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LEXICAL FIELDS AND STEPWISE LEXICAL DECOMPOSITION

IN A CONTRASTIVE ENGLISH-SPANISH VERB VALENCY DICTIONARY

Introduction

     In line with the recent trend to bridge the gap between theoret-
ical and applied linguistics, one of the most urgent and challenging
tasks in the domain of lexicography is the elaboration of contra-
stive dictionaries and lexica, organized both on a semasiological
and on an onomasiological basis. And in keeping with this trend, the
decision to supply lexical items with different types of grammatical
information relevant for their use in syntactic constructions can be
regarded as another improvement over the traditional bilingual dic-
tionary. Moreover, segmental or specialized lexica of different
types are becoming increasingly necessary as complements of diction-
aries covering the general vocabulary of individual languages. Among
these, one type which is felt to be urgently needed seems to be the
monolingual and the contrastive verb valency dictionary. As the verb
seems to constitute the central and most prominent element in a pre-
dication, its complete description requires a grammatical apparatus
which is much more complex than that of the other parts of speech.
It is perhaps mainly for this reason that so much research has been
done in this field since Tesnière's pioneering work, especially
during the past decade in Germany (cf. WÖRTERBUCH ZUR VALENZ UND
DISTRIBUTION DEUTSCHER VERBEN, KLEINES VALENZLEXIKON DEUTSCHER
VERBEN, DICCIONARIO DE VALENCIAS VERBALES ALEMÁN-ESPAÑOL, FRANZÖSI-
SCHES VERBLEXIKON, Gerling and Orthen 1979, Emons 1974, Schepping
1982, Projektgruppe Verbvalenz 1981, etc.).

     For these reasons it seems a more practical method to start a
constrastive dictionary with the verb. Furthermore, the possi-
bilities of elaboration of these types of dictionaries with a
scientific basis are beginning to be a reality thanks to recent
advances in lexical semantics, particularly in the so-called lexical
field theory, on the one hand, and in the methods of contrastive
linguistics, on the other. However, it would be as well to add here
that any project along these lines must, of necessity, be of a
provisional and rather experimental nature (cf. Hartmann 1980).

     In this paper an attempt will be made to expound in a schematic
way a model of a contrastive verb valency dictionary, based on
onomasiological principles currently under elaboration in the
Section on Contrastive Linguistics of the English Philology Depart-
ment of the University of Granada.[1]

     As this model is not so much an attempt at elaborating a verb
valency contrastive dictionary per se, but rather at laying the
foundations of such a lexicon, the research procedures will be ex-
pounded together with the organization of the model.

     As regards the organization of the lexicon, ideally a model of a
verb valency dictionary would have to deal at least with the
following points:

(1) Organization of lexical fields. This procedure would entail:

(a) A search for methods of selection and delimitation of the lexical fields of each language involved, together with methods for the establishment of semantic hierarchy relations, taking into account the establishment of 'dimensions', as defined by Geckeler (1973:24); the problem of 'points de vue' (cf. Germain 1979); and inter-field relations.

(b) A system of definitions of lexical items based on hierarchical semantic relations, which entails the utilization of hyperonymic terms as defining terms in the definition of their hyponyms.

(c) Definitions of archilexemes, with factorization of components taken from dictionary definitions as a possible practical method.

(d) Arrangements of lexical fields into 'constellations', in order to account for different types of sense relations such as synonymy, antonymy, hyponymy, etc., together with 'Aktionsarten' (i.e. inception, duration, cessation, iteration, etc.) and relations involving causation in each subsystem.

(2) Organization of different types of grammatical information in lexical units.

(3) Methods of representation of fields, dimensions and lexemes. This entails the problem of finding a formula that would capture both the semantic definitions and grammatical information of lexical items.

(4) Establishment of contrastive relations
(a) at intra- and interlingual level;
(b) at field level, dimension level and lexical unit level.

In order to illustrate how these notions and assumptions would work in practice, our project has been organized along the lines described below.

Organization of the verbal lexicon

With regard to one of the most widely debated issues, viz. the organization of the verbal lexicon into lexical fields, we have tried to find a compromise solution between theory and practice in the following way:

We have restricted our research to the general vocabularies of English and Spanish. Hence our results and conclusions can only be tentatively valid for these languages, because, as a working hypothesis, we start from the assumption that semantic universals can only be arrived at from the analysis of the vocabularies of particular languages. In addition, in our analysis the contrast is made on a bilateral basis.

Again, a compromise solution has been devised for the problem of how to set up criteria for the delimitation of lexical fields in the following areas:

(a) Concerning the practical problem of establishing lexical fields, we have had to rely both on intuitive knowledge (cf. Müller

1979) as well as on existing and well-established systems of organ-
ization of lexical fields, ranging from those set up on an extra-
linguistic conceptual basis to those organized on purely linguistic
principles. (Well-known systems of classification based on extra-
linguistic reality are Hallig and Wartburg 1963, the DICCIONARIO
IDEOLOGICO by Casares, Roget's THESAURUS, the LONGMAN LEXICON OF
CONTEMPORARY ENGLISH, etc. Cf. also the monographs by De Zordi 1972,
Karcher 1979, Nellessen 1982, Schepping 1982, Schneeberger 1964,
Stadler 1969, and Snell-Hornby 1983.)

(b) As regards the theoretical level, we have relied upon the
methodology of distinctive feature analysis and functional oppo-
sitions, as developed by structural semantics, fundamentally as
found in 'lexematics' (cf. Coseriu 1977, 1978 and Geckeler 1981,
1973, 1971).

Specifically, our application of these structural principles
starts first with the analysis in distinctive features of small
groups of lexemes, taking into account exclusively features which
yield functional oppositions, and proceeds on a bottom-to-top basis
to arrive at the archilexeme covering the entire field.

The fact that some archilexemes have no lexemic realization is
not a problem for dictionary-making, but it certainly is a moot
point for semantic theory.

Then, as regards the organization of definitions into hier-
archical systems, in principle we can follow either a top-to-bottom
procedure or, alternatively, a bottom-to-top procedure; however, it
seems to us that, from a practical point of view, the latter pro-
cedure is more amenable to practical solutions.

This procedure consists basically of extracting the underlying
hyperonymic defining verb of the lexical units under consideration,
by 'factorization'. And the process is repeated for the factorized
predicate until we arrive at the highest superordinate term. The
lower predicates are defined by means of the term immediately super-
ordinate to them, plus a specification (generally expressed by means
of an adverbial phrase).

Having first dealt with the definitions of the lexemes in terms
of their superordinate predicates and specifying adverbial phrases,
we can now turn to the definition of archilexemes of fields and of
constellations. The definitions of these archilexemes would be best
captured by designational systems of relations. Since they cannot
be defined in terms of other lexemes, they have to be defined in
terms of noological structure and extralinguistic information. For
this type of definitions the models devised by the techniques of
componential analysis (cf. Nida 1975), Katz and Fodor and, particu-
larly, Miller and Johnson-Laird (1976) and Miller (1978) are best
suited.

For the task of devising a method for the elaboration of defin-
ition systems in a dictionary we have started from the definitions
given in the most widely used dictionaries for each language. This
procedure can be justified on the following grounds:

(1) standard dictionaries contain the body of knowledge gathered by lexicographic tradition;

(2) their definitions of lexemes have the status of referential authority for users of the languages involved;

(3) generally speaking, their definitions provide a basis for extracting the stocks of more generic terms, which are intuitively felt by most speakers to be close to the status of archilexemes.

Although it is well-known that standard dictionaries, with few exceptions, do not apply a con sistent method of definitions, these definitions contain never theless the information necessary for the procedure of factor ization of the semantic components of lexemes.

One step further is the grouping of lexical fields into what has been termed 'constellations'. Constellations are organized in the following way: they have at their core a (super-) archilexematic verb which in most cases is the lexemic representation of a conceptual notion. The (super-) archilexematic verb must enter, as a superordinate term, in the definitions of other lexemes of the constellation, either directly or indirectly, i.e. by means of lexemes which occupy a lower position in the hierarchy of semantic relations. Around the core predicate is a network of verbal lexemes expressing different phases of a process, indicating, on the one hand, the states, actions, etc. associated with it, and on the other, their possible Aktionsarten (inception, duration, cessation, etc.). (Ballmer and Brennenstuhl's (1981) verb-models are organized on a basis partially similar to constellations, but the organization of some verb-models seems to have been arrived at through a rather sophisticated mixture of linguistic and extralinguistic criteria.)

Associated with each phase of the process there is a causative relation, which is expressed either by a lexeme or by a periphrastic construction. Among these we must single out, for its special relevance in the organization of constellations, a type of construction intermediate between syntactic constructions and lexicalized complex lexical units, namely the so-called functional verb construct ('Funktionsverbgefüge') (cf. Nickel 1968, Engelen 1968, Herrlitz 1973, Fink 1977, Björkman 1978, Martín 1983). Their function is in most cases to serve as fillers for lexical gaps in the lexemic expression of modes of action.

A typical example of a constellation would be the system of lexemes with /MOVE-1/ as centre or core:

1. Centre: /MOVE-1/ - /MOVERSE/
   Causative action: /MOVE-2/ - /MOVER/

2. Inchoative phase: /GET INTO MOTION/ - /PONERSE EN MOVIMIENTO/
   Causative action: /SET INTO MOTION/ - /PONER EN MOVIMIENTO/

3. Durative phase: /BE IN MOTION/ - /ESTAR EN MOVIMIENTO/
   Causative action: /SET INTO MOTION/ -/PONER EN MOVIMIENTO/
   (/PONER EN/ = /CAUSAR ESTAR EN/)

4. Cessative process: /STOP-1/ - /PARAR(SE)/
   Causative action: /STOP-2/ - /PARAR/

The organization of grammatical information in verbal lexemes

After having established lexical fields, constellations and de-
finition systems, the next step consists of supplying the lexical
units with different types of grammatical information. All lexical
units must be supplied with morphophonological, syntactic, pragmatic
and, as far as possible, stylistic information. However, we will
presently deal only with syntactic information, since it is the most
relevant piece of information in a verb valency dictionary. The
syntactic information can be broken down into the following specifi-
cations:

(1) quantitative valency: number of obligatory and facultative
arguments required by the logico-semantic structure of the predicate
(cf. Emons 1978, Dik 1978a);

(2) qualitative valency: it refers to the type of arguments from
the point of view of their semantic function (cf. Dik 1978a, 1979)
and of the syntactic constructions realizing them, what is called in
German 'Satzbauplan' (cf. Emons 1978, Engelen 1975);

(3) relevant syntactic-semantic constraints on the arguments,
expressed by a hierarchy of classemes, or even semes, when neces-
sary.

Besides, specifications of the following types would also be
necessary for a complete description and understanding of verbal
lexemes:

(4) pragmatic analysis of lexical fields, with a meta-language
for meaning explanations (cf. Jessen 1979);

(5) specifications concerning register, style, etc. (cf.
Hartmann 1983);

(6) specification of possibilities of passivization and word-
formation.

However, at the present state of the art, a great deal of re-
search would be necessary to incorporate these specifications in a
systematic way in dictionaries. For the time being it is only in
some monographs where this type of research can be found.

Representation formulae of verbal lexemes

The goal of previous sections has been to delineate the semantic
and syntactic information apparatus which we feel is required for
every verbal lexical unit.

In this section we want to propose a notational device to cap-
ture, by means of an integrated formula, all the information assoc-
iated with verbal lexemes, organized in a hierarchical manner (cf.
Dik 1978a, 1978b, 1979, 1980), adapting in particular Dik's two key
notions of the 'predicate frame' and the system of 'stepwise lexical
decomposition'.

Functional Grammar, like other linguistic theories, distingui-
shes between a lexicon and different sets of rules. The lexicon
consists of basic predicate frames (verbal as well as non-verbal)
and basic terms, referential expressions for entities in some world.
Predicate frames are "schemata specifying a predicate together with
a skeleton of the structure in which it can appear" (Dik 1979:5).
The lexicon includes basic terms and basic predicates; special rules
form derived predicates and terms through predicate and term form-
ation rules. Besides, Functional Grammar operates with lexical
items already existing in individual languages and, therefore, no
abstract lexical decomposition is allowed.

Each predicate frame specifies the following semantic and syn-
tactic properties of the predicate it contains (Dik 1978a): (a) its
lexical form; (b) the (sub-) category to which it belongs; (c) its
number of arguments; (d) the semantic function of these arguments;
(e) the selection restrictions imposed on these arguments. At the
same time, each predicate frame designates a state of affairs
(Actions, Positions, Processes and States, defined by the parameters
'Dynamism' and 'Control'; cf. Dik 1978a). Thus, the predicate frame
of eat would be:

$$\text{eat}_V \ (x_1: \text{animate}(x_1))_{Ag} \ \ (x_2: \text{solid food}(x_2))_{Goal}$$

This predicate frame indicates that eat is a two-place predicate of
the syntactic category V(erb) with an animate term fulfilling the
semantic function 'Agent' and a term indicating some type of food
fulfilling the semantic function 'Goal' as arguments.

As for the semantic definition of predicates, the method of
stepwise lexical decomposition defines predicates in a hierarchical
order, from more specific to more generic superordinate terms, i.e.
each predicate frame is defined in terms of the configurations of
other lexical items of the same language. In other words, it is
roughly tantamount to the previously discussed bottom-to-top pro-
cedure (see below for a sample fragment of a field).

Contrastive analysis: sample fragment of a field

The contrast constitutes the ultimate stage in the elaboration
of a dictionary. The contrast should be a two-level one: the con-
trast of lexical units and that of field. With regard to lexical
units, we can conceive of two distinct and separate types of con-
trast:

(a) intralingual, i.e. contrasting each lexical unit with the
other units of its group, specifying the differentiation feat-
ures;

(b) interlingual: relations of equivalence with lexemes of the
other language, specifying also the differentiation features and
indicating the units which express the equivalence in the other
language.

With regard to contrast at the lexical-field level, only the
relations of symmetry and isomorphy in the presence or absence of
lexemes of the other language should be indicated.

Below is given an illustration of the model using a sample fragment of the field of 'verbs of luminosity':

1. Organization of the field in terms of dimensions, with the archilexemes of the lower-level dimensions:

1.1. Appearance of light

1.1.1. Reference to period of day: /DAWN-1/ - /AMANECER/

1.1.2. Reference to atmospheric phenomena: /CLEAR-1/ - /CLAREAR/

1.1.3. Reference to transparency: /CLEAR-2/ -/TRANSPARENTARSE/

1.1.4. Reference to light with emission of heat: /BURN-1/ - /ARDER/

1.2. Intensity of light

1.2.1. Reference to degree of intensity:

1.2.1.1. higher: /FLASH/ - /DESTELLAR/

1.2.1.2. lower: /FLICKER/ - /CENTELLEAR/

1.2.2. Reference to brightness: /SHINE/ - /BRILLAR/

1.2.3. Reference to light with emission of heat: /BEAM/ - /IRRADIAR/

1.3. Cessation of light

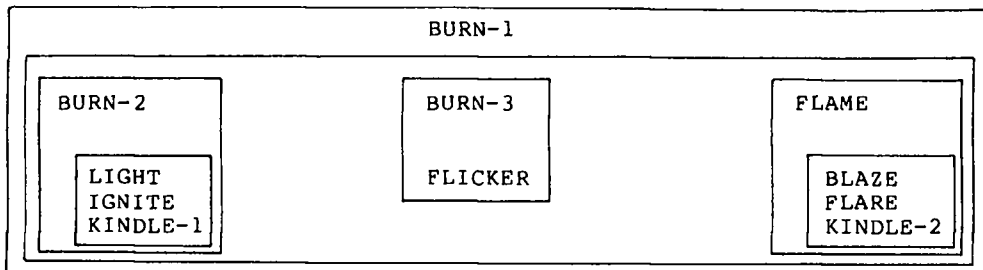1.3.1. Reference to period of day: /DARKEN/ - /OSCURECER/

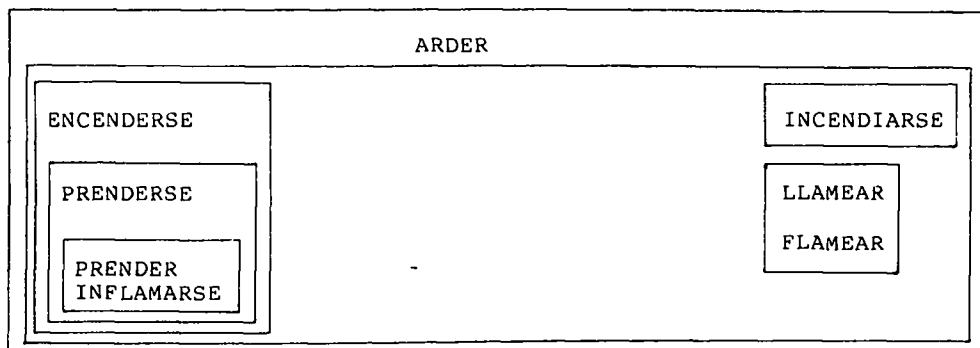1.3.2. Reference to atmospheric phenomena: /CLOUD-1/ - /NUBLARSE/

1.3.3. Reference to opacity: /CLOUD-2/ - /ENSOMBRECERSE/

1.3.4. Reference to light with emission of heat: /EXTINGUISH/ - /APAGARSE/

2. Diagrammatic exemplification of the lower-level dimension

1.1.4.: light with emission of heat in both languages:

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┌─────────────────────────────────────────────────────────────────┐
│                              ARDER                                │
│  ┌───────────────────────────────────┐    ┌───────────────────┐  │
│  │ ENCENDERSE                         │    │   INCENDIARSE     │  │
│  │ ┌───────────────────────────────┐ │    └───────────────────┘  │
│  │ │ PRENDERSE                     │ │    ┌───────────────────┐  │
│  │ │ ┌───────────────────────────┐ │ │    │   LLAMEAR         │  │
│  │ │ │ PRENDER                   │ │ │    │                   │  │
│  │ │ │ INFLAMARSE                │ │ │    │   FLAMEAR         │  │
│  │ │ └───────────────────────────┘ │ │    └───────────────────┘  │
│  │ └───────────────────────────────┘ │                           │
│  └───────────────────────────────────┘                           │
└─────────────────────────────────────────────────────────────────┘
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3. Definitions of the lexemes of the subgroup /FLAME/ by means of predicate frames in accordance with the system of stepwise lexical decomposition (with simplified notation):

$\text{FLAME}_V \quad (x_1: \text{NP} \langle -\text{Anim,(Phys. Obj.)}\rangle \quad (x_1))_{\text{Aff}}$

$=_{df}$

$[\text{BURN-1}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}]_{\text{Process}}$
$\qquad\qquad (y_1: \text{AdvP} \quad \langle \text{brightly}\rangle \quad (y_1))_{\text{Manner}}$

$\text{FLARE}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}$

$=_{df}$

$[\text{FLAME}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}]_{\text{Process}}$
$\qquad\qquad (y_1: \text{AdvP} \quad \langle \text{unsteadily}\rangle \quad (y_1))_{\text{Manner}}$

$\text{BLAZE}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}$

$=_{df}$

$[\text{FLAME}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}]_{\text{Process}}$
$\qquad\qquad (y_1: \text{AdvP} \quad \langle \text{thoroughly and with more intensity}\rangle$
$\qquad\qquad (y_1))\text{Manner} \quad (y_2: \text{AdvP} \quad \langle \text{for a short time}\rangle$
$\qquad\qquad (y_2))_{\text{Time}}$

$\text{KINDLE-2}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}$

$=_{df}$

$[\text{FLAME}_V \quad (x_1: \text{NP} \quad \langle \ldots \rangle \quad (x_1))_{\text{Aff}}]_{\text{Process}}$
$\qquad\qquad (y_1: \text{AdvP} \quad \langle \text{with flame : red colour : intense}\rangle$
$\qquad\qquad (y_1))_{\text{Manner}}$

4. Contrastive analysis

4.1. At field level: cf. diagram above for a lower-level dimension.

4.2. At lexical unit level

4.2.1. Intralingual: e.g.: /FLAME/ opposes /KINDLE-2/ in the feature
'with flame', further specified by two restrictors: 'red colour' and
'intense'; /FLAME/ opposes /BLAZE/ in 'degree of intensity', etc.

4.2.2. Interlingual: in this group, except for its archilexeme, the
English lexemes have to be rendered into Spanish by means of
periphrastic constructions: e.g.: /BLAZE/:/ARDER CON LLAMA INTENSA/;
/FLARE/: /ARDER CON LLAMA INCONSTANTE/, etc.

Conclusion

The character of this paper has been clearly programmatic; hence
many important details of the model have been left out. Our goal
has been to give an overview of the model itself, laying the stress
on the importance and usefulness of lexical field theory on the one
hand and of the notions of predicate frame and stepwise lexical
decomposition (which we have borrowed from Dik's Functional
Grammar), on the other; while lexical field theory enables us to
articulate the structure of the lexicon, the method of represent-
ation by means of the system of stepwise lexical decomposition
enables us to capture in an economic way both the hierarchy of
lexical relations and the different types of grammatical information
required by verbal lexemes for their correct usage in syntactic
constructions.

Note

[1] I should like to thank my colleague Dr. J.M. Martín whose
comments on an earlier version helped me make this paper more
readable. I am also indebted to my student Mr. O. Ranea for
allowing me to take from his Memoria de Licenciatura (in pre-
paration) the illustrations of the sample field described in the
penultimate section. All errors are, of course, my own.

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