subject fields. In *Terminology* 17 (1), 157-180.

Fuertes-Olivera/Nielsen 2012 = Pedro A. Fuertes-Olivera and Sandro Nielsen 2012: Online dictionaries for assisting translators of LSP texts: The *Accounting Dictionaries*. In *International Journal of Lexicography* 25 (2), 191-215.

- Fuertes-Olivera/Tarp 2014 = Pedro A. Fuertes-Olivera and Sven Tarp 2014: *Theory and practice of specialised online dictionaries: Lexicography versus terminography*. Berlin, New York: De Gruyter.
- Gouws 2011 = Rufus H. Gouws 2011: Learning, unlearning and innovation in the planning of electronic dictionaries. In Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 17-29.
- Granger 2012 = Sylviane Granger 2012: Introduction: Electronic lexicography – from challenge to opportunity. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 1-11.
- Granger/Paquot 2010 = Sylviane Granger and Magali Paquot (eds.) 2010, *eLexicography in the 21st Century: New Challenges, New Applications*. Louvain-la-Neuve: Presses Universitaires de Louvain. Cahiers du Cental 7.
- Granger/Paquot 2012 = Sylviane Granger and Magali Paquot (eds.) 2012, *Electronic Lexicography*. Oxford: Oxford University Press.
- Hanks 2012a = Patrick Hanks 2012a: The corpus revolution in lexicography. In *International Journal of Lexicography* 25 (4), 398-436.
- Hanks 2012b = Patrick Hanks 2012b: Corpus evidence and electronic lexicography. In S. Granger and M. Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 57-82.
- Hartmann 2005 = R.K.K. Hartmann 2005: Pure or hybrid? The development of mixed dictionary genres. In *Facta Universitatis* 3(2), 193-208.
- Haß/Schmitz 2010 = Ulrike Haß and Ulrich Schmitz (eds.) 2010, *Lexikographie im Internet*. Thematic section. In *Lexicographica* 26.
- Heid 2012 = Ulrich Heid (ed.) 2012: Corpora and lexicography. Thematic Section. In *Lexicographica* 28.
- Heid/Prinsloo/Bothma 2012 = Ulrich Heid, Daan J. Prinsloo and Theo J.D. Bothma 2012: Dictionary and corpus data in a common portal: state of the art and requirements for the future. In *Lexicographica* 28, 269-291.
- Jackson 2013 = Howard Jackson (ed.) 2013: *The Bloomsbury Companion to Lexicography*. London, New Delhi, New York, Sidney: Bloomsbury Academic.
- Kilgarriff 2012 = Adam Kilgarriff 2012: [Review of] Pedro A. Fuertes-Olivera/Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. *Kernerman Dictionary News*, July 2012, 26-29.
- Kilgarriff/Kosem 2012 = Adam Kilgarriff and Iztok Kosem 2012: Corpus tools for lexicographers. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 31-55.
- Kosem/Kosem 2011 = Iztok Kosem and Karmen Kosem (eds.) 2011, *Electronic Lexicography in the 21st Century: New Applications for New Users*. Ljubljana: Institute for Applied Slovene Studies.
- Kosem et al. 2013 = I. Kosem, J. Kallas, P. Gantar, S. Krek, M. Langemets and M. Tuulik (eds.) 2013: *Electronic lexicography in the 21st century: thinking outside the paper. Proceedings of the eLex 2013 conference, 17-19 October 2013, Tallinn, Estonia*. Ljubljana/Tallinn: Trojina, Institute for Applied Slovene Studies/Eesti Keele Instituut.
- L'Homme/Robichaud/Leroyer 2012 = Marie-Claude L'Homme, Benoit Robichaud and Patrick Leroyer 2012: Encoding collocations in DiCoInfo: from formal to user-friendly representations. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 211-236.
- Leroyer 2011 = Patrick Leroyer 2011: Change of paradigm: From Linguistics to Information Science and from dictionaries to lexicographical information tools. In Pedro A. Fuertes-Olivera & Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 121-140.
- Lew 2011 = Robert Lew 2011: Online dictionaries of English. In Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 230-250.
- Lew 2012 = Robert Lew 2012: How can we make electronic dictionaries more effective? In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 343-361.
- McEnery/Hardie 2012 = Tony McEnery and Andrew Hardie 2012: *Corpus Linguistics: Method, Theory and Practice*. Cambridge: Cambridge University Press.
- Meyer/Gurevych 2012 = Christian M. Meyer and Iryna Gurevych (2012): Wiktionary: a new rival for expert-built lexicons? Exploring the possibilities of collaborative lexicography. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 259-291.
- Nielsen/Almind 2011 = Sandro Nielsen and Richard Almind 2011: From data to dictionary. In Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 141-167.
- Paquot 2012 = Magali Paquot 2012: The LEAD dictionary-cum-writing aid: An integrated dictionary and corpus tool. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 163-185.

- Parkinson, 2005 = Dilys Parkinson 2005: Preface. *Oxford Business English Dictionary for Learners of English*, v.
- Pimentel/L'Homme/Laneville 2012 = Janine Pimentel, Marie-Claude L'Homme & Marie-Ève Laneville 2012: General and specialized lexical resources: A study on the potential of combining efforts to enrich formal lexicons. In *International Journal of Lexicography* 25(2), 152-190.
- Rundell 2010 = Michael Rundell 2010: What future for the learner's dictionary? In Ilan J. Kernerman and Paul Bogaards (eds.), *English Learners' Dictionaries at the DSNA 2009*. Jerusalem: Kdictionaries, 169-175.
- Rundell 2012a = Michael Rundell 2012a: 'It works in practice but will it work in theory?' The uneasy relationship between lexicography and matters theoretical. In Ruth E. Vatvedt Fjeld and Julie Matilde Torjusen (eds.), *Proceedings of the 15th EURALEX International Congress*. Oslo: Institutt for lingvistiske og nordiske studier, 47-92.
- Rundell 2012b = Michael Rundell 2012b: The road to automated lexicography: An editor's viewpoint. In Sylviane Granger and Magali Paquot (eds.), *Electronic Lexicography*. Oxford: Oxford University Press, 15-30.
- Rundell/Kilgarriff 2011 = Michael Rundell and Adam Kilgarriff 2011: Automating the creation of dictionaries: Where will it end? In F. Meunier, S. De Cook, G. Gilquin and M. Paquot (eds.), *A Taste for Corpora. In Honour of Sylviane Granger*. Amsterdam, Philadelphia: John Benjamins, 257-281.
- Sánchez/Cantos 2011 = Aquilino & Pascual Cantos 2011: e-dictionaries in the information age: The lexical constellation model (LCM) and the definitional construct. In Pedro A. Fuertes-Olivera and H. Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 251-274.
- Tarp 2008 = Sven Tarp 2008: *Lexicography in the borderland between knowledge and non-knowledge*. Tübingen: Niemeyer.
- Tarp 2011 = Sven Tarp 2011: Lexicographical and other e-tools for consultation purposes: Towards the individualization of needs satisfaction. In Pedro A. Fuertes-Olivera and Henning Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 54-70.
- Tarp 2012a = Sven Tarp 2012a: Online dictionaries: today and tomorrow. In *Lexicographica* 28, 253-267.
- Tarp 2012b = Sven Tarp 2012b: Do we need a (new) theory of lexicography? In *Lexikos* 22, 321-332.
- Tarp 2013a = Sven Tarp 2013a: Old wisdom: The highly relevant lexicographical knowledge obtainable from a specialized dictionary from 1774. In *Lexikos* 23, 394-413.
- Tarp 2013b = Sven Tarp 2013b: What should we demand from an online dictionary for specialized translation? In *Lexicographica* 29, 146-162.
- Tarp/Bothma 2013 = Sven Tarp and Theo J.D. Bothma 2013: An alternative approach to enlightenment age lexicography: *The Universal Dictionary of Trade and Commerce*. In *Lexicographica* 29, 222-284.
- Trap-Jensen 2010 = Lars Trap-Jensen 2010: One, two, many: customization and user profiles in internet dictionaries. In Anne Dykstra and Tanneke Schoonheim (eds.), *Proceedings of the XIV Euralex International Congress, Leeuwarden, 6-10 July 2010*. Ljouwert: Fryske Akademy, Afuk, 1133-1143.
- Verlinde 2011 = Serge Verlinde 2011: Modelling interactive reading, translation and writing assistants. In Pedro A. Fuertes-Olivera and H. Bergenholtz (eds.), *e-Lexicography: The Internet, Digital Initiatives and Lexicography*. London, New York: Continuum, 275-286.
- Vintar 2010 = Špela Vintar 2010: Bilingual term recognition revisited. The bag-of-equivalents term alignment approach and its evaluation. In *Terminology* 16(2), 141-158.
- Ye et al. 2012 = Zheng Ye, Jimmy Xiangji, Ben He and Hongfei Lin 2012: Mining a multilingual association dictionary from Wikipedia for cross-language information retrieval. In *Journal of the American Society for Information Science and Technology* 63 (12), 2474-2487.