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An Instruction-Based Analysis of *Over*

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Abstract

Many studies in cognitive linguistics have analysed the semantics of *over*, notably the semantics associated with *over* as a preposition. Most of them generally conclude that *over* is polysemic and this polysemy is to be described thanks to a semantic radial network, showing the relationships between the different meanings of the word. What we would like to suggest on the contrary is that the meanings of *over* are highly dependent on the utterance context in which its occurrences are embedded, and consequently that the meaning of *over* itself is under-specified, rather than polysemic. Moreover, to provide a more accurate account of the apparent wide range of meanings of *over* in context, we ought to take into account the other uses of this unit: as an adverb and particle, and not only as a preposition. In this paper, we provide a corpus-based description of *over* which leads us to propose a monosemic definition.

Key-words: polysemy, instruction, gestalt compositionality, *over*, corpus, preposition, adverb particle, monosemy, convocation-evocation principle

1. Introduction

This paper deals with the semantics of the English word *over*. We think this word is particularly interesting to study since it can be a preposition, but also a particle, an adverb and even a prefix. As a consequence, its semantics is difficult to grasp, the word appearing in a wide range of contexts¹ with apparently a lot of potential meanings depending on these

¹ □ This range of contexts is obviously connected with frequency as *over* ranks 182 among the most frequent units of the English language according to the Corpus of Contemporary American English (see the the top 60,000 lemmas on <http://www.wordfrequency.info/files/entriesWithoutCollocates.txt>).

contexts. *Over* has been the subject of a large number of scientific papers trying to describe its meaning, using different points of view and different theoretical frameworks (see section 1).

Most studies interested in the semantics of *over* enumerate a number of meanings with the hope of accounting for all its different uses in context (Lakoff 1987, Dewell 1994, Deane 1993). These descriptions are thus largely static, which is not satisfactory since, in our opinion, it is highly doubtful that humans have access to a repertoire of meanings among which they have to choose the correct one depending on the context. This kind of assumption leads to polysemy and multi-categorization of the word whereas we think it would be more plausible to imagine that the meaning of *over* appears gradually in interaction with the information brought by the context².

Very few studies refer to an ongoing process to explain how the semantics of the word could “appear” during communication, depending on the context. One of the most recent and most inspirational study in this direction is Tyler and Evans (2001, 2003). They explicitly say in the introduction of their paper (Tyler and Evans, 2001) that the meaning of *over* should not be stored in a repository of meaning but must be construed depending on the context. They also introduce the idea of a “protoscene” from which all the other meanings of the word could be derived. However, the process itself is not explicitly described in their paper: the protoscene is the center of a network of meanings but these meanings eventually seem to be rather static. Moreover, their protoscene presupposes that a concrete, spatial representation comes first whereas this assumption has not been verified in corpora yet.

Finally, another reason to have a fresh look at the word *over* is the fact that few publications take into account the full complexity of the word: most studies focus on the preposition only, and some of them only take into account some of its uses. We think there is a need to focus on real examples at least to get an idea of the productivity of the different uses of the word.

Our main hypothesis is that the meaning of *over* is not polysemic by nature. Rather, we believe that it is the context of use that triggers the different meanings of *over*. We suggest the idea of “a schematic form” that provides an underspecified account of the meaning of the word. Depending on the context, this schematic form can produce the different shades of

² Another reason to disagree with this approach is that listing numerous entries in the dictionary shifts the emphasis on disambiguating the word in context. Natural language processing has shown long ago that lexical disambiguation is a hard task suffering combinatorial explosion.

meaning associated with *over*, but also the different categories associated with the word (in this framework, *over* is not a preposition or a particle in itself, it is the context of use that gives the word its category).

Our study is based on a corpus made up of occurrences of *over* extracted from the BNC (British National Corpus). The use of a real corpus has several advantages, among others the fact that in doing so, it is possible to focus on real data that are representative of the usage of the word. We also think that frequency information is important. Last but not least, the use of real data gives us access to actual contexts that are fundamental to define the features relevant for a dynamic approach to meaning.

Of course, we agree that *over* in context conveys several potential meanings. We thus took Tyler and Evans's study as a starting point for our corpus analysis and annotated a series of examples using the different word meanings defined by these authors (their repertoire of senses of *over* is one of the most precise and complete). However, this is not our ending point but rather our starting point: taking into account the different meanings in context and the main co-occurring features, we attempt to define *i)* how a schematic meaning can be "profiled" to give birth to the full meaning of the word in context and *ii)* what the core meaning of *over* is, *i.e.* its "schematic form". The investigation of these two questions is the main goal of this paper.

This study is structured as follows. In a first section, we give an overview of previous approaches and explain what their limitations are. In a second section, we describe the corpus we used and the method we followed for the exploitation of these data. We then observe the main features associated with the different meanings of the word, which allows us, in the last section, to offer an answer to our two initial questions: we try to define the "schematic form" associated with *over* and explain how this form can be profiled depending on the context to explain the different uses of the word.

2. State of the Art

2.1. Polysemic Frameworks

Over seems to be the favourite unit of many cognitive works: see Taylor 1988, Deane 1993, Dewell 1994, for the last century, and Deane 2005, Talmy 2005, Tyler and Evans 2001, 2003, Van der Gucht *et al* 2007 or Zlatev 2003 more recently. All of them derive from the seminal

work of Brugman 1981 and Lakoff 1987. We can nonetheless make a clearcut distinction between contributions advocating a polysemic approach and contributions favouring a monosemic one.

The first work on *over* developed in cognitive semantics was inspired by the radial network analysis by Lakoff 1987, after Brugman 1981. They have inspired many other works on semantics as they oppose a non objectivist view to a conception of meaning committed to necessary and sufficient conditions. The lexical network theory puts forward the idea that meaning is represented by images and image schemas. This theory also advocates that meaning is present in a network of family resemblances based on Wittgenstein's model. To Lakoff, an expression like *over* cannot be analysed and represented by a single core meaning because it is too polysemic. An abstract sense would not be able to

«distinguish among the cases and [would be] so devoid of real meaning that it is not recognizable as what people think of as the meaning of [the] word» (Lakoff 1987: 416).

A polysemic word like *over* is best represented by a motivated semantic network in a radial model in which:

« the senses of each expression form a radially structured category, with a central member and links defined by image-schemas transformation and metaphors.» (ib. 460).

From this perspective, the 'central' or 'primary' sense is spatial insofar as semantic structures are grounded in human experience and perception, notably the perception of space. The *Above-Across* Sense – a combination of *above* and *across* -- is then the central node of the radial network, as expressed in (1):

- (1) The plane flew over.

In (1) a trajector (TR) moves above an unidentified landmark (LM):

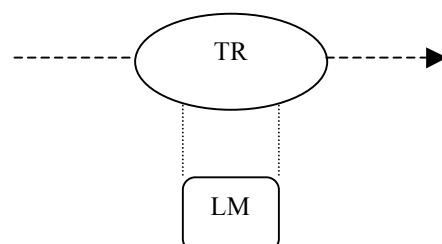


Fig. 1. The *Above-Across* Sense (Lakoff 1987: 419)

By adding information, for instance about the nature of the landmark (*yard, hill, wall*) and by specifying the presence of contact or not, the basic schema will be enriched and get more complex, as in (2):

(2) Sam lives over the hill.

In this example, information is added by the verb and the noun. The LM is vertically extended, the TR is in contact with it, and the sentence yields an end-point focus corresponding to a new schema linked to the basic one. This sort of extension produces a very fine-grained conception of polysemy, based on what Lakoff called *motivation*.

Meaning such as Excess or Repetition for instance are actually metaphorical extensions from the central spatial schema. They are not fully arbitrary, but they cannot be predicted from the central senses like the Covering Schema (Lakoff 1987: 426 and ff) or the Reflexive Schema (p. 430). Excess or Repetition are actually *motivated* by various elements of the semantic chaining : «they are conventional extensions» (p. 116). Words like *overlook, oversee* or *look over* are thus «specialized assembly of independently existing parts» (p. 438), but their meaning cannot be predicted from the meaning of *look, see* or even ‘over’. Lakoff is actually concerned not by «why those expressions mean what they mean, but why those are natural meaning for them to have» (p. 438).

Lakoff’s radial conception of polysemy is considered too fine-grained for Tyler and Evans (2001, 2003), who rather oppose what they call the ‘principled polysemy’. For these authors, the polysemy of *over* could be schematized as a proto-scene «involving a spatial configuration in which the TR is located higher than the LM» (Tyler Evans 2003: 64) and associating a functional aspect: «the LM (or the TR) is conceptualized as being within the sphere of influence of the TR (or the LM)» (2003: 66). They suggest the following schema:

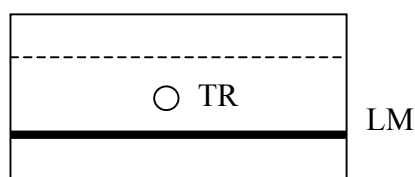


Fig. 2: Proto-scene for *over* (Tyler and Evans 2003 : 66)

Such a proto-scene is highly schematic insofar as its purpose is to capture configurational information, i.e. the conceptual-spatial relation between the TR and the LM. Tyler and Evans's view – inspired by Lakoff 1987 and Langacker 1987 – is that

«the meaning assigned to any utterance is radically underdetermined by the lexical items and the grammatical structures in which they occur. Rather, sentential interpretation is largely the result of various cognitive/inferential processes and accessing appropriate world knowledge» (2003: 69).

Hence according to them, sentences (3) and (4):

(3) The cat jumped over the wall.

(4) The tree branch extended over the wall.

do not represent two different senses as Lakoff argue, but they prompt for the same one as (3) shows it. In this example, the Path sense is derived by inference from knowledge of the real world, namely of the way a cat jumps (not straight up in the air):

«we argue that the interpretation regarding the 'above-across' trajectory of the movement assigned in sentence [(3)] is not prompted for by 'over', but rather from the integration of linguistic prompts at the conceptual level, in a way which is maximally coherent with and contingent upon real-world interactions.» (2003: 71).

Even if Tyler and Evans oppose a unique schematic scene to classical lexical network theory, they nonetheless propose a semantic network for *over* with different clusters (the A-B-C Trajectory Cluster, Up Cluster) and senses (Covering, Examining, Reflexive):

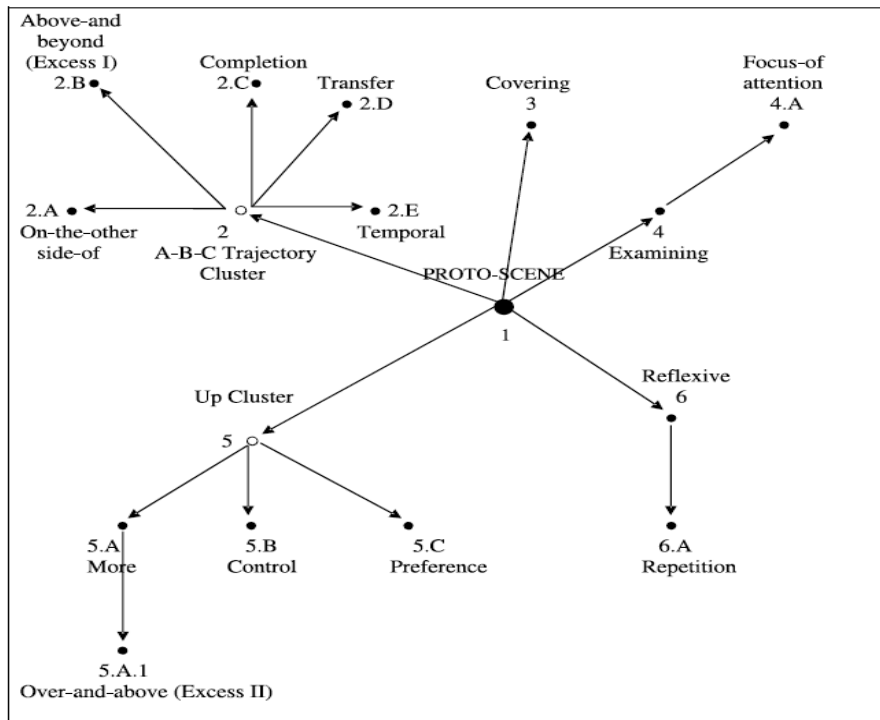


Fig. 3. The semantic network for *over* (Tyler and Evans 2003)

Fig. 3 shows that some senses are not connected directly to the central schematic meaning of *over*. Covering, for instance, or Examining are rather connected to the proto-scene by *usage* – they are attested meanings – and not in an intrinsic way, *i.e.* directly to the proto-scene. Deane 2005 notices however that the connection between senses «appears to be incidental, contingent upon inferential processes that remain relatively open und unspecified» (Deane 2005: 244). The main drawback to what is put forward by Tyler and Evans is the sense discontinuity. For Deane, the ‘covering’ schema motivates an example such as (5a) as well as an example like (5b):

(5a) The wig is over his head.

(5b) The wig is over his face.

Deane 2005 suggests that the core meaning of *over* applies to both examples, whereas Tyler and Evans argue that the interpretation of an example like (5b) derives from the context. They actually argue for a distinct meaning for the ‘covering’ sense, with an example like the following:

(6) They put a transparent plastic sheet over the painted ceiling of the chapel during repairs.

(Tyler and Evans, 2003: 91)

In (6), the TR («the transparent plastic sheet») is physically lower than the LM namely «the painting ceiling». Still, *over* is used in the utterance and not ‘under’ and

«unless ‘over’ had a distinct Covering Sense associated with it, we would expect this sentence to be semantically anomalous because the TR is higher than the LM, a canonical part of the meaning of ‘over’» (Tyler and Evans 2003: 92).

The explanation given by the authors is that the vantage point in the case of (6) is higher than the TR and no longer off-stage:

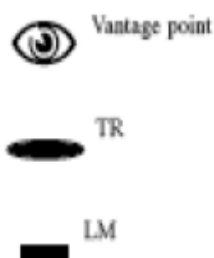


Fig.4: The covering sense, from Tyler and Evans 2001: 133

Hence, they conclude that «the covering implicature can be reanalysed as distinct from the spatial configuration designated by the proto-scene.» (2003: 91) and «the ‘covering’ component comes to be instantiated in the semantic network, via pragmatic strengthening as a distinct sense» (*id.*).

Deane 2005 actually reformulates Tyler and Evans’s position on *over* in a more dynamic way. His analysis concerns *over* as a spatial preposition (which excludes its use as a particle or a prefix). He both rejects geometrical approaches like Lakoff’s 1987 or Brugman’s 1981 and more functional ones like Herskovits’s 1986 or Vandeloise’s 1991. He rather suggests that multiple reference frames are needed to understand prepositions, and the role of these multiple frames is to capture the complexity of spatial thought. Deane’s position is that prepositions ought to be defined as «clusters of sensorimotor representations» (2005: 250). By introducing visual notions borrowed from the world of photography like *resolution*, *occlusion*, or *viewpoint*, Deane analyzes *over* in contrast with *on* and *above* in examples like the following ones:

- (7a) The balloon is over the table.
- (7b) The balloon is above the table.
- (7c) The balloon is on the table.

In Deane's perspective, the difference between examples (7a) and (7b) relies on a difference of resolution and occlusion. From the same viewpoint (the side) and at the same level of resolution (i.e. low resolution) the TR is separated from the LM by a gap in (7b) whereas it is not separated from the LM in (7a). There is nonetheless no difference between these examples at high resolution. Viewed from the top, which is taken into account in the case of *over* only, the TR partially occludes the LM. It is the case in (7c) too, with *on*, but this preposition differs from *over* as regards the viewpoint: from the side, the TR is not separated from the LM by any gap.

By introducing force dynamics notions like movements, paths, and forces interacting in space, Deane proposes to define *over* in three image-sequences:

- (a) the LM functions as a barrier on the locomotor space and the TR is on the far side of the LM from its initial position
- (b) the LM functions as a barrier for movement over the locomotor surface and the force-dynamics impetus of the TR carries it to a location higher than the LM
- (c) the TR has force-dynamics impetus downward toward the LM and consequently the TR exerts force upon the LM.

Deane completes the definition of *over* by introducing an allocentric space ('maneuver space'). The maneuver space comprises notions like distance, relative orientation and the consequences of manipulation, the basic concern being clearance,

«the open space from a point within the edge of a figure to the nearest point on the ground. An object's position may therefore be defined by systematically mapping its clearance under different manipulations such as rotation, motion toward the ground, or motion parallel to the ground.» (2005: 264).

Over is then defined by the following maneuver-space image complex (id.):

- «a- Initial position: there is clearance between the TR and the LM, with the TR orientated parallel to the ground.
- b- Image after vertical displacement: zero clearance
- c- Image after horizontal displacement: no change in clearance

d- Image after rotation: zero clearance. »

Deane's dynamic model aims at «provid[ing] an account of the mechanisms which relate a word's polysemy to its prototype [whose] effect is to enforce a close relationship between a word's conceptual representation and its potential for polysemy» (2005: 271). From the acknowledgement that to give a general definition of the various senses of 'over' lumped together is as unsatisfactory as to keep these senses distinct (which could make the semantic coherence not visible enough even if each sense gets a definition), Deane puts forward the idea of a central prototype via application of «preference rule upon structured sets of images to produce contextually induced semantic interpretation» (2005: 272).

Deane's study concerns the spatial meaning of *over* and very little is said about the other senses (temporal, examining, control, *etc.*) whereas Tyler and Evans offer a more general study and then a more complete definition. Besides, in Deane's study, nothing is said either about the other uses of this unit, as for instance its role as a verb particle.

What comes out from the various semantic networks under consideration, and notably from Lakoff's, is that they are too fine-grained – about 100 different meanings are described in Lakoff 1987 for instance. Moreover, the very structure of the network is not made obvious in most (or all?) studies. Nothing is explicated about the orientation of the branches for instance, or about the distance between the nodes. The absence of rules on the one hand and the proliferation of meanings on the other hand tend to show that *over* is indeed polysemic, but we actually prefer to follow Sandra and Rice 1995 who focus on a major problem coming from this kind of approach:

«the least that can be said is that prepositional network-style networks are minimally committed to a psychological process (or several such processes) of human categorization» (Sandra and Rice 1995: 100).

For these authors, and for us as well, networks create a real confusion between the semantic *extension* and the semantic *representation*: a network helps represent polysemy, but not its extension nor its proliferation. According to them, speakers do make distinctions between the different uses of *over*, but “what is in the network is only in the structure of the language and not at all in the structure of the mind” (Sandra and Rice 1995: 104). For all these reasons, we

will favor monosemic models rather than polysemic ones.

2.2. A Monosemic Answer

Rejecting polysemic approaches and the proliferation of values it promotes, Van Der Gucht *et al.* 2007 put forward a monosemic account of *over*. The authors try to give a more complete definition of the unit – even if nothing is said about *over* as a verb particle as we shall see. The authors choose to root the debate on polysemy in the classic opposition between Locke and Leibniz. Locke (1689) promotes the idea of a general polysemy insofar as he stresses that words cannot be translated from one language into another and that basically they are means to record human thoughts. He nonetheless makes a distinction between words that are «names of ideas in the mind» and words «that are made use of to signify the connexion that the mind gives to ideas, or to propositions, one with another» (1689, III, 7, §1, quoted by Van der Gucht). The latter, called «Particles», have a functional role and their meaning is not directly calculated, as compared with the particle «but» for instance which has a great number of meanings but from which it is not always possible to draw a general, formal meaning. Locke's position is to some extent mirrored in today's cognitive framework developed in particular by Lakoff, Langacker or Taylor. In Lakoff's view for instance (1987), polysemy is largely natural and characterizes any linguistic item. This view promotes a radial network conception of *over* with one or more centers ('above' meaning and 'across' meaning) in the network since

«One subcategory is the center; the other subcategories are linked to the center by various types of links. Non-central categories may be subcenters, that is, they may have further center-periphery structures imposed on them.» (Lakoff, 1987: 287).

As Lakoff favours a model of the mind as being «embodied», the central values of the network are essentially spatial and semantic structures are grounded in experience and perception. The non central meanings are derived by different links (metaphor, metonymy, similarity, *etc.*) and are not predictable from the central sense.

As for Leibnitz, his view on polysemy is less radical, even if he shares Lockes's view on the difficulty to find one general meaning for particles like *but*. He actually favours a paraphrase, which can substitute the word in every occasion, with the condition that this paraphrase ought

to be chosen once all instances of the linguistic item have been analysed. Van der Gucht *et al.* follow Leibnitz's position and they reject a conception of polysemy which enables meaning to proliferate rather to form a coherent unit:

«the radical polysemy hypothesis leads to a semantic analysis that not only is too fine-grained but also fosters a highly problematic rampant polysemy.» (Van Der Gucht *et al.* 2007: 741)

They then favour Tyler and Evans's moderate view on polysemy, akin to Leibnitz's conception, mainly because Tyler and Evans reject the primacy of spatial meanings. But Van der Gucht *et al.* do not follow them on the embodiment postulate as according to them «the embodied meaning postulate can lead to assuming unnecessary polysemy.» (2007: 744). For them, the 'covering' sense that Tyler and Evans underscore in their article is in fact the projection of extra-linguistic categories on semantic ones and does not constitute a distinct meaning. Hence, Van der Gucht *et al.* consider that the following example,

(8) Joan nailed a board over the hole in the ceiling.

has two different readings and is thus ambiguous:

a-reading : the board is situated in a lower position with regard to the ceiling

b-reading : the board is situated in a higher position with regard to the ceiling

These readings put forward two different perceptions of the situation, one in which we consider the board being nailed below the hole and the other one if we consider the board being nailed on the upper side of the ceiling³. This distinction is supported by the fact that this sentence could be uttered from two different speakers with two different viewpoints:

«Interpreting the scene from a focal perspective means that one interprets the meaning of over from the own point of view of the speaker ((a)-reading). By contrast, interpreting the scene from a disfocal perspective implies that one takes the point of view of the board or, by way of extension, the point of view of another speaker who is to be located at the attic or another room above the ceiling ((b)-reading).» (Van der Gucht *et al.* 2007: 746)

³ But in that case, we may suggest that the board could also be nailed over the hole located on the *floor* rather than in the ceiling.

This leads Van der Gucht *et al.* to support the idea that *over* is not ambiguous but is realized in a distinct, unpredictable sense in this sentence. Their explanation is that

«*over*, being a means to conceptualize the relation between a spatially ‘superior’ TR and an ‘inferior’ LM and conceivable as a semantically invariable meaning bearing linguistic item, can be said to display a structured polyvalence (or: polyreferentiality) at the experiential level, i.e. at the level of interpreting extralinguistic reality, which is perfectly explainable. We stress that the item is polyvalent in a structured way, because the linguistic meaning constraints the range of interpretations in a principled fashion, due to the fact that *over* invariably expresses that one object is situated in a specific relation to a lower reference point. Therefore, to assess the relation between the invariable meaning proper and the polyvalence of *over*, it is imperative not to interpret the specific configuration which holds between the TR and LM in a single – call it ‘prototypical’ – way, excluding other possibilities which then have to be accounted for by invoking polysemy or certain kinds of ‘extension’.» (id.)

Their view is then that the meaning of *over* and the relation it refers to have to be distinguished: the relation established by *over* between two entities X and Y should be differentiated from the same relation which can be experienced and perceived in various ways by the speaker. According to them, Tyler and Evans’s methodology is not the right one as it does not enable them to make a clearcut distinction between the semantic contribution of *over* to the meaning construction of the utterance and the semantic contribution of the other linguistic units of the utterance. Building their own methodology on Coseriu (1985, 2000), Van Der Gucht *et al.* propose to assign a single, non ambiguous meaning to the preposition *over* and to reconsider the “battery of senses” associated with the preposition as a side effect of our connection with the outside world:

“The main reason why a battery of senses is postulated in the first place derives from a non-linguistic criterion we term the ‘iconicity of embodied meaning’. This criterion prompts the linguist to accept as many distinct senses as there are prototypical common sense experiences commonly associated with (or, ‘reflected by’) the use of a specific linguistic item in various instantiations.” (Van Der Gucht *et al.* 2007: 734)

Van Der Gucht *et al.* distinguish instruments from lexical items. A lexical item has a self-contained conceptual meaning, whereas prepositions have an instrumental meaning in the sense that their main goal is to connect two different words. Therefore, the meaning of a

preposition can be underspecified: its full meaning will be derived from the meaning of the words connected using this preposition. In other words, the meaning will be self-contained when and only when the preposition is analysed together with the words it connects together.

Contrary to Tyler and Evans's view, the authors propose that:

- 'the meaning of *over* is an instrumental meaning which can only be instantiated in combination with lexical meanings';
- 'the meaning of the linguistic context should not be projected into the meaning of the preposition'
- 'the meaning of *over* should be conceived of as a 'general' non-lexical meaning which only specifies a relation between slots that have to be filled by autosemantic items, e.g., Noun *over* Noun, Noun BE *over*, Verb *over* Noun, etc.' (Van Der Gucht *et al.* 2007: 748)

Van Der Gucht *et al.* then postulate a general instrumental meaning for *over* which is paraphrased as follows: '*positioning of X vis-a-vis a reference point Y which is inferior to X*' (2007: 748) where X is an object and Y a landmark.

In our article, we globally follow Van Der Gucht *et al.*'s position concerning polysemy and its processing in natural language. We do agree with them on their use of an instrumental meaning for *over* rather than a proliferating semantic network based on Lakoff's model or even a more moderate view of polysemy. However we think that it is of prominent importance to determine the meaning of *over* thanks to analysis of attested data, contrary to Van Der Gucht *et al.* who only consider a small set of examples and no attested corpus data. Furthermore, we think it is also essential to take into consideration the use of *over* as an adverb since Hallan's corpus-based study (2001) clearly shows that the adverbial use is primary in pre-school children speech as well as in adult speech (Van der Gucht *et al.* only consider *over* as a preposition)⁴. The next section presents our study of a representative set of utterances containing *over* (whatever its category), extracted from the British National Corpus.

⁴

The same criticism could be levelled at the various authors presented here.

3. Data Analyses: a closer look at the polysemy of *over*

3.1. A Corpus-Based Method

Cognitive linguists now frequently make use of corpus data to ensure their theories by the examination of attested examples (see for example Gries 2006). This paper will use a similar method to explore the semantics of *over* since previous studies of this word have been mostly based on introspection.

We think that corpus-based data is fundamental to provide a clear account of the diversity and frequency of the different values associated with *over*. Besides, the systematic annotation of data requires making the decision process explicit ('how should one choose the right semantic value for this example?') and helps identify borderline cases. It may even lead to the discovery of categories that have not been previously described.

On the other hand, we are aware that the precise analysis of all the slight differences of meaning of *over* would require the annotation of thousands of examples. This approach was clearly not realistic in our context. Moreover, all the relevant linguistic features for the analysis were not known in advance.

As a consequence, we set up a four-stage process for data analysis:

1. First, a series of examples is annotated and discussed in order to find the different semantic values, the relevant variables and their contribution to the meaning of the lexical unit
2. A detailed analysis of the different meanings along with the corresponding contexts is done through manual corpus annotation, in order to get appropriate level of generalization on the basis of which senses are to be distinguished.
3. Then, an instructional schematic form is elaborated from the analysis of examples, unfolding the core semantic of the word (schematic form) and its interaction with the context (the set of instructions it gives and/or receives)
4. Eventually, some old and new examples are analysed using the conclusions reached during the second stage, to ensure that the model is coherent and practically manageable.

This method is very close to Corpus Pattern Analysis (CPA), a lexicographic method defined

by P. Hanks in coordination with various other linguists (see Hanks, 2004 and the Website <http://nlp.fi.muni.cz/projects/cpa/>).

The key point of CPA and other corpus-based approaches like Gries 2006 is that the lexical meaning of linguistic items cannot be defined for words in isolation.

However, verbs have been intensively studied in corpus linguistics (i.e. the flagship of CPA is the DTV project, Disambiguation of Verbs by Collocation, see <http://clg.wlv.ac.uk/projects/DVC/>) whereas connectors have received less attention, probably because the problem is more challenging. A word like *over* corresponds to several part-of-speech, with a wide range of different meanings as we have just seen in section 2.

Our corpus has been automatically extracted from the British National Corpus using *over* as a keyword. 325 utterances are extracted containing more than 346 occurrences of *over* (*over* may appear twice in the same utterance; it can also be part of the collocation *over and over*). This corpus is then manually annotated using a specifically designed multi-level annotation scheme. For the annotation itself, we chose to use ANALEC, a piece of software especially designed for this kind of problem⁵: ANALEC uses an XML structure for the annotation but contrary to other annotation tools, ANALEC makes it very easy to add a new feature, remove another one, merge two initially distinct features (taking into account conflicts and proposing a nice interactive process to solve them, *etc*). ANALEC also provides various visualization modules to identify relevant features, correlations of relevant features and exceptions.

As already said, it is crucial to notice that the annotation has not been done with a fixed set of *a priori* features. Several cycles of annotation and revision of the annotation scheme (involving several annotators) have been necessary to reach a consensus, and define an annotation scheme that was at the same time rich, tractable and storable in generic formats (so that the corpus and the annotation are re-usable). Thus, the use of a corpus makes it possible to have a data-driven approach to meaning.

Practically, the syntactic value of *over* was first tagged: *over* can be a preposition, a particle or an adverb. All the occurrences were then annotated with a semantic value derived from Tyler and Evans (2003: 125, see Figure 3 above). We then coded information concerning the context of *over*. We annotated dependencies around *over* (e.g. trajectory / landmark); lastly, information about these elements was annotated as well (lemma and tense of the verbs, *etc*).

⁵ ANALEC is downloadable at: <http://www.lattice.cnrs.fr/Telecharger-Analec>. For a presentation of ANALEC, see Landragin, Poibeau, Victorri 2012.

One of the main problems of corpus linguistics is to be able to annotate all or most of the useful information in context, but still get a tractable annotation scheme. We made several practical experiments to get an optimal solution using different annotation schemes and different annotators. Lastly, disagreements between annotators were solved by consensus after discussion. During the last stage of the annotation process described above, new examples are extracted from the BNC to check the adequacy of the linguistic description on new, unseen sentences.

3.2. Results of the Corpus Annotation

We have annotated the 325 sentences using the semantic categories identified by Tyler and Evans (2003) presented in Figure 3. Yet, this classification needed to be refined so as to integrate recurrent values of *over*, like for instance temporal values. So, even if this classification remains a good starting point for the study of *over*, we had to modify it. We relabeled certain meanings, like 2.D (“Temporal” became “Scanning of an Interval”), 4.A (“Focus-of-Attention” became “Topic”) or 5.C (“Preference” became “Divider”). These new labels actually suit the data we found in our corpus and provide a better account of their meanings. “Scanning of an Interval” for instance is more precise than “Temporal” since we notice that *over* is generally followed by a period rather than just a date: “over a number of years”, “over the course of the last 25 years”, “over time”, *etc.* “Topic” (a subject people talk or write about) is also more precise than “Focus of Attention” insofar as in the majority of the examples we analysed, *over* is associated with a noun or a verb of debate, opposition, agreement:

(9a) French Museums proved unable to agree over the price at which the paintings should go to the Museum of Melun

(9b) Methodists' main concern was not so much the debate over collectivism v. individualism as over reunion of the various Methodist divisions.

In the case of “Divider”, we found that the context of most utterances of our corpus is mathematical, as in “A hundred and seventy over eighty”, which drove us to change Tyler and Evans’s label.

We also suggested new labels, which were not included in Tyler and Evans’s classification. These new meanings are in fact derived from the Covering node, that we divided into 3.A “Full covering” and 3.B “Scattering”. These new meanings came to light through the

annotation of the corpus and the analysis of the data. Thus, we made a distinction between two different cases:

(10a) ZEPPELINS of World War One by Wilbur Cross, tells of the little-known aerial battles that took place over England during the Great War, when Germany attempted to paralyse the British by dropping tons of bombs from a fleet of super-Zeppelins.

(10a) construes the case of “Scattering” because the battle took place over different parts/regions of England, but not all over the land itself.

(10b) I do thank you for stopping and not running poor Nellie over.

(10b) construes the case of “Full Covering” because the pet could have been entirely “flattened out” by the car.

Apart from distinctions of labels, we obtained results in terms of correlations and regularities that are presented and discussed in the following sub-section.

3.3. Data Analysis: Correlations and Regularities

The results we obtained thanks to our annotations make it possible to establish correlations between the semantic values of *over* and the various linguistic features we observed in our corpus, notably concerning the matching of semantic values and categories (Chart 1) and the distribution of the different semantic values (Chart 2):

Semantic Values	adverb	particle	preposition	Total
2E - scanning of an interval	1	0	60	61
4A - topic	0	1	57	58
5A - more	45	0	4	49
2B - above and beyond	4	5	23	32
5B - control	0	9	21	30
3A - full covering	0	7	18	25
2A - on the other side of	2	5	9	16
5A1 - above	0	2	16	18
3B - scattering	0	0	13	13
2C - completion	2	9	0	11
2D - transfer	0	10	0	10
5C - divider	1	1	6	8

6 - reflexive	1	5	0	6
4 - examining	0	3	1	4
6A - repetition	4	1	0	5
TOTAL	60	58	228	346

Chart 1: the matching of semantic values of *over* with its categories

Semantic Values (frequency sorting)	Number of tokens	Frequency (%)
2E - scanning of an interval	61	17.38
4A - topic	58	16.52
5A - more	49	13.96
2B - above and beyond	32	9.12
5B - control	30	8.55
3A - full covering	25	7.12
2A - on the other side of	16	4.6
5A1 - above	18	5.13
3B - scattering	13	3.7
2C - completion	11	3.13
2D - transfer	10	2.85
5C - divider	8	2.28
6 - reflexive	6	1.71
4 - examining	4	1.15
6A - repetition	5	1.42
TOTAL	346	100,0

Chart 2: the distribution of the semantic values of *over*

What clearly appears in Chart 2 is that semantic values are not evenly distributed. Values 2.E (Scanning-of-an-interval, 61 occurrences, 17,38% of the total), 4.A (Topic, 58 occurrences, 16,52%) and 5.A (More, 49 occurrences, 13,96%) are by far the most representative cases. Semantic values related to a spatial meaning (5.A, On-the-other-side-of, 20 occurrences, 5,7%; 2.B, Above-and-beyond”, 32 occurrences, 9,12%) are in comparison not so much used in our corpus. Text genre might have an impact on this observation (abstract texts may entail more abstract semantic use of the word) but the BNC is made of different text genres; as a consequence the impact of the genre should be limited. This general observation shows that the spatial use of *over* whatever its syntactic status is not pervasive.

Now, if we have a closer look at the data (and we consider both Chart 1 and Chart 2), finer-grained regularities are to be observed. These regularities, or selectional preferences, show

that some patterns (be they lexical, syntactic or semantic) are to be found in the context of *over* and that these patterns can explain why a given semantic value is associated with the occurrence.

The most frequent tag is Scanning-of-an-interval (examples 2.E, 61 occurrences, 17.38%). When expressing this value, it is clear that *over* is a preposition and this preposition establishes a link between a process and (generally) a period of time:

(11) The process has evolved over the decade with the linking up of what used to be short runs into long, cross-country routes.

(12) Distinguish architecture matures over time

(13) progressive impoverishment of the flora and vegetation over thousands of years

This usage of the *over* is massive and regular. The range of nouns governed by *over* is rather restricted (*decade, time, thousands of year, past decade, lunch, Sabbath*).

The same observation may be made for Topic (4.A, 58 occurrences, 16.52%). Even if this usage of the word seems more abstract (because the noun appearing after *over* itself is abstract), *over* is here clearly a preposition establishing a link between a noun or a verb that expresses the idea of debating and the very topic of the debate.

(14) The Party's formative years were marked by controversy over its relations with the Labour Party, over its internal reorganization along "Bolshevik" lines, over its attitudes towards parliamentary democracy, but not significantly over its allegiance to the Communist International and the Soviet Union

(9)b Methodists' main concern was not so much the debate over collectivism v. individualism as over reunion of the various Methodist divisions

(15) Interest was also expressed over another site in the village, adjacent to the school

Regularities concerning the headword are also to be noted. The headword is most of the time related to the idea of debate, discussion or controversy. The idea of Control (5.B, 30 occurrences, 8.55%) reflects the same pattern: the headword itself expresses the idea of control, while the dependent noun expresses the entity under control, a country for instance in (16) and (17):

(16) In the fifth century, the Pauline orthodoxy of Rome was still attempting to impose its

hegemony over Egypt.

(17) B'nai B'rith International's decision-makers now seek total control over their empire.

Note that in this case the second noun may not be expressed, in which case *over* is categorized as a particle:

(18) In fact Leamington got a few things wrong, because they've now been taken over.

When *over* corresponds to More (5.A, 49 occurrences, 13.96%), it is generally followed by a quantitative expression (expressing quantity, distance, time, *etc.*):

(19) Chernobyl, the Soviet nuclear reactor which blew up in January 1987 caused nuclear traces to be recorded over 2000 miles away in the sheep of Scotland.

(20) The distance from his grandmother's house was just over a mile.

(21) The time between sleep onset and active sleep onset thus tends to be either very short indeed (less than ten minutes) or over fifty minutes.

As for 2.A (On-the-other-side-of, 20 occurrences, 5.7%) and 2.B (Above-and-beyond, 32 occurrences, 9.12%), they clearly emerge from the spatial relationship between two objects/surfaces associated with a verb of motion:

(22) Go over the bridge and turn right immediately onto a track leading into the trees.

(23) Wood arrived at the conclusion that the compass error they were experiencing was opposite to the error they had found coming south over the Timor Sea

(24) Lions jump over obstacles in their home territory or laze around under a favourite tree

Note that in some examples, when the dependent noun is not expressed, *over* is categorized as a particle expressing the manner of motion, as in the following pair:

(25) Why don't you come over?

(26) Not far from the citadel, should you choose to cross over to that less appealing side of Bayonne

The spatial relationship between a surface and an entity can also be observed with the Full-

covering (3.A, 25 occurrences, 7.12%) and Scattering (3.B, 13 occurrences, 3.7%) meanings. The verb found in the pattern is not a motion verb in that case:

(27) My eyes were open, just able to discern the tent staked out over me. (Full-covering)

(28) I was interested last year to see Tim Jonke's article and his method of spraying acrylic paint over oil paint. (Scattering)

The difference we make between 3.A and 3.B is relevant to the distinction of two situations of covering. In (27), the function of the tent is to cover (and protect) the people inside whereas what is important in (28) is that the acrylic paint is sprayed over the oil paint and not spread onto it (that it does not cover it completely). However, *over* can be categorized as a preposition in both cases. Here again, one can find frequent uses of *over* as a particle⁶ when it expresses Full Covering:

(10)b I do thank you for stopping and not running poor Nellie over. (“Full Covering”)

4. Toward a Dynamic Solution

Polysemy has been intensively studied in linguistics (Lyons 1977, Apresjan 1977), and even more in cognitive linguistics (Cuyckens and Zawada 2001, Nerlich et al. 2003, Ravin and Leacock 2000). The omnipresence of polysemy makes a purely bottom-up calculation of meaning along with a homonymic processing of polysemy totally unrealistic, both from a computational and cognitive point of view (the consequence of the polysemy approach being either a combinatorial explosion of meaning potentials or undecidability issues in the disambiguation process).

At the opposite, we advocate a non-homonymic treatment of polysemy and consequently a context-dependent specification of an abstract meaning shared by all the uses of a polysemic unit. This point of view is not new since we are putting ourselves in the line of famous ancestors, within the framework of cognitive grammar (Langacker 1987, Talmy 2000, etc), or in theories of enunciation (Ducrot 1984, Culioli 1990, 1995) and other semantic-based

⁶ Examples of *over* expressing Scattering and categorized as a particle were not found in our corpus.

theories (Cadiot, Visetti 2001, Visetti, Cadiot 2001, Ruhl 1989, Van der Gucht, Willems and De Cuypere 2007). The following quotation of Fauconnier (1997: 37-38) for instance is particularly illuminating:

A language expression does not have a meaning in itself; rather, it has a *meaning potential*, and it is only within a complete discourse and in context that meaning will be actually be produced. The unfolding of discourse brings into play complex cognitive constructions. They include the setting up of internally structured domains linked to each other by connectors; this is effected on the basis of linguistic, contextual and situational clues.

We assume that linguistic units are perceived dynamically. In this context, the Necker cube can provide an interesting analogy. The Necker cube is an ambiguous line drawing: each part of the picture is ambiguous by itself, yet the human visual system picks an interpretation of each part that makes the whole consistent (as a completion process). The same is true with human languages: each word of a sentence is ambiguous by itself but the human brain is able to dynamically chose a meaning that will make the whole sentence meaningful. Victorri and Fuchs (1996) call “gestalt compositionality” the calculation process that leads to the simultaneous attribution of a global meaning to an utterance and a particular meaning to each unit composing the utterance. Gestalt compositionality is a dynamic process implying a non-homonymic treatment of polysemy: each unit taken out of context is characterized by an instruction describing how the unit has to behave in context during the process of meaning construction (this model is detailed further down).

4.1. A Continuous Model of Meaning

So as to describe the meaning of *over* without rejecting its polysemy, we chose to ground our model on the description of meaning construction *during the unfolding of discourse*, as exposed in Col *et al.* 2012. As a matter of fact, cognitive psychology shows that the processing of a sentence has four major features: it is automatic, very quick, non conscious and irrepressible – it cannot be stopped.

«As a listener or a reader perceives an utterance, the information carried by it is processed and interpreted without any effort, and its meaning is constructed extremely rapidly without his being conscious of the words used in the utterance, or of the grammatical structure or of the style and even less of the way his mind has operated to understand.» (Le Ny 2005: 116; our

translation)⁷

Another fundamental feature of the process is that it is continuous, as Spivey 2007 shows it:

«real-time language comprehension takes place not just “incrementally,” as the field of sentence processing is fond of saying, but in a genuinely continuous fashion, without breaks, without stops and starts. As phonemes, words, and sentences flow into a listener’s ears, this stream of input is continuously processed into an evolving estimate of the communicative message and of plans for motor action.» (Spivey 2007: 172)

These features drive us to put forward a constructivist model, following Barsalou (Barsalou 1999, 2008, 2010) or Coulson (Coulson 2001, 2006). Barsalou puts forward the idea that cognition is *grounded* in multiple ways including simulation, «situated actions» as well as «bodily states». In the field of language and language comprehension, Barsalou highlights the central role of simulation:

«As people comprehend a text, they construct simulations to represent its perceptual, motor, and affective content. Simulations appear central to the representation of meaning.» (Barsalou 2008: 633)

In our own perspective, «information processing» corresponds to the construction of a series of representations that are continuously modified during processing. In order to truly account for the construction of meaning, what ought to be described is the continuous evolution of these representations, including what Coulson calls Frame Shifting, i.e. an «operation of semantic reanalysis process that reorganizes existing information into a new frame» (Coulson 2001: 34).

Consequently, our model is grounded on both the *perception* and the *comprehension* of meaning, and considers the construction of meaning as on-line information processing. What now needs to be specified is the kind of information actually processed.

⁷

This quotation describes the ideal situation, but we assume that there are frequent cases when a speaker or writer fails to put across the intended meaning of her utterance.

An Instruction-Based Model

We consider that the meaning of an utterance depends on the instructions given by the linguistic units of the utterance. An instruction is a “directive” associated with each linguistic unit that is used to guide the dynamic process of meaning construction. In the framework of cognitive science, several researchers have already used the term with a related meaning, see for example Barsalou 1999 or Fauconnier 1997:

«On parsing the sentences in a text, surface syntax provides instructions for building perceptual simulations» (Barsalou 1999: 52).

«the space building *instruction* associated with a particular grammatical construction are unique. [...] But the effect of such instructions may be widely different, depending on the configuration they operate on when they come into the discourse» (Fauconnier 1997: 65, underlined in the text)

Besides from being unique and producing various effects, the most typical feature of an instruction is its under-specification: it is not self-sufficient to provide the full meaning of a linguistic expression. Actually, an instruction gives a contribution that may bend the previous contribution and may in turn be bent by the instruction provided by the following linguistic expression. This process is dynamic and progressive since the meaning of an expression expands while discourse unfolds.

«a language expression entering the discourse at stage n constrains the construction of a new configuration, together with the previous configuration of stage n-1 and various pragmatic features.» (Fauconnier 1997: 38)

In our perspective (Col *et al* 2012), any linguistic unit provides an instruction, whether lexical or grammatical. We also consider that the instruction provided by a linguistic unit must be generic enough to ensure its compatibility with a large number of co-texts. There is only one instruction per linguistic unit and this instruction must remain independent of any particular context.

4.2. *The Instruction Given by Over*

To give a specific meaning to *over* taking into account both its apparent polysemy in context and the different categories it belongs to drives the linguist to put forward the *mechanisms* producing the various meanings rather than a single artificial meaning. We must avoid selecting one meaning associated with one particular category even if this meaning and this category are the most frequently used ones (and for instance consider *over* as a “spatial preposition”) or else we would run the risk to create two different units, a proposition on the one hand, and a particle on the other one. What should be central is the unique *meaning potential* associated with *over* and so its capacity to produce one meaning or another. This potential is actually «beyond», as it were, any categorization and polysemy. As a consequence, the instruction presented here is based on the three most frequent groups of meanings observed on corpus-data (scanning of an interval, excess and repetition, completion and transfer). This instruction could nonetheless display both general and under-specified features, and it may even sound insufficient insofar as it is in the interaction with the contextual elements convoked by *over* that the meaning of the unit will gradually and temporarily emerge and be staged. We then suggest to formulate the instruction given by *over* as follows:

OVER convokes a bounded domain and evokes a movement of covering of the domain, its bounds included.

The notions of ‘covering’, ‘domain’ and ‘bound’ are to be understood as topological, thus encompassing spatiality, temporality and more abstract meanings. Please note that this instruction does not reflect diachrony: we assume the point of view of a contemporary speaker who uses the word without any metalinguistic knowledge (or ‘epilinguistic’ knowledge, to refer to the kind of knowledge of a language a non linguist would have). We think that a unique instruction can explain the different usages of *over* in all kinds of contexts, as we will try to show in the following section.

4.3 *Application to the Different Usages of Over*

It is now necessary to detail how the underspecified schematic form we propose for *over* makes it possible to explain the different usages and meanings in context. It is thus necessary to show that the different meanings in context are due to the interaction between *over* and

other lexical units, and not to the sole meaning of *over* itself.

On-the-other-side-of (2.A)

Let us begin with an example where *over* has the meaning On-the-other-side-of :

(22) Go over the bridge and turn right immediately onto a track leading into the trees

The bounded domain construed in this example is a spatial one, as it is mostly always the case with the On-the-other-side-of meaning: the space under the bridge (a river or a road) is minimally delimited by both ends of the bridge itself. This first example, where *over* is used as a preposition, is rather obvious; *over* takes part to the spatial meaning of the sentence.

(29) Jenny rose lethargically from her bed and went over to the wash basin and began bathing her eyes.

In (29), the bounded domain is also a spatial one: the space between the bed and the wash basin. Thus, Jenny ‘covered’ the space delimited by the bed (one of the bounds) to reach the wash basin (the other bound). In both examples, *over* is used with a motion verb (*go*). But the domain does not need to be spatial, as in (30):

(30) The day Ruth walked out of this family — when she went over to the Roman Church — she cut herself off from us.

The bounded domain is actually delimited by two entities, *family* on the one hand and *Roman Church* on the other, which are not spatial but construed as the bounds of the domain anyway. The idea of conversion is indeed the product of the interaction between these lexical units and *over*. This example shows that the meaning of the sentence is distributed on more than one unit and at the same time that the instruction given by *over* is compatible with more metaphoric meanings.

In the first two examples (22 and 29), the bounded domain is a location (*i.e.* a physical object, a geographical entity) that describes a closed surface. In the third one (30), the domain is associated with a metaphor (conversion as a journey) and it is also construed as a space covered and eventually crossed. The covering process for 2.A means to go from one side of

this closed surface to the other, be they banks of a river or different religions.

Above and beyond (2.B)

As for 2.B, the bounded domain is generally physical or geographical but one of the bounds is not merely covered because the movement of covering of the domain goes further. Let us consider example (31):

(31) ‘That policewoman I was telling you about’, she exclaimed over her shoulder.

It is obvious that the sound of her voice will be heard even beyond the domain itself, *i.e.* her shoulder. Hence, the domain is fully covered, its bounds included. What is most interesting in this example is the notion of bound since it enables the idea of exceeding. Then, the following example, associated with a spatial domain, still construes The Above and Beyond meaning:

(32) "He could see over the tops of the trees of the demesne; over bog and river and plain to the distant Partry mountains."

In this example, ‘the tops of the trees’ as well as ‘bog and river and plain to the distant Partry mountains’ correspond to the bounded domain and the gaze covers the trees, up to the distant Partry mountains. But we also find examples where the domain is not spatial yet physical, as we saw in (31) and (32):

(33) Inside I am delirious, but then comes the bombshell: Ma turns to me and, shouting over the screams, says: ‘Let baby have your spoon, dear, there's a good boy.’

In (33), the domain is actually a quantity of noise delimited by a sound level. Once beyond this level, *i.e.* once the full domain covered up to its highest level, Ma can be heard.

Completion (2.C)

The Completion meaning is massively associated with a temporal dimension, thus in the following examples, the bounded domain is a period of time:

(34) By the time the summer was over, the predictions that Syria was about to release all the hostages had come to nothing and the issue was dead again.

(35) Her on-off romance with 27-year-old Rob Camilleti, who she met serving pizzas, is also definitely over.

In (34), the bounded domain is the summer and time has ‘covered’ all the duration of summer, and in (35), the bounded domain is the romance which has been lived through until it came to an end. More generally speaking, the bounded domain is a period of time and this period of time has been completely covered, i.e. the corresponding time has gone out.

Transfer (2.D)

Here again, *over* interacts with a specific environment, namely a limited group of verbs such as *hand*, *take*, or *turn*. Then, *over* is almost always a verb particle and the Transfer meaning is largely dependent on the meaning of the verb itself. These verbs specify the orientation of the covering movement, the domain being covered either ‘from one bound to the other one’ (*hand over*) or ‘toward one bound from the other one’ (*take over* or *turn over*). The domain may be spatial or even physical as in (36) or rather abstract as in (37):

(36) ‘Oh, do lend me your anorak, Seb dear’, Nutty said, and he nobly took it off and handed it over.

(37) In or before 1814 Augustus Applegath and his younger brother Joseph ran a printing establishment in Covent Garden, until 1815 when Augustus Applegath took over the printing firm of Cornish & Co. at Nelson Square, Peckham.

The domain in (36) is bounded by Seb and Nutty and in this case, it is a spatio-physical domain: the anorak fully ‘covers’ the space between the two persons, from one hand to the other. In (37), it is more abstract as it refers to the notion of power and control. The printing firm of Cornish & Co is controlled by new owners and the domain is a blend of time (the period bounded by ‘in or before 1814’ and 1815) and physical elements (previous owners and new owners). The firm goes from one owner to the other over a period of time.

Temporal (or Scanning of an interval) (2.E)

The Temporal meaning is close to the Completion one as regards the domain: it is indeed

temporal and corresponds to a period of time.

(11) The process has evolved over the decade with the linking up of what used to be short runs into long, cross-country routes.

(38) At least her show of independence may have avoided an intolerable sense of strain over lunch, in Sandringham's pale green dining room.

In (11), the bounded domain is the decade (the process has covered the whole decade and during that time, it has evolved) and in (38) the bounded domain is the time to have lunch. Even if the domain is generally temporal, we also encounter examples where it is spatial:

(39) If it is transported over long distances, it can be dangerous.

The domain is the distances covered by the product and its possible dangerous evolution during transportation. In the case of the Temporal meaning, the idea of 'covering' of the bounded domain is closer to the idea of 'scanning': the bounds themselves are not as important as the interval between them and they are not taken into account as it is the case with the Completion meaning. The period of time or the distances are covered but what is salient is the scanning itself, whereas in the case of the Completion meaning, the 'result' of the covering is essential.

Covering (3)

The specificity of this value is that the domain may be either fully covered or partially covered as we specified in the 3.2 section. Thus, we made a distinction between two different cases:

- Scattering in (10a):

(10a) ZEPPELINS of World War One by Wilbur Cross, tells of the little-known aerial battles that took place over England during the Great War, when Germany attempted to paralyse the British by dropping tons of bombs from a fleet of super-Zeppelins.

The battle took place over different parts/regions of England, but not all over the land itself.

- Full Covering in (10b):

(10b) ‘I do thank you for stopping and not running poor Nellie over.

Here, the pet could have been entirely “flattened out” by the car.

The bounded domain is then either England or a pet. The first example could be glossed by ‘the bounded domain is England and the battles took place somewhere in the partially covered domain’ and the second example could be glossed by ‘the bounded domain is a pet and the domain has not been fully covered’. The difference between them is the extension of the covering, but the domain in both cases is bounded, whether the bounds are reached and salient or not.

Topic (“Focus-of-Attention” in Tyler and Evan’s terms) (4)

Contrary to most of the meanings examined so far, the Topic/Focus of attention meaning is massively expressed by the same pattern : N_1 *over*_{prep} N_2 . N_1 is generally a ‘cognitive’ noun like nouns evoking speech (argument, debate, settlements *etc*) or thought (concern, confusion, position *etc*). The bounded domain is generally a topic for discussion and debate and correspond to N_2 . It may be bounded for different reasons. In the following example:

(40) Though Perkins, Stubbes, and Chamberlain hardly convey this, the controversy over dress was no less complex than the social shifts which provoked it.

It is bounded because the speakers cannot have a controversy about every dress of the world but about the idea of dress among other notions. In (41):

(41) As he released his anger, he felt his love for his ex-wife, and wept over their divorce.

The boundedness rather comes from the specificity of the divorce, i.e. *their* divorce. This last example is particularly interesting as 1) the pattern is different (V over N) and 2) we clearly notice that it is in the interaction with *weep* and *divorce* that *over* succeeds in giving the Topic meaning to the sentence. Still, *over* alone does not make the Topic meaning emerge; it needs the other lexical units to construe it, and particularly an ‘objects to weep over’. The interaction between *over* and the lexical units of (41) for instance, as well as its recurrence in regular pattern like N_1 *over*_{prep} N_2 facilitate the emergence of the Topic meaning. But it does not prevent other meanings to come out with some of the same units, like *weep* in (42):

(42) These children weep, will weep as long as they live. There are other children who have wept over the decades, have grown into adulthood in the midst of their tears. (GloWbE Corpus)

In (42), *over* makes a contribution to the emergence of the Temporal/Scanning meaning together with *the decades* and the more general context (enhancing the weeping of dead parents).

More (5.A)

The More meaning depends on a regular pattern like the previous meaning: *over* + quantity. This quantity is the bounded domain and its bounds are included since one of them is ‘exceeded’:

(43) Radio 1 is heard by an average audience of over seventeen million every week.

The bounded domain is *seventeen million* (people) and the sentence may be glossed as the following: the audience ‘covers’ seventeen million people. All our examples of More contain a quantity; the difference between this meaning and the Temporal one is to be found in the difference of category. The preposition *over* takes part to the temporal meaning, as in (11) and (38), whereas in (43) and the examples expressing the More meaning, it is the adverb *over*.

Control (5.B)

Most of the examples expressing this meaning contain nouns or verb belonging to the control semantic field: *control, victory, win, hegemony, right, power, influence, triumph* etc. The bounded domain is the controlled entity, as in:

(44) B'nai B'rith International's decision-makers now seek total control over their empire.

The bounded domain is ‘their empire’ and we could rephrase the sentence by: ‘B'nai B'rith International's decision-makers now want to have full coverage of their empire’. The

difference with the Transfer meaning is that in the case of the Control meaning, the mastering of the bounds is central, hence the bounds are salient, whereas in the Transfer meaning, the process of ‘transferring’ is central and salient.

Preference (5.C)

The Preference meaning requires at least two entities making up the set which is covered. One of them is selected, but the full domain is covered first.

(45a) Since 1961 (to be precise, since Selwyn Lloyd's ‘pay pause’ that summer) British people had given sustaining the economy the priority over foreign affairs among their concerns.

The bounded domain is the ‘concerns’ and one of the entities of the set is ‘preferred’. Most of the examples we encountered are taken from mathematical contexts, hence the Divider meaning that we suggest in 3.2.:

(45b) A hundred and seventy over eighty.

Reflexive (6)

As in the case of the Transfer meaning, *over* is most of the time a verb particle when it takes part to the construction of the Reflexive meaning.

(46) My stomach turned over as I watched the ball heading for the out-of-bounds, but to my relief it looked as though it had stayed in, even if it seemed in an awful spot.

The bounded domain in this sentence is ‘my stomach’ and to some extent, it ‘covers itself’ as it ‘turns over itself’. The following example describing a physical movement and not a state functions the same way:

(47) Yeah but even so, even so you could still fall over.

In (47), the bounded domain is the body which could fall headfirst. The domain would be

vertically covered, ‘from head to foot’ so to say.

Repetition (6.A)

This meaning is expressed by regular patterns such as *over and over* or *start over*.

(48) She wept and spoke at the same time — uttering fragments of sentences, half completed threats, pieces of swear words, repeating the name Richard over and over with the intonation of a child calling for its mother.

We could assume that the Repetition meaning comes from the repetition of *over* but in fact, it comes from the very verb *repeat*. The bounded domain is the process of repeating the name of Richard. But in the following example:

(49) Taking out of his pockets whatever might be in them — keys, pencil, purse, or pen-knife — and laying himself parallel with the edge of the hill, he actually descended turning himself over and over till he came to the bottom.”

the repetition meaning comes from the verb *turn himself* implying some circularity (of the body) and the repetition of the same motion. The bounded domain is the process *turn himself* and once its aspectual interval is fully covered, the covering movement is repeated. *Over and over* hence implies two coverings of the same domain. The repetition of *over* is in fact not necessary:

(50) The mechanical voice intoned, ‘The number you require is’ and he found he hadn't got a pen handy, nor anything to write on, and had to start all over again.

Here again, the whole process is repeated, hence the bounded domain (the process of calling) will have to be covered a second time.

4.4 Discussion: Relevance of the Instruction-Based Definition of Over

4.4.1. Spatiality

As we noticed in the previous part of this study, *over* expresses a large range of meanings, which cannot be accounted for by the prototypical values Across-Above only. Actually, this sense sometimes seems to be the least suitable one to describe *over*. As a preposition, *over* may of course evoke spatiality as in (51), which is the closest example to the Across-Above meaning:

(51) 200 walks organised by The Ramblers' Association to be held all over England, Scotland and Wales.

Yet the spatial meaning of *over* in (51) largely depends on the adverb *all* which is by the way the most frequent adverb connected with *over* as a preposition expressing spatiality in our corpus (50% of the combination <adv. + *over*>):

(52a) All over the country, and particularly in American libraries abroad run by the International Information Administration, intelligent men rushed to destroy books by 'suspect' authors, embracing among others Sherwood Anderson, W. H. Auden, Theodore Dreiser and Edmund Wilson.

(52b) He is an expert in grading wools that come from all over the world and blending together the many different types for yarn production.

It also closely depends on the noun *country* in (52a), which evokes in this example a spatial domain ('a nation' for instance would have evoked something more than spatiality). By definition, this domain is bounded and when it is convoked by *over*, together they give pride of place to the notion of covering. The same analysis could be made of (52b) even if the spatial domain evoked by "world" in this example is bigger. This domain is actually seen as bounded insofar as *all* enables a full vision of it, hence again a covering including the bounds of the domain.

When analysing corpus data, one can notice that the majority of the occurrences of the preposition *over*⁸ actually mirrors two meanings, which are either only partially spatial -- Scanning of an interval, as in (11) and (53) , or not spatial at all -- Topic in (54):

⁸ To be precise: 117 cases out of 228, so more than 50%. See 4.3.

(11) The process has evolved over the decade with the linking up of what used to be short runs into long, cross-country routes.

(53) But to be able to hunt successfully, males have to remain close together — sometimes, when hunting success is low, for many hours and over several kilometres, and so unusual tolerance of each other is called for.

(54) "The Party's formative years were marked by controversy over its relations with the Labour Party, over its internal reorganization along "Bolshevik" lines, over its attitudes towards parliamentary democracy, but not significantly over its allegiance to the Communist International and the Soviet Union."

As we explain in 3.2., it is the very nature of the noun governed by *over* which drives us to suggest the Scattering meaning. This noun massively refers to a period of time. The domain convoked by *over* is then more temporal than spatial. Furthermore, as (11) shows, the evolution of the process mentioned in the example is accomplished at the end of the period: the domain is then covered from one bound to the other. The notion of interval actually enables us to explain the meaning of *over* in (53) which is apparently spatial (thanks to *kilometres*) but which puts forward a notion of length rather than space, especially as it is in the neighbourhood of *for many hours*.

4.4.2 Covering and Boundedness

Over contributes to evoke the notion of Topic in many examples of our corpus. The instruction supplied by *over* in terms of covering of a bounded domain is again relevant. We actually chose the term 'covering' for at least two reasons. We are conscious that Covering is one of the meanings listed in Tyler and Evans 2003, but it is isolated in the semantic network and this is why we actually prefer giving the term 'covering' a usage that does not suit Tyler and Evans's. Besides, the notion conveyed by 'cover' implies some kind of multi-dimensionality.

The multi-dimensional aspect of the notion of covering actually includes the notion of focussing on a specific point as well as the notion of «surrounding» that we find in (41):

(41) As he released his anger, he felt his love for his ex-wife, and wept over their divorce.

In this example, the convoked domain has a temporal dimension because the process of getting divorced is accomplished (*cf. ex-wife*) and then comparable to a boundary. The meaning of Topic that (41) construes is then based on the fact that this domain is entirely covered in all its dimensions. The divorce is presented here in its interaction with *weep* and *over* and not from a legal point of view or from the financial one for instance. It is then presented as an entity compacting its different steps in a non-sequential way, in a global vision or «summary scanning» (Langacker 1987). To some extents, this domain could be reduced to a point and thanks to this discrete character, it encompasses its bounds.

In the formulation of the instruction supplied by *over*, the notion of boundedness is of capital importance. It accounts for various meanings such as the spatial or temporal ones, as well as the More, Control or Transfer ones thanks to the alternative between an open bounded domain and a closed bounded one. Thus, the notion of covering of a bounded domain gives also account of the meaning of More as we find in (55):

(55) Rescue workers had battled for over an hour to revive them.

As a matter of fact, we assume that the boundedness of the domain includes the possibility for the covering to extend beyond the very bounds. Examples (55) or (56), like the majority of the examples encountered in our corpus, convoke a quantified domain which contains intrinsic limits (from one to 60 minutes in (55), from one to 50 per cent of social workers in (56))⁹:

(56) Over 50 per cent of social workers gave the questions in all dimensions a rating of 4 or 5.

If we examine less frequent semantic values construed by *over*, notably when *over* is a particle or an adverb, the instruction given by the unit in the construction of the meaning of

⁹ Incidentally, we notice that the instrumental meaning put forward by Van der Gucht *et al.* ('positioning of X vis-à-vis a reference point Y which is inferior to X') does not provide a suitable explanation for such examples ; positioning remains a spatial notion absent from this context.

the utterance is still relevant. As a particle, the meaning associated with *over* is the idea of Transfer (2.D) in (57), or Completion (2.C) in (58):

(57) They will hand over to new operators at the end of this year, and are likely to sell their shareholdings in ITN.

(58) Her on-off romance with 27-year-old Rob Camilleti, who she met serving pizzas, is also definitely over.

In the case of Transfer, we saw that *over* is mainly combined with the verb *hand*, which is actually essential to this meaning. In this specific context, *hand* expresses the idea of change and then the notion of boundary is central. As for Completion, the idea of a topological interval fully covered from one bound to the other seems obvious. Once again, the nature of the phrase governed by *over* or the nature of the governing verb are of paramount importance; the context plays an essential role whatever the category of *over*.

4.4.3 Semantic Continuity

What consequently appears is the necessity to make allowance for both the variety of syntactic categories and the heterogeneity of meanings. The appeal to networks as in Lakoff (1987) or Tyler and Evans (2003) hardly promotes true continuity in the various meanings of *over* or in its different categories, especially as no real cues are given so as to calculate the distance between the meanings or the congruence between them and the exact usage of *over*. If we consider the following pair of examples:

(59) "Quickly they spread it out, and it became a sail; the boat flew over the waves, faster than the sea-people could follow. "

(60) When we were flying over Holland I did steel myself to look out and I remember seeing where miles of land had been submerged under sea water to keep the Germans out, and houses, trees and roads were still under water.

We notice that with the same verb, the difference of aspect (*flew* vs. *were flying*) brings a

slight difference of interpretation of the meaning of *over*. In the latter example, *over* expresses the Over-and-Above meaning (5.A.1) as the process is not accomplished, whereas (59) rather conveys the Above-and-Beyond meaning (2.B) as the process is finished. This simple comparison shows that the interpretation of *over* depends, in this particular case, on an aspectual difference only. More generally, this comparison enhances a true continuity of the meaning of this unit. In (59) and (60), the semantic difference between 5.A.1 and 2.B actually relies on grammar, but we may also assume that the nature of the phrase governed by *over* has consequences on the categorization of the very unit, and similarly on its semantic interpretation. Thus, (61) clearly expresses the idea of examination (4 or 4.A) and *over* is categorized as a particle:

(61) Now breathing, breathing in erm poisons, we'll go over this in more detail erm, there's so many things as we've already gone through that can cause us asphyxia, one of them's poison in itself isn't it?

Yet, in the following utterance:

(22) Go over the bridge and turn right immediately onto a track leading into the trees.

which contains the same verb *go*, *over* is clearly categorized as a preposition thanks to the noun clause *the bridge* referring itself to a spatial entity. As a consequence, *over* makes its contribution to the emergence of the spatial meaning of (22), *i.e.* On-The-Other-Side-Of (2.A). This example shows that the dynamic interaction between the unit (*over*) and its context -- the governed noun clause in (22) or similarly the aspectual markers in (59) / (60) -- are central in the interpretation of *over*, and more generally in the comprehension of the utterance. What appears through these observations is that the process of meaning construction is twofold as it comprises the categorization of *over* (as a preposition, adverb or particle) and the *simultaneous* emergence of a specific meaning. Consequently, what we need is a more regular and schematic meaning which presents two essential features: it should be corpus-based as we have already shown and it should be defined in a continuous semantic model.

Conclusion

The «story of *over*» is most of the time a spatial one, as the literature usually tends to show. As a consequence, the spatial meaning is generally the core meaning of a large semantic network whose aim is to show the polysemy of the unit. The starting point of our paper is actually the dissatisfaction arising from this kind of approach: the spatial meaning is unable to explain every meaning of *over*, even thanks to semantic extensions. Finer-grained analysis cannot actually cover every particular meaning and usage of the unit, especially as most of the time in the literature, *over* is studied as a preposition. Now if one considers a monosemic definition of the unit, the risk is to suggest a general meaning devoid of any kind of dynamicity or continuity, thus erasing what makes the semantic diversity possible.

What we propose here is a corpus-based study of the *unit over* considered in its different usages and categories (preposition, particle, adverb). Our purpose is not to suggest a finer range of meanings for *over*, but rather to describe a new theoretical framework so as to capture its *semantic dynamics* as well as its *categorial dynamics*. As the role of the context is central here, our compositional gestalt framework enables us to take into account the dynamic shifting from one meaning to another through an instructional definition of *over*.

What we intend to work on now is a systematic analysis of the largest number of grammatical units of the English language in the same continuous, dynamic framework. The purpose of this kind of analysis would be to compile the instructions given by these units in a repertoire which would be the first step of an «instructional grammar» of the English language.

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