Lexicon and its Essential Subtypes in English Language

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Annotation. Over recent years there has been much interest in the sphere of distributional semantics, focusing on the distributional hypothesis: words that occur in similar contexts tend to have similar meanings (Harris, 1954). There is a large body of work on the use of different similarity measures (Lee, 1999; Weeds and Weir, 2003; Curran, 2004) and many researchers have built thesauri (i.e., lists of "nearest neighbours") automatically and applied them in a variety of applications, generally with a good deal of success.

Key words: hyponyms, hypernyms, co-hyponyms.

Introduction. An initial focus of distributional semantics has been on analyzing words which are similar to each other. However, semantic similarity encompasses a variety of different lexico-semantic and topical relations. Even if it is just considered as nouns, an automatically generated thesaurus will tend to return a mix of synonyms, antonyms, hyponyms, hypernyms, co-hyponyms, meronyms and other topically related words. A central problem here is that whilst most measures of distributional similarity are symmetric, some of the important semantic relations are not. The hyponymy relation (and converse hypernymy) which forms the ISA backbone of taxonomies, and determines lexical entailment, is asymmetric. On the other hand, the co-hyponymy relation which relates two words unrelated by hyponymy but sharing a (close) hypernym, is symmetric, as are synonymy and antonymy.

Lexicon, lexis, vocabulary, dictionary: these terms are synonymous in lexicology and they all refer to total stock of words in a language. The term lexicon is known in English from the early 17th century, when it referred to a book containing a selection of a language's words and meanings, arranged in alphabetical order. The term itself comes from Greek *lexis*-word. It is still used in present day in this meaning, but it also has an abstract sense, especially within linguistics, referring to the total stock of meaningful units in a language – not only the words and idioms, but also the parts of words which express meaning, such as prefixes and suffixes.

What is Hyponymy? In linguistics and lexicography, *hyponym* is a term used to designate a particular member of a broader class. For instance, *tulip* and *daisy* are hyponyms of *flower*. Also called a *subtype* or a *subordinate term*. The adjective is *hyponymic*. The term is pronounced "HI-po-nim" (with the emphasis on the first syllable), and its etymology from the Greek, "below" plus "name." Words that are hyponyms of the same broader term (that is, a hypernym) are called *co-hyponyms*. The semantic relationship between each of the more specific words (such

as *tulip* and *daisy*) and the broader term (*flower*) is called *hyponymy* or *inclusion*. Hyponymy is not restricted to nouns. The verb *to see*, for example, has several hyponyms—*glimpse, stare, gaze, ogle*, and so on. In language: Its Structure and Use," some scholars point out that although "hyponymy is found in all languages, the concepts that have words in hyponymic relationships vary from one language to the next. The included items are the *hyponyms*. The lexeme at the top is the *superordinate* term, or *hypernym*. Hyponymy is particularly important to linguists because it is the core relationship within a dictionary. This is the example:

- Sweep, wipe and scrub are hyponyms of clean
- Clean is the hypernym of sweep, wipe and scrub
- Sweep, wipe and scrub are co-hyponyms of each other

In other words, **hyponymic relations refers to the super- and subordinate relationships** between words. Words on the super ordinate level are called **hypernyms,** and words on the subordinate level are called **hyponyms.**

The most illuminating way of defining a lexeme is to provide a hypernym along with various distinguishing features – an approach to definition whose history can be traced back to Aristotle. E.g. a *majorette* is a 'girl *(hypernym)* who twirls a baton and accompanies a marching band'. It is usually possible to trace a hierarchical path through a dictionary, following the hypernyms as they become increasingly abstract, until we arrive at such general notions that clear sense-relations between the lexemes no longer exist. At any point along this path, a lexeme can be seen to have a hyponymic relationship with everything above it, though we usually take seriously only those involving successive levels. "Hyponymy is a less familiar term to most people than either synonymy or antonymy, but it refers to a much more important sense relation. It describes what happens when we say 'An X is a kind of Y'—*A daffodil is a kind of flower*, or simply, *A daffodil is a flower*."[David Crystal, The Cambridge Encyclopedia of the English Language, 2nd ed. Cambridge University Press, 2003]. "*House* is a hyponym of the superordinate *building*, but *building* is in turn, a hyponym of the superordinate *structure*, and, in its turn, *structure* is a hyponym of the superordinate *thing*. A superordinate at a given level can itself be a hyponym at a higher level."[Patrick Griffiths, "An Introduction to English Semantics and Pragmatics." Edinburgh University Press, 2006]. "Hyponyms and hypernyms have multiple layers, as in the following examples, where *fry* is a hyponym of the hypernym *cook*, but *fry* itself is a hypernym for some other types of frying:

Hypernym: *cook*

Hyponyms: *bake, boil, grill, fry, steam, roast*

Hypernym: *fry*

Hyponyms: *stir-fry, pan-fry, sauté, deep-fry*" [Michael Israel, "Semantics: How Language Makes Sense." *How Languages Work: An Introduction to Language and Linguistics*, ed. by Carol Genetti. Cambridge University Press, 2014]

This example shows that:

Animal is the hypernym of bird and dog; bird and dog are the hyponyms of animal.

Bird and dog are co-hyponyms of each other. Bird is the hypernym of robin and parrot; robin and parrot are the hyponyms of bird. Robin and parrot are co-hyponyms of each other. Based on the examples it is summarized as follows: Hypernym refers to a general term (superordination). Hyponym refers to a more specific term (subordination).The word meaning of a hyponym is

included in its hypernym. Co-hyponym refers to the hyponyms on the same hierarchical level. Hyponyms, hypernyms, and co-hyponyms have a multiple-layers relationship.The classification is based on how many levels there are and what perspective you are looking from, so to speak. From Example 3 it can be said that: From the perspective of the word robin, robin is the hyponym of bird and bird is the hypernym of robin. However, if seen from the perspective of the word bird, bird is now the hyponym of animal and animal is the hypernym of bird. The same notion applies to co-hyponyms. Bird & dog are co-hyponyms on their level; and robin & parrot are co-hyponyms on their level.

Co-hyponyms

If the hypernym Z consists of hyponyms X and Y, X and Y are identified as co-hyponyms. Co-hyponyms are labelled as such when separate hyponyms share the same hypernym but are not hyponyms of one another, unless they happen to be synonymous. For example, *screwdriver*, *scissors*, *knife*, and *hammer* are all co-hyponyms of one another and hyponyms of *tool*, but not hyponyms of one another:

"A hammer is a type of knife" is false.

Co-hyponyms are often but not always related to one another by the relation of incompatibility. For example, *apple*, *peach* and *plum* are co-hyponyms of *fruit*. However, an *apple* is not a *peach*, which is also not a *plum*. Thus, they are incompatible. Nevertheless, co-hyponyms are not necessarily incompatible in all senses. A *queen* and *mother* are both hyponyms of *woman* but there is nothing preventing the *queen* from being a *mother*. This shows that compatibility may be relevant.

In some cases, autohyponyms duplicate existing, distinct hyponyms. The hypernym "smell" (to emit any smell) has a hyponym "stink" (to emit a bad smell), but is autohyponymous because "smell" can also mean "to emit a bad smell", even though there is no "to emit a smell that isn't bad" hyponym.

Conclusion. Our proposal of adding hyponymy to word net structure is a small step to enrich its knowledge structure. We believe that the semantic contrasts assumed in the theory semantic field underlines the need to capture the conceptual underpinning of meaning clustering. The addition of hyponymy as a lexical semantic relation has several important implications. Linguistically, hyponymy should predict collocation better than coordinated terms, and it poses an interesting question for the nature

of lexical semantic relations. In terms of knowledge representation, it offers the possibility of explicitly representing the logic and conceptual motivation behind each class. All these implications will be explored in our future studies.

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