

## Deducing collocations

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### Abstract

There is a certain consensus on some defining features of collocations (they are frequent, recurrent, conventional, institutionalized, etc.), but there is not much agreement on other characteristics, for example whether or not they constitute binary lexical relations, and, crucially, whether they are arbitrary, and must be stipulated, or should instead be deduced or inferred. I will argue that most collocations are not instances of binary relations, and also that these combinatorial associations are not memorized as individual pieces of lexical information. Collocates should not be stipulated or specified individually, since the appropriate bases for them constitute large paradigms which meet a number of restrictive semantic criteria. Speakers (whether native or not) who learn collocations have intuitive access to these abstract semantic features, which are proven to be recurrent throughout the grammar. Lexical functions in Meaning-Text Theory (MTT) could also be formulated taking these semantic groups as bases, instead of the specific keywords provided by their respective paradigms.

### Keywords

Collocations, explanatory and combinatorial lexicology, lexical functions, semantic compatibility.

## 1 Features of collocations

One of the first things that one learns about the field of collocations is the fact that there is a set of basic, defining features of these peculiar word combinations that is often repeated in the abundant literature of this topic. It seems to me that these features come in two groups: non-controversial features and controversial features. Non-controversial features of collocations do not seem to be very interesting, since they do not provide crucial information about them, but controversial features are quite useful, I believe, even if some of them are problematic, or simply wrong. The features that I consider to be non-controversial are the following:

NON-CONTROVERSIAL FEATURES OF COLLOCATIONS:

1. Recurrent
2. Frequent
3. Conventional
4. Institutionalized.

The fact that collocations are recurrent is a natural consequence of their being systematic. Since grammatical and lexical phenomena are expected to be recurrent, it seems to me that there is nothing special about 1. As for 2, frequency is, again, a consequence of systematicity. Even if one takes collocations to be more frequent than other expected combinations, we should evaluate expectation in order to understand this property.

We must also be aware of the fact that reasons for frequency are often extra-linguistic. Let me give a simple example of this. According to the *Collins Cobuild English Collocations on CD ROM* dictionary (CCEC), based on the *Bank of English Corpus*, the English nouns most frequently combined with the verb *protect* are *people, interests, order, rights* and *children*. I do not have any reason to question this statement, but notice that the relevant question is whether or not we should take it to be proper “linguistic information”. Certainly, frequency of word combinations (whether linguistically grounded or not) is a useful tool for automatic disambiguation and other tasks in natural language processing, but notice that those are technical applications of the basic data that we try to understand. The frequencies that the *Cobuild* dictionary provides for nouns combined with the verb *protect* hardly qualify as linguistic information, in a strict sense, for the fairly obvious reason that, from a linguistic point of view, you can protect anything. In fact, this information is more interesting for a sociologist than for a linguist: it is information about our customs or our habits. It tells us something about the frequency of some human actions, rather than the combinatorial properties of words.

We may admit 3 as well, but granting that conventional phenomena are part of many morphological or syntactic patterns, thus not a particular feature of collocations. As regards 4, another alleged feature of collocations, notice that the adjective *institutional* does not apply to linguistic phenomena (whether morphological, syntactic or lexical) in a straightforward manner. I do not mean that it is wrong, but rather that it is scarcely informative as a distinctive characteristic of collocations, as opposed to other linguistic patterns.

In this talk I would like to concentrate on the controversial features of collocations, which I take to be the following:

#### CONTROVERSIAL FEATURES OF COLLOCATIONS:

1. Salient
2. Binary
3. Arbitrary
4. Transparent.

We may admit that collocations are salient combinations, but saliency can be understood as a psychological concept or a statistical notion. In the first case, it must be evaluated in relation to 3 (in the same list), since saliency will then depend on the semantic classes in relation to which restricted combinations make sense. If saliency is interpreted as a mere statistical notion, it will take us back to frequency.

I believe it is important to stress the idea that collocations should not give us information about things people do often, but about the restrictive properties of lexical combinations within a linguistic system. The combinations with the verb *protect* that I just quoted from the *Cobuild* dictionary are, without any doubt, frequent, conventional, salient and even institutionalized, but —from a restrictive point of view— I do not think they are collocations. Since

the concept of ‘collocation’ is nowadays used for different purposes by different people in a number of different interpretations (often incompatible with each other), one should not avoid the controversial question whether or not attested, frequent combinations based on extra-linguistic information should be properly considered to be collocations. If I am not mistaken, most Meaning-Text Theory (MTT) practitioners would answer NO to this question. Although it would be fair to say that my work in the field of collocations and related matters in the grammar of Spanish (Bosque 2001a,b; 2004a,b) does not quite comply with some MTT principles, I completely agree with mainstream MTT on this issue.

As for controversial feature 2, my belief is that this feature is wrong if *binary* is interpreted as “associated with a lexical item in a one-to-one exclusive relationship”. The reason is the fact that collocates may be compatible with long paradigms of bases, an important point to which I will return shortly. Binarity would certainly be a feature of collocations in the trivial sense that a particular base is always related to some particular collocate in some particular text.

The feature *arbitrary* is also controversial, but it largely depends on the precise meaning of this term. Collocations are arbitrary if this adjective is interpreted in a Saussurean sense, but they are not if *arbitrary* is interpreted as “non-predictable”, since most collocations are not memorized individually, as I will argue. As for *transparency*, the final controversial feature, it is a matter of degree (as it is often acknowledged) whether or not this is a property of collocations. In the following pages I will try to argue for a positive answer to this question.

## 2 Collocates and paradigms of bases

I will assume the by now widely accepted distinction between *bases* and *collocates* (Hausmann 1984, 1989). As it is well-known, collocates are analyzed in MTT as values for keywords or bases of lexical functions (LFs) (Mel’čuk, 1996). Taking this for granted, I would like to emphasize some properties of collocates seldom stressed, and often hidden (or even rejected) in the vast literature on collocations:

- Most collocates are fully meaningful. The restrictive relation which holds between bases and collocates depends, to a large extent, on that property.
- Most collocates are related to bases which constitute semantic classes. These classes are recurrent throughout the grammar. If we analyze lexical functions as specific binary relations, we will miss a large number of generalizations.
- The features that allow us to build these classes are part of the native speaker’s knowledge of the language.

Here is an example. The piece of information encoded in a LF such as *Magn(increase) = substantially* belongs to a broader generalization, since the adverb *substantially* typically modifies verbs of change of state, more specifically so-called *gradual completion verbs* or *degree achievement predicates* (Declerck, 1979; Tenny, 1994; Bertinetto and Squartini, 1995; Levin and Rappaport, 1995; Kennedy and Levin, 2007, among many other studies). Here are the major lexical groups that we may distinguish:

1. Verb of increasing: *enhance, enlarge, exceed, expand, go up, grow, improve, increase, overshoot, progress, raise, upgrade, etc.*

2. Verbs of decreasing: *cut back, decline, degrade, diminish, discount, dwindle, fade, fall, lessen, limit, minimize, moderate, reduce, shrink, slow, tighten, weaken, etc.*
3. Verbs denoting the notion of change: *alter, amend, change, deviate, differ, diverge, fluctuate, modify, redefine, reformulate, revise, rewrite, transform, vary, etc.*
4. Comparative adverbs (*more, less*) and adjectives (*higher, lower, greater, older, bigger, etc.*).

To these groups we may add a few adjectives denoting (un)equality, such as *different, similar* or *identical*, and some other minor lexical classes to which I will return below. Notice that the verb *rewrite* appears in group 3, whereas the verb *write* does not belong to any of these paradigms. In fact, speaking of a chapter of some book, one could naturally say that it has to be “substantially rewritten”, but one would not say that it has to be “substantially written”. In the same vein, notice that two analyses can be “substantially identical”, but not “substantially interesting”, and, also, that some amount of money might be “substantially reduced or increased”, but not “substantially calculated or donated”. Since any speaker of English has an intuitive knowledge of these contrasts, and many other similar to them, it seems to me that the natural move would be to formulate LFs in a way that they involve the lexical classes sketched, or some variants of them, rather than specific lexical items. That is, instead of

Magn(*increase*) = *substantially*,

we would have something like

Magn(VERBS OF INCREASING) = *substantially*.

If, contrary to what it is commonly assumed, we formulate LFs relative to lexical groups or semantic features, rather than particular lexical items, we will not have to specify collocates as individually choices of hundreds, perhaps thousands, of bases. It is in this particular sense that a large number of collocations are DEDUCIBLE. I am using the verb *deduce* here as opposed to *postulate* or *stipulate*. I simply want to stress the fact that, if we stipulate collocations as binary, individual choices (avoiding semantic groups such as the ones above), they would represent a huge amount of specific, redundant and hardly learnable lexical information.

But we must admit that semantic generalizations are never easy, sometimes not even possible. In fact, it would be appropriate to distinguish between *deducible* and *non-deducible* collocations. The difference is somehow similar to Cowie’s (1983) distinction between *open* and *restrictive* collocations, but there is a terminological aspect of the latter distinction that seems unclear to me. Notice that, by opposing *open* collocations to *restrictive* collocations, we infer that the former are not restricted. But this is not correct: so-called *open collocations* are restricted as well, even if restrictions come from more abstract lexical or semantic features.

In *deducible collocations*, such as the example I just gave with the English adverb *substantially*, collocates are not individual choices for bases. On the contrary, bases form paradigms defined on semantic grounds, to which collocates are sensitive. This is, in fact, a standard characteristic of most predicate-argument relations.

We must also acknowledge the existence of *non-deducible collocations*. These form reduced (*i.e.* closed) paradigms of bases for each collocate, or rather no paradigm at all. They include

examples such as the English verb *bleat* (with *sheep* or *goat* as possible subjects), or perhaps VPs such as *pay someone's Ns to someone else*, where Ns stands for a reduced paradigm of nouns containing *respects*, *regards* and perhaps a few other. The Spanish VP *conciliar el sueño* ('get to sleep') is also a good example of this pattern, since this is not a VP idiom (as opposed to, say, *tomar el pelo* 'pull one's leg') but, even so, it does not give rise to a paradigm. In the case of the verb *fruncir* ('frown'), a very short one is obtained: *ceño*, *entrecejo*, *cejas* ('brows' the three of them, with minor differences).

Sometimes, paradigms of bases for a single collocate are rather short, but not necessarily closed. Note that an LF such as  $\text{LiquFunc}_0(\text{order}) = \text{countermmand}$  is straightforward, but it somehow misses the point that there is a paradigm of bases here (*order*, *command*, *request*, *instruction*, *sanction*, etc.). The existence of the paradigm can be simply thought as the natural consequence of the fact that *countermmand* has some meaning that we should grasp. The paradigm is not necessarily closed, since a person might countermand somebody else's execution or some other similar action.

Light verb constructions fall somehow in between deducible and non-deducible collocations, since they give rise to paradigms of bases with exceptions. Possible example include English *take a bath*, *take a shower*, *take a dip*, *take a plunge*, *take a swim*, etc., or Spanish *dar un paseo*, *dar una vuelta*, *dar un garbeo* (all three, 'take a walk'), *dar un rodeo* ('make a detour'), but not \**dar una excursión* ('go on an outing').

Not many scholars have emphasized the need to search for generalizations on collocates, but some of them have noticed the relevance of this way of looking at them. Outside MTT, I have in mind Aisenstadt (1979), Cowie (1979, 1981, 1983), Stubbs (1996, 2001) or Nesselhauf (2005). Cowie (1978, 1981) sometimes characterizes "collocational ranges of open collocations" on semantic grounds, as in *Run*: INSTITUTION, ORGANIZATION (*run a business*, *a theatre*, *a bus company*). In other occasions, he simply provides the relevant paradigm with no covering semantic label, as in Cowie (1981: 227):

Entertain: *idea*, *notion*, *suggestion*, *proposal*, *doubt*, *suspicion*, ...

By chance: *find*, *discover*, *notice*, *come across*, *meet*, *happen*, *come about*, ...

Inside MTT, I think that J. Apresjan is perhaps the scholar who has made that point in a most straightforward manner (Apresjan, 2009; Apresjan & Glovinskaja, 2007). For example, Apresjan & Glovinskaja (2007) present a series of proposals on the semantic grouping of bases for LFs. Their examples include the following:

*Commit* is preferred as the value of  $\text{Oper}_1$  from nouns denoting negatively evaluated acts: *commit aggression*, *a blunder*, *a crime*, *an error*, *murder*, *a sin*, *suicide*, *treachery*.

*Draw* is preferred as the value of  $\text{Oper}_1$  from nouns denoting a mental operation, especially various operations of comparison: *draw an analogy*, *a comparison*, *a distinction*, *a parallel* (vs. *draw a conclusion*).

*Enjoy* is preferred as the value of  $\text{Oper}_1$  from nouns denoting those social attributes of people which can be seen as privileges: *enjoy freedom*, *privileges*, *a good reputation*, *rights* (vs. *enjoy good health*).

*Experience*, and especially *feel*, often collocate with nouns denoting emotional states and attitudes: *experience grief, joy, pleasure* (vs. *experience need*); *feel fear, hatred, pity*.

Moreover, they show that different groups are possible for the same collocate. Here is one of their examples:

*Undergo* as a value of  $\text{Oper}_2$  is preferred with three groups of nouns:

- (a) Nouns denoting hostile actions or activities: *undergo criticism, an interrogation, punishment, torture*;
- (b) Nouns denoting various forms of inspection: *undergo censorship, a check-up, an examination, inspection, a test*;
- (c) Nouns denoting interference: *undergo an operation, reform, repair, surgery*, etc.

This is exactly the approach taken in the combinatory dictionary *REDES*, which I coordinated some years ago. This is a dictionary of Spanish in which the semantic groups that bases constitute are studied in detail for a large number of collocates (see also DeCesaris and Battaner, 2006, for an outline of its main lexicographic features). In the rest of this paper I will point out the major advantages of this approach to collocations, and also some problems and perspectives that this line of research gives rise to.

### 3 Some advantages of the deductive approach to collocations

#### 3.1 Learning

Paradigms of bases can be easily extended, as long as they fit the appropriate features. The speaker is not supposed to memorize long lists of verbs denoting ‘increasing’, ‘decreasing’, ‘change’, etc, in the case of the adverb *substantially*, or other lists of bases for similar collocations. These combinations are not memorized individually by native speakers, regardless of the obvious fact that computers may have quick access to those extensive paradigms in a trivial way.

#### 3.2 The relevance of the collocate’s meaning

Notice that the definition of the verb *read* seems to play no direct role in either the formulation of a LF such as  $\text{Real}_1(\text{book}) = \text{read}$  or the linguistic characterization of the possible nominal bases for  $\text{Real}_1(\text{Noun}) = \text{read}$ . But the meaning of collocates (either as defined by dictionaries or in a different format) is an important piece of evidence in the analysis of collocations.

If one accepts the reasonable assumption that a LF such as  $\text{Real}_1(\text{prediction}) = \text{corroborate}$  is not a specific piece of lexical information that the learner has to memorize, two natural questions will arise: (i) whether or not the possible nominal bases in the LF  $\text{Real}_1(\text{Noun}) = \text{corroborate}$  have something in common; and (ii) whether or not the definition of the verb *corroborate* (“to strengthen, support or confirm something with additional evidence”) plays any role in the task or restricting this nominal paradigm. I believe that the answer to both ques-

tions in affirmative. Here is a tentative classification of the possible nominal bases for the verb *corroborate*:

1. NOUNS DENOTING PROPOSED EXPLANATIONS: *account, analysis, calculation, claim, diagnosis, hypothesis, interpretation, theory, version, view, ...*
2. NOUNS DENOTING RESULTS GENERALLY OBTAINED FROM INQUIRY OR RESEARCH: *conclusion, confession, evidence, finding, observation, report, result, testimony, ...*
3. NOUNS DENOTING RESULTS OF SUPPOSING OR EXPECTING SOME INFORMATION: *rumor, supposition, suspicion, ...*
4. NOUNS DENOTING OTHER PIECES OF INFORMATION: *information, data, story, words, statement, detail, ...*

These nominal bases give rise to about 50 collocations, perhaps some more. Again, it is very unlikely that speakers of English, where native or not, learn them by heart on individual basis.

The relevance of the collocate's definition in the task of restricting its possible bases is easily confirmed by simple LFs such as *Magn(seal) = hermetically*, where *hermetically* approximately means "in a way that air cannot escape or entry", or even *Magn(increase) = substantially*, since a standard definition of the adverb *substantially* is "to a great extent or degree". In fact, processes of change of state and other so-called *gradual completion verbs* nicely fit in the paradigm suggested by this simple definition (Kennedy and Levin, 2007). Many other similar examples could be added here.

We may now wonder about the precise way in which these lexical classes are related to the collocate's definition. This is a very relevant question which we could not raise in the *REDES* project. On theoretical grounds, one should expect that the lexical features involved in the semantic groups in which bases are gathered are also present in the description of the collocate's meaning. If this could be proved for a significant number of collocations, it would certainly be a most welcome result.

### 3.3 Deriving the information provided by dictionaries of collocations

This advantage of the deductive approach is not a minor one. A large part of the information found in dictionaries of collocations (BBI, OCD, MCD, etc.) could be automatically obtained if entries of collocates were based on semantic classes. This is exactly what we did in the combinatory dictionary *REDES*, which, as I have pointed out, was conceived as a dictionary of collocates, rather than a dictionary of bases. In fact, entries for bases in this dictionary are interpreted as simple indexes which reverse the semantic information considered to be central: the one provided in entries for collocates. Notice that the latter is precisely the kind of information that a computer program could never obtain by itself.

To build up entries for bases, we developed a rather simple system of superscripts which sends the user to the specific point of the correspondent collocate entries. For example, the entry for *victoria* 'victory' (a base) contains adjectives and verbs such as these:

*abrumador*<sup>17</sup>, *abultado*<sup>25</sup>, *a domicilio*<sup>21</sup>, *agridulce*<sup>8</sup>, etc. (many other follow in alphabetical order).

*abocar(se)(a)*<sup>43</sup>, *acariciar*<sup>2</sup>, *aderezar*<sup>4</sup>, *aguar(se)*<sup>30</sup>, *airear*<sup>42</sup>, etc. (many other follow in alphabetical order).

More generally, entries for most nouns in *REDES* (quantificational nouns are not included because they are collocates) are just indexes of the core restrictive semantic information provided in entries for collocates. This information is organized in lexical classes, roughly as in the examples above. I will return to this point below.

It is hard to avoid “the issue of direction” as applied to lexical selection; that is, the question of whether bases select for collocates or the other way around. Although I have discussed this issue somewhere else (Bosque 2004b), it may be worth pointing out here that this is just a terminological problem: the term *selection* may be used with an intentional interpretation, but also in a somehow more standard and technical non-intentional reading. In the former case, it is the speaker who deliberately chooses some lexical item to suit some particular linguistic need (for example, expressing the notion of coming into existence as applied to some abstract entity). In the latter case, a predicate selects for its arguments and, by doing so, it restricts the paradigm of its possible complements. In this interpretation, the notion of intentionality does not play any role, as standardly assumed.

Notice that, if the distinction is made, collocates turn out to be natural candidates for entries in a combinatory dictionary, since it is predicates that restrict arguments, rather than the other way around. Needless to say, the information provided in entries for bases in standard dictionaries of collocations may not be primitive, as I have tried to explain, but it is quite useful for learners and other users. The very fact that this information “follows from something else” does not have to be interesting or intriguing for common users, much less worrying. My point is simply that perhaps it should be for lexicologists.

### 3.4 Literal interpretations vs. figurative senses

By focusing the meaning of collocates we may show, in a very explicit form, the transition from their literal interpretation to more abstract or figurative senses. It has been repeatedly pointed out in most cognitive approaches to linguistics, but also in other frameworks,<sup>1</sup> that these extensions provide an important piece of linguistic information for both native and non-native speakers. If we consider simple pairs such as the following:

*relish the tomato / relish the victory; sugar dissolves / problems dissolve; disguise a child / disguise the truth; block access / block negotiation; straighten a tie / straighten a problem,*

we may realize that the meaning of the verbs involved does not necessarily change depending on whether their nominal argument denotes some physical entity or a more abstract notion. I realize that these are long-discussed and much controversial matters in the fields of lexicography and lexicology. Even so, their relevance for the analysis of collocations is quite evident,

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<sup>1</sup> The number of references here is too large to cite. I will simply point out a few of them (namely, Glucksberg, 2001; Fauconnier & Turner, 2002; Vega Moreno, 2007) and refer to the journal *Metaphor and Symbol* (<http://www.tandf.co.uk/journals/titles/1092-6488.asp>), being published from 1986.

since the meaning of many LF values may keep constant (at least in the consciousness of speakers) when bases become abstract. Certainly, this property cannot be extended to all bases, and it is also subject to large cross-linguistic variation. Interestingly, the observation that paradigms of bases and collocates are much more restricted in their abstract, non-literal interpretations is found in early studies of collocations. Here is a clear example:

“Whereas [...] *explote* and *bomb* exhibit openness of collocability in relation to each other, *explode* in its figurative sense has a very limited collocational range: *myth*, *belief*, *idea*, *notion*, *theory*” (Cowie, 1981: 226).

As a matter of fact, this property of figurative interpretations, as regards “collocational ranges”, holds generally. Consider the following LF in Spanish: Oper<sub>1</sub>(*crisis*) = *atravesar*. The Spanish verb *atravesar* (‘cross, go through’) admits any direct object denoting a physical object or a place, but it is very restricted in its figurative interpretation. In this reading, it typically combines with nouns denoting situations of adversity: *crisis* ‘crisis’, *problema* ‘problem’, *dificultad* ‘difficulty’, *bache* ‘bad time’, *depresión* ‘depression’, *vaivén* ‘change of fortune, up and down’, and a few other similar nouns belonging to a paradigm described in detail in the dictionary *REDES*. Again, it is rather unlikely that the Spanish verb *atravesar* in *atravesar el desierto* (‘go through the desert’) has a meaning different to that of the same verb in *atravesar una depresión* (‘go through a depression’).

This aspect of the analysis of collocations is clearly related to the one discussed in 3.2. The LFs in the second column of the following table may be correctly formulated, but notice that it is almost impossible to relate the information displayed in the other columns without taking into account the speaker’s knowledge of the collocate’s meaning. We should also bear in mind the fact that abstract bases provide very restrictive paradigms in these cases, unquestionably related to the literal, physical or non-figurative meaning of the LF’s values:

| Collocate                                   | Lexical function       | Bases for the literal, physical or non-figurative interpretations of the LF’s value | Bases for the abstract or figurative interpretations of the LF’s value     |
|---------------------------------------------|------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <i>torcerse</i> ‘bend, twist, go wrong’     | AntiFact <sub>0</sub>  | <i>tobillo</i> ‘ankle’, <i>árbol</i> ‘tree’, <i>cable</i> ‘cable’                   | <i>plan</i> ‘plan’, <i>proyecto</i> ‘project’, <i>previsión</i> ‘forecast’ |
| <i>canalizar</i> ‘canalize, channel, carry’ | CausFact <sub>0</sub>  | <i>agua</i> ‘water’, <i>río</i> ‘river’                                             | <i>ayuda</i> ‘help’, <i>sentimiento</i> ‘feeling’                          |
| <i>disolverse</i> ‘dissolve’                | FinFunc <sub>0</sub>   | <i>azúcar</i> ‘sugar’, <i>polvo</i> ‘dust’                                          | <i>pacto</i> ‘pact’, <i>matrimonio</i> ‘marriage’                          |
| <i>cosechar</i> ‘harvest, win, achieve’     | Mult+Oper <sub>1</sub> | <i>trigo</i> ‘wheat’, <i>uva</i> ‘grape’                                            | <i>triunfo</i> ‘victory’, <i>beneficios</i> ‘profits’                      |
| <i>atravesar</i> ‘go through’               | Oper <sub>1</sub>      | <i>desierto</i> ‘desert’, <i>muro</i> ‘wall’                                        | <i>crisis</i> ‘crisis’, <i>depresión</i> ‘depression’                      |

### 3.5 Lexical classes are recurrent

This is an important property of collocations. Since the lexical classes to which bases pertain are recurrent, reference to these semantic groups makes it unnecessary to multiply LFs for each member of the paradigm. For example, the following verbs of influence in Spanish

*afectar* ‘affect’, *condicionar* ‘condition’, *gravitar* ‘gravitate’, *incidir* ‘have an effect’, *influnciar* ‘influence’, *influir* ‘influence’, *marcar* ‘mark, determine’, *pesar* ‘weigh, carry weigh’, *repercutir* ‘affect, have repercussions’,

are appropriate bases for the following adverbial collocates:

*considerablemente* ‘considerably’, *decisivamente* ‘decisively’, *favorablemente* ‘favourably’, *inevitavelmente* ‘inevitably’, *irremediabilmente* ‘irremediably’, etc.

Certainly, we may find cases in which not all the members of a semantic paradigm of bases are entirely natural when combined with a particular collocate. The irregular combinations must be specifically marked in those cases, but the number of possible exceptions is insignificant as compared to the cost of the opposite option, that is, the task of specifying the full list of members of each semantic paradigm, instead of the appropriate semantic covering label.

In order to relate bases, collocates and the semantic notions connecting them, we used letters and numbers in *REDES*, since the dictionary is printed, and it is not available on line for the moment. Here is a fragment of an adverbial collocate entry:

**decisivamente** *adv.* ■ Se combina con...

**A** VERBOS QUE DESIGNAN LA ACCIÓN DE TOMAR PARTE EN UNA ACTIVIDAD, MUY FRECUENTEMENTE UNA TAREA COMÚN A VARIAS PERSONAS: **1** *contribuir* ++: Secuestros en Colombia de 1995 y 1996, en la solución de las cuales Mauss contribuyó *decisivamente*. SEM210197 **2** *co-laborar* ++: ...es un especialista en biomecánica de apoyos y hace algunos meses colaboró *decisivamente* en la recuperación del tenista... LVE120296 **3** *intervenir* ++: En las consecuencias finales de la movida monetaria inter-vendrán *decisivamente* muchos otros factores. LVE220495 **4** *participar* ++: ...en más de una ocasión ha participado *decisivamente* en desvelar casos que han estremecido a lectores y televidentes. CAP080198 **5** *cooperar*: ...la guerra de las galaxias puede enjuiciarse como un farol que coo-peró *decisivamente* a que la URSS arrojara la toalla. LVE290996 **6** *coadyuvar*: Pero este viaje real ha coadyu-vado *decisivamente* a obtener resultados favorables para la economía española. LVE241096 **7** *tomar parte*: ...una larga y enconada polémica en la que tomó parte *decisivamente* a lo largo de varios meses. INDOC **8** *sumarse*:

*decisiva* por dar un nuevo paso. EPE191199 **25** *incentivar*: ...con ella se incentiva *decisivamente* a las pequeñas y medianas empresas... EME031296

**D** VERBOS QUE DENOTAN CAMBIO DE ESTADO O MODIFICACIÓN DE ALGO: **26** *cambiar* +: A veces, son viejos recortes los que cambian *decisivamente* la marcha de la trama. EME090494 **27** *alterar* +: ...en puridad analítica po-drían estar casi un 10 por encima sin que la situación económica se alterase *decisivamente*. EME060294 **28** *modi-ficar*: ...esquemas formales legados por la tradición es-colástica, a los que modifican *decisivamente* la inventiva y pragmatismo de Chávez. PME210796 **29** *variar*: ...confi-dencias que nacen en el verano de 1991 y que hacen variar *de forma decisiva* la posición de Bono ante Gue-rra. EME200294

**E** VERBOS QUE DENOTAN AUMENTO O DESARROLLO. TAMBIÉN CON OTROS QUE DENOTAN MEJORA, PROGRE-SO O INCREMENTO DE ALGUNA MAGNITUD: **30** *ampliar*: Todos estos funestos episodios han sido descubiertos o ampliados *de modo decisivo* por El Mundo. EME031295 **31**

A series of semantic groups are displayed for each collocate. The bases exemplifying these groups contain marks of frequency (+, ++). They are followed by examples taken by a large press corpus. Literary sources were disregarded, since percentages of non-representative samples were proven to increase in significant ways in combinations extracted from literary texts.

Group B of this entry refers to verbs on influence (a fragment of this part of the entry follows). Notice that combination number 12 corresponds to the verb *afectar* ‘affect’:

**B VERBOS QUE DENOTAN INFLUENCIA O REPERCUSIÓN:**

**10 influir** ++: Mitterrand tiró el anillo al Sena y aquella ruptura debió influir *decisivamente* en su personalidad. EME090196 **11 pesar** ++: El otro elemento que pesó *decisivamente* en el éxito aliado es que los alemanes nunca sospecharon seriamente de su máquina de cifrar. EME260295 **12 afectar** ++: Hay otros factores, como las incertidumbres o el mercado de trabajo, que afectan *decisivamente* al cambio de actitud de las familias... LVE241095 **13 marcar** ++: ...llegando a pasar por todas sus categorías en los doce años que marcaron *decisivamente* su carrera deportiva. ENH010201 **14 incidir** +: ...su mayor producción no incide *decisivamente* en un mejoramiento económico para él, sino para el intermediario. LHG300497 **15 condicionar** +: ...son la raíz profunda del deterioro académico y condicionan *decisivamente* cualquier reforma. PME221296 **16 influenciar**: ...el no poder responsabilizar por la acción a un Gobierno que no puede influenciar *de manera decisiva*. EPE170977 **17 repercutir**: ...las próximas semanas repercutirán *decisivamente* en la brillantez de la conclusión de su carrera profesional. EME130296 **18 gravitar** —: La percepción de un mundo aún conflictuado, incierto e inseguro (...) sobre el que los Estados Unidos de América gravitan *decisivamente*...

LNA080792

This piece of information is retrieved by the program, which displays the entry of the verbal base *afectar*:

**afectar** ♦ claramente, considerablemente<sup>78</sup>, de cerca<sup>37</sup>, decisivamente<sup>12</sup>, de lleno, de pleno<sup>25</sup>, desfavorablemente<sup>2</sup>, directamente, especialmente, favorablemente<sup>11</sup>, físicamente, fuertemente<sup>24</sup>, gravemente<sup>24</sup>, indefectiblemente<sup>19</sup>, indirectamente, inmediatamente, intensamente, levemente, negativamente<sup>1</sup>, notablemente<sup>2</sup>, ostensiblemente<sup>21</sup>, parcialmente, pasajeralemente, peligrosamente<sup>41</sup>, personalmente, poderosamente<sup>6</sup>, positivamente, profundamente<sup>74</sup>, proporcionalmente, psicológicamente, relativamente, sensiblemente, seriamente<sup>2</sup>, severamente<sup>35</sup>, significativamente, sustancialmente<sup>45</sup>, tangencialmente, temporalmente, visiblemente

□ Véase también: incidir, influir.

Non-numbered collocates in base entries were added manually, since the number of collocate entries in *REDES* is limited. Finally, the notion of influence, which corresponds to class B in this example, can also be targeted:

#### INFLUENCIA

♦ (SUSTANTIVOS) Véase: *abrumador<sup>I</sup>, acatar<sup>I</sup>, acusado<sup>I</sup>, acusar<sup>H</sup>, apreciable<sup>F</sup>, atemperar<sup>H</sup>, crucial<sup>E</sup>, decisivo<sup>H</sup>, decrecer<sup>E</sup>, deducir<sup>C</sup>, desmedido<sup>I</sup>, determinante<sup>C</sup>, dominante<sup>B</sup>, emanar<sup>E</sup>, fecundo<sup>I</sup>, imborrable<sup>C</sup>, insignificante<sup>B</sup>, magnificar<sup>B</sup>, ostensible<sup>G</sup>, palpable<sup>B</sup>, preponderante<sup>B</sup>, profundo<sup>F</sup>, rendirse (a/ante)<sup>B</sup>, sacudir(se)<sup>E</sup>, sobreponerse (a)<sup>B</sup>, sopesar<sup>D</sup>, sustraer(se) (de/a)<sup>A</sup>, tangencial<sup>H</sup>*

♦ (VERBOS) Véase: *considerablemente<sup>I</sup>, cordialmente<sup>E</sup>, decisivamente<sup>B</sup>, desfavorablemente<sup>A</sup>, drásticamente<sup>H</sup>, encarecidamente<sup>B</sup>, enérgicamente<sup>F</sup>, en mucho<sup>E</sup>, favorablemente<sup>C</sup>, fuertemente<sup>E</sup>, gravemente<sup>D</sup>, indefectiblemente<sup>F</sup>, inevitablemente<sup>E,I</sup>, inexorablemente<sup>C</sup>, irremediablemente<sup>G</sup>, ligeramente<sup>F</sup>, maliciosamente<sup>F</sup>, negativamente<sup>A</sup>, notablemente<sup>A</sup>, ostensiblemente<sup>C</sup>, peligrosamente<sup>H</sup>, plenamente<sup>G</sup>, poderosamente<sup>A</sup>, profundamente<sup>I</sup>, severamente<sup>F</sup>, sustancialmente<sup>E</sup>, trágicamente<sup>D</sup>, vagamente<sup>D</sup>*

□ Véase también: ATRACCIÓN.

The information highlighted in the entry *INFLUENCIA* tells the user that in group B of the entry for the collocate *decisivamente*, he or she will find a paradigm of verbs of influence. Similar paradigms of verbs or nouns will be found for each reference in the list.

As can be seen, collocates are the focus of the lexical analysis in *REDES*. The semantic information provided in these entries is retrieved by a program in various ways, and presented to the user in the form of indexes.

### 3.6 Standard cases of semantic restrictions

Not much profit is taken in the literature on collocations from the well-known fact that predicates restrict the paradigms of their possible arguments. We may remember that the relevant semantic generalizations on predicate-argument traditional restrictions are often grounded in aspectual notions: verbs such as *witness*, *take place* or *recount* involve events; prepositions such as *during* take NPs denoting temporal units and also events, although perhaps not the same events that are possible in the complement of *on the occasion of* and other complex prepositions. On the other hand, a large number of well-known non-aspectual restrictions hold for verbs such as *play*, *wear*, *breath*, *nick* or *rescind*, to mention just a few, or adjectives such as *drastic*, *irrefutable*, *withering*, *effusive* or *crowded*.

Since most manner adverbs are predicates of events, parallel restrictions are expected for them on similar grounds: *overwhelmingly*, *impeccably*, *hectically*, *arduously*, *hermetically*, and many more. In fact, the attempt that I just made to provide possible bases for the adverbial collocate *substantially* was not different from the task of restricting the paradigm of possible

events selected by this predicate. This natural relation can be easily established if collocates are considered targets of research in themselves, rather than blind results of particular LFs.

### 3.7 Collocations vs. free word combinations

The deductive approach helps us to understand why the traditional opposition between collocations and free combinations is gradual. As a matter of fact, many of the so-called *free word combinations* are subject to abstract semantic restrictions which prove them not to be as free as they might look like. I have in mind expressions such as *Time flows*, or VPs such as *tell the truth*; *know English*; *close a door*; *supervise some work* or *win a match*. From a grammatical point of view, a verb restricts the paradigm of its possible objects in all these cases on the basis of some semantic features, but from a lexicographic point of view it is not absolutely clear how to tell whether or not these are collocations.

I must confess that I have always had more troubles than some of my colleagues telling apart collocations from free word combinations. If *write carefully* were a “free combination”, as it is supposed to be, there would be nothing peculiar or strange in VPs such as *take a walk to the beach carefully*, *laugh carefully*, *imagine something carefully*, *kill someone carefully*, and many other VPs involving actions. I do not intend to describe the relevant generalization to be made on the grammatical properties of the adverb *carefully* (as it is obvious, a feature such as “action” would not do the work<sup>2</sup>), but simply point out that even the simplest candidates for “free word combinations” turn out to be part of restrictive semantic or pragmatic relations that we cannot hide or disregard. I am simply trying to emphasize that the problem with the standard term *free combination* is the exact meaning of the adjective *free* in this expression.

It is important to bear in mind that the existence of aspectual restrictions (i.e. based on the classes of *Aktionsarten*) on arguments by the predicates selecting for them—as opposed to restrictions based on other, more specific, semantic features—does not by any means imply that the sequences obtained stand for “free combinations”. For example, the adverb *indefinitely* typically modifies either unbounded predicates (*continue*, *follow*, *hold*, *keep*, *occupy*, *persist*, *prevail*, *repeat*, *retain*, *seek*, *sustain*, *talk*, *wait*, etc.) or bounded predicates giving rise to resultative interpretations, and more frequently those which refer to the action of putting an end to something (*cancel*, *close*, *defer*, *delay*, *detain*, *isolate*, *open*, *postpone*, *put off*, *shut*, *suspend*, etc.). These restrictions are aspectual, rather than properly lexical, but it would be absurd to sustain that VPs containing this adverb are examples of “free word combinations”.

The conclusion is straightforward. Many adverbs are predicates of events and turn out to be restricted on lexical or aspectual grounds. They do not seem to be collocates, but they do not give rise to free combinations either. In these and many other similar cases, the lexicographer might be happy to know that he or she is not facing a collocation, but the grammarian will be aware that, even so, there is likely to be some restriction to be accounted for. If, on the contrary, the lexicographer decides that he or she is meeting a collocation in some particular case,

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<sup>2</sup> Lakoff (1973) is a classical piece as regards the various ways in which manner adverbs are lexically or pragmatically restricted.

the grammarian will equally reach the conclusion that there is some semantic restriction to formulate or some paradigm to characterize.

## 4 Some challenges of the deductive approach

### 4.1 The problem of relating semantic classes

Given a series of groups of bases for each collocate, a natural question arises: How are the several classes compatible with each collocate to be related to each other? At least two options present themselves:

1) *Attempt unification*. I have not been able to unify semantic classes (A, B, C...) in a single one for each collocate in most entries in *REDES*, but the attempt to reach unification to a certain extent is a quite reasonable enterprise. Moreover, this partial unification could provide crucial information for the task, by no means simple, of gathering verbs in semantic classes. Let me present an example of this. Here are two of the several lexical groups obtained for verbs which may be modified by the adverb *deeply*:

- *Breath, bury, delve, dig, embed, enmesh, fall, immerse, inhale, root, sigh, sink, ...*
- *Analyze, examine, inquire, investigate, research, scrutinize, study, ...*

Interestingly, verbs such as *penetrate* clearly belong to these two groups. It seems that unification will be a rather natural option here. It would tell us that *study, investigate* or *inquire* are interpreted linguistically as verbs denoting “movement towards the interior of something”. This is a welcome result for a paradigm of verbs which do not seem to fit in other, more open, semantic classes, such as perception, communication, knowledge, etc.

I would like to emphasize the idea that focusing the meaning of collocates may lead us to a better understanding of the semantic classes to which bases objectively belong. In fact, the comparison of collocates is of great help in the task of classifying predicates. In *REDES* it is shown that the Spanish verb *leer* (‘read’) belongs to three different verb classes:

1. VERBS OF SPEECH: *leer en voz alta* ‘aloud’, *leer de carrerilla* ‘non-stop’, ‘in one go’, *leer atropelladamente* ‘in a rushed way’.
2. VERBS OF PERCEPTION: *leer de refilón* ‘slantingly’, *leer entre líneas* ‘between the lines’, *leer por encima* ‘leaf through, skim through’, *leer de cerca* ‘closely’.
3. VERBS OF CONSUMPTION: *leer ávidamente* ‘eagerly, avidly’, *leer con fruición* ‘with relish’, *leer vorazmente* ‘voraciously’, *leer compulsivamente* ‘compulsively’.

Incidentally, no dictionary of Spanish seems to care about the third of these interpretations, a fact that might be of interest to lexicographers. Similar conclusions can be reached after a detailed comparison of similar collocates combining with other bases, whether verbal or not.

2) *Avoid unification*. Since it is not clear that lexical groups can always be unified, maybe they should be kept apart in some cases. For example, most verbal bases for the English adverb *substantially* denote changes of state, as we saw, but this semantic class does not seem to em-

brace verbs such as *aid*, *benefit*, *contribute*, *facilitate*, *help*, *support* and other similar to these, which may be modified by this adverb.

The policy of the dictionary *REDES* as regards this point was to keep lexical groups apart and hope that subsequent research will help us to reduce or integrate them. In more general terms, unification of lexical classes is always a tenable option, up to the point that the classes to be unified are not shown to play an independent role in other collocations. Again, this is an empirical issue, rather than a theoretical one.

## 4.2 Semantic vs. pragmatic paradigms

Any close scrutiny of the lexical paradigms that bases of collocations give rise to will reach the conclusion that the relevant information cannot always be formulated on semantic grounds. This is not a common situation, but it is attested in a number of cases.

Let us take some LFs such as  $\text{Oper}_2(\text{challenge}) = \text{face}$  or  $\text{Real}_1(\text{challenge}) = \text{face}$ . One might consider the issue whether or not one of them is more properly formulated than the other according to MTT principles, but I am more interested in another question, namely this: “What are the proper generalizations for nominal bases here”? We might try to isolate a group of nouns denoting situations of uncertainty (*challenge*, *choice*, *danger*, *dilemma*, *quandary*, *question*, *uncertainty*, ...), another group of nouns denoting obstacles (*barrier*, *difficulty*, *hurdle*, *obstacle*, ...), and perhaps a third one with nouns referring to nouns denoting situations of adversity (*death*, *catastrophe*, *loss*, *discrimination*, *drought*, *illness*, *punishment*, *pressure*, *prison*, *threat*, *violence*, ...). These groups cover a large part of the possible nominal paradigm of bases that we might consider to be appropriate here, but this is not sufficient. The reason is, simply, that we can face the truth, face the world, face reality, face life or face the consequences of some action, and these nouns do not belong to a semantic paradigm. That is, the noun *barrier* intrinsically denotes an obstacle, but the noun *world* does not belong to a semantic paradigm of nouns denoting situations of difficulty or adversity.<sup>3</sup>

The solution that we gave to this problem in the project *REDES* was somehow similar to the standard solution given to conversational implicatures in Pragmatics: we may enlarge some paradigms (for example, those of nouns denoting adversity or difficulty) with items which do not belong to them from a lexical point of view (*world*, *truth*, *life*, etc.). This process is an attributive operation, since we predicate the features characterizing the paradigm (for example ‘being difficult, adverse, hard, etc’) of the new nominal elements that come to be integrated in it. A very natural question to be asked now is what lexical paradigms allow for this *pragmatic enlargement*, and which ones reject that possibility. This is another interesting, as well as promising, line of research that the project *REDES* suggests.

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<sup>3</sup> The fact that paradigms in collocations may meet some pragmatic, rather than semantic, criteria is sometimes implicit in the literature. An example is Stubbs’s (1996) observation that the complements of the verb *cause* typically refer to negative notions (*accident*, *damage*, *death*, etc.) whereas complements of *provide* typically denote positive notions (*care*, *shelter*, *food*, etc.).

## 5 Conclusion: Back to controversial features of collocations

In the outset of this paper, I distinguished non-controversial features of collocations from controversial features, and I pointed out that the latter seem to be much more interesting than the former. The deductive approach to collocations that I have sketched here, and developed in the dictionary *REDES*, points towards the following evaluation of controversial features:

1. We may accept that collocations are salient, but we have to be sure that saliency is not a merely statistical notion.
2. Most collocations are not binary, since bases form large paradigms that can be defined and characterized on semantic grounds. If it is true that a language might contain around half a million collocations, as it is often argued, a straightforward conclusion follows: collocations cannot be memorized by speakers, whether native or not. In the deductive approach to collocations that I favor, it is assumed that speakers have access to the semantic notions involved in paradigms of bases, and also that collocates are sensitive to these abstract semantic features. Most of these paradigms are open, and a few of them might even be characterized on pragmatic (i.e. not just semantic) grounds.
3. Most collocations are not arbitrary, since the fact that some particular lexical items belongs to some semantic class is not an arbitrary fact, but rather a direct consequence of its meaning. Certain collocations (for example, those constituted by light verbs) seem to present a higher degree of arbitrariness, but even in these cases a number of generalizations are possible (as shown in Sanromán Vilas, 2011).
4. There is no simple answer to the question whether or not collocations are transparent relations. I believe that they are, to a certain extent, as a natural conclusion of the fact that collocates are meaningful.

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