

A cognitive perspective on the representation of MWEs in electronic learner's dictionaries

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Abstract

One of the main pending methodological issues in lexicography is the representation of multiword expressions (MWEs). Their heterogeneous and fuzzy nature has given rise to diverse typologies in linguistic theory and to a variable and inconsistent treatment in lexicographic practice. Addressing this issue in the context of pedagogical lexicography is of vital importance because, due to a complex interplay of features of form, meaning and use, MWEs present major difficulties for learners as regards reception, production and retention. This paper thus examines the representation of different types of MWEs in online versions of English monolingual learner's dictionaries and points out the need for a more rational, motivated and systematic lexicographic treatment. We argue for a cognitively oriented approach to MWEs that draws on Frame Semantics and the Conceptual Metaphor and Metonymy Theory. The proposal is illustrated through two case studies, which demonstrate how MWEs are integrated in a motivated semantic network of the motion verbs *crawl* and *dash*. The flexibility of the electronic medium can make it feasible to design cognitively informed features of the dictionary microstructure to improve the representation of MWEs.

Keywords: multiword expressions; monolingual learner's dictionaries; Frame Semantics; Conceptual Metaphor and Metonymy Theory; motion verbs

1. Introduction

This paper is motivated by the elusive nature of multiword expressions (MWEs) which are notoriously difficult to handle in lexicography. Although dictionary practices continuously develop, it remains unclear how MWEs should be represented in dictionaries. By overcoming space constraints and making new search paths feasible, the potential of the electronic medium has been widely recognised (de Schryver, 2003; Atkins & Rundell, 2008). MWEs have received much attention from a lexicographic and natural language processing perspective (for an overview see Gantar et al., 2019). However, challenges still remain at both macro- and microstructural levels, and the lack of “a comprehensive theoretical approach to the treatment of all types of MWEs in lexicography” is noted (ibid.: 143).

Focusing on English monolingual learner's dictionaries (MLDs) as representatives of the most recent developments in lexicography, several studies have observed considerable variation in the treatment of MWEs (e.g. Atkins & Rundell, 2008: 394-397; Walker, 2009: 289-291). For example, the same MWEs have been recorded under different entries and in a different manner, e.g. as fixed expressions needing an explanation or as simple examples, highlighted within “focus boxes” or indicated by

special labels (e.g. “idiom”, “phrasal verb”, “phrase”). The lack of consistency in the selection and wording of MWEs seems to result from differences in what each dictionary regards as collocation, idiom, etc., and from the large number of variant forms observed in corpora. At the level of the macrostructure the consultation process may have become easier due to access flexibility in electronic dictionaries; MWEs can be retrieved automatically wherever entered as long as they have received “lemma-sign status” (de Schryver, 2003: 178; Atkins & Rundell, 2008: 253). However, at the level of the microstructure no major change has been made in the description or arrangement of MWEs; they are usually presented as a list of hyperlinks at the end of an entry with no clear indication of how they are connected to the lemma’s semantic network (Wojciechowska, 2020).

Against this background and on account of the user perspective in MLDs, we propose that cognitive semantic theories, namely Frame Semantics (Fillmore, 2006 [1982]) and the Conceptual Metaphor and Metonymy Theory (Lakoff & Johnson, 1980), can help us improve the lexicographic treatment of most MWEs since they are – at least to some extent – motivated. Considering Lakoff’s (1987: 346) claim that “it is easier to learn something that is motivated than something that is arbitrary”, the paper draws examples from a small-scale corpus-based and cognitively-oriented pre-lexicographic database for motion verbs to outline an informed and more user-friendly treatment of MWEs.

To set the scene, section 2 discusses MWEs from a typological and lexicographic perspective, while section 3 considers what cognitive semantic theories can contribute to the ongoing question of the representation of MWEs in dictionaries. Section 4 demonstrates the practical solutions proposed through two case studies focusing on the manner-of-motion verbs *crawl* and *dash*. By reviewing the treatment of the *crawl*- and *dash*- MWEs in online versions of MLDs and reconstructing the microstructures of the entries, we illustrate a cognitively informed treatment of MWEs – complementary to the preliminary corpus-based extraction of typical word combinations.

2. MWEs and lexicographic issues

MWEs have long been a focus of great interest in the field of lexicology and lexicography due to their pervasive but also fuzzy nature. From a theoretical perspective, numerous attempts have been made to capture the complex interaction of idiomaticity and flexibility, giving rise to terminological diversity. From a lexicographic perspective, however, the representation of MWEs in dictionaries has not been extensively researched, and “the status of MWEs in lexicography still remains unsettled” (Wojciechowska, 2020: 584). This study does not aim to offer one more classification of MWEs; rather it uses Gantar et al.’s (2019) integrative typology as a point of reference with a view to discussing the lexicographic treatment of MWEs in two case studies.

Bringing together three classifications (i.e. Atkins & Rundell’s, 2008: 164, Bergenholtz & Gouws’s, 2014, and Baldwin & Kim’s, 2010), Gantar et al. (2019) present a

lexicographically relevant typology consisting of seven types of MWEs: collocations (e.g. *severe criticism*), fixed phrases and idioms (e.g. *to have a heart of gold*), compounds (e.g. *lame duck*), proverbs (e.g. *half a loaf is better than no bread*), phrasal verbs (e.g. *take off*), light-verb constructions (e.g. *take a walk*), and prepositional phrases (e.g. *with regard to*). This typology is built on gradable criteria such as collocability, contiguity, idiomaticity, compositionality, figuration and fixedness (ibid.: 141-142). In fact, despite variation in terminology it is generally agreed that there is a scalar relationship between types of MWEs exhibiting gradability of one or more of the following broad dimensions: (a) semantic/pragmatic specialisation and metaphoricity, (b) lexico-grammatical fixedness/variation, and (c) frequency of occurrence (for an overview see e.g. Dalpanagioti, 2018: 425-427). However, not only are there fuzzy borders between different types of MWEs, but also between co-occurrence patterns in the broad sense of typical contextual environment and the narrower sense of MWEs (ibid.). As Fellbaum (2016: 412) points out, “there are no hard rules to distinguish between merely preferred co-occurrences and more or less fixed collocations that arguably have lexical status”.

The interplay of features of form, meaning and use makes the representation of MWEs in dictionaries a challenge. Decisions regarding “what”, “where” and “how” are not easy to take, and thus there is a lack of consistency in the lexicographic treatment of MWEs. For example, Oppentocht and Schutz (2003: 218) observed that phraseological entities “can often be found under more than one entry, in different forms, and even with different explanations”, while more recently Gantar et al. (2019: 156) underlined the need for standardisation in categorising and tagging MWEs in dictionary databases and identifying their canonical forms and variants. Relevant in this respect is Bergenholtz and Gouws’s (2014) call for differential treatment of MWEs in light of users’ needs (reception vs. production) and dictionary function (communicative vs. cognitive). Learner’s dictionaries in particular should rise to the challenge of representing both their meaning and full range of usage (Fellbaum, 2016: 424).

Corpus data and the electronic medium have opened exciting possibilities for learner’s dictionaries. As regards phraseological information, developments mainly concern its coverage and access (Lew, 2012: 349-351; Paquot, 2015: 469; Dziemianko, 2017: 669; Wojciechowska, 2020). An increasing number of word combinations seems to be channelled into electronic dictionaries through various microstructural components (e.g. definitions, examples, subentries, boxes), while more effective search options are also offered (e.g. fuzzy matching, type-ahead search, menus, signposts, hyperlinks). However, the potential of the electronic medium has not yet been fully realised, and suggestions to further this include developing user-friendly customisation options and blending electronic dictionaries with learning environments (Lew, 2012: 353, 361), systematically specifying word combinations in terms of genre and register (Paquot, 2015: 470), integrating corpus-query tools into dictionary platforms (Paquot, 2015: 476), and reflecting the semantic relations between MWEs (Wojciechowska, 2020). Elaborating on the last research direction, this study argues for a cognitively oriented approach to MWEs.

3. The potential contribution of cognitive semantic theories

There seems to be a growing trend to advocate the application of cognitive linguistics in lexicography (see e.g. Geeraerts, 1990; Fillmore & Atkins, 1992; Van der Meer, 1999; Moon, 2004; Molina, 2008; Wojciechowska, 2012; Kövecses & Csábi, 2014; Jiang & Chen, 2015; Ostermann, 2015; Xu & Lou, 2015; Wiliński, 2016; Dalpanagioti, 2019). As Geeraerts (2007: 1168) explains, what cognitive linguistics can contribute to lexicography is a more realistic conception of semantic structure. While corpus linguistics has revolutionised lexicography by providing access to vast amounts of authentic language data and foregrounding the role of context, cognitive linguistics can make dictionary entries more reasonable and streamlined. Relevant studies mainly propose ways of ordering and defining senses to make semantic relations more transparent; however, MWEs have not received much attention. In this context, the present study aims to demonstrate how the combined use of Frame Semantics and the Conceptual Metaphor and Metonymy Theory can help improve the treatment of MWEs in electronic dictionaries.

The main assumption of Frame Semantics is that words must be grouped and explained in relation to a "(semantic) frame", i.e. a structured background of experience which constitutes a kind of prerequisite for understanding the meaning of a word (Fillmore, 1985: 224). Every semantic frame consists of specific "frame elements" (FEs), i.e. the "various participants, props, and other conceptual roles" involved in the schematic representation of a situation (Fillmore & Petruck, 2003: 359). Frame semantics links these situation-specific semantic roles to their syntactic realisations (grammatical functions and phrase types), thus specifying valence in both semantic and syntactic terms.

Targets of annotation in the Berkeley FrameNet project are typically single words but can also be MWEs such as phrasal verbs (e.g. *give in* in the frame [Giving_in]) or idioms (e.g. *kick the bucket* in the frame [Death]) (Ruppenhofer et al., 2016: 21). Focusing on predicates with a clear syntax-semantics mapping, FrameNet marks MWEs only with a Target label with no FE/grammatical function/phrase type annotation (ibid.: 59). However, MWEs receive special attention in the context of another frame semantic project for German, the SALSA (SAarbrücken Lexical Semantics Annotation and Analysis) project, which addresses the issue of metaphor representation. What is proposed for single-word and multi-word metaphors is a double annotation scheme with "a source frame representing the literal meaning, and a target frame representing the figurative meaning" (Burchardt et al., 2009: 216); by contrast a single frame annotation is assigned to (pure) idioms. Since the strategy of double frame semantic annotation allows for capturing both the overall meaning (target frame) and the internal structure (source frame) of metaphorical MWEs, it could be a useful starting point for a motivated lexicographic treatment.

Conceptual motivation has been discussed in relation to idiomatic expressions within

the framework of Conceptual Metaphor and Metonymy Theory (as laid out by Lakoff & Johnson, 1980) and its application in language learning. For instance, Gibbs (1993) argues that there are thousands of idioms which, without being predictable, seem to be motivated partially by metaphorical/metonymic schemes of thought very much alive in everyday reasoning. Similarly, Dobrovolskij (2011: 56) defines motivation as “transparency of conceptual links between source and target” and posits that “there are many idioms which are not semantically analyzable, and yet they are motivated”. Applied cognitive linguistic studies point out the pedagogical benefits of raising learners’ awareness of motivated meaning and semantic networks; for example, Boers and Lindstromberg (2006) and Kövecses (2012) make special reference to the usefulness of conceptual metaphor in the comprehension and retention of figurative idioms.

The implications of Conceptual Metaphor and Metonymy Theory for pedagogical lexicography are mostly discussed in relation to ordering and defining senses. For instance, Van der Meer (1999) argues that making learners aware of the extensions of words, by ordering senses in the dictionary from literal to figurative, can facilitate vocabulary learning. Similarly, it is important to show the relation between senses in the wording of definitions; as Lew (2013: 299) explains, “foregrounding the links between different shades of meaning may help repair some of the damage done by artificially chopping semantic space into separate dictionary senses”. Lexicographic applications of the Conceptual Metaphor and Metonymy Theory to the treatment of MWEs can be traced in specialised dictionaries for phrasal verbs or idioms, which seek to express the underlying conceptual motivation (for an overview see Kövecses & Csábi, 2014: 129-130), and in the “metaphor boxes” of the MEDAL (print and electronic) dictionaries (for an overview see Moon, 2004). Metaphor boxes provide an explanation of a metaphorical concept in terms of the mapping between source and target domains, and group together illustrative examples for words and phrases that realise the mapping; they were developed for about 60 concepts and have been placed in the macrostructure near the relevant target domain headword to facilitate encoding in L2.

Within the context of corpus-based, electronic, pedagogical lexicography, we use two case studies as a framework for making suggestions that move beyond reference to one MWE type (e.g. idioms) or customisable macrostructural arrangement (e.g. metaphor-based). We proceed to demonstrate how insights from Frame Semantics and Conceptual Metaphor and Metonymy Theory can be systematically combined to improve the treatment of MWEs.

4. Case studies: *to crawl* and *to dash*

Whereas metalexigraphic studies can be selective about the MWEs examined for the purposes of illustration, in practical lexicographic work an exhaustive analysis of the polysemy and phraseology of words is required. To discuss the role and (actual and proposed) treatment of MWEs within the framework of a holistic lexicographic portrait, we present two case studies that draw data from a pre-lexicographic database for

motion verbs; for a short description of the corpus-based and cognitively oriented features of the database see Dalpanagioti (2018: 422-423). Examining the entries for the verbs *crawl* and *dash*, we focus on the microstructural representation of MWEs of various types; in terms of Gantar et al.'s (2019) typology, they can be classified as collocations (*crawl the Net/web*, *dash someone's hopes*), idioms (*crawl out of the woodwork*, *make your skin/flesh crawl*), proverbs: routine/situational formulas (*I must dash*, *dash it all*), and phrasal verbs (*crawl with*, *dash off*). We thus proceed to first compare the "Big Five" MLDs with regard to their representation of MWEs (section 4.1), and then to present an alternative cognitively informed treatment (section 4.2).

4.1 The treatment of MWEs in the "Big Five" MLDs

Aspects of form, meaning and presentation of MWEs are examined in the *crawl* (v) and *dash* (v) entries of the online editions of OALD, LDOCE, COBUILD, CALD and MEDAL. To facilitate the comparative analysis of the data, we have collected the relevant information for the MWEs accessed through the *crawl* (v) and *dash* (v) entries in Table 1 and Table 2, respectively.

With regard to coverage, we do not expect to find great differences, since all these dictionaries are corpus-informed. Striking instances, nevertheless, are *crawl the Net/web* and *crawl back to*, which are recorded in only one dictionary, i.e. LDOCE and CALD respectively.¹ Variant forms, such as *make your skin/flesh crawl*, *come/crawl out of the woodwork*, *dash it/dash it all*, seem to be consistently recorded with only slight differences. Similarly, there is agreement on the semantic and pragmatic information reflected in definitions and labels; in particular, corpus-derived information on implications and register restrictions seem to be systematically provided.

However, variation can be observed with regard to the arrangement of MWEs. Although hyperlinking MWEs to a separate entry seems to be the most common practice among the five MLDs, there are various positions in which hyperlinks are placed. More precisely, MWE hyperlinks may appear as separate senses (e.g. *dash somebody's hopes* in LDOCE, *make your skin/flesh crawl* in COBUILD), in an "idioms" or "phrasal verbs" box (e.g. *dash off* in OALD and CALD), in a right-hand panel with more results (e.g. *crawl/come out of the woodwork* in LDOCE and CALD), or in both a box and a right-hand panel (e.g. *make your skin/flesh crawl* and *dash it (all)* in MEDAL). When MWEs are not hyperlinked they are defined and illustrated in the main entry as a separate sense (a typical practice in COBUILD) or in a sub-entry in a box (a strategy preferred by OALD), or, less often, they are located among illustrative examples without being highlighted (e.g. *I must dash* in COBUILD and CALD).

¹ In fact, the Word Sketches for *crawl* (v) in two web corpora available through Sketch Engine (i.e. ukWaC and enTenTen18) confirm the high frequency of its occurrence with nouns denoting a Web location such as *Web*, *Internet*, *website*, *net*, etc. (semantic preference). In contrast, there is not enough evidence to support the recording of *crawl back to* as an idiom.

| OALD | LDOCE | COBUILD | CALD | MEDAL |
|--|---|---|--|--|
| <i>be crawling with</i> | <i>be crawling with something</i> | <i>be crawling with</i> | <i>be crawling with sb/sth</i> | <i>crawl with</i> (usually progressive) |
| <i>(informal)</i> to be full of or completely covered with people, insects or animals, in a way that is unpleasant | to be completely covered with insects, people etc. | If you say that a place is crawling with people or animals, you are emphasizing that it is full of them. [informal, emphasis] | to be full of insects or people in a way that is unpleasant | 1. to be full of people in a way that is unpleasant 2. to be covered in insects |
| label: phrasal verb hyperlink in a box | sense 6 hyperlink | sense 4 | sense signpost: 'Fill' | label: phrasal verb hyperlink in a box |
| <i>make your skin crawl</i> | <i>make somebody's skin crawl</i> | <i>to make your skin crawl</i> or <i>make sb's flesh crawl</i> | <i>make sb's skin crawl</i> | <i>make your skin/flesh crawl</i> |
| to make you feel afraid or full of horror | (informal) to make someone feel very uncomfortable or slightly afraid | If something makes your skin crawl or makes your flesh crawl, it makes you feel shocked or disgusted. | If someone or something makes your skin crawl, you think they are very unpleasant or frightening | to give you a very unpleasant and slightly frightened feeling |

| | | | | |
|---|---|---------------------------------------|--|--|
| label: idiom sub-entry in a box | hyperlink in the “More results” panel | sense 6 hyperlink | label: idiom hyperlink in the “More meanings” panel | label: phrase hyperlink in a box & in the “Other entries for this word” panel |
| <i>come/crawl out of the woodwork</i> | <i>crawl/come out of the woodwork</i> | - (<i>come out of the woodwork</i>) | <i>come/crawl out of the woodwork</i> | <i>come/crawl out of the woodwork</i> |
| <i>(informal, disapproving)</i> if you say that somebody comes/crawls out of the woodwork, you mean that they have suddenly appeared in order to express an opinion or to take advantage of a situation | if someone crawls out of the woodwork, they suddenly and unexpectedly appear in order to take advantage of a situation, express their opinion etc. – used to show disapproval | | (mainly disapproving) to appear after having been hidden or not active for a long time | to suddenly appear after a long time, especially for unpleasant reasons |
| label: idiom sub-entry in a box | hyperlink in the “More results” panel | | label: idiom hyperlink in the “More meanings” panel | label: phrase hyperlink in the “Other entries for this word” panel |
| - | <i>crawl the Net/web</i> | - | - | - |

| | | | | |
|---|--|---|---|---|
| | if a computer program crawls the Net, it quickly searches the Internet to find the particular information you need | | | |
| | sense 7 hyperlink | | | |
| - | - | - | <i>crawl back (to sb)</i> | - |
| | | | to admit that you were wrong and ask someone to forgive you or ask them for something that you were offered and refused in the past | |
| | | | label: idiom hyperlink in a box | |

Table 1: *Crawl* MWEs in the "Big Five" MLDs

| OALD | LDOCE | COBUILD | CALD | MEDAL |
|---|--|---|---|---|
| <i>I must dash</i> | <i>(I) must dash/(I) have to dash</i> | <i>dash</i> <i>(I have to dash/ must dash</i> in examples; not highlighted) | <i>I must dash</i> | <i>I must dash/I have to dash</i> |
| <i>I must dash</i> (= leave quickly), <i>I'm late.</i> | <i>(British English, spoken)</i> used to tell someone that you must leave quickly | If you say that you have to dash, you mean that you are in a hurry and have to leave immediately. [informal] | UK <i>I must dash - I've got to be home by seven.</i> | used for saying that you must leave quickly because you are in a hurry |
| example under sense 1 | sense 3 hyperlink | sense 2 | example under sense 'Move quickly' | label: phrase spoken hyperlink in a box & in the "Other entries for this word" panel |
| <i>dash somebody's hopes</i> | <i>dash somebody's hopes</i> | <i>dash</i> <i>(dash hopes</i> in examples) | <i>dash sb's hopes</i> | <i>dash someone's hopes</i> |
| to destroy somebody's hopes by making what they were hoping for | to disappoint someone by telling them that what they | If an event or person dashes someone's hopes or expectations, it destroys | to destroy someone's hopes | to make it impossible for someone to do what |

| | | | | |
|---|---|---|---|--|
| impossible | want is not possible | them by making it impossible that the thing that is hoped for or expected will ever happen. [journalism, literary] | | they hoped to do |
| label: idiom sub-entry in a box | sense 2 hyperlink | sense 6 | label: idiom hyperlink in a box | label: phrase hyperlink in a box & in the “Other entries for this word” panel |
| <i>dash (it)! / dash it all!</i> | <i>dash it (all)!</i> | <i>dash/ dash it/ dash it all</i> | <i>dash</i> | <i>dash it (all)</i> |
| <i>(old-fashioned, British English)</i> used to show that you are annoyed about something | <i>(British English, old-fashioned)</i> used to show that you are slightly annoyed or angry about something | You can say dash or dash it or dash it all when you are rather annoyed about something. [British, informal, old-fashioned, feelings] | <i>(UK, old-fashioned, informal)</i> used to express anger | used when you are annoyed about something |
| label: idiom sub-entry in a box | sense 5 hyperlink | label: exclamation sense 10 | label: exclamation separate entry: <i>dash</i> <i>(Oh dash (it)!</i> as an example) | label: phrase informal old-fashioned hyperlink in a box & in the “Other entries for this word” panel |

| <i>dash something off</i> | <i>dash off</i> | <i>dash off</i> | <i>dash sth off</i> | <i>dash off</i> |
|---|---|---|---|---|
| to write or draw something very quickly | <p>1. to leave somewhere very quickly</p> <p>2. <i>dash something off</i> to write or draw something very quickly</p> | <p>1. If you dash off to a place, you go there very quickly.</p> <p>2. If you dash off a piece of writing, you write or compose it very quickly, without thinking about it very much.</p> | to write something quickly, putting little effort into it | <p>1. [intransitive] to leave quickly or suddenly because you are in a hurry</p> <p>2. [transitive] to write or draw something quickly because you are in a hurry</p> |
| label: phrasal verb hyperlink in a box | label: phrasal verb hyperlink | label: phrasal verb hyperlink | label: phrasal verb hyperlink in a box | label: phrasal verb hyperlink in a box & in the "Other entries for this word" panel |

Table 2: *Dash* MWEs in the "Big Five" MLDs

Besides dictionary-specific preferences, it is important to notice how the same MWEs are classified across the dictionaries and whether the same MWE types are treated consistently. As regards classification, in Table 1 and Table 2 we can find clear-cut cases like *dash off*, which is labelled as “phrasal verb” and accessed through a hyperlink in all dictionaries, but also more challenging cases like *be crawling with* and *dash somebody’s hopes*, which are tagged as fixed phrases (“phrasal verb”, “idiom”) in some dictionaries and as contextual realizations of a sense in others. As regards the question of consistency, there does not seem to be an identifiable type-specific treatment. Irrespective of whether MWEs are collocations, idioms, phrasal verbs or situational formulas, the general tendency is to present them separately from the main entry (in separate hyperlinked entries or in separate boxes in the entry) and even when they appear among numbered senses there is no indication of their relation.

To sum up, based on the examination of the sample entries we can conclude that corpus analysis has led to a high degree of consistency in the representation of MWE variant forms, meanings, implications and illustrative examples. However, corpus analysis cannot address the issue of linking semantically related units into a coherent network unless combined with an appropriate theoretical model. Focusing thus on the “where” and “how”, rather than on the “what”, we outline a cognitively oriented representation of MWEs in the two case studies.

4.2 A cognitively informed treatment of MWEs

Instead of detaching MWEs from the main entry, we propose incorporating them in the network of lexical units (LUs). Drawing information from a database that has applied a corpus-based and cognitively oriented methodology to establishing LUs (Dalpanagioti, 2013; 2018), we reconstruct the skeletal structure of the entries *crawl* (v) and *dash* (v). The semantic networks of the verbs appear in Table 3 and Table 4, and demonstrate the links between single-word and multi-word LUs.²

Since separate senses generally correspond to different semantic frames and assign different FEs (Atkins, Rundell & Sato, 2003: 335-337), we cluster corpus uses and distinguish LUs (single-word and multi-word ones) based on FrameNet’s frames.³ To lend further support to the frame-based sense distinctions, we consider how they are motivated by the cognitive mechanisms

² Corpus examples are not included in Table 3 and Table 4 because the study focuses on arranging and presenting LUs rather than establishing them based on corpus uses; besides, there seems to be considerable agreement in the senses and uses provided in the MLD entries examined above. Variant forms of MWEs have been clustered together under the same LU (see e.g. the idiom schema *make someone’s skin/flesh/scalp crawl*).

³ Descriptions of all FrameNet frames mentioned in Table 3 and Table 4 are available online at <https://framenet.icsi.berkeley.edu/fndrupal>. The only exception is the [Self_motion]_{figurative} frame (*crawl*, LU4) which has been introduced and described in Dalpanagioti (2013: 17-19).

of metaphor and metonymy. Promoting a cognitive-based rather than a frequency-based approach to the ordering of LUs (Van der Meer, 1999: 203-4; Lew, 2013: 293), we proceed from literal to metonymic to metaphorical extensions and organise LUs into a tiered structure with two main clusters of related senses in each table.

While in Table 3 all LUs correspond to discrete frames, in Table 4 we notice that the frames [Departing] and [Cause_impact] are mentioned twice. This is due to our decision to distinguish between LUs that evoke the same frame, when corpus uses exhibit distinct semantic-pragmatic nuances not reflected in frame distinctions (e.g. *dash it (all)* is separated from the other [Cause_impact] uses because it serves a special discursual function). However, in combining semantic and contextual criteria for determining LUs, we pay particular attention not to elevate mere contextual variations to the status of an LU, because it is easy to lose sight of the semantic integrity of words by means of excessive splitting (Atkins & Rundell, 2008: 313). Relevant in this respect is the collocation *dash someone's hopes* (Table 4, LU7), which is treated as a usage pattern rather than as a stand-alone LU.

The (pre-lexicographic) cognitive semantic analysis presented in Table 3 and Table 4 has practical implications for the representation of MWEs in online MLDs. First of all, it is evident that all instances of the various MWE types examined are motivated, i.e. they have clear conceptual links with other LUs. However, these are not reflected in current dictionary practices, which create distance between semantically related LUs, for instance, by hyperlinking MWEs to separate entries or listing them in separate boxes. What is suggested instead is to take advantage of the flexibility of the electronic medium to translate cognitively oriented information into (microstructural) dictionary features.

Adding frame-based signposts as guidewords and using a tiered structure with clusters of senses ordered in a logical manner can be applied to whole entries to make connections more transparent. We should note in this respect that only CALD uses guidewords in the entries examined, yet without rational arrangement of sense divisions (e.g. the “Fill” MWE *be crawling with* appears far from the “Move” sense after the “Try to please” section), and only MEDAL uses a tiered structure, yet without incorporating MWEs in it. Besides these general techniques, MWEs in particular could be recorded (with frame-based signposts) in alphabetical order in a menu at the top of the entry to facilitate access, but placed within the related sense division in the entry text to indicate semantic motivation. For example, the idiom variants *make someone's skin/flesh/scalp crawl* could be placed under the “Motion” cluster after the *be crawling with* motivating LU. In this way, the entry could draw users' attention to both the overall meaning (target frame) through the frame-based signpost and the internal structure (source frame) of metaphorical MWE through its position.

| Clusters of senses | LU | Frame | Conceptual motivation | |
|--------------------|----|---|-------------------------------------|--|
| I. Motion | 1 | move along with the body close to the ground | [Self-motion] | literal sense; natural locomotion of insects/ reptiles with legs and literal extension to the motion of human beings (toddlers) on the basis of similarity of posture |
| | 2 | Phrasal verb: <i>crawl with something/ someone</i> (progressive colligation) be covered/ crowded with movers (creatures or people) | [Abounding_with] | CONTAINER FOR CONTENT metonymy from LU1; shift of emphasis from the SELF-MOVERS to the LOCATION where motion takes place |
| | 3 | Idiom: <i>make someone's skin/ flesh/ scalp crawl</i> make someone feel fear or revulsion | [Stimulate_emotion] | motivated by the [Abounding_with] LU and the metonymies PHYSIOLOGICAL EFFECT FOR EMOTION and BODY PART (skin, flesh, scalp) FOR PERSON/ EXPERIENCER experiential basis: when we feel horrified or revolted we have the sensation that insects are moving over our skin; i.e. we feel as if crawling with insects |
| | 4 | move forward slowly | [Self_motion] _{figurative} | extension from LU1 (collocate type: human); experiential grounding: when you crawl, your speed is reduced - metonymy : shift of emphasis from the manner of motion of humans (i.e. on hands and knees) to their speed of motion (i.e. slow) |

| | | | | |
|------------|---|---|------------------------------|---|
| | | | | <p>- metaphor: further extension to the slow speed of any kind of activity</p> <p>SELF_MOVER: human, vehicle, plant, substance, path, process, time, fear</p> |
| | 5 | <p>Idiom: <i>crawl/come out of the woodwork</i></p> <p>appear for unpleasant reasons</p> | [Coming_to_be] | <p>extension from LU1 (collocate type: human) via the metaphor LACK OF VIRTUE IS DOWN (weak/ dishonest people are characterised as “worms”, i.e. underground movers)</p> <p>it implies contempt</p> |
| II. Action | 6 | <p>behave in a servile manner; try hard to please someone in authority in order to get an advantage</p> <p>Colligation: <i>crawl to someone</i></p> | [Subordinates_and_superiors] | <p>extension from LU1 (collocate type: human) via the metaphor BEING SUBJECT TO CONTROL IS DOWN; experiential grounding: lowering the body to the ground is a gesture of submission</p> <p>it implies disapproval of the behaviour and of the people involved</p> |
| | 7 | <p>search the Internet for information</p> <p>Collocation: <i>crawl the Web</i></p> | [Scouring] | <p>extension from LU1 (collocate type: insect) on the basis of the Computing sense of spider, and the metaphors ACTION (i.e. searching) IS MOTION (i.e. path traversing) and ABSTRACT STRUCTURE OF A COMPLEX SYSTEM (i.e. information database) IS PHYSICAL STRUCTURE (i.e. spider web)</p> <p>SEARCHER: computer program (e.g. <i>web spider, search</i>)</p> |

| | | | | |
|--|--|--|--|--|
| | | | | <p><i>engine, software</i>)</p> <p>GROUND: Internet (e.g. <i>Web, (web)site, net</i>)</p> <p>it implies that the software carries out the search quickly and lists the results</p> |
|--|--|--|--|--|

Table 3: Integrating *crawl* MWEs in a motivated semantic network

| Clusters of senses | LU | Frame | Conceptual motivation | |
|--------------------|----|--|-----------------------|--|
| I. Motion | 1 | run towards a goal very quickly or hastily | [Self_motion] | literal sense; violent manner of motion |
| | 2 | Proverb (routine formula): <i>(I) must/ have (got) to dash</i> used for saying that you must leave quickly because you are in a hurry | [Departing] | spoken expression related to LU1 (collocate type: human); it serves a special discursal function, i.e. to excuse yourself for leaving |
| | 3a | Phrasal verb: <i>dash off</i> leave a place quickly because you are in a hurry | [Departing] | special case of LU1; the particle <i>off</i> contributes the SOURCE FE to the [Self_motion] of LU1 |
| | 3b | Phrasal verb: <i>dash off something</i> write or draw something quickly | [Text_creation] | extension from LU3a via the EVENT STRUCTURE metaphor : MANNER OF ACTION IS MANNER OF MOTION mapping: leaving in a hurry (literal source: place) → writing |

| | | | | |
|------------|---|---|----------------|---|
| | | | | something in a hurry (metaphorical source: mind) it implies that you are not thinking very much or trying very hard |
| II. Impact | 4 | hit against a surface with great force | [Impact] | literal extension from LU1 by adding the element [contact by impact] to self-motion: SELF-MOVER = IMPACTOR |
| | 5 | make something move violently against a surface, usually so that it breaks | [Cause_impact] | causative extension from LU4: the action of the verb has an effect on an entity (IMPACTOR) so that it will move forcibly/violently and hit against another entity, the IMPACTEE (ACTION FOR RESULT metonymy); it implies (physical) damage |
| | 6 | Proverb (routine formula): <i>dash it (all)!</i> exclamation used to express annoyance | [Cause_impact] | spoken expression motivated by LU5; it serves a special discursal function, i.e. its sole meaning is its implication (the speaker is annoyed about something) |
| | 7 | destroy someone's hopes, dreams, plans, etc., thus disappointing them Collocation: <i>dash someone's hopes</i> | [Destroying] | extension from LU5 via the metaphors THOUGHTS/ FEELINGS ARE OBJECTS and BAD IS DOWN; it implies cruelty and emotional damage (frustration) UNDERGOER: <i>hope, expectation, dream, effort, prospect, spirits</i> (restricted set of collocates) |

Table 4: Integrating *dash* MWEs in a motivated semantic network

The descriptions of conceptual motivation in Table 3 and Table 4 can be used not only to position MWEs inside the entries, but also to systematically incorporate a new type of information in electronic entries. What is proposed in this respect is to create short and simplified notes about how MWEs are connected to the motivating meaning and include them in definitions and/or in awareness-raising notes. For example, the use of the word “movers” in the definition of *crawl with something/someone* (Table 3, LU2) is a clue to its link to the literal motion LU1; similar is the function of the parallel use of adverbs (“quickly”, “violently”) in the definitions in Table 4. As regards awareness-raising notes, they can have the form of hyperlinked notes that explain the underlying motivation of MWEs. The relevant information in Table 3 and Table 4 should be expressed in a simplified manner following the example set by MEDAL’s metaphor boxes. For instance, complementing MLDs’ quite similar definitions of *make someone’s skin/flesh/scalp crawl* (see Table 1) with a note on the experiential grounding of the idiom schema (see Table 3) would facilitate learners’ understanding and recall. Enriching learners’ dictionaries with cognitive information is expected to have positive effects on L2 vocabulary learning (see e.g. Yang & Wei 2015), but more user studies are needed to firmly support this.

5. Conclusion

Situated within the framework of “cognitive lexicography” (Ostermann, 2015), this paper has explored the relevance of cognitive approaches, namely Frame Semantics and the Conceptual Metaphor and Metonymy Theory, to the lexicographic treatment of MWEs. A review of two entries in the online versions of the “Big Five” MLDs has revealed the need for a rational organising framework that could help users (learners) make sense of the rich corpus-derived information on MWEs (including variant forms, illustrative examples, implications and usage constraints). In reconstructing the skeletal structure of the sample entries, we have demonstrated the motivation of different types of MWEs and their link to the rest of the LUs. This conceptual information can be reflected in various elements of the microstructure – frame-based signposts, tiered structure, points of access through menus and related sense divisions, clues in definitions and notes – to show the relation between the unit (meaning) and its components (form). This suggestion can complement cognitively oriented macrostructural practices like MEDAL’s “metaphor boxes” and make a step towards treating MWEs holistically within motivated semantic networks.

In “post-editing lexicography”, where lexicographically relevant information can automatically be extracted from corpora and drafted in preliminary entries, organising single-word and multi-word LUs in a coherent and principled manner still seems to be one of the most challenging tasks. As relevant lexical databases like Framenet and MetaNet develop further, they could be integrated into the editorial workflow and more ways to channel cognitive linguistic insights into MLDs could be devised.

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