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# Bilingual Dictionaries and Theories of Word Meaning

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## Abstract

When theory is applied to dictionaries, it is first of all monolingual dictionaries that are addressed. However, there is no reason to consider bilingual dictionaries as somehow less theory-prone than their monolingual counterparts. The domain of linguistics that is most relevant for lexicography is word meaning. Therefore, I present four theoretical perspectives of word meaning and discuss how they can be applied to bilingual dictionaries. Word meaning has been conceived of as the set of objects the word can refer to, the lexical relations the word has with other words, the way the word has been used, or the semantic information stored with the word in a speaker's brain. As I show, the reference-based view of meaning and the one based on lexical relations would require radically different types of bilingual dictionaries than the ones we currently have. The perspective based on the use of a word gives rise to corpus linguistics and frame semantics. It is particularly useful when it comes to compiling a bilingual dictionary. The concept-based, mental view of meaning offers a good basis for the evaluation and interpretation of dictionaries. These two perspectives can be seen as supplementing each other and need not be in competition.

**Keywords:** reference, lexical fields, corpora, frame semantics, Conceptual Structure, prototypes, dictionary compilation, dictionary evaluation, dictionary interpretation

## 1 Introduction

Lexicography is a very practically oriented field. Dictionary production is a practical and economic undertaking and dictionary use is a practically oriented activity. Still, there is a strong tendency to justify lexicographic work, both in the sense of activity and of the product of this activity, by appealing to theories of language. This connection between linguistic theory and lexicography is not a straightforward one. First, there is no agreement about theory among linguists. Moreover, linguistic theories are generally not focussed on dictionaries and not all of them can be readily extended to include dictionaries in their scope.

In matters of theory, there is a strong distinction between monolingual and bilingual dictionaries. Monolingual dictionaries have a much higher standing. No bilingual dictionary could claim to be a "dictionary of record", as Simpson (2000: 1) does for the OED in his preface to the third edition. Bilingual dictionaries are rather considered as tools. Significantly, Bogaards (2003: 27) notes that second language teachers prefer their pupils to use monolingual dictionaries, but second language learners prefer using bilingual dictionaries. One reason for the perceived theoretical superiority of monolingual dictionaries is that it is easier to apply linguistic theories to them than to bilingual dictionaries.

Here, I will focus on bilingual dictionaries and their relation to theories of meaning. In section 2, I will outline some theoretical assumptions that characterize (classes of) theories of word meaning. Section 3 presents some general considerations about bilingual dictionaries. Section 4 then turns to

the application of the different theoretical perspectives to bilingual dictionaries. Finally, section 5 discusses the consequences of choosing a particular theoretical outlook for the compilation of a bilingual dictionary.

## 2 Theories of Word Meaning

There are many different theories of word meaning, far too many to discuss each of them in this context. Instead of arbitrarily choosing one or a few, I will present four general conceptions of what word meaning is and how it should be studied. The first is based on reference, the second on relations between words, the third on use and the fourth on cognition. I will not take them as fully specified theories, but rather as general conceptions that can and have been elaborated in different ways.

### 2.1 Meaning and reference

An idea that is widespread among philosophers is that the meaning of words is a link between a linguistic form and an entity in the real world. This approach to meaning is described very well by Mackenzie (1997) and Chierchia & McConnell-Ginet (2000). As is obvious from such presentations of the approach, word meaning is not itself the central issue in these theories of meaning. It is subordinated to the concept of *truth*. Truth is a property that can only be assigned to propositions, not to entities. The meaning of words is only relevant in this perspective to the extent that it contributes to the meaning of sentences.

For word meaning, the general idea is that a word such as *donkey* refers to an animal, so that the meaning of *donkey* is the set of animals it can refer to. Although this idea is intuitively appealing, it raises a number of problems. If *donkey* has as its meaning the set of donkeys, what is the meaning of *centaur*? There are no objects in the real world that *centaur* refers to. However, it is not appealing to assume that the meaning of *centaur* is the empty set, because then it would be synonymous with *sphinx* or *dragon*. Various solutions have been proposed for this problem, all of which have in common that they aim to solve it from the perspective of calculating truth conditions for propositions.

Of course there are many words whose meanings cannot easily be modelled in terms of the entities they refer to. Words do not only refer to things, but also to properties, actions, times, etc. For a word such as *blue*, it is crucial that it does not refer to blue things, but only to the colour of blue things. Similarly, *journey* and *hour* cannot be pointed at directly without using symbols. For some of these words, one might think of using definitions in terms of necessary and sufficient conditions, a solution that is adopted in certain approaches to terminology (e.g. Wüster 1991).

For function words, it is not possible to find a referent in the real world, but because they have a reduced lexical meaning, the truth-conditional approach is certainly not at a disadvantage. The meaning of words such as *the* and *because* can be described quite well as their contribution to the truth conditions of the proposition expressed by the sentence they appear in.

### 2.2 Meaning and lexical relations

An idea that emerged from the structuralist approach inspired by Saussure (1916) is that a language is a system of signs which is characterized by the relations between the signs. The sign, consisting of a *signifiant* ('signifier', i.e. form) and *signifié* ('signified', i.e. meaning), is primarily marked by its difference from other signs (1916: 159). In the analysis of the *signifiant*, this was elaborated by Nikolai S. Trubetzkoy (1890-1938), who proposed the concept of *phoneme* and the analysis of phonemes into distinctive features. Jost Trier (1894-1970) aimed to achieve the same for the *signifié* in his *Wortfeldtheorie* ('theory of lexical fields').

An example of a lexical field that has been studied a lot in the framework of Trier's theory is colour names. The idea is to have a map of colours, with the names of colours projected on to different areas. An example is Webster's (1961) representation under *color*. Trier used such charts especially as a basis for comparing two systems reflecting different historical stages. An example is the borrowing of *violet* ('purple') by German from French in the 18<sup>th</sup> century, which influenced the colour areas referred to by other words. One problem with this approach is that colour names have different levels of generality. *Vermilion* and *scarlet* are types of *red*, so we cannot represent all three directly as areas in the same colour chart. We could of course represent each colour name on a separate chart, but then it is not so obvious how the relationship can be visualized. A more substantial problem with lexical field theory is the focus on boundaries. In the context of Rosch's (1978) theory of prototypes, it was demonstrated that colour names are better described in terms of their central instances than of their borderlines.

An alternative elaboration of this approach to word meaning is the structuralist focus on semantic relations. An example is Cruse's (1986) overview of semantic relations. However, Cruse never claims that the semantic relations constitute the meaning. They only give structure within the lexicon and do not link the words to an external standard. By stating that *vermilion* and *scarlet* are hyponyms of *red*, we do not specify how to recognize the colours these words designate.

A partial solution to this problem can be found in componential analysis. This takes Trubetzkoy's analysis of the phoneme into features as a model. The problem is that meaning is much more difficult to encompass in contrastive features than sound. Whereas the phoneme /p/ is completely determined by the features [+stop], [+bilabial], [-voiced], there are few words whose meaning can be decomposed in the same way. Whereas *she* can be characterized as [+3<sup>rd</sup> person], [-plural], [+feminine], for *donkey* there will always be a non-categorized residual meaning. Lieber (2004) solves this by making a distinction between the skeleton and the body and between the formalized and non-formalized parts of the body.

## 2.3 Meaning and use

A third approach to word meaning is based on the use of the word. In principle, we can distinguish the situational context and the linguistic context. In terms of Saussure (1916), the situational context belongs to *parole*, i.e. the way the *langue* ('language system') is used by a particular speaker in a particular context, whereas the linguistic context is shaped by the syntagmatic relations. *Parole* is individual, whereas syntagmatic relations are part of the language system. The study of meaning on the basis of syntagmatic relations was developed further by J.R. Firth (1890-1960), whose famous dictum "You shall know a word by the company it keeps" is often quoted in this context.

The study of syntagmatic relations was boosted by the emergence of electronic corpora and the development of tools to extract information from them. An issue that can be debated is to what extent syntagmatic relations cover meaning. When we consider *donkey* in a corpus, BNC (2007) gives 499 occurrences. The most frequently preceding word is *a* (123), followed by *the* (118), the most frequently following word is *and* (29). While this undoubtedly gives information about the use of the word, it is not very informative as to its meaning. For other words, for instance verbs, a larger share of the meaning can be derived from their syntagmatic relations. However, also for the contrast between, for instance, the verbs *state* and *claim*, the information about typical subjects and typical objects will only give a very partial view on the actual meaning difference. Useful though the information from a concordance will be, it always requires a competent speaker to interpret it. This explains the use of corpora by lexicographers.

A more radical view of the relation between use and system is formulated by Taylor (2012). He claims that the language system as it exists in a speaker is directly based on the corpus of utterances and texts the speaker has been exposed to. It is rather difficult to reconcile this view with experimental results on vocabulary acquisition which state that children learn new words on the basis of very few occurrences. The meaning of such words is not in the potential of surrounding words, but rather in what they are intended to convey.

## 2.4 Meaning and concepts

The final view of meaning to be considered here starts from the observation that individual instances of a concept are specified for properties that do not determine the boundaries of the concept. Any particular car has a colour, automatic or manual transmission, two or four (or another number of) doors, etc. The meaning of *car* does not specify these. Therefore, the meaning of *car* is not a particular car.

Jackendoff (1983) argues that concepts of the type of *car* are categories that speakers use to classify their observations. Such categories are represented in the mind/brain of speakers, rather than in the real world of road traffic. One of the consequences of this assumption is that when two speakers know the word *car*, they will each have their own concept of *car*, not a shared one. For a shared concept, they would have to share part of their brain. The similarity of the concepts in the two speakers arises from similarities in their physical and cultural background. They live in the same physical world and have perception mechanisms that are determined by a genetic basis that is shared among the human species. Their environment, both physical and cultural, may be more or less different, which influences how well they will understand each other.

If concepts are mental categories, observation should be seen as interpretation and classification. Jackendoff (1983) distinguishes the real world and the projected world. The real world is the world around us. The projected world is the world as we perceive it. We can only speak about the projected world. The real world only plays a role as the source of the impressions we perceive. There is a concept *car*, because we classify our perceptions in such a way.

Concepts are based on prototypes. Which image serves as a prototype is determined by personal experience. In the case of *car*, we do not have to assume a particular car as the prototype. As Labov's (1973) experiment with the meaning of *cup* showed, a prototype is first of all a component of the cognitive mechanism to determine whether something is an instance (or, if relevant, a typical or marginal instance) of the concept represented by the prototype.

## 2.5 Differences and similarities between the conceptions of meaning

The different conceptions of meaning briefly presented here can be divided into system-internal approaches and approaches with an outside reference. The system-internal approaches determine meaning only in relation to other linguistic elements. Following Saussure's (1916) division into associative (or paradigmatic) and syntagmatic relations, they include the approach based on lexical relations (section 2.2) and one of the use-based approaches (section 2.3). For the approaches with an outside reference, Ogden & Richards's (1923: 11) triangle of reference provides a good basis. In the triangle, we have a symbol, a thought, and a thing. The referential approach to meaning (section 2.1) takes meaning to be based in the things. The corpus-based approach to use (section 2.3) prioritizes the symbols. The cognitive approach (section 2.4) places meaning in the mind/brain of the speaker, hence in the thoughts. Therefore, we can be reasonably confident that the classification of the types of semantic theory is complete. New theories are either in the same classes identified here, or they would have to bring up a new dimension of classification.

### 3 Bilingual Dictionaries

Before we turn to the question of how the choice of a theory of word meaning interacts with bilingual dictionaries, let us briefly consider the category of bilingual dictionaries. As mentioned in section 1, there is a certain imbalance in the attention paid to monolingual and bilingual dictionaries. A strong example of this imbalance is van Sterkenburg's (2003) handbook. In the introduction, van Sterkenburg (2003a: 3) states that "The prototypical dictionary is the alphabetical monolingual general-purpose dictionary." The only section devoted to bilingual dictionaries is Hannay's (2003) short overview in the chapter "Special types of dictionaries". One might assume such a chapter contains sections on etymological dictionaries or reverse dictionaries. In fact, the only other section is on dictionaries for specialized domains. Swanepoel's (2003: 46) taxonomy of dictionaries has the opposition between monolingual and what he labels as "multilingual" as the highest distinction, immediately below the one between dictionaries and encyclopedias, and does not specify any types of multilingual dictionaries.

The bias against bilingual dictionaries is perhaps particularly strong in van Sterkenburg's (2003) handbook, but when we consider other handbooks, e.g. Zgusta (1971), Atkins & Rundell (2008), Svensén (2009), we invariably find that monolingual dictionaries are treated before bilingual dictionaries and more pages are devoted to monolingual than to bilingual dictionaries. If you, reader, now think this is natural, this constitutes a further confirmation of the bias.

A first point to be made here is the distinction between *bilingual* and *multilingual*. The way Swanepoel (2003: 46) combines them in his taxonomy suggests that there is a distinction between monolingual and other dictionaries. If we assume *n-lingual* as the overarching term, Swanepoel groups together all dictionaries with  $n \geq 2$ . However, there is a significant difference between  $n = 2$  and  $n > 2$ . In a bilingual dictionary, the object language and the language of description can be different. In such a case, each language has its clearly allocated function. For  $n = 3$ , no such functional division is possible. The most typical kind of multilingual dictionary with  $n \geq 3$  are visual dictionaries with labels in multiple languages, e.g. V5LD (2006).

Historically, bilingual dictionaries often preceded their monolingual counterparts. With the rise in status of vernacular languages in Europe from the 16<sup>th</sup> century onwards, we first see the emergence of bilingual dictionaries. Pruvost (2002: 92-113) gives an extensive list of French dictionaries throughout the centuries. The period 1680-1700 is labelled "Les premiers dictionnaires monolingues" ('the first monolingual dictionaries'). For the older dictionaries, in most cases the titles clearly show their bilingual nature. Although Fontenelle (2015) claims that monolingual dictionaries have an older pedigree, going back to early civilizations in Ancient Egypt and Babylonia, in the history of European lexicography after the Middle Ages, bilingual dictionaries generally precede their monolingual counterparts.

A reason for this earlier appearance of bilingual dictionaries is not difficult to think of. According to its preface, Dijkhoff (1994) is the first dictionary for Papiamentu. Papiamentu is a creole language spoken on Aruba, Curaçao and Bonaire. The dictionary is bilingual with Dutch and offers two parts, going in both directions. A monolingual dictionary would be much less useful. It would not be accessible to non-speakers of Papiamentu, but Papiamentu speakers are not used to consulting a dictionary about their native language. Often such dictionaries are not fully bidirectional. Thus, Suter's (1984) dictionary of the German dialect of Basel explains the dialect words in German, but the reverse is only an index to find the dialect words, not a full dictionary.

One misunderstanding that should be resolved before we turn to the application of semantic theories to bilingual dictionaries is the idea that bilingual dictionaries are a type of dictionary. This idea emerged in the perspective of the monolingual dictionary as the standard or default type of dictionary. In fact, however, there are many different types. Fontenelle (2015) distinguishes four types on the basis of the task they are intended to support. Of these, production and reception are tasks we can also associate with monolingual dictionaries. The other two are specific to bilingual dictionaries and concern their use in translation, in which they can support the reception or the production. Fontenelle frames these tasks in terms of L1 and L2. There is no necessity to do so, however. The dictionaries offer just information. It depends on the users' problems and skills how they use this information. Many dictionaries of minority languages have a role in documentation and standardization that is normally rather identified with monolingual dictionaries.

In view of this variety among bilingual dictionaries, the label of *bilingual* should not be interpreted as designating a type, but rather a class. Bilingual dictionaries are not a type at the same level as, say, rhyming dictionaries or etymological dictionaries. Rather, the distinction between bilingual and monolingual dictionaries is of the same kind as the one between electronic dictionaries and paper dictionaries. Whereas *electronic* and *bilingual* restrict the nature of the dictionary they designate, they do not determine it as a single, homogeneous type.

#### 4 Applying Theories to Dictionaries

The first question to ask about applying theories of word meaning to dictionaries is what we can expect from such an application. A theory is a hypothesis about the model underlying (some of) our observations. The main function of a theory is to provide explanations. Here an analogy with a more prototypical science is useful.

In the 18<sup>th</sup> century, there were two competing theories for the phenomenon of fire. One, developed by Georg Ernst Stahl (1659-1734), proposed that burning was the release of phlogiston, whereas the other, developed by Antoine-Laurent de Lavoisier (1743-1794), took it that burning was a reaction with oxygen. In order to come up with an explanation, we need a question. Fire is not a question, but it can be used as a shorthand for questions such as (1).

- (1) a. What happens if something burns?
- b. Why do certain things burn and others not?

In the case of dictionaries, we not only have to take into account empirical questions such as (1), but also more practical problems. Science has generally attracted attention and funding because it claims that its theories have a practical application. For a theory of fire, we can think of issues such as (2).

- (2) a. How can a fire be extinguished reliably?
- b. How can we prevent fires?

Of course, questions such as (2) have always been answered from a practical perspective. The idea that water can be used to extinguish fire does not need a theory of fire. However, the idea that a fire in an oil well can be extinguished by using an explosion to take away the oxygen supply from the fire is not one that would have emerged without a theory.

Like fire, dictionaries do not by themselves constitute a question that can be used as a basis for explanation. By analogy to (1) and (2), however, we can take *dictionary* as a shorthand for questions such as (3).

- (3) a. How can a dictionary entry be interpreted?  
 b. How can we determine how good a dictionary entry is?  
 c. How can we compile a dictionary entry?

The questions in (3) can be labelled as interpretation, evaluation, and compilation, respectively. Whereas (3a) is an empirical question, (3c) is applied. For (3b) it is more difficult to classify it as empirical or applied, because it has elements of both. Its central concern is a standard that can be used for evaluation. All questions in (3) focus on the microstructure of a dictionary. Other questions could be asked about the macrostructure, but I will take the microstructure as my starting point here and consider each of the theories of word meaning in turn.

#### 4.1 Reference and bilingual dictionaries

If meaning is seen as reference, we have a simple interpretation of dictionary entries as in (4).

- (4) **donkey** [ˈdɒŋki] (*pl -s*) *n* burro *m -a f*.

The entry in (4) is taken from the Larousse (2000) English-Catalan pocket dictionary. It states that *donkey* in English corresponds to *burro* in Catalan. This can be interpreted as saying that English *donkey* and Catalan *burro* refer to the same objects in the world. In fact, (4) gives two translations for *donkey*, *burro* and *burra*, which are differentiated as masculine and feminine. This can still be interpreted analogously, but we will return to some complications later. The evaluation of (4) can be based on the question of whether these words actually identify the same objects.

It is interesting to explore how far we can extend this interpretation strategy. As mentioned in section 2.1, we can appeal to truth conditions to account for the meaning of words that do not refer to objects in the world, e.g. *centaur* and *dragon*. Without special provisions, *centaur* and *dragon* would be synonymous, because they refer to the same (empty) set of objects. We can also use this approach in the account of function words, e.g. *because*.

Complications arise when we consider words with different meanings. The word *property* can refer to a feature, to an item of real estate, or to a possession. In other languages, these meanings are not expressed by the same word. In an English-Dutch dictionary, we might encode the three meanings as in (5).

- (5) **property** *n* 1 eigenschap; 2 perceel; 3 bezit.

In (5), the style of presentation is roughly the same as in (4). However, the interpretation cannot be the same, because the three translations are not differentiated. A Dutch speaker will know which sense is which in (5), but it is not encoded in the entry. This contrasts with (4), where the gender distinguishes *burro* and *burra*. The problem is then to come up with a mechanism for distinguishing different meanings that correspond to different translations. Such a mechanism should ideally take as its point of departure the properties of the real world or the truth conditions that distinguish them. The Collins (1999) English-German dictionary solves this problem by giving English synonyms and domain indications, e.g. “(= *characteristic, Philos*)” for the first meaning, “(= *thing owned*)” for what in (5) is the third meaning. The van Dale (1984) English-Dutch dictionary does not give such markers. Neither approach is ideal in this perspective. The former is not systematic, the latter not explicit. This means that current lexicographic practice does not fulfil the requirements a reference-based theory of word meaning would impose.

It should be noted in this respect that the way the relation between *burro* and *burra* is recorded in (4) raises problems. The indications *m* and *f* are gender marking, but their interpretation is not unambiguous. Catalan has grammatical gender, but the referential meaning that is associated with the

contrast remains implicit. In fact, *burro* is ambiguous between a member of the species and a male specimen.

Whereas such problems highlight the lack of information, much of what is given in a bilingual dictionary entry would be seen as irrelevant. This can be illustrated with the Collins (1999) entry for the real estate sense of *property*, given in (6).

(6) **property** [...] c (= *building*) Haus *nt*, Wohnung *f*; (= *office*) Gebäude *nt*; (= *land*) Besitztum *nt*; (= *estate*) Besitz *m*; **this house is a very valuable** ~ dieses Haus ist ein sehr wertvoller Besitz; **invest your money in** ~ legen Sie Ihr Geld in Immobilien an; ~ **in London is dearer** die Preise auf dem Londoner Immobilienmarkt sind höher

In (6), the first part gives five German translations with gender and an English synonym that can be used for selecting the best match. Three examples are given. The problem of translating this sense of *property* into German is that German does not have an obvious equivalent. The five translations given at the start are all hyponyms. The most direct German semantic equivalent is *Immobilien*, but this is a *plurale tantum*, so that it cannot be used in many contexts in which *property* can be used. This is where the examples come in. They are not meant as idiomatic expressions to be recorded literally, but suggest translation strategies. The last two examples indicate some contexts of use for *Immobilien*. However, suggestive examples of this type have a very limited value in the reference-based perspective of meaning, because their interpretation is highly dependent on the user's linguistic competence.

In conclusion, the approach to word meaning based on reference does not yield a very productive theoretical basis for bilingual dictionaries. Simple entries such as (4) can be interpreted without major problems, but when we need to indicate which translation to choose from among a list, the formal perspective implied by the focus on reference requires a different approach to the one adopted in lexicographic practice. Instead of indicative labels and examples, it would require a systematic, theoretically founded list of labels with precisely determined boundary conditions.

## 4.2 Lexical relations and bilingual dictionaries

If lexical relations are taken as the basis of word meaning, the vocabulary of each language should be seen as a system of its own. Trier's *Wortfeldtheorie*, which is the most elaborated version of this approach, was developed by analogy to Saussure's approach to phonology. Criticizing the dominating trend in historical-comparative linguistics in his days, Saussure (1916: 136-137) rejects the statement that the short *a* in Latin *facio* ('make') becomes an *i* in *conficio* ('produce'). His point is that we cannot take one sound from one stage of the language and follow its history, but can only compare the entire system the sound is part of with an earlier or later stage of the entire system. This means that diachronic linguistics can only be based on the results of synchronic linguistics. Each stage of the language should be described as a system and then these systems are compared.

This point has far-reaching consequences for the compilation and evaluation of bilingual dictionaries. The two languages used in a bilingual dictionary are each a separate system, in the same way as the two stages of the same language. The individual elements of phonology can only be distinguished because they have a different position in the system. In the same way, words exist as different units of meaning only in the sense that they contrast with each other within the same system. An entry for *donkey* as in (4) would for Saussure be unacceptable in the same way as the statement that Latin *a* becomes *i* in certain contexts.

Trier's *Wortfeldtheorie* offers a solution for this problem at the theoretical level. Where we can compare sound relations in phonology, we can compare meaning relations in semantics. However,



Trier's theory was not intended as a basis for lexicography. The alphabetical bilingual dictionary is not supported by this approach to word meaning. Instead, we would have to contrast entire word fields across languages, observing where boundaries between the meanings of words in different languages coincide and where they diverge.

One way to approach this task might seem to be the visual multilingual dictionaries of the type exemplified by V5LD (2006). However, on closer inspection, this is exactly what we should *not* do in this approach. V5LD (2006) and other, similar dictionaries use an image and label individual parts in different languages. In the case of terminology, Cabré (1999) makes a strong point against such a method, because it imposes the conceptual system of one language on the others. While this is acceptable for, for instance, the rules of football, where the game should be played with the same interpretation of the rules everywhere, it obscures the contrasts between languages when we apply it to general language words.

A better example of the work supported by this approach to meaning is Steffan's (2016) contrastive analysis of verbs of seeing in English and German. She first explores the contrasts of the verbs in this word field monolingually, then considers the correspondence across languages. The result is more a theoretical analysis than a dictionary. However, a well-conceived bilingual dictionary in this approach to lexical semantics should be a collection of such analyses. This is of course quite far removed from bilingual dictionaries as we know them.

### 4.3 Frames and corpora and bilingual dictionaries

When we turn to the use-based approach to meaning, we arrive in a more familiar environment. Two central concepts that are based on the study of the use of a word are frames and corpora. They correspond to what in section 2.3 was called the syntagmatic and the *parole*-based approaches, respectively.

The idea that a dictionary entry should be based on the use of the word it treats is quite old. The *Vocabolario della Crusca*, published in 1612, contains many examples from Dante, Petrarca and Boccaccio. As described by Pruvost (2002: 30-31), this approach was pursued more systematically in Richelet's *Dictionnaire françois*, published in 1680. Samuel Johnson's dictionary in 1755 approached the limits of what a single author could achieve in this respect. For the OED, the corpus of texts taken into account was so extensive that a reading programme had to be set up. In their historical introduction, Craigie & Onions (1933: viii) explain that from the start the OED had (7) as its first principle.

(7) The first requirement of every lexicon is that it should contain every word occurring in the literature of the language it professes to illustrate.

As noted by Svensén (2009: 44-45), modern use of corpora in lexicography is qualitatively different from this older use of citations. Whereas dictionaries such as the first edition of the OED and Webster's third were based on an impressive collection of usage data, they were all collected on file cards. This means that someone excerpted the particular use of the headword from a text. In (7), there is no reference to frequency, because this way of using corpora does not give quantitative data. Conceptually, the crucial difference is not the fact that modern corpus use accesses corpora by means of a computer, but the fact that modern corpus use is based on the evaluation of all occurrences rather than a conscious selection made by readers. This is one aspect which makes (7) look dated.

Whereas the use of a corpus is obvious for a monolingual dictionary, it is less directly clear how to use it in the compilation of bilingual dictionaries. Atkins (2002) gives a nice illustration of how monolingual corpora of both languages as well as a parallel corpus with matched sentences can be

used to improve an entry for a dictionary. The use of a monolingual corpus of the source language is in many respects similar to its use in compiling a monolingual dictionary. It provides examples for and gives quantitative data about headwords and their senses. The target language monolingual corpus can only be used after a hypothesis about the translation has been made. A parallel corpus may provide help with formulating such a hypothesis, but, as Atkins (2002: 12-13) notes, its use requires more time than is usually available in a commercial dictionary enterprise. She suggests supplying the material to the user, so that advanced users (e.g. translators) can take advantage of the extra examples provided. A problem with such corpora, noted by Grundy (1996), is that the target language side of a parallel corpus may reflect the fact that it is a translation, as opposed to original language use.

Frame semantics is a framework for expressing syntagmatic relationships developed by Charles J. Fillmore. It is a formalization of the general idea put forward by J.R. Firth that in order to represent the meaning of a word one should consider the word in its direct environment. Fillmore & Atkins (1994) use frame semantics as a way of encoding the findings from a monolingual corpus as a basis for improving dictionary entries. In 1997, Fillmore started the FrameNet project at Berkeley. Since then, this framework has been used increasingly in the compilation of dictionaries (cf. Atkins 2002) and terminology (cf. van der Vliet 2006). The idea is that the occurrences of an expression in a corpus are grouped according to their environment. This grouping takes into account the role and the nature of the entities referred to, thus giving a fine-grained mapping of the various senses. Clearly, such a mapping can also be used for the source language of a bilingual dictionary.

An issue that is specific to bilingual dictionaries is whether the meaning of the source language or the translations in the target language should be used as a basis for structuring an entry. For the English verb *cut*, COED (2011) gives 13 senses. Many of these are specialized, e.g. for films or card games. In Dutch, there are two words for the basic sense of *cut*, *snijden* and *knippen*. The difference is that *snijden* is done with a knife and *knippen* with scissors. Van Dale's (1984) bilingual dictionary gives 8 senses of the intransitive verb, 15 of the transitive, as well as 3 of the 'transitive and intransitive'. (8) gives the second sense of transitive *cut*.

(8) ⟨ben. voor⟩ ***scheiden d.m.v. scherp voorwerp*** ⇒ (af / door / los / op / open / uit / ver / weg) *snijden* / *knippen* / *hakken*

Instead of a translation, the main Dutch equivalent is preceded by "ben[aming] voor" ('designation of?'). The actual translations follow the arrow, which in this dictionary generally means that they are alternatives with a more limited range of use. The words in brackets are separable parts of a phrasal verb. No sense distinction is made on the basis of the tool used for cutting. The three verbs *snijden*, *knippen* and *hakken* (which is done with an axe or hatchet) are not differentiated. Van Dale (1984) obviously took the English sense distinctions rather than the Dutch translations as a criterion for organizing the entry. The lack of distinction is not due to an excessive lumping, as the number of senses demonstrate, but may be explained by the use of an English monolingual corpus as the basis for sense distinctions.

The relationship between the corpus and frame semantics is one of mutual support. Without a concordance on a large corpus, it is hardly possible to collect enough information to come up with a representation of the different senses at such a fine-grained level. Conversely, without frame semantics (or an alternative system with the same function) it is not possible to encapsulate the findings from a corpus in a sufficiently systematic way to make them productive.

Frame semantics and corpus use were originally applied in monolingual lexicography, but there is no principled reason to exclude an application to bilingual lexicography. Let us therefore consider how they have an impact on the answer to the questions in (3). Given the practical nature of the two ideas,

it is to be expected that (3c) is the easiest question to answer. Frame semantics and corpora can be included in the compilation workflow very naturally. The evaluation perspective in (3b) is illustrated in Atkins (2002). She compares an entry for the verb *cook* and related words in an English-French dictionary to the information one can collect by analysing corpora. This results in an improved entry. There is no immediate impact on the interpretation, (3a). Although Taylor (2012) devotes a substantial part of his discussion to the lexicon, his orientation is exclusively monolingual and it is not obvious how his approach could be extended to bilingual dictionaries.

#### 4.4 Mental concepts and bilingual dictionaries

In the same way as for Taylor's theory of the mental lexicon as a corpus, conceptual theories of the mental lexicon are generally monolingually oriented. In Jackendoff's (2002) theory of Conceptual Structure, there is a clear boundary between meaning and language. As discussed in ten Hacken (2015), he does not distinguish semantic and conceptual structures. This has important implications for a bilingual perspective on meaning. As argued by ten Hacken (to appear), the process of translation involves only one conceptual representation. Any differences in the expression are located in the mapping between Conceptual Structure and the linguistic representations of Syntactic Structure and Phonological Structure.

For monolingual dictionaries, ten Hacken (2009) formulates a proposal for how they can be interpreted in a framework in which language and meaning are mental concepts. The central assumption is that the meaning of any dictionary entry is not in the entry but in the person reading and interpreting the entry. Dictionaries are tools for problem-solving, not descriptions of language. Instead of attempting a formal interpretation of what an entry means, it is more appropriate to start from a usage scenario such as the one in (9).

- (9) a. The dictionary user (*U*) has a linguistic problem (*P*)  
 b. *U* relates *P* to a particular word or expression (*W*)  
 c. *U* selects a dictionary (*D*)  
 d. *U* looks up *W* in *D*  
 e. *U* finds information (*I*) about *W* in *D*  
 f. *U* interprets *I* in order to solve *P*

The scenario in (9) does not assume that a dictionary contains the solution to the problem, but that in successful dictionary use, the user is able to solve the problem on the basis of the interpretation of the information found in the dictionary. As is obvious from the prominent position of *U* in (9), at all steps the user takes the agentive role. The first part, (9a-b), can be described as deciding what to look up. The second part, (9c-d), consists of finding the relevant entry. In the final part, (9e-f), the focus is on processing the entry.

The steps in (9) are not dependent on whether the dictionary used is monolingual or bilingual. The decision which type of dictionary to use is taken in (9c). Crucially, this decision does not depend on *P*, but on *U*, more precisely on *U*'s assessment of which (type of) dictionary contains information that *U* can use in (9f).

As an example, I will take myself as a user. I am a native speaker of Dutch with a good knowledge of English and a modest knowledge of Polish. If I want to know (some detail of) the meaning of the Polish word *pyszny*, I have to decide whether to look it up in a monolingual dictionary for native speakers, in a learners' dictionary, in a Polish-English bilingual dictionary, or in a Polish-Dutch dictionary. The dictionary titles and other information I have about these dictionaries can help me choose the best dictionary for my purpose. PWN/Oxford (2008) gives (10).

(10) **pyszny**<sup>1</sup> *adi. grad.* haughty

■ **mieć się z ~a** to be up a gum tree GB pot., to get oneself into a hole pot.

**pyszny**<sup>2</sup> *adi. grad.* [1] (*smakowity*) delicious [2] (*doskonały, świetny*) great pot.; ~y **dowcip** a great joke;

**mieliśmy ~ą zabawę** we had enormous fun

The entry in (10) is considerably more informative than entries such as (4) and (5) above. However, the information guiding the user to the right equivalent is in Polish. A user who does not know *smakowity* ('tasty') or *doskonały* ('excellent') will only have the English equivalent to guide their selection. Also "pot." for *potoczne* ('colloquial') is a Polish abbreviation. Of course, these words can be looked up in the dictionary themselves and the abbreviation is explained both in Polish and in English on the inside cover. For comparison, (11) is the entry for *pyszny* in Martens & Morciniec's (2008) Polish-Dutch dictionary.

(11) **pyszny** *adj* **1.** arrogant, hoogmoedig; **2.** (*wspaniały*) heerlijk

The entry in (11) is much more like the one in (5). In (11), the successful interpretation is more dependent on knowledge of the target language than in (10). The first sense, with *arrogant* and *hoogmoedig* ('proud, haughty') as equivalents has no guidance. The second has *wspaniały* ('wonderful, splendid') as a guide and *heerlijk* ('delightful, delicious') as an equivalent. The absence of examples tends to leave the user in doubt as to whether the interpretation of the information is correct.

In evaluating (10) and (11), the perspective taken here cannot appeal to the correspondence of the entries to an external truth. The only standard for evaluation is whether users can interpret the entries in such a way that they help them solve the problems they consulted the dictionary for. Let us suppose the user wants to interpret or translate *pyszny* in (12).

(12) **pyszny** hotelu dyrektor

PYSZNY hotel<sub>GEN</sub> director

'arrogant hotel director'

The question is now, under which conditions the user can interpret the information in (10) and (11) in a useful way. A speaker of English using (10) will have to know enough Polish to exclude the second reading, but there is a much better chance this is achieved than for a speaker of Dutch using (11). If the dictionary is used for translation from Polish by a speaker of Polish, the entry in (11) requires a very high level of competence in Dutch. (11) can be used to remind one of a word that is already part of one's competence.

An interesting issue concerns the fact that the second sense of *pyszny* in Polish has a narrower set of nouns it can modify than Dutch *heerlijk*. In the same way as *delicious*, *pyszny* can be said mainly of food. In Dutch, we find collocations such as (13).

(13) a. een heerlijke vakantie ('a delightful holiday')

b. heerlijk weer ('wonderful weather')

The Polish distinguisher in (11) can easily be misinterpreted as encompassing the use in (13). Whether this is serious depends on the user and the question for which the dictionary is consulted. A Polish user will start from the meaning of the Polish word and data such as (13) will not interfere. A Dutch user may extend the meaning of *pyszny* to include uses such as (13), but this is only problematic if two conditions are met. First, the user uses (11) not to interpret or translate *pyszny* in a particular context, but as a way of finding the full range of meanings of *pyszny*. Second, the user takes

the sense in (13) to be the same sense of *heerlijk* as when it modifies a food noun. In fact, many Dutch speakers who know some foreign languages will be aware of this difference.

## 5 Conclusion: Implications of Theory Selection

Two obvious questions to ask about the application of theories in general are what are the criteria for selecting a theory and what is the benefit that can be expected from applying a theory. In the case of theories of word meaning to be applied in the context of bilingual dictionaries, the central questions are the ones in (3), repeated here as (14).

- (14) a. How can a dictionary entry be interpreted?  
 b. How can we determine how good a dictionary entry is?  
 c. How can we compile a dictionary entry?

In sections 2 and 4, we did not consider individual theories, but rather four different theoretical perspectives or frameworks. Let us now consider each of the questions in (14) in turn and see what these frameworks have to say about them. Not all frameworks address each of the questions to the same extent.

The first question, (14a), is about the interpretation of dictionary entries. When meaning is taken as reference, giving a translation in a bilingual dictionary means that the headword and the translation have the same reference. All other information in the entry should be taken as refining such statements. As we saw in section 4.1, this type of interpretation is quite problematic, especially for entries that show a degree of complexity transcending the one for simple entries such as (4). If meaning consists of lexical relations, the interpretation of an entry should be that the words of the two languages we find in the entry have the same position in their respective lexical fields. For meaning as use, we have two central considerations. On one hand, the claim is that words put together in a simple entry are used in the same way in the reference corpora for the two languages. On the other hand, this perspective gives a more appealing interpretation of examples given in entries. They reflect how the words in the two languages are used in the corpora. Meaning as mental concepts leads to an interpretation of dictionary entries as providing problem-solving tools, i.e. information to be interpreted by dictionary users in order to be of help in solving the problems they consulted the dictionary for.

The question about evaluation, (14b), asks for the standards that are used when we determine how good an entry is. Here, reference-based theories use truth as the starting point. In a good entry, we can replace words in one language by words in another language following the instructions of the entry and preserve truth in the process. For lexical relations as a basis for meaning, a good entry should record the position of all the words in their respective lexical field, so that the expressions in the two languages can be compared in this respect. In usage-based approaches, the corpus can serve as a standard. The information given in the entry should be justified on the basis of the corpus. Finally, in a view of word meaning as mental concepts, the dictionary is a tool for solving problems, so that the success in problem solving should be at the basis of the standard used for evaluating the dictionary and its entries. The difference between the corpus and the problem-solving potential as standards can be illustrated very well in relation to the entry for *cut* in (8). Whereas this entry is impeccable as far as the (English) corpus is concerned, it does not highlight the translation issues. The criteria for choosing *snijden*, *knippen*, or *hakken* as a translation for *cut* have to be contributed entirely by the user.

The last question, (14c), addresses the compilation process. The reference-based perspective on word meaning has little to say about this. Any method that works is good. In this respect, it is similar to the conceptual view of word meaning. The usage-based view on word meaning offers the corpus as a natural and compelling source of information for dictionary compilation. Finally, if the word meaning is determined by lexical relations, a dictionary is based on the analysis of lexical fields rather than individual words. The approach does not say what the relative role of the corpus and the lexicographer's intuition is in such an analysis.

One way we can generalize about these results is that the four frameworks can be divided into two groups. When we take reference or lexical relations as the basis for our concept of word meaning, we find theories that reject bilingual dictionaries as we know them. The formal, reference-based perspective requires that a dictionary entry can be interpreted as two expressions belonging to different languages having the same referent. The approach by which meaning arises from lexical relations would require a systematic comparison of corresponding word fields rather than an alphabetical dictionary. By contrast, the approaches that assume that meaning arises from use or exists in the form of mental concepts are broadly compatible with bilingual lexicography as we know it. This means that they are more readily applicable.

When we consider the contributions of the usage-based and the concept-based theories of meaning, we can argue that they are complementary to each other. With its emphasis on the corpus, the usage-based theory is particularly strong on compilation methodologies. Concept-based theories have more to say about the interpretation. For the evaluation, usage-based theories guide us towards the correctness and concept-based theories towards the usefulness of the information. This may seem paradoxical. However, when we realize that *usage* in *usage-based* refers to how word meaning is interpreted, not to how a dictionary entry is interpreted, the statement makes sense. Because a corpus provides a standard, a theory of meaning based on use in a corpus will evaluate the dictionary against this standard. By contrast, mental concepts as the basis of meaning place the meaning in the mind of the dictionary user and make successful use of the entry the standard for a good dictionary. In the case of (8), this leads to different evaluations.

Dictionary making is not primarily a theoretical undertaking. It is a practical task with economic implications for the publisher. The theoretical considerations given here have something to contribute also to this economic perspective. Users buy dictionaries to solve problems. This makes the concept-based, mentalist theory of word meaning immediately relevant to the success of a dictionary. The interpretation and evaluation of dictionaries is supported by this theoretical perspective. For the task of compiling a dictionary, the corpus-based perspective and the idea of frames to group together the data found in corpora make significant contributions. An eclectic approach to theories, using both in different stages, seems to offer the best perspective for practical improvement based on theories.

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