

GENERATIVE SEMANTIC MECHANISMS WITHIN MORPHOLOGICALLY COMPLEX WORDS¹

Eulalia Sosa Acevedo
Universidad de La Laguna

Abstract: *This paper seeks to introduce an alternative perspective on the treatment of derivation within a functional framework like Role and Reference Grammar (RRG). By taking a functional perspective, we assume that word formation is a two-dimensional phenomenon involving both onomasiological and grammatical components. Furthermore, grammatical processes are considered to be semantically motivated. In order to properly account for the internal mechanisms involved in word formation, we formulate affixal lexical representations by using Lexical Templates as devised within the LCM (see Mairal Usón & Faber 2007; Mairal Usón & Ruiz de Mendoza 2008a,b; Ruiz de Mendoza & Mairal Usón 2008; Butler 2009; Cortés Rodríguez 2009, among others).*

Key words: *Word formation, derivational morphology, lexical representation, affixal lexical templates.*

1. INTRODUCTION

The proposal put forward in this paper is in the same line as other lexical semantic models particularly in that it provides a view of the lexicon as a component integrating both the primary lexicon and the affixal lexicon (see Booij 1988, 2005 & 2009; Lieber 1992, 2004, 2005 & 2009; Štekauer 2005a & 2005b). In addition, the lexicon is regarded as a bidimensional component involving an onomasiological (i.e. lexicological) facet and a grammatical facet. Our proposal essentially departs from the following theoretical assumptions:

1. i. The lexicon comprises both free lexical morphemes (i.e. words) and bound lexical morphemes (i.e. derivational affixes).
- iii. Both free and bound lexical morphemes are grouped into lexical classes set up by closeness in meaning.
- iv. Both free and bound lexical morphemes are semantically represented by means of Lexical Templates.
- v. Word-formation processes are determined by a mechanism of **subsumption** between Lexical Templates.

The diagram in Figure 1 below provides a partial view of how the main affixal lexical classes are distributed across a semantic macronet for languages like English and Spanish (cf. Faber and Mairal 1999: 251-270).

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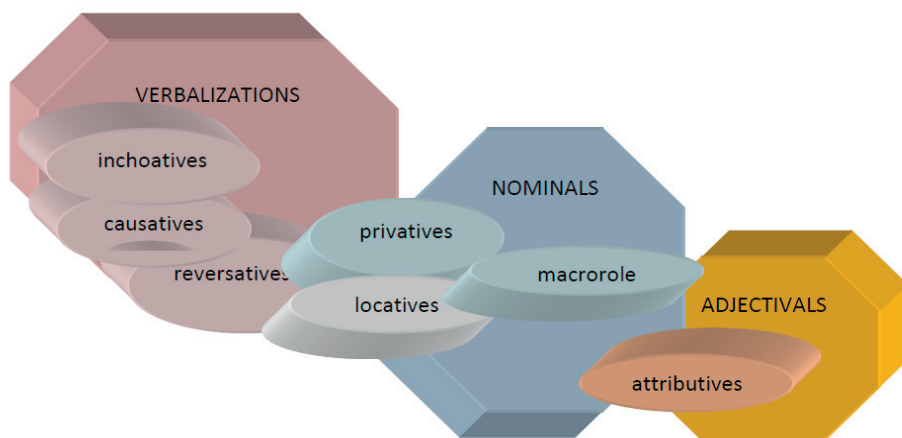


Figure 1. Partial map of the major affixal classes in the lexicon.

The affixes as well as other morphological processes, primarily compounding and parasynthesis², are organized into hierarchies of different levels of semantic specification. Double or multiple class-membership is not uncommon. Consider, for instance, the class of Nominals in which the Spanish affix *-ero* exhibits various semantic values. In formations like, *panadero*, *camionero*, *torero*, *cosechero*, etc. it conveys its more prototypical meaning of Agent (i.e. X does Y: X produces/drives/plays/works in... bread, lorry, bullfighting/ harverst, etc.) and, in derived forms like *comederero*, *monederero*, *desfiladero*, etc. it has a locative meaning (i.e. X is a place where Y is : eat, keep money, fall down). In contrast, a word like *azucarero* or *joyero* may be interpreted either as an agentive formation (the one who produces sugar) or as a locative unit (the container where sugar is preserved)³. As we shall see in the next sections, these facts lead to the conclusion that the suffix *-ero* occupies an area between the Macrorole and the Locative affixal classes.

As for Word-formation processes, they are regarded as a Subsumption operation between at least two Lexical Templates, i.e. as a (set of) mechanism(s) whereby (part of) one template is subsumed under the (an)other (see Cortés Rodríguez 2009; Mairal Usón & Ruiz de Mendoza 2009). Subsumption processes generally involve two basic semantically-motivated mechanisms. Firstly, **co-indexation or binding** between one element of the base template and another of the modifying template, a mechanism which restricts the referential potential of the resulting formation so that it constitutes an individual referential unit (v. Lieber 2004; Booij & Lieber 2004). Secondly, **qualia selection** which assigns the complex word one specific semantic structure out of a range of possible meanings (see Pustejovsky 1995; Batiukova 2008, Cortés Rodríguez & Sosa Acevedo, in press).

² In this paper we focus on the analysis of processes of affixation. For the treatment of compounding see Cortés Rodríguez & Sosa Acevedo (2008) and Martín Arista (2009), among others.

³ It seems worth noting that the degree of specificity in meaning may also vary according to diastatic, diaphasic and diatopic features (see Coseriu 1978). This kind of phenomena explains why in some varieties of Spanish (E.g. Latin America, the Canary Islands, etc.) *azucarero* and *azucarera* may both designate 'container for sugar' (cf. examples 2 and 3 below) but only the feminine formation is used to refer to the industrial production of sugar as exemplified in (1). Examples are extracted from CREA:

1. BCH y Sucrière son los accionistas principales de **la azucarera** española [El Mundo, 29/04/1996. Unidad Editorial Madrid, 1996]
2. Al otro lado, un pesado cenicero de cristal cortado y **la azucarera** que hacía juego. [Cabrera Infante, Guillermo. *Delito por bailar el chachachá*. Alfaguara: Madrid, 1995]
3. Acercó **el azucarero** a mi café, [Skármeta, Antonio. *El cartero de Neruda (Ardiente paciencia)*. Plaza y Janés (Barcelona), 1996]

2. AFFIXAL LEXICAL TEMPLATES

The configuration of a theory of lexical representations is essential to account for the internal semantic interrelations involved in word-formation processes. Following recent contributions within the LCM (see Mairal and Ruiz de Mendoza 2008a, 2008b and 2009; Ruiz de Mendoza and Mairal 2008; Butler 2009; Cortés-Rodríguez 2009, *inter alios*), our proposal incorporates Affixal Lexical Templates (henceforth Affixal LTs). By way of illustration, consider the overall layout of the following Affixal LT formulated for the Spanish suffix *-ista* as in formations like *ebanista*, *corista*, *pianista*, etc.

2. $[\alpha_{N/ADJ} + ista^i_N]^i_N : [DO(x^i, [do'(x^i, [e2: LT \dots \varphi_{BASE}: (Qualia: \dots LT(x^i \dots))])])]$,

E.g. pianista

In formulating Affixal LTs, four essential components are specified: the morphological frame, the (sub)event-structure(s), qualia specifications and co-indexation. The initial segment of this representation constitutes the **morphological frame** $[\alpha_{N/ADJ} + ista^i_N]^i_N$ which defines the constituent structure of the derived and provides information regarding the categories of both the base $[\alpha_{N/ADJ}]$ and the complex word $(\dots)^i_N$ ⁴ (cf. Nolan 2010). In the case of words like *pianista*, the base is specified as a nominal $[\alpha_N]$ (cf. adjectival formations: $legal_{Adj} - ista_N$). The **Event Structure** associated to these formations comprises the Agent operator $([DO(x^i, \dots)])$. Within RRG, a crucial distinction is made between Agent and Effector (Van Valin & LaPolla 1997: 118-120; Van Valin 2005: 56): an Agent is defined as an entity capable of volition, intention and control over the action that is being carried out whereas the Effector is "... the doer of an action, which may or may not be willful or purposeful..." (Van Valin & LaPolla 1997: 85). Interestingly, this distinction fully applies to the set of affixal formations which have been traditionally defined as "agentive". In this respect, we shall consider a division between, on the one hand, Effector Nominalization affixes with a strong volitional component like *-ista* (i.e. *pianista* an animate human entity volitionally and purposefully plays the piano) which are therefore truly agentive, and on the other hand, Effector nominalizations affixes which imply no control like *-ero* in *apeadero*, *despeñadero* (i.e. a place where typically human entities get out of a vehicle). Integrated as a part of the Event Structure, **Qualia** specifications, adopted from Pustejovsky (1995), are represented as a restriction on the (sub)event structure associated to the LT of the base Word: $[LT \dots \varphi_{BASE}: (Qualia: \dots LT(x^i \dots))]$. Finally, **co-indexation** by means of the superscript *i* expresses the existence of a semantic bond between the suffix $-ista^i_N$ and one of the arguments specified within the Qualia structure of the base (i.e. x^i) (see Cortés Rodríguez 2006, Cortés Rodríguez and Sosa Acevedo 2008). Let us go into some detail on the role of these components.

From a semantic perspective, Qualia Structures provide the relevant semantic constraints restricting the meaning of a given concept in context. According to Pustejovsky (2001: V; 1995:143), for any concept x , there are at least four types of Qualia which convey the following contents⁵:

3. QUALIASTR: FORMAL QUALE (Q_f)= what x is
 CONSTITUTIVE QUALE (Q_c)=what x is made of
 TELIC QUALE (Q_t)= function of x
 AGENTIVE QUALE (Q_A)= how x came into being

⁴ This is a simplified representation of the base word. In a fully specified description, further specifications concerning the semantics of the base words (E.g. features like animate/inanimate, etc.) are included.

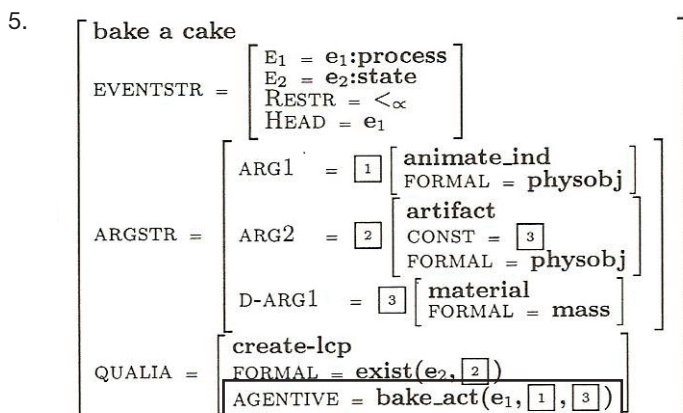
⁵ It must be emphasized that the four qualia are not necessarily activated for all the words and in all the contexts. Words activate them only if they are relevant in their semantic interpretation.

A prototypical example illustrating Qualia structures is represented below for the word **cake** (Pustejovsky 1995:123):

4. **cake**

QUALIASTR: CONSTITUTIVE (Q_C)= mass (**y**) (e.g. flour, dough, etc.)
 FORMAL (Q_F)=*food* (**x**) 'what x is' (piece of food)
 TELIC (Q_T)= *eat* (**e₂,z,x**) 'function of x' (consumption)
 AGENTIVE (Q_A)= *bake* (**e₁,w,y**) 'how x came into being' (by baking)

Together with Qualia Structures, Pustejovsky (1995:142) distinguishes two other dimensions of meaning, Event Structure and Argument Structure, which come into play in the interpretation of a word in context. Thus, in (4), the Qualia structure is associated both to a particular subevent structure (i.e. usually the subevent of baking e_1 takes place before the subevent of eating e_2) and to the specific Argument structure entailed by each of these subevents (e.g. Effector for the activity of eating, Patient for cake). What this Qualia structure therefore captures is the fact that **cake** is “prototypically brought about by the activity they are [it is] in composition with...” (Pustejovsky 1995: 123). In other words, a suitable context for the word *cake* to appear in would be *bake a cake* and this information is encoded in the Agentive Quale of the word *cake* as shown in the full representation provided in (5) (extracted from Pustejovsky 1995:125):



This example illustrates one of the most relevant semantic mechanisms defined by Pustejovsky (1995:125 ff) as Co-composition. This process allows to interpret *bake a cake* with telic meaning (typically assigned to activities of “creation” i.e. the making of a cake) by combining the “atelic” activity meaning of *bake* with the Qualia Structure of *cake*.

In the following sections, we address in detail the role of Qualia structures in the formulation of Affixal LTs and in enriching lexical semantic representation for the most relevant affixal classes in Spanish and English. Our analysis will focus on the study of Macrorole Nominalizations and Causative Verbalizations as two of the major classes of affixes in these two languages.

3. WORD-FORMATION PROCESSES

The use of the label *Macrorole*, adopted from RRG terminology and intended to comprise both Actor and Undergoer Nominalizations, is amply justified since not all the formations belonging to this class are agentive. While it is true that the most prototypical formations are **effector** nominals (E.g. *escritor*, *violinist*, *designer*, etc.) there are many other formations (E.g. *occupier*, *believer*, *owner*, *lover*, *amante*, etc) in which the notion of ‘effectorhood’ is absent (see Cortés Rodríguez & Pérez Quintero 2002)

In the light of these distinctions, affixal morphemes and Nominalizing Affixal LTs in the lexicon appear to be organized into a hierarchical structure comprising four different levels:

The *Macrorole Nominalization Template* at Level 1 represents the most generic or hyperonymic template which thus encompasses all the affixes of the class, including the Spanish *ista*, *-ero*, *-or*, *(-a/-e/-ie)nte*, *(-a/-i)do* and *-ario* as well as the English *-er*, *-ee*, etc. At Level 2, we find two distinct subspecifications of *Macrorole* Nominalizations. On the one hand, Actor Nominalizations with Spanish *-ista*, *-or*, *-ante*, etc. (E.g. *socialista*, *segregacionista*, *opositor*, *embaucador*, *cantante*) and with English *-er*, *-ant*, etc. (*hunter*, *shaker*, *contestant*, etc) and, on the other hand, Undergoer Nominalizations like English *-ee* (Eg. *addressee*, *payee*, *employ-ee*). Level 3 comprises Effector Nominalizations which roughly correspond to the traditionally labeled ‘agent formations’ like *driver*, *runner*, *smoker*, etc. and, finally, Level 4 represents Agent Nominalizations like the Spanish *fabulista*, *bromista* or the English *beautician*, *physician* etc.

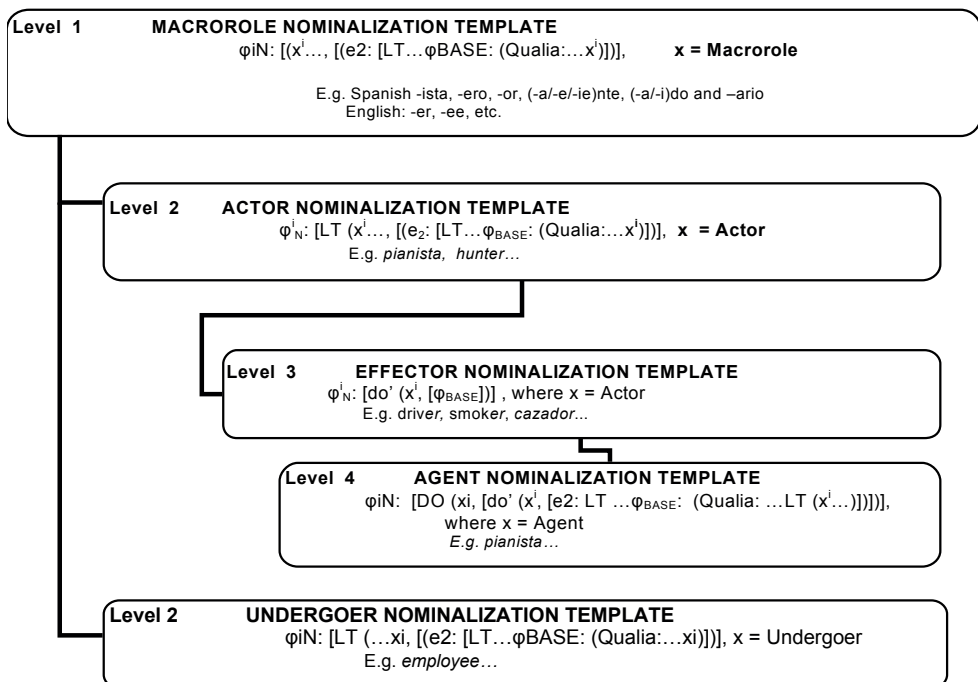


Figure 2. Hierarchical architecture of the affixal lexical class ‘Macrorole Nominalizations’.

Coindexation is precisely used as a means to indicate which of the participants involved receives the specific macrorole function, either Actor or Undergoer. As illustrated in (6), for

The operator CAUSE specifies the causative nature of the semantic relation between the two subevents involved: First, the causing subevent expressed as $[\mathbf{do}'(x, \emptyset)]$, with an unspecified second argument representing some kind of activity (E.g. see VV.), and second, the caused subevent involving the base word $[e_2: (\text{LT} : \dots \alpha_{\text{base}} \dots)]$.

The relevant process in this case is **Selective Binding** or **Exploitation** of one Quale from the LT of the base. This is expressed in (8) by means of the vertical arrow connecting ϕ_V <Quale: $[\alpha_{\text{BASE}}^i >]$ to the derivational Causative Template (see Cortés Rodríguez 2006a; Batiukova 2008). As an example, let us consider the Spanish formation *empaquetar*:

9. $[\text{en-} + \text{paquete}_{\text{N}}^i]_{\text{V}}; \mathbf{do}'(z, \emptyset) \text{ CAUSE } [e_2 = [\text{BECOME } \mathbf{be-in}'(\text{paquete}_{\text{N}}^i, y)]]$
- \swarrow
*paquete*_N
- TYPESTR = (x: **artifact-lcp**)

QUALIASTR = ...

Q_f : **container'** (x^i, y)

Q_c : **cardboard/paper-like'** (x)

Q_a : ... $e_1[\mathbf{do}'(z, \emptyset)]/ \mathbf{artifact}'(x \vee y)$

Empaquetar involves a causative-locative interpretation i.e. 'to cause something to be inside/wrapped in a pack(et)'. As indicated in (9), this interpretation emerges from the selection of the Formal Quale which defines the nominal *paquete*_N as a container (Q_f : **container'** (x^i, y)). This quale activates the interpretation of the caused subevent as a locative (...**be-in'**(x^i, y)) and co-indexation further specifies that, within this locative structure, it is the entity designating the *locus* that is selected as a restriction on the meaning of the derived word, that is to say, *empaquetar* basically designates a locus.

What Qualia selection therefore helps us explain are semantic differences across formations involving the same affix. This is self-apparent with affixes like the Spanish suffix *-izar*. As shown in (10), in deadjectival formations like *mineralizar*, the selected Quale is the Formal Quale of the base, which activates a causative-resultative meaning: 'to cause to become like mineral'.

10. $[\text{mineral}_{\text{Adj}}^i + \text{izar}_{\text{V}}] \phi_V; [\mathbf{do}'(z, \emptyset) \text{ CAUSE } [e_2 = [\text{BECOME } \mathbf{pred}'(y^i, x)]]]$
- \swarrow
*mineral*_{Adj} : {... Q_f : **be'**($y, \text{mineral}'$) ...}

Derived formations like *caramelizar*, *señalizar*, *ejemplarizar*, *eterizar*, etc. constitute the reverse case in which the relevant Quale is the Constitutive Quale (see (11) below). Thus, for instance, *caramelizar* implies 'to cause to have caramel as a part' (cf. *acaramel-ar*: 'to cause to become caramel-like').

11. $[\text{caramelo}_{\text{N}}^i + \text{izar}_{\text{V}}] \phi_V; [\mathbf{do}'(z, \emptyset) \text{ CAUSE } [e_2 = [\text{BECOME } \mathbf{have.as.part}'(x, y)]]]$
- \swarrow
*caramelo*_N : {... Q_c : **caramelo'** ...}

The choice of specific qualia from the base word is sometimes possible with the same formation thus causing polysemy effects. This is indeed the case of *mineralizar* which can be additionally interpreted as 'to cause to have a mineral(s) as a part' when the Constitutive Quale is selected (see Batiukova 2008). Compare the representations in (10) and (12):

$$12. \quad [mineral_{Adj}^i + izar_v] \varphi_V: [do' (z, \emptyset) CAUSE [e_2 = [BECOME pred (y', x)]]$$

The existence of polysemy motivated by Qualia Selection paves the way for interesting work which, along the lines of the Štekauer (2005a,b), may help clarify the conditions which determine and the degrees of predictability for the realization of each possible interpretation.

4. CONCLUSION

In our view, the proposal we have expounded in this paper provides a sound basis for the development of a comprehensive theory of word formation coherent with a functional framework of language like RRG. Our approach lays special emphasis on the commonalities between the primary and the affixal lexicon: both are organized into hierarchies of different semantic specificity and both are represented by means of Lexical Templates. Furthermore, word formation has been described in terms of a process of Subsumption, a mechanism which determines the semantic structure of both primary and affixal lexical units in context. Although we have basically focused on the description of some processes of derivation, this proposal is intended to be equally valid for the analysis of other word-formation phenomena like compounding and parasynthesis. The formulation of Affixal LTs has proved crucial to highlight the internal workings of Co-indexation and Qualia Selection which determine the final semantic structure and also to account for what are sometimes very subtle distinctions concerning the affixes which belong to the same affixal class (E.g. Nominalizing affixes) as well as the formations derived from the same affixal class (E.g. *mineralizar* vs. *caramelizar*).

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