

Corpus-based Cognitive Lexicography: Insights into the Meaning and Use of the Verb *Stagger*

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Abstract

Situated within the framework of “cognitive lexicography”, this paper aims to demonstrate how lexical meaning and usage patterns can be represented in a coherent and principled manner by applying cognitive semantic theories to corpus data. The focus of attention is on the lexicographic tasks of establishing lexical units, capturing usage patterns and providing definitions. The proposed corpus-based and cognitively-oriented approach is applied to a lexical item from the semantic field of motion, the verb *stagger*. Monolingual learner’s dictionaries (MLDs) are examined as to their *stagger* entry in order to specify in what respects this approach can improve EFL lexicography. The paper is not restricted to a theoretical discussion of lexicographic issues or a critical review of existing entries; rather, a new version of the *stagger* entry is offered.

Keywords: frame semantics; conceptual metaphor and metonymy theory; word sense disambiguation; usage patterns

1 Introduction

The application of cognitive linguistics to lexicography has led to the emergence of a new interdisciplinary research field called “cognitive lexicography” (Ostermann 2015). This paper aims to contribute to this field by demonstrating how cognitive linguistic theories can be applied to corpus data in building up a dictionary entry. To this end, the polysemous manner-of-motion verb *stagger* is used as a case study.

The study builds on the idea that the compilation of dictionary entries can be systematized by structuring corpus-derived lexical information in a pre-lexicographic database (Atkins & Rundell 2008: 100-101). To interpret the data, we draw on Corpus Pattern Analysis (Hanks 2013a: 404), Frame Semantics (Fillmore 1982), the Conceptual Metaphor and Metonymy Theory (Lakoff & Johnson 1980) and the Principled Polysemy approach (Evans & Green 2006: 342-352).

After outlining this theoretical background, the paper presents the corpus-based and cognitively-oriented analysis of the meaning and use of the verb *stagger*. Then, we briefly examine the *stagger* entry in the “Big Five” MLDs (i.e. online editions of OALD, LDOCE, COBUILD, CALD, MEDAL) with respect to sense distinctions, usage patterns and definitions. By way of conclusion, we present a new version of the *stagger* entry, which is claimed to be more enlightening to users.

2 Corpus-based Cognitive Lexicography

“Corpus-based cognitive lexicography” brings together corpus linguistics, cognitive linguistics and lexicographic practice. Corpus linguistics has revolutionized lexicography by providing access to vast amounts of authentic language data. The empirical approach to the study of language has promoted

the contextual view of meaning, changing not only the source of data but also its presentation in dictionaries, so as to demonstrate use in context; EFL lexicography has been a pioneer in this respect (Rundell 1998: 320, 330). Cognitive linguistics can contribute to lexicography in a different way, i.e. by making dictionary entries more reasonable and streamlined; as Geeraerts (2007: 1168) has pointed out, what cognitive linguistics can offer to lexicography is a more realistic conception of semantic structure.

The combination of corpus linguistics and cognitive linguistics is not something new, in particular with regard to the issue of distinguishing senses (e.g. Gries & Stefanowitsch 2006). In lexicographic practice, we can find dictionaries which explicitly combine some cognitive insights with corpus-based lexicography (e.g. Moon 2004); however, this can be done more widely and systematically by applying a variety of cognitive linguistic theories and corpus approaches to various parts of dictionary entries and aspects of lexicographic work. In this light, the present study aims to demonstrate how cognitive semantics can operate in combination with a corpus approach to improve the treatment of lexical meaning and use in EFL dictionaries. This section summarizes the approaches upon which this study relies most.

The power of the corpus to foreground the syntagmatic aspect of lexis has led to a contextual theory of meaning expressed in statements such as “every distinct sense of a word is associated with a distinction in form” (Sinclair 1987: 89), and “context disambiguates” (Moon 1987: 87). Viewing meaning as function in context, Sinclair (1998: 14-23) has proposed four categories of co-selection (i.e. “collocation”, “colligation”, “semantic preference”, and “semantic prosody”) as components of an extended unit of meaning, which can be identified only by observing “the cumulative effect of usage” in corpora (Tognini-Bonelli 2002: 73). Building on this idea, Hanks (2004a: 246-251) argues that the lexicographer’s task is to identify the normal patterns of the usage of words by means of a Corpus Pattern Analysis (CPA), and to present these norms rather than their exploitations in dictionaries. As Hanks (2004b: 88) explains, in CPA “concordance lines are grouped into semantically motivated syntagmatic patterns”. A “pattern” in the Pattern Dictionary of English Verbs (PDEV) – a CPA product – includes information on the semantic types of arguments that are relevant for distinguishing between different senses.

The present study combines CPA with Frame Semantics and takes account of their application in PDEV and FrameNet, respectively. Both of these pioneering projects “seek to identify stereotypical contexts”; while PDEV focuses on the “phraseological context”, FrameNet concentrates on “the context of situation in which words are used” (Hanks 2013b: 729). 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 & Petrucci 2003: 359). Frame semantics links these situation-specific semantic roles to their syntactic realizations (grammatical functions and phrase types), thus specifying valence in both semantic and syntactic terms. Work in the FrameNet project involves developing frame descriptions, establishing lexical units (LUs, i.e. words in one of their senses) as annotation targets, extracting example sentences from the BNC, and annotating them in terms of FEs, phrase types, and grammatical functions (Ruppenhofer et al. 2016: 7-8).

CPA and Frame Semantics may be regarded as complementary approaches, as “each CPA pattern can in principle be plugged into a FrameNet semantic frame” (Hanks 2018); in fact, PDEV includes direct links between its verb patterns and FrameNet frames. FrameNet is claimed to be valuable for lexicography, because it provides principles for identifying what is lexicographically relevant in the overwhelming amount of corpus data (Atkins, Fillmore & Johnson 2003; Atkins, Rundell & Sato

2003). However, it is also criticized for randomly selecting the frames and the LUs to be analyzed and for adopting a “top-down” (as opposed to “bottom-up”) corpus approach (Hanks 2013b: 729; Johnson & Lenci 2013: 45). Therefore, our lexicographic study of *stagger* can benefit from combining CPA’s methodology of identifying normal patterns with FrameNet’s in-depth analysis of semantic frames in discovering usage patterns and distinguishing senses. However, this theoretical background needs to be complemented by a framework for organizing senses and uses into a coherent and motivated network; the Conceptual Metaphor and Metonymy Theory and the Principled Polysemy approach are relevant in this respect.

Cognitive semanticists view metaphor and metonymy as phenomena fundamental to the structure of the conceptual system rather than mere stylistic features of language (Lakoff & Johnson 1980; Croft 2000; Kövecses 2002; Evans & Green 2006). The cognitive mechanisms of metaphor and metonymy account for lexical semantic extension, as they can show the relationship between multiple synchronic uses of a given form. Metaphor and metonymy differ in terms of the function of the conceptual relationship (imagistic reasoning in metaphor vs. shift of reference in metonymy) and its nature (similarity in metaphor vs. contiguity in metonymy). Mapping occurs across two separate domains (domain mapping) in metaphor, whereas in metonymy it occurs within a single domain (domain highlighting). Nevertheless, the distinction between metaphor and metonymy is not absolute, but rather scalar (Radden 2003) and metaphorical mappings often have a metonymic basis.¹

The metaphorical/metonymic extensions that are of particular lexicographic interest are those that have achieved conventional status, as opposed to ad-hoc coinages (Hanks 2004a: 272). While no one would disagree about the type of linguistic metaphors/metonymies to be included in dictionaries, there are opposing views with regard to their arrangement within a dictionary entry. According to the frequency-based approach, highly frequent metaphorical extensions should precede less frequently occurring literal meanings (Hanks 1987: 133-134). In contrast, according to the semantic order approach, the core meaning should precede extended uses. In particular, Van der Meer (1999) argues that making users – and especially learners – aware of the metaphorical extensions of words, by ordering senses in the dictionary from literal to figurative, facilitates vocabulary learning and especially understanding of subtle shades of meaning. Apart from making metaphorical extension implicit in the entry structure, dictionaries may explicitly mark it with a label (“figurative”). However, this is not recommended because labels are considered to be a “blunt instrument”, as they mean more to the lexicographer than the user (Atkins & Rundell 2008: 496, 498); instead, it is better to show the relation of senses in the wording of definitions. Against this background, we will attempt to reflect the metaphoric/metonymic relation between senses in both the structure and the definitions of the proposed entry.

To this end, it is also useful to take account of the Principled Polysemy approach which seeks to “develop clear decision principles that make semantic network analyses objective and verifiable” (Evans & Green 2006: 342). In brief, according to this approach, the semantic network of a polysemous word must be organized around the synchronically prototypical sense, from which other senses are naturally derived with varying degrees of relatedness; distinct senses must contain additional meaning, and manifest specific collocational patterns and/or grammatical structures (Evans 2005: 38-44). In this light, in the present study the core motion meaning of the verb *stagger* is used as a basis on

1 Two instances of metonymy-based metaphors, which are mentioned in the case study below, are ACTION IS MOTION and EMOTION AS MOTION. With regard to the ACTION IS MOTION metaphor, Kövecses and Radden (1998: 61) explain that since “MOTION may be seen as a subcategory of ACTION”, this metaphor may be understood “as ultimately deriving from the conceptual metonymy MEMBER OF A CATEGORY FOR THE CATEGORY”, i.e. a part-whole relationship. Similarly, Niemeier (2003: 195, 209) argues that metaphors related to emotions are dependent on a conceptually prior metonymic relationship; for example, the EMOTION AS MOTION metaphor is experientially grounded on the metonymy PHYSIOLOGICAL/ BEHAVIORAL EFFECT FOR EMOTION.

which cognitive processes (metaphor, metonymy) are applied to justify semantic extension. Evans's (2005) meaning criterion is defined here in frame-semantic terms as involving additional or different FEs, while lexicogrammatical patterns are identified by means of CPA.

3 Case Study: *To Stagger*

The aim of this section is to implement the corpus-based and cognitively-oriented framework described above in the analysis of the verb *stagger*.

3.1 Corpus Data

The data for the study is drawn from two corpora, i.e. the BNC and the ukWaC, accessed through the Sketch Engine interface. The combined use of these corpora provides a more representative basis for the analysis, as they differ in size (759 vs. 3,565 *stagger* occurrences, respectively) and coverage of text types. As Ferraresi et al. (2008: 7) point out, the BNC has a higher proportion of narrative fiction texts and spoken texts, and is characterized by a stronger historical perspective, whereas the ukWaC contains comparatively more texts dealing with the Web, education and public sphere issues, and is characterized by a stronger concern with the present time.

The Word Sketches derived for *stagger* from the two corpora help us make some preliminary remarks about its usage patterns. Both Word Sketches indicate that most of the times the verb is followed by a prepositional phrase (e.g. *to, into, from* + NP), a particle (e.g. *off, along, out, home*), or an adverb (e.g. *backwards, drunkenly*) – contextual cues that point to the basic motion sense of the verb. However, the ukWaC Word Sketch shows more evidently that *stagger* also occurs in non-motion contexts; for example, collocates in object position include *joint, start, hour, time*, and patterns such as *staggered by the amount of, staggered to find/learn/see* are explicitly recorded. Word Sketches are hence used as a springboard for a thorough analysis of concordances; they make it easier to identify separate senses when scanning corpus examples.

In short, the process followed in the study includes first examining the Word Sketches derived for *stagger* from the two corpora and then analyzing all occurrences of the verb in a large random sample (i.e. 60% of the *stagger* uses in each corpus). Uses are clustered together and LUs are established in the way illustrated in the following section.

3.2 Word Sense Disambiguation

To interpret the corpus data, we apply the integrated approach to word sense disambiguation outlined in Section 2. The first step in the process of establishing LUs involves identifying the frame evoked by *stagger* in each corpus sentence and annotating its predicate-argument structure in terms of FEs, phrase structure and grammatical structure, following FrameNet's practice. Separate senses generally correspond to different semantic frames and assign different frame elements (FEs) (Atkins 2008: 256-257; Atkins, Rundell & Sato 2003: 335-337).

Table 1 demonstrates how sample corpus sentences are clustered under semantic frames. In an attempt to exhaustively analyse the polysemy of the verb under study, we develop a frame-semantic analysis of LUs currently missing from FrameNet. Whereas FrameNet records *stagger* under two frames (i.e. [Self_motion] and [Stimulate_emotion]), we identify four relevant frames. The FE annotation may generally demonstrate the straightforward applicability of the existing FrameNet descriptions; yet, metaphorical uses under 1b seem to pose a subtle problem for frame assignment. In light of the Principled Polysemy approach, we have decided to distinguish these uses from the literal ones in 1a, and

mark them as evoking the [Self_motion]_{figurative} sub-frame, because they exhibit distinct co-occurrence patterns that affect aspects of meaning (see Section 3.3).²

To lend further support to the frame-based sense distinctions, we consider how they are motivated by the cognitive mechanisms of metaphor and metonymy. In this respect, Table 2 points out the non-arbitrary relationship between the semantic extensions of *stagger* and proposes a rational arrangement of the LUs. More precisely, the core [Self_motion] LU is related, on the one hand, to the [Self_motion]_{figurative} frame-evoking LU by means of the EVENT STRUCTURE metaphor (MANNER OF ACTION IS MANNER OF MOTION), and, on the other hand, to the [Cause_motion] frame-evoking LU by means of the ACTIVITY FOR CAUSED EVENT metonymy. Similarly, different conceptual metonymies and metaphors account for the [Stimulate_emotion] and [Arranging] frame-evoking LUs, which extend from the [Cause_motion] one. As the fourth column of Table 2 shows, LUs can be organized into a tiered structure with two main clusters of related senses.

At this point, we should also note that the [Cause_motion] LU poses the following dilemma: to record it in the dictionary entry because it motivates other senses or not to record it because it is relatively infrequent? The decision relies on the purpose of the dictionary and the principle (coherence vs. frequency) adopted. The issue is further discussed in Sections 4 and 5.

Table 1: Assigning semantic frames to corpus examples.

1. Frame: [Self_motion]³

a

- (1) Chopra^{SELF_MOVER} **staggered**, and slumped on to the floor.
- (2) There were a lot of young drunks staggering about^{AREA}.
- (3) Now, as he watched him^{SELF_MOVER} limping and **staggering up the slope**^{PATH}, it occurred to hint that he might actually be wounded in some way.
- (4) She^{SELF_MOVER} **staggered home**^{GOAL} and called help.
- (5) The porter^{SELF_MOVER} **staggered drunkenly**^{MANNER} to his feet^{GOAL}.
- (6) She had not finished exhorting Dr Neil about this when McAllister^{SELF_MOVER}, who could hear every word in the kitchen, returned with the tea-tray, **staggering under its weight**^{EXTERNAL_CAUSE}.
- (7) He^{SELF_MOVER} could have been shot at close range to the device and **staggered 20 yards**^{DISTANCE} away^{SOURCE} before collapsing.

b

- (8) Both of them^{SELF_MOVER} recovered, and **staggered on**^{DIRECTION} through the year^{PATH}.
- (9) When Gilda heard what happened, she said, ‘A man who^{SELF_MOVER}’s just **staggered out of a nasty relationship**^{SOURCE} wants a bloody nursemaid at first, and then he wants to play the field for a bit’.
- (10) And, as his administration^{SELF_MOVER} **staggered through its winter of discontent**^{PATH} in the first two months of 1979, Callaghan’s famed skills as a crisis-manager seemed to desert him.

2 For further evidence on the [Self_motion]_{figurative} sub-frame, see Dalpanagioti (2013: 19-20). Metaphorical uses are not treated systematically in FrameNet, since “such work is worthy of an entire research project in itself” (Ruppenhofer et al. 2016: 101). Similarly, with regard to the metaphorical LU of *stagger* evoking the [Stimulate_emotion] frame, no annotated sentences are currently available in FrameNet and there is no indication of the relation between the source and target frames.

3 Frame definition: “The SELF_MOVER, a living being, moves under its own direction along a PATH. Alternatively or in addition to PATH, an AREA, DIRECTION, SOURCE, OR GOAL for the movement may be mentioned” (FrameNet).

- (11) A lot of marriages^{SELF_MOVER} **staggered** along^{PATH} with less.
- (12) Rarely has so important a constitutional bill^{SELF_MOVER} **staggered** towards enactment^{DIRECTION} so inelegantly.
- (13) The company^{SELF_MOVER} was a victim of the mania for leveraged buyouts of the late 1980s and has been **staggering** under its burden of debt^{EXTERNAL_CAUSE}.
- (14) Agriculture and the transport system^{SELF_MOVER} were likewise soon **staggering** under the strains^{EXTERNAL_CAUSE} imposed by war.
- (15) Now the Boston Museum of Fine Arts^{SELF_MOVER}, struggling to service debt on its 1980s expansions, is **staggering** under the weight of a nearly \$5 million deficit^{EXTERNAL_CAUSE}.
- (16) The economy^{SELF_MOVER} continued to **stagger** from crisis^{SOURCE} to crisis^{GOAL}.

2. Frame: [Cause_motion]⁴

- (17) The collision^{AGENT} **staggered** her^{THEME} and she fell.
- (18) He^{AGENT} slapped Bicker on the back, **staggering** him^{THEME}, then turned to Riven.
- (19) The vicious slap^{AGENT} on Polly's soft cheek had for a moment **staggered** the little girl^{THEME}, but Polly was the stuff that heroines are made of.
- (20) So unprepared was Ryan that the blow^{AGENT} **staggered** him^{THEME} sideways^{DIRECTION}, his head smashing into the corridor.
- (21) Christy^{AGENT} reacted instinctually, firing her other fist into Laura's face and **staggering** her^{THEME} backwards^{DIRECTION}.

3. Frame: [Stimulate_emotion]⁵

- (22) The sense of effort^{STIMULUS} in his conversation **staggered** her^{EXPERIENCER}, and she watched him with pity, for he laboured as though he were to try to write a sonnet.
- (23) The howl of dissent^{STIMULUS} that came from the entire room **staggered** me^{EXPERIENCER}.
- (24) This^{STIMULUS} **staggered** Mrs Funnell^{EXPERIENCER} into silence^{RESULT}, and her feelings were registered on her grim face as she watched this husband and wife whom she had never liked.
- (25) Rory^{EXPERIENCER} **was staggered** by his answer^{STIMULUS}.
- (26) All-who met him^{EXPERIENCER} **were staggered** by his easy command of innumerable languages, by his polished manners, by his superb musicianship and by his mastery of courtly pursuits^{STIMULUS} like hunting and playing chess – not to mention his astonishing good looks.

4 Frame definition: "An AGENT causes a THEME to move from a SOURCE, along a PATH, to a GOAL. Different members of the frame emphasize the trajectory to different degrees, and a given instance of the frame will usually leave some of SOURCE, PATH and/OR GOAL implicit" (FrameNet).

5 Frame definition: "Some phenomenon (the STIMULUS) provokes a particular emotion in an EXPERIENCER" (FrameNet).

4. Frame: [Arranging]⁶**a**

- (27) The two side groups^{.THEME} are no longer eclipsed but become slightly **staggered**.
- (28) The framework is then clad with two layers of 12mm plasterboard, the second layer^{.THEME} being **staggered** so that the joints do not coincide.
- (29) Many of the tables^{.THEME} were screened from one another, and **staggered** over different levels^{.CONFIGURATION}.

b

- (30) This led to the evacuation of 250.000 people^{.THEME} which, although **staggered** over several days^{.CONFIGURATION}, led to great pressure on transport arteries.
- (31) We will be able to do this because, for the first time in a World Cup, it seems there will be three different kick-off times each day with all three daily matches^{.THEME} being **staggered**.
- (32) I just wish they^{.AGENT}'d **stagger** lecture finishing times^{.THEME} because the corridors just get so totally packed.
- (33) During the season, the NEDC group^{.AGENT} sees further benefits in amending the traditional school summer holiday, **staggering** the starting dates^{.THEME} to avoid the sudden rush of tourist traffic.

Table 2: Building a motivated semantic network.

Corpus-attested examples	Frame	Motivation	Structure
<i>There were a lot of young drunks staggering about.</i>	[Self_motion]	core meaning: to walk unsteadily	1a
<i>The economy continued to stagger from crisis to crisis.</i>	[Self_motion] _{figurative}	EVENT STRUCTURE metaphor (MANNER OF ACTION IS MANNER OF MOTION)	1b
<i>The blow staggered him sideways, his head smashing into the corridor.</i>	[Cause_motion]	ACTIVITY FOR CAUSED EVENT metonymy	2a
<i>The howl of dissent that came from the entire room staggered me.</i>	[Stimulate_emotion]	BEHAVIORAL EFFECT FOR EMOTION metonymy, EMOTION AS MOTION metaphor	2b
<i>The tables were staggered over different levels. I wish they'd stagger lecture finishing times because the corridors just get so totally packed.</i>	[Arranging]	MANNER OF MOTION ALONG THE PATH FOR CONFIGURATION OF THE PATH metonymy (fictive motion), TIME IS SPACE metaphor	2c

⁶ Frame definition: "An AGENT puts a complex THEME into a particular CONFIGURATION, which can be a proper order, a correct or suitable sequence, or a spatial position" (FrameNet).

3.3 Usage Patterns

The results of applying CPA to the verb under study are summarized in Table 3. It presents the typical co-occurrence patterns identified in the two corpora examined, and makes it clear that each LU exhibits distinct patterns. Following CPA, we specify the semantic type of the verb's arguments and demonstrate that different semantic types in the same syntactic slot can give rise to different senses. At the same time, each pattern is connected with a FrameNet frame, and semantic types of argument fillers are associated with FEs.

The combination of CPA and FrameNet features constitutes a powerful tool for representing the combinatorial behavior of the LUs and thus accurately discriminating between senses. This becomes obvious if we compare Table 3 to PDEV *stagger* entry (comprised of four patterns) and FrameNet's *stagger* LUs (two patterns); Table 3 seems to complement both resources by providing a more detailed and coherent picture of the senses and usage patterns of *stagger*. At this point, we should also note that, although PDEV attempts to link its verb patterns to FrameNet frames, only one link actually works in its *stagger* entry, directing to the [Self_motion] frame; the rest of the patterns are not connected to FrameNet.

Table 3: Combining CPA and FrameNet.

LU	Frame	Corpus Patterns
1a	[Self_motion]	<p>SELF_MOVER collocate type: human (less prototypically: four-legged animal, such as a horse, a deer, a dog)</p> <p>colligation: <i>stagger</i> + PP or AVP of DIRECTION, PATH, SOURCE, GOAL, AREA, EXTERNAL_CAUSE</p> <p>collocation: <i>stagger</i> + NP of DISTANCE</p> <p>collocation: <i>stagger to one's feet</i></p> <p>semantic prosody: it implies that the lack of balance is due to being drunk, ill or under a great weight</p>
1b	[Self_motion] _{figurative}	<p>SELF_MOVER collocate type: 1. human (acting, not moving), 2. business enterprise, institution (e.g. <i>company, colony, sports team, marriage, bill, economy</i>)</p> <p>colligation: <i>stagger</i> + figurative PP or AVP of DIRECTION, PATH, SOURCE, GOAL, AREA, EXTERNAL_CAUSE</p> <ul style="list-style-type: none"> - <i>stagger on</i> - <i>stagger through</i> + time period (TIME IS STATIONARY AND WE MOVE THROUGH IT) - <i>stagger from... to...</i> + unpleasant situation - <i>stagger under</i> + <i>weight/ burden/ load/ strains/ debt</i> (the [+ heavy] NP used literally in LU1a is used here metaphorically to indicate obstacles to actions) <p>semantic prosody: it implies continuation in difficult circumstances</p>
2a	[Cause_motion]	<p>AGENT collocate types: 1. human, 2. event (e.g. <i>collision, blow, slap</i>)</p> <p>THEME collocate type: human</p>
2b	[Stimulate_emotion]	<p>STIMULUS collocate type: event</p> <p>EXPERIENCER collocate type: human</p> <p>semantic prosody: it implies an unexpected or unusual happening</p>
2c	[Arranging]	<p>AGENT collocate type: human</p> <p>THEME collocate type: 1. artifact, 2. activity/ event</p> <p>CONFIGURATION colligation: PP- <i>over</i> (denoting space or time respectively)</p>

3.3 Definitions

The wording of the proposed definitions for the *stagger* LUs is presented in Table 4. In devising definitions, we have a twofold aim. On the one hand, we try to reveal the interrelationship between the senses (outlined in Table 2); consider, in this respect, the repetition of “unsteadily” in 1a and 2a, the repetition of “cause” in 2a, 2b and 2c, as well as the lumping of “spatial” and “temporal” arrangement in 2c. On the other hand, we try to reflect implications revealed in the wider context of corpus examples, such as the semantic prosody in 1a and 1b (outlined in Table 3). At the same time, we need to use a defining vocabulary that intermediate-level language learners can understand.

Table 4: Devising definitions.

LU	Definition
1a	walk or move unsteadily as if you are going to fall over (e.g. because of being drunk, ill, or under a weight)
1b	continue or carry on with great difficulty
2a	cause someone to lose their balance and walk unsteadily
2b	cause someone to feel surprised/ shocked
2c	cause things or events to be at different levels in space or time

4 The *Stagger* Entry in MLDs

The aim of this section is to briefly examine how the *stagger* senses and uses are treated in the “Big Five” MLDs (i.e. online editions of OALD, LDOCE, COBUILD, CALD, MEDAL). In particular, we are interested in the treatment of the features analyzed above, i.e. sense distinctions, usage patterns and definitions. Table 5 indicates whether the LUs identified above have been entered in the dictionary entries, under which sense they have been recorded and what usage patterns are used to illustrate them.

As the numbers in Table 5 indicate, all five *stagger* entries use a “flat” structure to present the meanings of the polysemous verb, as opposed to the “tiered” structure used in the analysis above. All entries generally cover the senses distinguished above, with the exception of the [Cause_motion] LU, which is not recorded in any of the entries, most probably due to its relatively low frequency. They all record the core [Self_motion] LU first, and most of them choose to record the [Stimulate_emotion] LU second due to its high frequency. What is interesting to note is that there is considerable variation in the treatment of the [Self_motion]_{figurative} LU; entries seem to disagree as to whether it should be presented as a distinct sense (LDOCE, COBUILD, MEDAL) or as an example under the literal [Self_motion] sense (OALD, CALD), and even those which choose the first option disagree as to the position of this sense (2nd in COBUILD vs. 3rd in LDOCE and MEDAL). Lastly, Table 5 indicates that most entries have two sense divisions corresponding to the [Arranging] LU; they either separate the two theme semantic types of the [Arranging] LU, i.e. artifacts and events (MEDAL), or assign the status of a distinct sense to the special event of the start of a race (LDOCE, CALD).

With regard to usage patterns, we do not expect to find great differences in coverage, since all dictionaries are corpus-informed. However, some variation may be observed with regard to the grammatical structure of the [Self_motion] LU; while all entries record the “+ adverb or preposition” structure, only OALD records the transitive use, only COBUILD indicates the non-complement option, and LDOCE and CALD differ as to the “always” vs. “usually” specification of the “+ adverb or

preposition” structure.⁷ Similarly, the entries seem to complement each other with regard to the lexicogrammatical patterns of the [Self_motion]_{figurative} and [Stimulate_emotion] LUs. In contrast, they all record almost the same collocations for the [Arranging] LU; in this respect, it is worth noting that MEDAL’s treatment is very close to PDEV’s recording of both artifact and event collocate types, while LDOCE’s and CALD’s decision to particularly highlight the use of *stagger* in the context of a race is not verified by PDEV or our corpus analysis. Lastly, we should mention that the usage patterns entered in Table 5 have been retrieved from various parts of the entries, i.e. examples, definitions, highlighted figures.

Definitions have not been included in Table 5 due to space limitations; yet, we have examined whether the wording of the definitions in the five entries reflects (a) the interrelationship between the senses, and (b) implications/ associations revealed by corpora. Our conclusion is that whereas subtle aspects of meaning can be detected in some definitions (e.g. “If you stagger, you walk very unsteadily, for example because you are ill or drunk.” in COBUILD, “to continue doing something when you seem to be going to fail and you do not know what will happen” in LDOCE, “to cause someone to feel shocked or surprised because of something unexpected or very unusual happening” in CALD), no serious attempt is made to indicate the conceptual link between the senses of the polysemous headword. There are only two cases in which some traces of cognitive reasoning can be found, i.e. OALD’s and CALD’s use of the label “figurative” to specify [Self_motion]_{figurative} examples which are entered under the literal [Self_motion] sense, and MEDAL’s similar wording in the following definitions: “to arrange for events or activities to start at different times” and “to arrange objects so that they are not at the same height or are not in a straight line”.

Table 5: Senses and uses in the *stagger* entry of the “Big Five” MLDs.

LUs	OALD	LDOCE	COBUILD	CALD	MEDAL
1a [Self_motion]	1 • something • + adv./prep. • <i>stagger to your feet</i>	1 always + adv./prep.	1 • verb • verb + adv./prep.	1 usually + adv./prep.	1 intransitive • <i>stagger backwards/ towards/ into/ out of</i> • <i>stagger to your feet</i>
1b [Self_motion] _{figurative}	example under 1 <i>under the weight</i>	3 • <i>stagger on</i> • <i>from something to something</i>	2 <i>someone or something staggers on</i>	example under 1 <i>under a debt</i>	3 intransitive • <i>stagger on</i> • <i>stagger under debts</i>

7 As Levin & Rappaport Hovav (1995: 197) note, through the addition of complements (particle, prepositional phrase, noun phrase) marking goals, English verbs of manner of motion are mapped onto the class of verbs of directed motion “in a completely productive way, and, therefore, the availability of the multiple meanings does not have to be listed in the lexical entry of any individual verb”. Therefore, we do not assign separate LUs to the atelic and the telic readings; however, this productive pattern should be clearly and systematically indicated in all relevant entries of a dictionary.

LUs	OALD	LDOCE	COBUILD	CALD	MEDAL
2a [Cause_motion]	-	-	-	-	-
2b [Stimulate_emotion]	2 • <i>stagger somebody</i> • <i>it staggers somebody that</i>	2	3 <i>something staggers you</i>	2	2 transitive <i>be staggered by</i>
2c [Arranging]	3 (time) <i>stagger something (events)</i>	4, 5 • <i>working hours, holidays</i> • <i>race</i>	4 (time) <i>holidays, hours of work</i>	3, 4 • <i>hours of work, holidays, events</i> • <i>start of a race</i>	4, 5 definition: • <i>events, activities</i> • <i>objects</i> example: <i>staggered working hours</i>

5 A New Version of the *Stagger* Entry

This section presents a new entry for the verb *stagger* compiled on the basis of the corpus-informed and cognitively-oriented analysis described in Section 3, while taking account of the comparative review of MLDs in Section 4.

The new entry, which is shown in Figure 1, has the following basic design characteristics:

- a signpost indicating the core semantic feature running through all uses (i.e. UNSTEADY, IRREGULAR MANNER)
- a tiered structure with two clusters of senses ordered in a logical manner (based on Table 2)
- definitions reflecting both the interrelationship between senses and the implications revealed by corpora (based on Table 4)
- corpus-attested examples (based on Table 1)
- tables indicating frequent usage patterns, the semantic types of core FEs, and/or their typical lexical realizations (based on Table 3).

The proposed entry looks quite different from the ones reviewed in Section 4; the differences are not so much due to its corpus-informed basis, but rather due to its cognitive orientation. For example, contrary to the other entries, which follow the frequency principle, we have decided to record the [Cause_motion] LU, though relatively infrequent, because it motivates other senses. We apply the coherence principle to the whole entry by displaying the interrelationship between senses in their arrangement and definitions. Similarly, the signposts preceding sense divisions are edintend to help users realize how the senses of the verb are linked together. Lastly, indicating the semantic types of core FEs and recording usage patterns in distinct tables are features which can facilitate findability and usability.

stagger verb UNSTEADY, IRREGULAR MANNER								
MOVE/ ACT								
<p>1a] walk or move unsteadily as if you are going to fall over (e.g. because of being drunk, ill, or under a weight)</p> <p><i>She staggered, and slumped on to the floor.</i> <i>He staggered 20 yards away before collapsing.</i> <i>There were a lot of young drunks staggering about.</i></p> <table border="1"> <tr> <td>human/ animal</td> <td><i>stagger</i></td> <td><i>about/ back/ backwards/ away/ into home to one's feet from side to side under the weight of</i></td> </tr> </table>			human/ animal	<i>stagger</i>	<i>about/ back/ backwards/ away/ into home to one's feet from side to side under the weight of</i>			
human/ animal	<i>stagger</i>	<i>about/ back/ backwards/ away/ into home to one's feet from side to side under the weight of</i>						
<p>1b] continue or carry on with great difficulty</p> <p><i>Both of them recovered, and staggered on through the year.</i> <i>The economy continued to stagger from crisis to crisis.</i></p> <table border="1"> <tr> <td>human business institution</td> <td><i>stagger</i></td> <td><i>on through + time period from... to... + unpleasant situation under + weight/ burden/ load/ strain/ debt</i></td> </tr> </table>			human business institution	<i>stagger</i>	<i>on through + time period from... to... + unpleasant situation under + weight/ burden/ load/ strain/ debt</i>			
human business institution	<i>stagger</i>	<i>on through + time period from... to... + unpleasant situation under + weight/ burden/ load/ strain/ debt</i>						
CAUSE MOTION/ EMOTION/ ARRANGEMENT								
<p>2] cause someone to lose their balance and walk unsteadily <infrequent></p> <p><i>The blow staggered him sideways, his head smashing into the corridor.</i></p>								
<p>3] cause someone to feel surprised/ shocked</p> <p><i>The howl of dissent that came from the entire room staggered me.</i> <i>Rory was staggered by his answer.</i></p> <table border="1"> <tr> <td>event</td> <td><i>stagger</i></td> <td>human</td> </tr> <tr> <td>human</td> <td><i>be staggered</i></td> <td><i>by + event to find/ learn/ see</i></td> </tr> </table>			event	<i>stagger</i>	human	human	<i>be staggered</i>	<i>by + event to find/ learn/ see</i>
event	<i>stagger</i>	human						
human	<i>be staggered</i>	<i>by + event to find/ learn/ see</i>						
<p>4] cause things or events to be at different levels in space or time</p> <p><i>The tables were staggered over different levels.</i> <i>The evacuation of 250,000 people was staggered over several days.</i> <i>I wish they'd stagger lecture finishing times because the corridors get packed.</i></p> <table border="1"> <tr> <td>human</td> <td><i>stagger</i></td> <td>event (<i>the start/ starting dates/ closing times/ working hours/ holidays</i>)</td> </tr> <tr> <td>event</td> <td><i>be staggered</i></td> <td><i>over + time period</i></td> </tr> </table>			human	<i>stagger</i>	event (<i>the start/ starting dates/ closing times/ working hours/ holidays</i>)	event	<i>be staggered</i>	<i>over + time period</i>
human	<i>stagger</i>	event (<i>the start/ starting dates/ closing times/ working hours/ holidays</i>)						
event	<i>be staggered</i>	<i>over + time period</i>						

Figure 1: The proposed dictionary entry for *stagger*.

6 Conclusion

This study illustrates how cognitive linguistic theories can be systematically applied to corpus data in building up a dictionary entry for an English manner-of-motion verb.⁸ In particular, we have demonstrated how an integrated methodology that draws on CPA, Frame Semantics, the Conceptual Metaphor and Metonymy Theory and the Principled Polysemy approach can facilitate the lexicographic tasks of establishing LUs, capturing usage patterns and providing definitions. The parts of the pre-lexicographic analysis have been used in compiling a new dictionary entry, which, if compared to the corresponding entry in MLDs, can be characterized as more reasonable and streamlined.

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8 In fact, the data presented here is part of a large corpus-informed and cognitively-oriented pre-lexicographic database compiled for English and Greek polysemous manner-of-motion verbs (Dalpanagioti 2012; 2013).

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