WHY THE NOTION OF LEXICAL TEMPLATE?

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1 Introduction

Lexical knowledge representation has become one of the crucial issues in linguistic theory today. Generalizing a bit, one finds two major schools of thought: (i) the syntacticocentric approaches[1] and (ii) the constructional approach. Within the former, subclasses can be differentiated on whether they employ natural language phrases (Dik, 1997), a metalanguage (Jackendoff, 1990; Rappaport/Levin (1998); Tenny (1994), Van Valin and LaPolla (1997), Wierzbicka, (1992, 1996, 1999)), or a set of thematic roles (Fillmore, 1968, Chomsky, 1981, etc.).

Most theories on lexical representation, with the exception of the work done in Construction Grammar, propose a set of grammatically salient features as the central and unique components in a lexical representation theory, based on the assumption that only those aspects which are grammatically relevant serve as the input for grammatical processes. In consonance with this, Pesetsky (1995: 14), in his analysis of speech act verbs, and Grimshaw (1993: 3), in her study of verbs of color, claim that the parameters "loud" and "soft" or the color parameters, though important in some other respects, do not have any role in grammatical processes. Seemingly, Levin/Rappaport (1996a) contend that the best way to isolate those properties of the lexical class of sound emission is to test the behaviour of these predicates against the Unaccussative Hypothesis. However, I believe that this is an oversimplification in the sense that although there are certain semantic patterns which do not actively interact in the different structural realizations, there are others which highly constrain the different syntactic configurations, e.g. the manner vs. result constants. This is not an excuse to overgeneralize and exclude all the semantic parameters in one blow.

Consequently, the approach presented in this paper diverges from these proposals in that in my opinion, lexical representations should be enriched with a much more robust and powerful semantic component. As is claimed in the most recent linguistic literature, lexical representations should capture those aspects of meaning which are grammatically relevant. However, this is done at the cost of sacrificing the meaning potential of a predicate. In this respect, a notable exception is the work of Construction Grammar, which formulates an encyclopedic representation of the meaning of predicates. Yet, this is accomplished at the cost of designing a linking algorithm which

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[1] I take the term used in Jackendoff (1997) to describe a particular group of linguistic theories and apply it to lexical representations. Also some other labels are used to describe this trend of research, viz. "syntactically-driven theories" (cf. Nirenburg and Levin, 1992).

loses a lot of the explanatory force as represented in the more syntacticocentric models.

Then, the aim of this paper is to present an alternative formalism which accounts for the full set of parameters which constitute the meaning of a predicate. We use the term lexical template to refer to this new lexical notational device. For the purposes of exemplification, this paper focuses on the internal structure of lexical templates by analyzing five lexical classes of verbs, viz. *contact-by-impact* verbs, *break* verbs, *consumption* verbs, *sound* verbs and *existence* verbs. The internal lexical complexities which revolve around these five classes are discussed. Finally, the generative power of lexical templates is brought to the fore.

2 An overview of the most relevant approaches to lexical representation

In order to evaluate the extent to which a lexical template is a departure from most current approaches to lexical representation, let me reproduce the format proposed for some of the predicates under analysis in this research monograph. I shall begin with Fillmore's (1968; 1970: 126-ff) representations, which illustrate the view that the meaning of a predicate can be reduced to a set of unanalyzable semantic notions called thematic roles, which are defined independently of the meaning of a predicate. These constructs indicate the type of relationship each of the arguments bear with respect to the predicate. Suffice the representation of the predicates *hit* and *break*:

(1)   *hit:* [Agent, Instrument, Place]
(2)   *break*: [Agent, Instrument, Object]

Role-centered representations have received abundant and well observed criticisms since its first formulation[2]. Although thematic roles are implicit in practically all linguistic models (with the exception of Ravin (1990)), their explanatory potential has been diminished since they are no longer regarded as primitive notions. In fact, in order to circumvent the basic problems inherent in thematic roles, it was suggested that these should be defined over predicate semantic decompositions. This means the development of well-articulated theories of lexical representation.

One of the central features common to many theories of lexical representation is the notion of event. The basic idea is that since verbs are taken to denote events, it is assumed that the principles underlying the lexical semantic representation of verbs derive from the type of event structure. In connection with this, there have been several proposals which take as the central corollary the notion of event and develop a lexical representation theory in terms of the conceptualization of this notion. For example, Jackendoff's (1983, 1990) logical structures are based on a localist conception, such that all events involving location and motion are central for the construal of events. He uses the predicates GO, BE, STAY, and CAUSE to encode the underlying properties of motion events, and the two types of location events, viz. stative and eventive, and their corresponding causatives respectively. He posits the Thematic Relations Hypothesis in order to account for certain instances of systematic or regular polysemy; hence the polysemic nature of a predicate like *keep* is accounted for by the fact that all of the different configurations can be explained by the functions CAUSE and STAY and their differences emerge from the different semantic fields involved:

(3)   *keep*:   [CAUSE, (x, (STAY y, z))]

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[2] For a survey of the major critiques, see Jackendoff (1990), Croft (1991), Dowty (1991), Levin and Rappaport (1996b), Van Valin and Wilkins (1996), among others.

A second line of research which strongly emphasizes the notion of event is that group of theories which make an extensive use of the notion of Aktionsart – the internal temporal properties of a predicate – to determine the event structure representation of each predicate; for example, Dowty (1991), Tenny (1994), Van Valin/LaPolla (1997); Levin/Rappaport (1995, 1996a), etc. Drawing on the pioneering work of Vendler (1967), predicates are classified according to the type of aspectual properties the event designates. In this regard, Van Valin/LaPolla (1997: chapter 3) propose an inventory of logical structures based on the type of event designated by the predicate. For example, predicates like *break, kill* or *destroy* designate a causative accomplishment whereas a predicate like *drink* can designate an activity or an active accomplishment structure depending on the referential nature of the NP:

(4) *kill* [**do'** (x, ϕ)] CAUSE [BECOME **dead'** (y)]
(5) *break*: [**do'** (x, ϕ)] CAUSE [BECOME **broken'** (y)]
(6) *destroy*: [**do'** (x, ϕ)] CAUSE [[**do'** (y,ϕ)] CAUSE [BECOME **destroyed'** (z)]]
(7) *drink*: [**do'** $(x, [\textbf{pred'}\ (x, y)])$ & BECOME **consumed'** (y)]

In much the same vein, Levin and Rappaport (1995, 1996a) and Rappaport/Levin (1998) propose an event structure representation for each predicate; hence a predicate like *drink* is assigned an activity event structure representation, while *break* a causative accomplishment interpretation:

(8) *drink*: $[x\ ACT\ _{<DRINK>}\ \underline{y}\ ]$
(9) *break*: $[x\ ACT]$ CAUSE [BECOME $[y\ <BROKEN>\ ]$]

Within the group of those theories which posit a system of lexical decomposition, it is worth noting another proposal which, unlike the preceding ones, does not resort to any sort of metalanguage but instead it constructs the argument structure of a predicate using natural language phrases. A case in point is Dik's (1978) procedure of stepwise lexical decomposition:

(10) *hack* $[V]\ (x_1:$ animate$)_{Ag}\ (x_2:$ object$)_{Go}$
      df = cut $[V]\ (x_1)_{Ag}\ (x_2)_{Go}\ (x_3:$ pieces : uneven$)_{Result?}$
      $(\sigma_1:$way $[N]:$ rough $[A]:$ violent $[A])_{Manner}$

If there is a factor shared by all these representations, it is the fact that all of them postulate notions – thematic roles, argument positions, causal chains, etc. – to which mapping rules can make reference to. In this regard, Tenny (1994:2) makes this point clear in his Aspectual Interface Hypothesis, when he affirms that *"Only the aspectual part of thematic structure is visible to the universal linking principles"*.

As previously mentioned, this is not necessarily incompatible with the claim that those factors which do not have a direct role in the formulation of mapping rules should be part of the lexical representation. In this regard, one of my central claims is that these structures still need further semantic decomposition, and this entails the inclusion of an enhanced semantic component, which necessarily goes beyond the present scope of the various lexical representations presented thus far. Furthermore, the fact that these theories postulate a separate lexical entry for each syntactic configuration signifies that it makes no allowance for information shared by sets of predicates, and as a result, is unable to account for regularities such as the distinctive sets of syntactic alternations that characterize certain classes of predicates.

As things stand, from these structure it would be desirable to work out a more complete representation in such a way that the set of semantic and syntactic factors that hold within a lexical class could be easily be represented into one unified structure. This claim has been echoed from some linguistic paradigms like RRG:

"Many aspects of the meaning of a verb [the specific requirements that a verb imposes on one or more of its arguments] would be represented in a full decomposition, <u>but given that no such representation exists at present, they will have to be stipulated for the time being</u>" (my own emphasis) (Van Valin and LaPolla, 1997:156)

In much the same way, Levin and Rappaport (1996b: 58) also recognize as an urgent need to analyse the way constants (or that part of the meaning of a predicate which is idiosyncratic) constraint the event structure representations[3]. As the authors affirm, this observation is also applicable to more encyclopedic approaches like that of Construction Grammar:

"Hardly any attention has been paid to the nature of what we have called the "constant" and the constraints on the association of constants with event structures. Since the multiple association of a constant with event structures is taken to be constrained by compatibility between the two, <u>only a more careful study of the nature of the constant and the ways in which this determines the event structure it is associated with will help answer the many open questions related to multiple argument expression</u>." (my own emphasis)

Seemingly, Jackendoff (1996: 118-119) explicitly admits this sort of compromise solution in his logical structure although he claims that:

(…) and all the extra stuff beyond the perceptual-motor differences must be represented in the meaning of these words. <u>But how? In what format? I don't have a formalizable theory of these aspects of meaning yet</u> (….) [my own emphasis]

As becomes clear from the preceding passages, it is necessary to investigate the way semantic aspects (thus far excluded from lexical representations) interact in the realization of structural configurations. In contrast to a deeply-rooted view that these aspects did not have a grammatical impact, a new conception has arisen such that some linguists have found out that these aspects of meaning can be a useful tool to provide answers to many of the unresolved issues which follow from a purely syntacticocentric approach in the design of a semantics-to-syntax linking algorithm[4].

With this theoretical credo in mind, the notion of lexical template grows out as an attempt to formulate a proposal along these lines. Such a template means a fully semantic decomposition of the meaning of a predicate together with the inclusion of those syntactically salient aspects. Moreover, each lexical template is not meant to represent the lexical properties of individual predicates but conversely it contains and captures the full set of linguistic features as encoded within a lexical class. This makes it possible to come to grips with the identification of those semantic parameters which define a set of predicates.

By way of example, after an analysis of the lexical entries proposed for *hit* above, I conclude that a full set of semantic parameters which play an active role in the meaning of this predicate are absent in these representations; manner, result, type of

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[3] In fact, in a more recent study Rappaport and Levin (1998) argue that result constants constrain the subcategorization frame of a predicate more than manner constants.

[4] Nonetheless, there are some tentative proposal to provide richer semantic decompositions, e.g. Van Valin and Wilkins' (1993:517) analysis of the predicate *remember* and Van Valin and LaPolla's (1997:117) analysis of *speech act verbs*.

blow, instrument, reason, etc. I have extracted these parameters by looking at the lexical class to which this predicate belongs as a whole, viz. *contact-by-impact* verbs.

Furthermore, following Levin/Rappaport's quotation, the notion of lexical template is not only applicable to the more syntactically-driven type of representations but it also comes to complement constructionist representations where constants, though implicit, have not been fully developed.

3 The format of a lexical template

In the previous section, I have discussed some of the unresolved issues in relation to the internal structure of a lexical representation, namely, the lack of a more fine-grained semantic decompositional system. Let me focus on more examples I have come across in the analysis of the corpus.

Firstly, if one compares the structure for *cooking* verbs, *destroy* verbs and verbs of *killing*, viz. a causative accomplishment, we have the same representation with the only difference being stated in terms of the resultative predicate, *dead', cooked'* and *destroyed'* respectively:

(11) *kill*:   [**do'** (x,ϕ)] CAUSE [BECOME **dead'** (y)]
(12) *cook*:   [**do'** (x,ϕ)] CAUSE [BECOME **baked'** (y)]
(13) *destroy*: [**do'** (x,ϕ)] CAUSE [[**do'** (y,ϕ)] CAUSE [BECOME **destroyed'** (z)]]

The question that arises is the following; to what extent do these representations tell us something about the multifaceted nature of these predicate meanings? How can one capture the difference both in meaning and syntactic productivity of these two classes of verbs? The easy answer is to affirm that both differ in the type of primitive involved. However, that does not tell us anything new at all. Furthermore, an analysis of the configurational patterns of these predicates is very revealing in the sense that their syntactic behavior differs substantially. *Cooking* verbs can occur in the following constructions: causative / inchoative and middle constructions, while these are excluded in the other two lexical classes. Moreover, *destroy* verbs cannot occur in a resultative construction, while verbs of cooking and killing can. Thus, how can we account for these syntactic contrasts? Can one provide any theoretical principle which explains this striking syntactic behavior?

By looking at the semantic class as a whole, one can figure out some tentative and initial answers to some of these queries. For example, one could argue that both *destroy* and *kill* are verbs of existence in contrast to *cook*, a verb of change of state, an assumption which explains why the first two group of verbs cannot occur with the middle, while *cooking* verbs can. What seems to be clear is that a glance at the semantic potential of a predicate, regardless of the fact of whether the semantic parameters encoded are syntactically relevant or not, turns out as a useful tool to elucidate some syntactic differences. Then, why shouldn't one exploit this line of research any further? This is precisely the bottom theoretical line behind the notion of lexical template; lexical templates are bound to lexical classes.

The notion of lexical template proposed in this paper feeds upon some of the major proposals in lexical semantics; hence it is an eventive aspectual theory in that the notion of event structure is represented in terms of the temporal internal properties of the predicate. The internal structure representation of the event is further fragmented into several causal chains which explain and justify the existence of the whole range of concatenated events which hold within a single event. As shown elsewhere, the bracketing which signals the different phases of an event is not accidental since it has important syntactic consequences. In this regard, a lexical template bears some resemblances with some of the axioms postulated in a causal approach (cf. Croft,

1991). Finally, one of the points of divergence with respect to the great bulk of theories of lexical representation concern the inclusion of an enhanced semantic component, as I have made it abundantly clear in the first part of this paper. This semantic component is the result of the research work presented in Faber/Mairal (1999), who divide the lexicon into coherent hierarchical semantic classes, each being represented with a full set of semantic parameters.

If I claim that lexical templates are bound to specific lexical classes, this presupposes a twofold distinction in the lexicon; one corresponding to the lexical template – which encodes the conceptual substance common to the members within a lexical class – and the actual forms of the lexical entries themselves – which inherit part(s) of the information in the template[5].

It is important to emphasize that, unlike some other functionally-oriented proposals such as Dik (1997a: 78-103), the notion of lexical template uses abstract predicates in its semantic decomposition. In order to obtain important cross-linguistic generalizations it is thus necessary to resort to some sort of universal metalanguage which can account for the actual similarities which hold among different lexical classes. The use of natural language phrases precludes the establishments of such generalizations. In this regard, one of the most problematic issues is the right-grain size to use in the identification of the type of primitives involved in a lexical representation. In order to solve part of this problem, I resort to the use of an ontological module. The ontological model, independently of how this is finally conceived – in computational or more lexicographic terms - converges on the use of a metalanguage as a descriptive device for lexical representations. In the ontology framework, it is claimed that natural language sentence can be reduced to a formalized, language-neutral representation, a Text Meaning Representation.

In sum, the format of a lexical template lies somewhere between the *Aktionsart* characterization of lexical units as proposed in RRG and to a lesser degree in Rappaport/Levin (1998) on the one hand, and the richer semantic description as postulated in the Functional Lexematic Model (FLM) (Faber/Mairal, 1999).

In reference to its internal structure, a lexical template consists of two major types of variables: internal and external variables[6]. The notational device adopted to distinguish one from the other is that internal variables are marked in Greek letters while external in Roman letters[7]. This is methodologically coherent with my claim that a lexical representation should contain those aspects of the meaning of a word which are grammatically relevant (external variables) and those aspects of the meaning of a word which reflect the idiosyncratic features relevant to each predicate (internal variables).

These two basic building blocks coincide with the distinction introduced in Rappaport and Levin (1998) and Grimshaw (1993). The first two authors argue that a verb meaning is composed of a set of primitive predicates and constants. The primitive elements encode the core meaning and the event type of the verb and thus define the broad lexical semantic classes of verbs. The constant, which has an ontological status

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[5] This twofold distinction is very similar in many respects to the lexical conceptual structures and predicate argument structures as proposed in some other approaches like Jackendoff (1990) or Levin and Rappaport (1995, 1996a). This comes to reinforce my claim that my proposal is not exclusive of one particular model but can be extended and accommodated into other theoretical frameworks.

[6] In a similar vein, Fillmore (1988:36), within the realms of Construction Grammar, affirms that a construction is constituted of external and internal properties. The external syntax of a construction encapsulates the properties of the construction as a whole, that is, "anything speakers know about the construction that is relevant to the larger syntactic contexts in which it is welcome". In contrast, the internal syntax of a construction refers to the construction's make-up.

[7] I have adopted this notational device from Role and Reference Grammar (cf. Van Valin and LaPolla, 1997 chapters 3 and 4).

(e.g. stuff, place, manner, etc.), specifies the idiosyncratic information to each individual predicate. Thus, verbs which share the same structural elements (that is primitives) are differentiated from each other in terms of the type of constant specific to each class member. In much the same vein, Grimshaw (1993) makes a distinction between semantic structure and semantic content. This author further suggests that certain verb arguments are structure arguments by virtue of the association with one of the open positions in the event structure representation and in turn these serve as the input for linking rules and for the determination of argument expression. Content arguments are identified with the type of constants. Grimshaw hypothesizes that this division may explain why certain arguments are assigned semantic roles while others cannot; the latter correspond to the content arguments.

Following Grimshaw, external variables are those aspects of the meaning of a word which are syntactically realized and are identified with a configurational position in the syntactic core. Internal variables are the product of extracting the semantic parameters which define the meaning potential of a whole lexical class. This distinction is also very similar in many respects to the constructional view which proclaims a constructional meaning – equivalent to our external variables and event structure – and a core verb meaning – equivalent to the set of internal variables.

Internal variables are classified along a scale of accessibility to argument realization. At one extreme, we do find a group of internal variables which are not strictly classified as non-projectable features. Often, it might be the case that an internal variable can also be bound to an explicit position in argument structure, viz. the instrument variable which characterizes a whole range of verbs may or may not be bound to give rise to an Instrument Subject Alternation:

(14)   The gun hit at her face, … (H85 0836)[8]

At the other pole of the scale, one finds internal variables which are never syntactically realized, viz. Reason and purpose which are not bound to any external variable because they never have a syntactic impact. These only form part of the meaning definition of the predicate, but they are never lexicalized in the argument structure. This possibility of lexicalization of an internal variable is not haphazard: internal variables are instantiated lexically in external variables if there is a construction triggered by the binding. This fact is explicitly expressed in the Lexical Mapping rules as developed in Mairal (fc).

In sum, the idea behind this work is that the full range of complements can be predicted from the semantic representation in its lexical entry together with an independently motivated set of morphosyntactic principles. Thus, the different interpretations of a predicate (as a propositional (knowledge)/believe, perceptual, intentional predicate, etc.) follow from the content of the internal variables in the semantic representation. A further issue is to correlate these different interpretations with the RRG Interclausal Relations Hierarchy, an issue which I have explored elsewhere (Mairal, (fc)).

4 Lexical templates in the primary lexicon

In what follows, I shall like to propose a lexical template for the lexical classes under analysis, each representing a particular facet which comes to illustrate different features of a lexical template's internal make-up. As advanced above, I have selected

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[8] I use corpus data from the BNC and the LOB so that a more complete version of the full gamut of syntactic alternations is obtained. Each example is accompanied by a code giving a reference to the exact place in the corpus where the example may be found.

five lexical classes, some closer in meaning and syntactic encoding, while others distant in either meaning or syntax but closer in some other respects.

4.1 *Contact-by-impact* verbs

The lexical class of *contact-by-impact* verbs belongs to the general semantic domain of action verbs. The generic term of *contact-by-impact* is *hit*, the central unit that defines the syntactic and semantic universe of discourse; the rest of the members of this class are: *strike, knock, tap, rap, cuff, slap, smack, spank, whack, swat, bash, bump, thump, punch, sock, jab, club, clout, butt, kick, dribble, hammer, crown, brain, box, beat, batter, clobber, whip, lash, flog, flagellate, birch* and *cane*.

After examining the whole set of both semantic and syntactic regularities which converge within this lexical class, I should like to propose the following lexical template:

(15) $[[\textbf{do}´ \text{ (w, } [\textbf{use.tool}.(\alpha).\textbf{in}.(\beta).\textbf{manner.for}.(\delta)´ \text{ (w, x)}]) \text{ CAUSE } [\textbf{do}´ \text{ (x,}$
$[\textbf{move.toward}´ \text{ (x, y) \& INGR } \textbf{be.in.contact.with}´ \text{ (y, x)], } \alpha = x]]$

The representation in (15) contains an effector (w) who carries out the action of hitting upon an affected entity (y) using a tool (x). More specifically, an effector uses a tool in a certain manner and with a certain purpose causing an activity such that the instrument moves towards the affected entity and *x* becomes in contact with *y*. It is not a problem that the predicate underlying the conative with *hit* verbs is move.toward´ while it is BECOME be-at´ with some other predicates (e.g. *cut*), because *hit at*, etc. does not necessarily entail contact, while *cut at* does.

Unlike *manner-of-cutting* verbs, *contact-by-impact* verbs do not conceptualise an intermediate subevent that makes reference to an intermediate activity ('make-a-cut-on' in the case of *cutting* verbs). This difference stems from the fact that cutting actions are conceptualized as having more duration than hitting actions, so that it is possible to elaborate internally the cutting event; hitting, on the other hand, involves a briefer contact: you may be cutting a piece of bread for a certain time, but if you are hitting an object for a period of time, there is not just one single blow, but a succession of hitting actions. That is, hitting is a punctual event, unlike cutting.

As for the format, the internal make-up of a lexical template consists of internal and external variables. The semantic content of the lexical class of *contact-by-impact* permeates a rich set of semantic parameters: (1) an agent that effects the blow (*w*); (2) a blow measured in terms of force (lightly: *tap, cuff*); hard (*strike, punch, thump, knock, clobber, clout, batter, cane, whip, lash, birch*); very hard (*sock, knock, clobber, bash*, etc.); sound (sharp, punctual, loud (*crack, smack, whack*, etc.); dull, punctual (*thump, bump*); and movement (quick, (*tap, rap, swat*, etc.); swinging (*swat*), iterative (*rap, jab, batter, clobber* (*b*); (3) an instrument with which the blow is delivered (body part, object) (hand: *hit, cuff, strike*, etc.); fist: *punch, box, sock*, etc.); head (*butt*), object (whip (*whip, slash*), newspaper /fly swatter (*swat*) (*a*); (4) the entity affected by the blow (person, body part, object, ball) (*head: crown, brain; buttocks: spank; ear: box*; etc.) (*y*); (5) the reason for the blow (anger (*strike*), punishment, causation of movement, desire to hurt (*spank, cane, whip, lash, flog*, etc.; desire to move something (*strike, hit*)) (*d*) (Faber/Mairal 1999: 185-186).

This rich set of internal variables again justifies my claim that further decomposition is required if one's theory aspires to account for what could be termed lexical competence.

4.2 *Break* verbs

This class of verbs marks the result of an action and are thus called result verbs. These include the following: *break, smash, shatter, splinter, snap, crack, fracture, decompose, destroy, split, burst, explode*, etc.

I believe that the internal variables for English, especially the manner variable, should be eliminated because English *break* (unlike its Lakhota counterparts) has no specification of the nature of the causing activity. This in fact suggests that the intermediate activity predicate should likewise be unspecified as well. This would lead to the following lexical template:

(16)   [[**do´** (x, [**use´** (x, y)] *CAUSE* [**do´** (y, Ø)])] CAUSE [BECOME/INGR **pred´** (z)]]

This structure, in its maximal projection, designates a causative accomplishment such that an effector initiates an action using an instrument such that the affected entity comes to have a new state – that of coming apart. Note that the only two internal variables relevant for this class of verbs, instrument and result, are codified in terms of a use predicate and a result subevent respectively, which is given by the resultative construction itself. Thus, there is not need, in contrast to the other two approaches, in postulating more internal variables. The important issue here is that these verbs lexicalize a result. There are a number of comments to be made about this representation:

1.   It treats the two causing actions, the one of the instigator *x* and the instrument *y* as unspecified, which, as noted above, seems to be correct for English.
2.   Having use´ as the first activity predicate is neutral with respect to the nature of the causing action but it introduces an implement argument, which is a potential instrument.
3.   There's no 'BECOME be-at´' component, because I am not really sure that that is not a fact about the world we attribute to the verb rather than a true property of the verb. If it is neutral with respect to the causing activity and specifies only that some unspecified action brought about a specific result state, then attributing BECOME be-at´ to its semantic structure is unjustified.
4.   There is no problem with the *y* argument being the actor when the *x* argument is unspecified; it is an implement-effector and the highest ranking remaining argument.

With regard to the resultative construction, one can not posit a structure like:

(17)   [LS2 [**state'** (z)]]

since that is a property of the resultative construction and not a lexical property of *break* verbs. The result state comes from the semantic representation of the construction, not from the lexical template of the main verb in the construction.

Thus, in contrast to the *contact-by-impact* verbs, *break* verbs only lexicalize the instrument and the result, without giving any glues as to the manner, the means, or the nature of the causing activity. This poor semantic description explains why this predicate subcategorizes certain syntactic constructions which are very much in consonance with this semantic description, viz. the causative / inchoative, the middle construction, and its ill-formedness with an unspecified object alternation, which presupposes an activity reading or interpretation, something which is absent in this lexical template.

4.3. *Consumption* **verbs**

According to Levin (1993:213), these verbs –also called verbs of ingesting – are related to the process of ingesting food or drink. I will be examining the latter group

which contains the following class members: *drink, imbibe, gulp, quaff, swig, swill, guzzle*, *tipple* and *sip*. In Van Valin/LaPolla (1997: chapter 3), the following representation is proposed:

(18)   do' (x, [**pred'** (x, y)]) & BECOME **consumed'** (y)

I believe that this structure only captures those facets of the meaning of the predicate which are grammatically relevant, and consequently this does not do justice to the internal semantic parameters which define this lexical class, viz. manner and quantity. Furthermore, one could question whether the predicate *drink,* which is the prototype of this lexical class, is in itself a primitive. If one looks at the definition given for *drink* in the lexicon, this is stated as follows:

(19)   **drink**: to consume liquid, taking it into one's mouth and swallowing it.

A possible formalization of this definition could be stated as follows:

(20)   **do'** (x, [**take'**.(α).**into one's mouth**.(β).**in**.(δ).**manner´**] (x,y)) & BECOME **consumed'** (y) α= y

Initially, this representation accounts for the fact that this classes of verbs designate an activity, and furthermore they can also designate an active accomplishment structure depending on the referential nature of the NP. However, two issues arise; first, to analyze to which extent take' could not be further decomposed; second, to represent the internal nominal structure which signals the goal of the movement described in the action (*into one's mouth*).

In relation to the first query, as a first approximation one could argue that *take* could be the primitive since this predicate also encodes movement, something which is essential to account for certain syntactic constructions, viz. the conative. However, **take'** is too complex a predicate to be used, and thus I shall like to formulate a further decomposition along the lines of 'cause become be-in' here. With regard to the second query, the representation of the nominal clause, possession could be expressed by **have.as.part'** (a,b). Depending on which argument becomes the head of this structure, I shall account for both the saxon genitive or a postmodification. In the case that concerns us here, *mouth* (which stands for b) is interpreted as the head of the nominal clause, yielding the structure, *one's mouth*.

With regard to the internal variables, it is no surprising that these predicates, unlike *contact-by-impact* verbs, only codify a manner component given that the prototypical interpretation of these verbs is that of an activity. Then, I will represent the manner of the activity by means of a (β) variable.

Then, with all this in mind I shall like to propose the following lexical template for this class of verbs:

(21)   **do´** (x, [CAUSE.BECOME.**be-in´**.([**have.as.part´**.(x, mouth)],
α).in.(β).manner´] (x, y)) & BECOME **consumed'** (y) α = y

The reading of this representation would go as follows; *x*, an effector, carries out an activity such that causes *y* to become into *x'mouth* and *y* becomes consumed. Unlike the other two previous interpretations, it is interesting to observe that the internal variable is in turn modified and further decomposed by a more elaborate logical event structure. This is a significant step forward in relation to the hotly debated issue of the dichotomy between internal and external variables.

Finally, one could even discuss the internal nature of the CAUSE predicate, and causatives in general. That is a very interesting and delicate issue to tackle. In this regard, I think that they are an inevitable part of some activity decomposition. However,

this is an issue that I shall like to come back to in relation to the codification of the next lexical template, verbs of existence, where the causative predicate has almost become a classic in the linguistic literature since the emergence of the debate between generative and interpretative semantics at the beginning of the seventies.

4.4 *Sound* verbs

Within this lexical domain, I shall concentrate on the lexical class *"to make a sound indicating happiness"*, which includes the following predicates: *laugh, chuckle, giggle, titter, snigger, snicker, cackle, guffaw, howl, roar.*

One of the recurrent semantic parameters of these verbs is that of manner. This is no surprising given that this group of verbs designate a prototypical activity event structure.

(22)   **do'** (x, [**express**. (α).**in**.(β).**manner** (x, y)] α = y

This structure would be interpreted as follows; *x* carries out an activity such that x expresses a sound *y* in a certain manner. The lexicalization of the manner component will ultimately lead to the actual choice of one lexeme over others in the lexical class.

It is interesting to observe that these predicates subcategorize a cognate object, as illustrated in the *y* variable, although their prototypical instantiation would be that of an intransitive verb. However, as shall be seen later, things are not that straightforward since these predicates can also occur with reaction objects or even in a caused motion construction like the following examples illustrate:

(23)   … he just laughed me straight out of the room (HMH 085).
(24)   The audience were slower to laugh themselves into such a roaring myth (HTN 0682).
(25)   Hillary threw back his head and laughed his great, frank, hearty laugh (H9D 2219).
(26)   He laughed his big , round, comfortable but oddly high-pitched laugh … (FB0 1159).
(27)   Margaret laughed her goat laugh at Shildon's stupidity (KRM 0096).

In principle, cognate objects are independent of reactions, as shown by the fact that both can cooccur together. In the case of a reaction object and a caused motion construction, I claim that both arguments are given by the constructions themselves. For example, in the case of the caused-motion construction I would posit a structure like the one below:

(28)   [laugh LS] CAUSE [BECOME NOT **be-in'** (y,z)]

4.5 Cessative phase of verbs of *existence*

Within the larger domain of EXISTENCE, I shall like to concentrate on the causative cessative phase, *to cause somebody to die*. The hierarchical structure of this lexical class includes a vast number of predicates which designate different means and manners of encoding the cessation of existence: *kill, murder, assassinate, eliminate, do in, bump off, do away with, liquidate, exterminate, massacre, butcher, slaughter, execute, behead, decapitate, guillotine, hang, crucify, electrocute, starve, strangle, suffocate, smother, gas, drown, slay.*

If one looks at the logical structures proposed for this type of verbs, I again observe that only those aspects which are grammatically relevant are encoded, without making any type of explicit mention to the range of semantic parameters encoded in this representation. In this line, one could even argue that there is almost no difference

between verbs of *cooking* and verbs of *killing* since both make use of the same event structure, an assumption which leads us to detect that something is wrong with these two representations:

(29)   [**do'** (x,ϕ)] CAUSE [BECOME **dead'** (y)]
(30)   [**do'** (x,ϕ)] CAUSE [BECOME **baked'** (y)]

In order to circumvent this problem, I resort to the semantic parameters encoded in this lexical class and postulate the following: instrument, manner, purpose or reason. The next step, as has been the usual practice thus far, consists of expanding the logical structure above and convert it into a lexical template. The resulting representation has the following format:

(31)   [[**do'** (w, [**use**.(α). **in**.(β).**manner.for**.(δ)´ (w, x)] *CAUSE* [**do'** (x, Ø)])]]
        CAUSE [BECOME **dead'** (y)] α= x.

However, a closer look at some of these predicates reveals that the parameter 'agency' is a salient and distinguishing property, thus the oddity of the following instances:

(32)   * Malaria murdered Fred (VV).
(33)   * The explosion murdered Larry's neighbor (Van Valin/Wilkins, 1996: 310).
(34)   * The dagger murdered Julius Cesar (Levin, 1993: 231).

In order to account for this particular feature, I shall like to reformulate the lexical template above and add a DO operator, which signals agency as an inherent feature of the verb (cf. Van Valin and LaPolla, 1997:119). Furthermore, this operator explains why these verbs cannot participate in the Instrument Subject construction. Then, the revised lexical template is the following:

(35)   [DO' [[**do'** (w, [**use**.(α). **in**.(β).**manner.for**.(δ)´ (w, x)]) CAUSE [**do'** (x, Ø)]]
        CAUSE [BECOME **dead'** (y)] α = x.

Then, this representation would go as follows; and effector (*w*), using an instrument, intentionally carries out an action in a certain manner and with a certain purpose such that this causes that the instrument instigates another action causing that a patient (*y*) becomes dead. Note that I have identified the α variable with the external instrument variable. The rest of the internal variables are not bound to any specific construction.

As noted above in the discussion of consumption verbs, an intricate issue that arises concerns the semantic decomposition of the causative operator CAUSE. In this regard, compare the following two structures:

(36)   John killed Bill.
(37)   John caused Bill to die.

The first represent a lexical causative while the second is a clear example of a core juncture, and consequently the causality is much less direct than in a nuclear juncture or in a lexical causative. Someone may object that the representation for both should be the same. Recall that this is one of the arguments against the use of semantic decomposition. However, following Van Valin/LaPolla (1997: 671, fn. 17), the logical structure for a predicate like cause would have the following format:

(38)   [**do'** (x, ϕ)] CAUSE [**undergo'** (y,z)]

where the variable z stands for the complement structure of the verb:

(39)   [**do'** (John, ϕ)] CAUSE [**undergo'** (Bill, [BECOME **dead'** (Bill)])]

This structure clearly differs from that proposed for a lexical causative such as *kill*. Despite this tentative analysis, it is unquestionable that one of the most intriguing and fascinating lines of research is to explore the universality and primitive nature of some of the predicates. In this regard, either an ontology or a set of culture-bound universals can serve as an alternative to detect where the chain of decomposition actually ends. However, this is an issue which is beyond the scope of this paper.

Finally, it is necessary to analyze whether there is any type of constraint on the directionality of the lexical template. In consonance with this, there are some authors who proclaim that lexical templates should be minimal representations, while others claim just the opposite. My analysis has shown that both processes are possible and this justifies the fact that the general linking principle – the Lexical Template Modelling Process (LTMP) - is in itself a modelling process, without invoking neither a reductionist nor a maximalist orientation.

5 Constraining the generative power of a lexical template

In the most recent literature the notion of template has been adopted by some linguistic models. In this regard, there are two questions that merit a brief comment:
- The format of a template should be a minimal expression or else a maximal representation.
- The directionality of the template, that is, whether the template should be constrained by an expansion mechanism, and accordingly, no reductions are possible, or else, whether a template should be maximal in its form and both reduction and expansion processes are possible.

Our approach formulates a maximal representation since this intends to capture the whole conceptual substance of a lexical class, though without invoking that reduction processes hold to account for those syntactic configurations which do not fit the model in full. This entails a very different conception of what basic templates are in comparison with other proposals: Rappaport and Levin's (1998) account of these phenomena is based on an incremental process on templates, their *Template Augmentation Process*, which is in turn inspired in the monotonic nature of verb meaning:

Template Augmentation: Event structure templates may be freely augmented up to other possible templates in the basic inventory of event structure templates.

Thus, if we consider a prototypical activity verb like *sweep* its basic template would be:

(40)   [x ACT $_{<SWEEP>}$ y]

However, the use of this predicate in a resultative construction entails the expansion of its basic activity template resulting in the following:

(41)   [x ACT $_{<SWEEP>}$ y] CAUSE [BECOME [y <STATE>]]

This procedure seems to work properly for these verbs, and makes in principle hard to decide whether a reduction or an expansion process is the right choice. I have found compelling evidence, both from the primary and the affixal lexicon, that shows that it is

desirable to formulate maximal representations, and thus unrestricted in nature, to minimal representations, which serve as input for expansion processes. This kind of solution runs the risk of being unrestrictive and unconstrained: it leaves open the possibility of yielding impossible or non-lexicalized structures, like the following:

(42)   fight: *[[x ACT $_{<FIGHT>}$ y] CAUSE [BECOME [y <STATE>]]]

Fight, as any activity verb would be an optimal candidate for augmentation to yield a causative accomplishment reading where the activity becomes the causing subevent for an accomplishment; but there is no such meaning available for this verb. Rappaport/Levin (1998:112) apparently filter out this possibility by imposing the so-called *Subevent Identification Condition*, according to which each subevent in the event structure must be identified by a lexical head in the syntax (either a verb, and adjective or a preposition). Thus, nothing prevents from interpreting the sentence *"The villagers fought against the invaders"* as a causative accomplishment since the prepositional complement would be associated to the second subevent in the causal chain; but this is obviously not the case. In much the same way, if we consider the template proposed for externally caused change of state verbs (*break, destroy, smash, decompose*, etc.) in Rappaport/Levin (1998: 116) we observe that such template is just the maximal projection after the Template Augmentation Principle has been applied resulting in the following structure:

(43)   [[X ACT $_{<MANNER>}$] CAUSE [BECOME [y <*BROKEN*>]]]

However, since this structure cannot be further augmented because it is already a maximal projection, this makes it difficult to account for the following instances:

(44)   The first question can be broken down into two further questions (LOB G8.H83)
(45)   At a particular depth in the sea, (it) resolves itself into two components (LOB J1H55)
(46)   The last three compounds decomposed to oxides on heat treatment (LOB J7.H94)
(47)   The shadow resolved itself into a large brown ...... (LOB 11.H58)
(48)   ....was not fit to go under water and then he had burst into tears (LOB N1H.39)

According to Rappaport/Levin (1998: 122-123), the resultative phrase is a further specification of the change lexicalized in the predicate. Though certainly true, Levin and Rappaport's structure cannot account for this phrase without having to stipulate a new expansion since the added subevent, according to the Subevent Identification Condition, can be satisfied given that this is headed by a preposition. In contrast, as noted above, our proposal already codifies this resultative phrase by means of the variable (z) in the expanded lexical template. This, again, is one more argument in favour of proposing maximal representations for the lexical properties of lexical classes.

Lexical templates, on the other hand, in being maximalist avoid the danger of overgenerating non-realized alternations; this involves a more economical kind of explanation. At the same time, maximalist templates are further motivated if one considers certain word-formation phenomena, such as what we might call "inherited polysemy": it is not unusual to find derived words with more than one meaning, each of which corresponds with different meanings of the base word. Suffice the following example: *descendant* can refer to either an entity involved in a motion activity ("someone who descends") or may designate one participant in a stative locative-temporal connection ("someone posterior in a temporal line"). It is clear that these two

possible meanings are bound directly to the polysemous nature of the verbal base: *to descend* can refer to the action of going down along a vertical path, in which case its event structure is that of an activity:

(49)   As we descend down the valley the views became more and more fascinating

or it may express just the localization in a temporal line:

(50)   We all descend of a forest-living ape

It is evident that the stative reading is part of a complex event structure such that it is possible to conflate under one single meta-entry the two possible interpretations without having to stipulate two different lexical entries, one for *descend* as an activity:

(51)   **do'** (x, [**descend'** (x, y)])

and a second augmented one as an active accomplishment where the state subevent is encapsulated:

(52)   **do'** (x, [**descend'** (x, y)]) & BECOME **be-loc'** (z, x)

A further complication of this approach is its inability to explain why the temporal meaning of the verb focalizes only on the stative resultative subpart of the augmented template (be-loc' (z, x)); Rappaport/Levin (1998) make no allowance for any reduction process, which is necessary if *descend* ("be after in succession") is taken as a base word for the suffix *–ant*; that is, one faces the following disadvantages:

  (a) if we want to correctly predict the two possible meanings of the derived word, and one makes no use of maximal representations, the base word would have to be represented at least twice.
  (b) even if this approach were adopted, the stative interpretation of the base word would have to be arrived at by an event pruning process from its active accomplishment interpretation, a mechanism disfavored by Rappaport/Levin (1998).

The maximizing approach is more economical in having to establish only one representation for the verb, something that is in accord with my aim of designing a minimalist lexicon. The affix will have then access to this meta-entry and will select all or part of it for the elaboration of the representation underlying the derived word. That is, affixes are sensitive to the semantic parameter of *degree of event elaboration* (D.E.E.) (cf. Kemmer 1993, and Wee 1999): affixes can opt to choose the event represented in the meta-entry as an undifferentiated whole:

(53) φ^i_n: **do'** (x^i, [**descend'** (x^i, y)]) & BECOME **be-loc'** (z, x^i) [D.E.E. = $\varnothing$]

or it may select one of its substructures or component parts:

(54) φ^i_n: **be-loc'** (z, x^i) [D.E.E. = ≥ 1]

Of course, I claim that the D.E.E. corresponds to alternative conceptualizations by the speaker. This parameter also refers to the extent to which participants in an event are distinguished. In the case of agentive formations the D.E.E. explains also the "potential polysemy" of units like *cleaner*, that can either refer to the Agent or to the Implement of the event, depending on whether the first participant is specified or not.

Role and Reference Grammar posits both directions, either reduction or expansions. For example, the lexical rules in section 4.6 go 'both ways' in the sense that they can be reduction or expansion rules. This is because languages do both; there are languages exemplified in Van Valin/LaPolla (1997) by Tepehua, Mparntwe Arrente, in which inchoatives are formed by the addition of an inchoative morpheme, and causatives are formed by the addition of a causative morpheme. These would clearly be expansions. However, in Romance and Slavic languages, the base form of a verb like *break* is a causative accomplishment, and the added morphology (reflexive morphemes) reduces the lexical template from causative accomplishment to an accomplishment (Van Valin/LaPolla, 1997: 98-99; 178-183). The tricky case is languages like English, in which there is little morphology signaling the alternations (Rappaport/Levin, 1998: 118).

Initially, when I began my research, it seemed to me more reasonable to propose a maximal form underlying the class and then to argue that the different verbs left different aspects of the maximal lexical template out. The advantage of this is that it constraints the system; the maximal lexical template would correspond either to a causal chain lexical template (or an extended motion event with activity + source + path + goal specified for motion verbs like *descend*). As things stand, I firmly believe that both expansion and reduction must be allowed but tightly constrained.

In order to make things clear, the format of a lexical template is a maximal expression but a different issue is the way this interacts with specific syntactic configurations. In this regard, I claim that the accommodation of a lexical template to a specific construction can take a maximized or reduced format. That is, I will be talking about modelling processes. In much the same way as predicates share a semantic area as encoded in their respective lexical subdomains, predicates select /licence/ focalize one part, or parts of the lexical template. This avoids the issue of whether lexical representations should be minimal or maximal representations, a theoretical issue which is highly controversial.

6 Final remarks

This paper has been mainly concerned with the notion of lexical template. Firstly, the major current approaches to lexical representations have been addressed with a view to showing that these primarily proclaim that the identification of those elements which form part of a lexical representation should be equated with those aspects which are grammatically salient. In connection with this, I advance the claim that a full semantic decomposition should be posited in order to explain the full meaning potential of a predicate. With this assumption in mind, I explain why the notion of lexical template grows out. In the second part of this paper, an explicit account of the nature of the lexical representation as well as the format of a lexical template is given. In order to prove the explanatory value of the notion of lexical template, I bring to the forefront the lexical templates proposed for a wide variety of lexical classes.

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