Proper Names and Polysemy: from a Lexicographic Experience

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Abstract

In the framework of the SI-TAL (Integrated Systems for the Automatic Treatment of Language) project the lexical coverage of IWN has been extended by adding, besides two grammatical categories not encoded in EWN (i.e. adjectives and adverbs), a set of proper names which are taken into consideration in this paper. This decision was also due to the high degree of incidence of proper names observed in the corpus selected within SI-TAL for semantic annotation.

In this paper we would refer more widely about the relations involving the pn in particular codifying the relation between the pn and the senses (literal, derived and extended). We consider the pn as the basis for many extensions of meaning.

In fact, many types of derivates and sense extensions are generated, by means of lexical rules that operate as “generative factors”. Novel usages of a word form can be derived through productive application of a lexical rule; therefore we propose to represent these lexical rules codifying new semantic relations in the database.

We want to give prominence to the polysemy of pn to confirm the linguistic manifestation(s) of the faculty for generative categorization and compositional thought “ (Pustejovsky, 2001).

1. Introduction

IWN (ItalWordNet) has been built enlarging the Italian WordNet developed in the framework of the European project EWN (EuroWordNet) by codifying new grammatical categories (adjectives and adverbs) and a subset of proper names (pn).

We aim at focusing this subset, mainly to achieve a well reasoned and structured enlarging of the database, also through the deeper study of the semantic relations involving the pn, on the basis of the recent experience carried out in IWN.

Within IWN, the ‘synonymy’ relation applies to the variants of a synset allowing to interchange the synonyms (or variants) in at least one proposition, and this kind of relation is valid also for the set of proper names as formalized below:

\[ a = b \iff \{a.f(a)\} = \{b.f(b)\} \]

In IWN, the relation ‘belongs to class’ and its reversed ‘has_instance’ connect ‘instances’ with ‘synsets’: only ‘inherence’ propositions (individual-class) are applicable to pn and not ‘relation’ propositions (class-class); the hyponymy relation ‘is a’ is not applicable to pn.

The subset of pn consists, up to now, of more than 4000 pn, originated from a first subset of geographic pn, further increased with data coming from sources of several type: atlases, Web sites, lists of various kind. More than 200 classes of pn were defined. The database was also enriched encoding other relations involving pn. In fact, it was evidenced that many pn are the basis of many substantives and adjectives as their derivates (e.g.: Nicot-nicotine) and that, when an adjective derived from the pn does not exist, pn are used very often in appositive/attributive position, e.g.: Braille alphabet. (Marinelli and Roventini, 2002).

The pertains_to relation and its reverse has_pertained, has been used both in WN and in EWN. It allows the link of a noun with a relational adjective.

In IWN this relation applies either between synsets or between synsets and instances: it connects 2nd order entities with 1st order entities, or 2nd order entities and instances:

dantesco (dantean) pertains_to Dante
discipline (disciplinary) pertains_to discipline

Like the other grammatical categories, also pn were linked with WordNet 1.5 by means of equivalence relations. The eq_synonymy is used to map proper names with an equivalent instance in WN; the eq_belongs_to_class, that was not present in EWN, is codified in IWN to link proper names to the generic belonging class when they have no equivalent in WordNet.

In the following examples all the types of relations so far encoded for this subset are shown:

| pn          | pertains_to_class      | pn          |
|-------------|------------------------|-------------|
| Roma        | città (city, town)     | Roma        |
| Romano      | pertains_to            | Roma        |
| Roma        | derivation             | romanità (Roman world) |
| Roma        | eq synonym             | Rome        |
| Livorno     | eq_belongs_to_class    | town        |

2. Polysemy of Proper Names

In this paper we would try to refer more widely about the relations involving the pn, in particular codifying the relation between the pn and the senses (literal, derived and extended). Regular polysemy has been widely studied, closely connected with linguistic phenomena such as metonymy.

Our purpose is to highlight particular cases of polysemy found in codifying pn.

The study of polysemy in pn may, in our advice, constitute the starting point for a more general ‘theory of
polysemy' concerning also the other grammatical categories. To study the sense shifting mechanisms in this subset is helpful for understanding and describing more sophisticated processes of transposition that are enriching the written and spoken language in every day life.

We consider pn as the basis for many extensions of meaning: this may happen when “a more general human metarepresentational capacity” is exploited (Papafragou, 1995). In fact, many types of derivates and sense extensions are generated, by means of lexical rules that operate as “generative factors” (Pustejovsky, 1995). Novel usages of a word form can be derived through productive application of a lexical rule; therefore we want to represent these lexical rules codifying new semantic relations in the database.

Polysemy can be understood as the result of generative lexical mechanisms like analogy/synecdoche (he would like to drink a Bloody Mary).

A polysemic production happens by means of a metaphorical use of the pn (Your husband is a Croesus), by means of metonymy (to read Dante), or by means of lexical mechanisms like analogy/synecdoche (he would like to drink a Bloody Mary).

Polysemy can be understood as the result of generative mechanisms. So we want to give prominence to the polysemic of pn to confirm the linguistic manifestation(s) of the faculty for generative categorization and compositional thought (Pustejovsky, 2001), that “projective transformations” are applied and that “sense extensions are productive processes which require generative lexical mechanisms” (Copestake and Briscoe, 1996).

Considering our experience, it has been noticed that some deviations from the literal reference are present regularly (Nunberg, 1996), when considering some particular belonging classes, sharing regular semantic relationships; hereafter some examples are shown:

- Place/product e.g.: Shiraz, Shantung, Damasco
- Writer/literary work e.g.: I like Manzoni
- Artist/work of art e.g.: a Picasso was stolen
- Craftsman/artifact e.g.: a Stradivari was found in an old chest
- Town/citizens e.g.: Roma has now its new mayor
- Nation/people e.g.: Only the 60% of Italy voted
- Building/person/Institution e.g.: the Quirinale welcomes the princess
- Person/corporation e.g.: Lacoste, Ford, Skoda
- Corporation/product e.g.: the Ferrari won the Formula 1
- University/town e.g.: Bologna is a good law faculty
- Place/battle/defeat or victory e.g.: Waterloo, Caporetto
- Physician/unit of measurement e.g.: Hertz, Baud, Ohm
- Scientist/discovery/medical analysis e.g.: Doppler
- Musician/composition e.g.: Mozart is too difficult for me
- Region/skiing technique e.g.: Telemark
- Athlete’s name/technique e.g.: Fosbury
- Name of the grapes/wine e.g.: Sauvignon

Until now only the ‘derivation’ relation has been used e.g.:

Ampere1 belongs to class fisico (physician) Ampere2 belongs to class unita di misura (unit of measurement)

Ampere1 derivation Ampere2

It connects variants belonging to different PoSs (Parts of Speech) and applies both to the first and to the second order entities as shown in the examples below:

- Dalton derivation daltonico (daltonic)
- Pastorizzare (pasteurize) derivation Pasteur

In these cases derivation fits well because it is a morphological relation which links the proper name with its derivates and viceversa. As in EWN, it is used to encode derivation links when no other semantic relation is available.

In the case of metaphor, instead, there is a substitution on the basis of similarity, and, like similitude, sentences like ‘he is a true Casanova’ are not reversible.

3. Lexicographic Experiences

3.1 WordNet 2.0

Considering a small subset of pn (Adonis, Waterloo, Cinderella, Casanova, Peter Pan, Eden, Cashmere, Champagne, etc.) and comparing their presence in WN 1.5 and in WN 2.0, it has been verified that the same concepts are also present in English; that they are far more numerous in WN 2.0 than in WN 1.5, so we can say that they are taken in greater consideration than before; and each pn of this subset is present with two (or more) senses, showing the same extension of meaning as in Italian from the literal to the metaphorical or metonymical sense, even if not codified by means of a relation. E.g.:

1. Chimera, Chimaera -- ((Greek mythology) fire-breathing she-monster with a lion's head and a goat's body and a serpent's tail; daughter of Typhon)
2. chimera, chimaera -- (a grotesque product of the imagination)
3. cashmere -- (a soft fabric made from the wool of the Cashmere goat)
4. cashmere -- (the wool of the Cashmir goat)
5. Kashmir, Cashmere, Jammu and Kashmir -- (an area in southwestern Asia whose sovereignty is disputed between Pakistan and India)

3.2 PAROLE Corpus Evidence

Many examples of the sense shifting phenomenon have been evidenced by textual corpora. Particularly rich in metaphorical uses are newspaper articles, which employ an increasingly impressive language to capture the reader’s attention. The effect is of surprising discovery of similarity between the two concepts involved in the metaphor. By means of these semantic procedures discourse is given total enrichment, a semantic ‘surplus’. Starting from a set of representative samples of proper names, a research has been carried out on the PAROLE (Marinelli et al. 2002) corpus, containing over 20,000,000 occurrences: various types of “sense shifting” (assimilated to typical cases of regular polysemy or regular sense shifting) have been verified. Moreover, for each proper name considered, more transpositions than expected were found: in the case of pn like Maratona (Marathon), there has been an extension of the reference from the place of Greece (base sense) to the athletic specialty (the winner of the marathon…) and then to the true metaphorical sense (Marathon of laws); the meaning of Lacoste has been extended from the tennis player René Lacoste (base sense), with the pseudonym ‘Crocodile’, leading competitor that helped France to win its first Davis cup in 1927, to the sportswear company and then to the garment (to wear a Lacoste).

It has been verified that the frequent use of a proper name in metaphorical sense makes it become a common noun:
as pointed out by Kilgariff (1992), "words have an indefinite number of potential senses", but there are cases in which one sense of a systematic relationship is most salient for certain instantiations of it, and, for some word
forms (cicerone, champagne, etc.), the derived sense will have a higher frequency than the base sense and will prevail on it. What is initially not endorsed as a “truthful description of a referent becomes the proper descriptive meaning” and is registered in the lexicon. (Papagragou., 1995). The frequent use of a pn in metaphorical sense, in many cases, makes it be lexicalised as common noun (sometimes the capital initial letter of the proper name is lost, sometimes it remains, even in similar contexts). In some cases a de-properization is found: ‘the Florence of the twenties’.

Moreover, it has been noticed that, in many cases, also a change of the ontological ‘value’ takes place with a shift of reference: some proper names belonging to the 1st order entities can shift towards 2nd or 3rd order entities, for example the pn indicating diseases (Parkinson), physical/engineering methodologies (Diesel), rehabilitative gymnastics methods (Pilates), surgical operating techniques (Milligan Morgan).

4. Our Proposal

When there is a regular shifting from a class to another belonging class (either in the case of metonym or in the case of metaphor), also for pn we deemed worthy to find a specific code representing this phenomenon in IWN: we propose to indicate the pn regular shifting using this code: ‘has extension’ and its reversed ‘is extension of’ e.g.:

| Firenze1 belongs to class città (town) | Firenze2 belongs to class cittadinanza, insieme dei cittadini | Firenze1 has extension Firenze2 |
| Firenze2 is extension of Firenze1 |

We think that to make explicit these sense extensions for pn could be an useful improvement for the IWN database. Our proposal is to study in detail the various subjects described, which seem worthy of peculiar research; to exploit more widely the other IWN relations. Many more connections will be created that may teach us about mechanisms of metaphor production and comprehension (Fellbaum 2004), considering that ‘the structures underlying the distinct meanings of the words are the heart of the cognitive linguistics enterprise’ (Kilgariff, 1997).

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