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Constraints on English middle structures: A Lexical-Constructional analysis[1]

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Abstract

This paper provides an analysis of English middle structures within the framework of the Lexical Constructional Model (LCM), which proposes a central module, the *level 1* or *argument module*, consisting of elements of syntactically relevant semantic interpretation based on the interaction between lexical and constructional templates. Hence, the first task will be to explain the *constructional template* corresponding to middle sentences in English by means of the metalanguage proposed in the model.

Nevertheless, and following some of the more recent—and still programmatic—proposals (cf. Cortés and Sosa, 2008; Mairal and Ruiz de Mendoza, 2008; Cortés, 2009), the Middle Template will also include its corresponding qualia features, following Pustejovsky's (1995) semantic theory. This extended system of representation will allow us to give a principled account of the semantic (in)compatibility between lexical elements (predicates and arguments) and the middle construction.

Keywords: Middle Construction Template, Lexical-Constructional Model, Subsumption restrictions.

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1. Introduction

This paper provides an analysis of English middle structures within the framework of the Lexical Constructional Model (LCM henceforth), which proposes a central module the level 1 or argument module, consisting of elements of syntactically relevant semantic interpretation based on the principled interaction between lexical and constructional templates. Thus, the lexical component is composed of (a) a repository of lexical units grouped into lexical classes; and (b) a catalogue of constructions, which is also devised as having internal organization.

The LCM develops a system of lexical representation composed of the Aktionsart properties of predicates, as described in Role and Reference Grammar (Van Valin, 2005; Van Valin and LaPolla, 1997), plus a semantic module which combines Mel'cuk's (1989) and Mel'cuk and Wanner's (1996) Lexical Functions and the semantic primitives proposed by the Natural Semantic Metalanguage (Goddard and Wierzbicka, 2002; Wierzbicka, 1996). Therefore, lexical decomposition encompasses both an eventive characterization and the set of semantic parameters that delimit the position of every predicate in the semantic architecture of the Thesaurus component. This proposal for semantic representation is extended to the realm of the constructicon. Section 2 offers a detailed description of the general structure of the LCM and specifically of its system of semantic representation.

The central task of Section 3 in this paper will be to provide the constructional template corresponding to middle sentences in English, based on this same metalanguage. Nevertheless, and following some of the more recent proposals (cf. Cortés-Rodríguez, 2009; Cortés-Rodríguez and Sosa, 2008; Mairal and Ruiz de Mendoza, 2008), the Middle Template integrates also Pustejovsky's (1995) qualia structure. This system of representation will allow us to give a principled account of the semantic (in)compatibility between lexical elements (predicates and

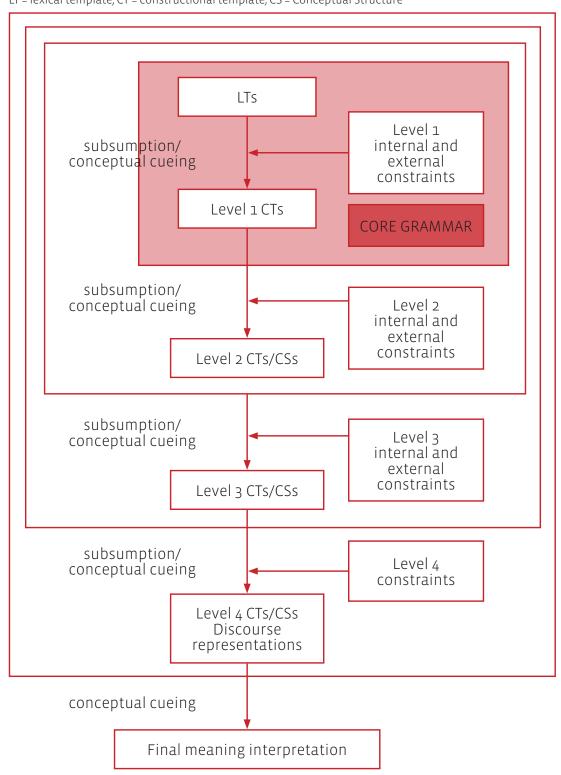arguments) and the construction. Section 4 is devoted to this issue.

The analysis of lexical subsumption within the middle construction reveals two types of restrictions: firstly, there is an external constraint affecting the unification of predicates and middle structures (cf. Ruiz de Mendoza and Mairal, 2007; Ruiz de Mendoza and Pérez, 2001). This external constraint is based on a high-level metonymic process which has been labelled process for action for (assessed) result: whereby an action is seen as a process that is assessed in terms of the viability of the intended result. Secondly, unification is conditioned by some internal constraints imposed upon the semantic structure of predicates. Among these there are also two subtypes: (1) constraints on the event structure of predicates, which make reference to the compulsory aspectual conversion of predicates. This is in fact a lower-level semantic parallel to the higher metonymic constraint proposed above; (2) constraints on the arguments of lexical templates. The analysis of these constraints will in fact reveal the feasibility and explanatory potential of the LCM for meaning construction.

2. An overview of the LCM

As mentioned before, this study adopts the LCM as a model for description. Figure 1 shows a schematic diagram of this model (Ruiz de Mendoza and Mairal, 2007c). Thus, the LCM has a level 1 or core grammar module consisting of elements with syntactically relevant semantic interpretation. It also has a pragmatic or level 2 module that accounts for low-level inferential aspects of linguistic communication. There is a level 3 module dealing with high-level inferences (i.e. illocutionary force). Finally, a level 4 module accounts for the discourse aspects of the LCM, especially cohesion and coherence phenomena. The lexical component, as envisaged in the LCM, is located at Level 1 and is composed of a thesaurus, or repository of lexical units with their

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FIGURE 1

The overall architecture of the Lexical Constructional Model (from Ruiz de Mendoza and Mairal, 2007c)
LT = lexical template; CT = constructional template; CS = Conceptual Structure

LTs

subsumption/
conceptual cueing

Level 1
internal and
external
constraints

Level 1 CTs

CORE GRAMMAR

subsumption/
conceptual cueing

Level 2
internal and
external
constraints

Level 2 CTs/CSs

subsumption/
conceptual cueing

Level 3
internal and
external
constraints

Level 3 CTs/CSs

subsumption/
conceptual cueing

Level 4
constraints

Level 4 CTs/CSs
Discourse
representations

conceptual cueing

Final meaning interpretation

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corresponding lexical templates and a catalogue of Level 1 constructions of a language—the constructicon—also endowed with a semantic description. The interaction between these two modules is determined by a set of subsumption operations and constraints—the Unification Process. Within the context of this model, semantic interpretation is the result of the unification of a lexical template (i.e. a low-level representation of the semantic and syntactic properties of a predicate) and a constructional template (i.e. a high-level—conceptual—representation of the semantic properties of a construction). This process integrates predicate argument structure (functional approaches) with linking constructions (constructionist approaches).

2.1. Semantic representation in the LCM

At the heart of the model lies the notion of the lexical template[2], intended to capture both the semantic and syntactic information encoded within a lexical class. This means that a lexicon hierarchically organized into coherent semantic classes—the so-called thesaurus—, each of which is represented in terms of a lexical template, figures prominently in this approach.

Lexical templates are enriched semantic representations of the logical structures proposed in RRG; hence they are part of an aspectual event structure theory and are the initial element in the semantics-to-syntax linking process. Logical structures are based on the *Aktionsart* distinctions proposed in Vendler (1967), and the decompositional system is a variant of the one proposed in Dowty (1979). Verb classes are divided into *states, activities, achievements, semelfactives* and *accomplishments* together with their corresponding causatives. States and activities are primitives, whereas accomplishments and achievements consist of either a state or activity predicate plus a BECOME and an INGR operator; semelfactives—the non-telic variants of achieve-

ments—are marked by the operator SEML. The inventory of RRG logical structures is shown in the table below:

TABLE 1

RRG's Logical Structures

Verb Class	Logical Structure
State	**predicate'** (x) or (x,y)
Activity	**do'** $(x, [$**predicate'** (x) or $(x,y)]$
Achievement	INGR **predicate'** (x) or (x,y), *or*
	INGR **do'** $(x, [$**predicate'** (x) or $(x,y)]$
Accomplishment	BECOME **predicate'** (x) or (x,y), *or*
	BECOME **do'** $(x, [$**predicate'** (x) or $(x,y)]$
Semelfactive	SEML **predicate'** (x) or (x,y), *or*
	SEML **do'** $(x, [$**predicate'** (x) or $(x,y)]$
Active accomplishment	**do'** $(x, [$**predicate$_1$'** $(x, (y))]$ and INGR **predicate$_2$'** (z,x) or (y)
Causative	α CAUSES ß where α, ß are LS of any type

As has been pointed out on several occasions both outside (Mairal, 2004; Mairal and Faber, 2002, 2005) and within (Van Valin and LaPolla, 1997: 116-118; Van Valin and Wilkins, 1993) the RRG model, not everything about the semantic complexities of predicates is captured by these formulas. Following the proposal in Mairal and Faber (2005), a predicate's semantic representation in the LCM consists of two elements: an eventual description along the lines of RRG's Logical Structures and a semantic decomposition in terms of primitive predicates extracted from a finite set. Such a group of primes is formed by the conjunction of Faber and Mairal's (1999) archiunits of the architecture of the verbal lexicon, the semantic primitives that constitute the core of the Natural Semantic Metalanguage (Wierzbicka, 1996; Goddard and Wierzbicka, 2002) and the Lexical Functions from Mel'cuk's model (Mel'cuk, 1988, 1989; Mel'cuk and Wanner, 1996). Following the most recent proposals (Cortés-Rodríguez, 2009; Cortés-Rodríguez and Sosa, 2008; Mairal and Ruiz de Mendoza, 2008) within the LCM, this

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2   The following description follows in part the works of Mairal and Faber (2005) and Ruiz de Mendoza and Mairal (2006, 2007a, 2007b, 2007c).

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information appears organized in the qualia structure characterization of predicates. According to Pustejovsky's (1995) lexical theory, qualia structure specifies four essential aspects of a word's meaning (or *qualia*) (Pustejovsky, 1995: 76, 85-86):

- CONSTITUTIVE (Q_C): the relation between an object and its constituent parts
- FORMAL (Q_F): that which distinguishes it within a larger domain
- TELIC (Q_T): its purpose and function
- AGENTIVE (Q_A): factors involved in its origin or 'bringing it about'

The following is an example of lexical representations based on this system (adapted from Pustejovsky, 1995: 101-102):

book
ARGSTR = [ARG1 = **x: information**]
         [ARG2 = **y: phys_obj**]
QUALIA = **information·phys_obj_lcp**
         FORMAL = *hold* **(x,y)**
         TELIC = *read* **(e,w,x·y)**
         AGENT = *write* **(e', v, x·y)**

What qualia structure tells us about a concept is the set of semantic constraints by which we understand a word when embedded in the language. Thus, the skeletal structure of semantic definitions is as follows:

(1) [Semantic module-qualia structure] + logical structure = predicate's meaning

Lexical templates are not only enriched semantic representations but also have the advantage of being heavily constrained, since they are made up of elements drawn from a finite set of primitives, lexical functions and logical structures.

The following example is the lexical entry for Spanish *captar* (Mairal and Ruiz de Mendoza, 2008):

know' (x, y ‹ALL›)
         {Q_F: MagnObstr **think' (x, y)**
         Q_T: Culm **know' (x,y)**}

The entry for *captar* has two parts: (i) the semantic component encoded within curly brackets; (ii) the representation of the logical structure. In this case, this predicate is represented by a state logical structure which takes **know'** as a primitive and has two arguments (x, y). This logical structure is in turn complemented by two qualia characterizations in its semantic module: the formal quale describes the degree of difficulty in carrying out the process of thinking, i.e. it includes the semantic attributes by means of which *captar* is semantically distinguished within the larger set of cognition predicates in English. This is captured by the lexical functions (or operators) MagnObstr, which specify the large degree of difficulty involved in carrying out the action. The telic quale as encoded in "Q_T: Culm **know' (x,y)**" depicts the section of the event that expresses the final aim of the event, to reach knowledge or understand. The lexical function Culm captures the end-point of knowing something (i.e. understanding). ALL is another lexical function—of the kind postulated by Mel'cuk—that falls within the scope of the internal variables. This lexical function refers to the propositional content of the object of apprehension and is, therefore, integrated as a selectional restriction upon the second argument (y) in the logical structure.

In spite of their apparent complexity, lexical templates of this kind have the advantage of showing how the information from the first module is closely intertwined with the event and argument structure of the predicates: semantic restrictions of the kind expressed in qualia structures show the often complex ways in which subevents are interrelated. Let us bear in mind that qualia structure is also described in terms of event structure, each of which can be identified with (part of) the logical structure representation.

This has interesting consequences for the semantics to syntax mapping possibilities of a predicate since, as pointed out in Pustejovsky (1995: 101-104), individual qualia compete for pro-

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jection, and there are mechanisms such as foregrounding or "focalizing" a single quale of the verbal semantic representation. Depending on which quale is foregrounded a given predicate will have a specific syntactic realization, i.e. foregrounding is in fact the effect of the cognitive operations that act as external constraints in the LCM, and provide a basis to understand the diathetic possibilities of a lexeme.

3. The middle construction

In the LCM overall organization the constructicon—or repository of constructions of a language—occupies a central space. However, there is still a dire need for a characterization of many of those constructions. Constructional templates are inspired by the work of construction-based approaches like Goldberg (1995, 1996, 2006). According to these approaches, grammar consists of an inventory of constructions, which are in turn defined as form-meaning pairings. Constructional templates are semantic, and have the same format as that used in decompositional models (e.g. x CAUSES y TO RECEIVE z).

With regard to this aspect, the LCM also proposes to use the same notational device for the semantic encoding of constructions in the constructicon. That is, constructions will be semantically described by means of templates as well. Since the formats of both LCM constructional templates and lexical templates are identical except for those elements that are specific for a given predicate, the subsumption of a lexical template by a constructional template is a straightforward process. In fact, constructional templates can be said to "subsume" lexical templates. This process is governed by a more general cognitive principle whereby higher-level structures invariably subsume lower-level structures (Ruiz de Mendoza and Díez, 2002).

Lexical-constructional subsumption entails the incorporation of lexical templates into higher-level constructional representations.

Although this process is regulated by a series of constraints, constructionist approaches have not as yet dealt with this issue. The constraints proposed are internal constraints and external constraints. Internal constraints refer to the semantic properties of lexical and constructional templates. External constraints specify the set of conceptual and cognitive operations (e.g. high-level metaphorical and metonymic mappings) that affect the subsumption process.

The remainder of this paper offers a detailed description of the constraints that mediate subsumption within the middle construction in English. The structure of the explanation will be the following: firstly we will provide both a description of the content associated with this construction and the corresponding template. Secondly, we offer a rationale for the constraints that stem both from the event structure and the features of the arguments that are part of the middle template.

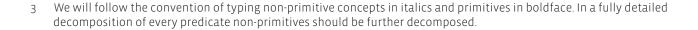## 3. 1. Middle Structures: syntactic, semantic and aspectual features

The basic properties of the middle construction in English are the following:

It is always a coercive construction on transitive verbs. That is, in sharp contrast with other constructions (e.g. inchoative, resultative or even conative), there are no English verbs that have an argument structure that instantiates; i.e. "elaborates" (cf. Cortés-Rodríguez, 2009; Michaelis, 2003) the structure of middles. An instance of elaboration or non-coercive subsumption occurs in the case of the unification of the verb *vanish* and the inchoative construction, as can be seen in the following example[3]:

(1) I'm looking for William. It's bed-time so he's vanished.74.525\flob_g.txt39).

vanish: [BECOME NOT *seen'* (x ‹CausFact›)]

Inchoative: [BECOME/ INGR **pred'** (x ‹CausFact›)]

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English middle clauses never result from an elaboration process; quite on the contrary, they are always the output of lexical coercion triggered by Cortés-Rodríguez's (2009) Extended Override Principle[4]: "If lexical and constructional features conflict, the feature specifications of the lexical element conform to those of the construction with which that lexical item is combined."

In general, middle clauses involve two types of overriding operations:

(a) Detransitivization via a process of non-realization of the first argument of the predicate's lexical template:

(2) The butcher killed the chickens → The chickens kill easily (Keyser and Roeper, 1984: 383)

This feature makes middle structures reminiscent of both passives and inchoative structures, but there are striking differences among these constructions with regard to the status of the unexpressed logical subject, as shall be described below in section 4.2.2.

(b) The introduction of a secondary predicate as a modifier brings along another coercive feature of middles[5]: they involve a non-eventive generic predication that assesses the process encoded in the verb's lexical template with respect to some standard. That is, the second overriding operation concerns aspectual conversion: the event depicted in the meaning of the predicate is embedded in a stative clause structure. Thus, a sentence like *this bread cuts easily* must be understood informally as "cutting this bread is easy in comparison with 'cutting bread'

events in general". Nevertheless, there are other important semantic traits in middle structures that will be spelled out, but it will be easier to describe them in relation to the basic structure of the Middle Template in our model:

(3) $_{TNS}PRES$‹**be'** ((([**do'**($\emptyset$, … **pred$_1$'** (…,y ‹Qα →**Able pred'**›)]), [**pred$_2$'**])›

Following Van Valin and LaPolla (1997: 416-417), the meaning of the adverb in middle clauses leads us to analyze it as a predicate in an attributive construction (remember the first part of the paraphrase for sentence (2) above: 'cutting this bread is easy'). In RRG, and also within the LCM, attributive constructions would have the following general pattern:

(4) **be' (**x, **[pred])**

(5) Coal is black   **be'** (coal, [**black'**])

Attributive constructions of this type depict stative eventualitites where the attribute is understood as inherent and the property is not conceived as obtained from a process, which is the reason for the use of the primitive **be'**. Note that in the case of result states (e.g. *the window is broken*) the representation is different (**broken'**(window))[6].

Therefore, in the case of Middles, we can say that they denote a state where the attribute ("easy") shows an inherent feature of the attributant, which is the event denoted by the verbal predicate together with its logical object ('cutting this bread'). Note that one of the hallmarks of the Middle Construction is its statal nature, thus involving not only a coercive process at the predicate level but also a conversion process at the predicational level. There are, however, other

4   This is a variation of Michaelis' (2003) Override Principle, since it does not only restrict coercion to the semantic aspect; there are cases of coercion that involve also subcategorial conversion, as in the case of middles.

5   Middles require the presence of a modifier, often an adverbial as in (2) but there are other possibilities, as is negation (*this bread doesn't cut*), or simply contrastive stress, as in (*this bread CUTS / this bread DOES cut*; example from Roberts, 1987: 195). Even it is not uncommon to have middles with no overt modifier, as in *Dan Brown's novels sell*).

6   While in English there is no formal distinction between both types of states, since it makes use of the same copular verb, other languages systematically distinguish them. Van Valin and LaPolla (1997: 103) provide Tagalog examples to illustrate this. Compare the different morphological encoding in the Tagalog sentences *Ma-puti ang bulaklak*, which depicts a result state—'the flower is white (it faded)' (**white'**(bulaklak))—and *Puti ang bulaklak*—'the flower is (naturally) white' (**be'** (bulaklak, [**white'**]).

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important features that characterize Middle structures and which are encoded in its corresponding template:

(A) Middles tend strongly to take simple present tense, and they cannot usually appear in progressive is (*the manuscript reading well*). These morphological restrictions derive from the stative character of the construction, and from the permanent nature of the property denoted by the secondary predicate which is ascribed to the single argument in middle structures. Progressive aspect, as other simple tenses, tends to be linked to non static eventualities. However, it is not impossible to find instances with middles in progressive form, or in past tense:

(6) The Osaka, the fashionable Japanese strain of ornamental cabbage, "is selling like hot cakes," a London florist says (BNC CEK 1)
(7) The truck is handling smoothly
(8) The steak you bought yesterday cut like butter (Fellbaum, 1986: 4)
(9) This manuscript is reading better every day (Fagan, 1988: 182)

According to Chung (1996: 311), progressive and past here also describe properties which cause the change of events, therefore not involving a specific eventive reading.

(B) The preference for simple present is encoded in the Middle Template by means of a tense operator "$_{TNS}PRES$" which modifies the clause layer in RRG's syntactic projection of clauses. This tense marker, in combination with the lack of an overt effector, endows middle clauses with its typical generic interpretation. The generic interpretation has been a topic of debate in some works[7]. Thus, Zwart (1998: 110) claims that middles are always generalizations over events, whereas Fagan (1992: 54-55) says that this is not often the case, and that "genericization" in middles is due to other reasons. Rapoport (1999: 149-150) distinguishes between habitual middles like *this paper reads daily*, which involve generalizations over events, and capacity middles (*this paper reads easily*) which does not necessarily mean any generalization over events. The implications of this argumentation are of crucial importance for a proper understanding of the meaning of the Middle construction: the so widely used feature of "genericity" in middles can never be understood as quantification over events. As Mendikoetxea (1998) explains, genericity usually applies to eventive predications, whereas middles are stative predications. The need to set up the difference between both types can be seen in the different scope of an adverbial such as *always* in the following pair of sentences:

(10) The kids always eat well
(11) Toys made in Taiwan always break easily

In the first case, *always* quantifies the whole event ("on every occasion in which the kids eat they eat well"), but such interpretation is not available for the middle clause: (11) cannot mean "on every occasion in which a toy made in Taiwan breaks it breaks easily". On this occasion, the adverbial modifies over the subject ("*All* toys made in Taiwan break easily"). In fact, as Mendikoetxea (1998) explains, the non-eventive character of middles allows them to be true even though they denote states-of-affairs that have never occurred, since they are non-eventive expressions that characterize as attributes over the subject. Consequently, contrary to Bassac and Bouillon's (2002: 38) analysis, middles should not be interpreted as events modified by a generic quantifying operator (GENe) of the type proposed by Chierchia (1995) or Krifka et al. (1995). In fact, "genericity" in middles seems to be more closely related with the absence of a specific effector argument[8], as stated in several studies. Thus, Fagan (1988, 1992) proposes to interpret middle "genericization" as a process which assigns a generic interpretation (ARB assignment)

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7   Cf. Klingvall (2003: 4-5) for a summary on this issue.
8   Effector is a term used in RRG to designate the thematic role of first arguments in activity structures. It corresponds in general with the more traditional 'agent' semantic function.

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to external arguments and this is consequently not projected to syntax. Similar interpretations are provided by Ackema and Schoorlemmer (1994: 69), for whom middle formation also involves assigning an arbitrary interpretation to an actor argument. They further argue that whenever this happens the verb also receives a generic reading and no longer denotes an event. Lyons (1995) "aspectual constraint" is very similar, though he extends the argumentation to any of the arguments of a verb, not just the agent. Lekakou (2002: 405-406) also describes agents in middles as arbitrary (ANY*) arguments licensed by a modal covert operator (CAN*) which in turn is responsible for the generic/habitual interpretation of middles.

We also think that the generic—or referentially unrestrictive—meaning is not derived from whether middles pick out specific events or not, but from the combination of the state primitive **be'** with the present tense marker. Present tense in inherent attributive structures (as middles are) has such a meaning by default value. In fact, it is widely known since Dowty (1979) that the simple present is a good test to distinguish states from events: if a verb is constructed in a simple present predication and keeps an unrestricted present tense reference (e.g. *John feels tired*), the verb is a state[9]; if, on the contrary, it does not preserve a present tense interpretation it is an event (e.g. *Peter runs around the park*, which has only an habitual interpretation; note the impossibility to add *right now*). The non realization of the effector argument of the embedded predicate (**do'**(Ø...) contributes further to the unrestrictive/generic flavour of the predication.

There are other features in the Middle Template in (3) that still need to be specified, especially because they impose certain requirements on lexical units if they are to be integrated in this construction. The next sections will describe in depth the constraints imposed by the middle construction on different types of predicates and arguments.

4. The interaction of the thesaurus and the constructicon: Subsumption processes

Within the LCM, the construction of the semantic structure of a clause involves either cueing or subsumption (cf. Mairal and Ruiz de Mendoza, 2008, 2009; Ruiz de Mendoza and Mairal, 2006, 2007a, 2007b). The former is an inferential process that leaves it up to the addressee to build the final interpretation based on the linguistic clues provided by contextual information. Subsumption is based on the stepwise integration of lower level (i.e. lexical) semantic structures into higher-level (constructional) structures. In my view (Cortés-Rodríguez, 2009), this process has two general types of *effects*: subsumption may provoke either *elaboration* or *full-matching* (in which all the features of lexical and constructional features match) *or coercion*, in which features intrinsic to a content expression conflict with features intrinsic to the construction containing that expression. As mentioned in section 3.1, Middle structures in English are always coercive, thus causing some overriding operations. Such overriding operations are in turn subject to a number of external (semantic) and internal (cognitive) constraints. The next sections spell out the conditions for Middle Construction subsumption.

4.1. Constraints on event-types

One of the most striking features of the studies on middle structures is the fluctuation of acceptability judgements with regard to the types of predicates that can be subsumed in this construction. Levin and Rappaport (2005: 97) comments are indicative of the variegated opinions that exist about what types of verbs are good candidates for middle structures. The English middle construction is found with many, but not

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9 The unrestrictive reference blocks the inclusion of a marker with specific reference: *??John feels tired at 3 p.m.; *the books sell easily at 6.*

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all, transitive verbs. They quote as an exception *abhor* (e.g. *Those kind of people abhor without any effort at all*). The attempts to set criteria to predict which transitive verbs can appear in middle sentences have produced different proposals. For instance, Roberts (1987) restricted the occurrence in middles to accomplishment verbs (e.g. *Fake Bohemian glasses shatter at the slightest touch*), whereas Fagan (1992: 68) adds activities to that class (e.g. *trucks don't drive easily*), and blocks states (e.g. *Ice-cream likes easily*) and achievements (e.g. *the race wins easily*).

Let us try to decipher some of the semantic constraints that are associated with this construction in order to provide a detailed reasoning for the subsumption possibilities of some types of predicates. The first relevant condition associated with the Middle Template in (3) derives from the nature of the constant **do'** which defines the type of event denoted by the verbal predicate of the construction. This together with the existence of a (y) variable tells us that the verbal predicate must have an (initial) activity structure and two argument variables. If we check the set of Logical Structures proposed within the LCM, and inherited from RRG (see Table 1 in section 2.1.), we can see that there are three basic types of classes excluded: states and internal-only— i.e. strictly inchoative—changes of states (non-causative accomplishments and achievements). This explains the oddity of the following examples as middles:

(12) *this girl loves easily / *this school sees easily
(states)

(13) *this race wins easily / *this town arrives easily
(achievements)

(14) *lemon trees bloom easily / *the temperatu-

re soars quickly
(accomplishments)

Note however, that we can find examples of middle structures with all other classes of verbs:

(15) This piano plays beautifully / this meat cuts like butter / After years of abusing students, minsters are clearly now hoping that nothing washes whiter than a government's attempt to get re-elected (BNC CAT 2)
(activities)

(16) Reindeer...don't frighten easily (BNC K27) / John persuades easily / John doesn't please easily (Halliday, 1968: 193)/ I was eloquently persuaded by Inge of a course of action and I noted to her earlier today that I don't persuade easily[10]
(causative states)

(17) because I can't help it if Pitt has the kind of bones that break easily, can I? (BNC ALH 5) / These chickens kill easily (Keyser and Roeper, 1984: 383)
(causative accomplishments)

(18) [...] groups of stinging cells known as nettle-cells or nematocysts, which explode at the slightest touch (BNC CNV9, 10) / When these materials are cooled below their glass transition they become brittle and shatter easily with a blow (BNC H0U, 1)
(causative achievements)

(19) These lights would not flash / if it is not atomising it won't bang easily but the diesel will collect in the piston crown until it does fire[11] / If the laser uses an oxygen assist gas...then you should be able to tap the holes... using conventional tapping processes. If the laser is using nitrogen or air as an assist gas then you will have a very hard nitrided edge on the holes....that probably will not tap easily![12]
(semelfactives)

The logic for the exclusion of (changes of) states lies in the very nature of the Middle Construction as a coercive structure that enforces a generic state interpretation upon verbs which encode event-types with some dynamic component[13].

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10 From http://casamurphy.blogspot.com/2006_12_01_archive.html (accessed 19 August 2010).

11 From http://www.ybw.com/forums/archive/index.php/t-34403.html (accessed 19 August 2010).

12 From http://www.practicalmachinist.com/vb/general/tapping-laser-cut-holes-a36-179254/ (accessed 19 August 2010).

13 The above examples (15-19) show that the scope of the middle alternation is wider than the causative/inchoative alternation with regard to event-types: Middles are transitivity alternations and include all lexical classes that participate in the causative/inchoative alternation; however, the reverse does not hold, as is clearly evidenced by the feasibility of activities or causative states to appear in middles but not in inchoative structures (e.g. *this book sold yesterday, *John will persuade tomorrow).

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Although we have established a territory of lexical classes amenable for subsumption in Middle structures, not all members of those classes behave equally; for instance, whereas we can find a typical middle pattern in *this book sells well*, the same sentence with *buy* is odd (**this book buys well*). It seems obvious that middles are also conditioned by additional restrictions affecting other components in the Template.

4.2. Constraints on arguments
4.2.1. The unexpressed effector

Closely connected with the condition associated to the constant **do'** is the requirement of middles to entail an unexpressed effector argument, as is encoded by Ø in the first argument position of the segment "**do'**(Ø, ...)". Thus, transitive verbs with no effector (as are cognition state verbs like *know, understand, realize*, verbs of feeling like *admire, love, fear like*, or perception verbs like *see, hear*) are naturally excluded for subsumption:

(20) *This problem understands well

(21) *Paintings admire easily (Levin, 1993: 191)

(22) *The Eiffel Tower sees easily form my window (Fagan, 1992: 65)

The fact that the effector can never be expressed syntactically:

(23) *This piano plays beautifully by Britten

signals a crucial feature of middles in comparison with passive structures, which do allow effectors to be specified:

(24) This piano was played beautifully by Britten.

We are referring to the fact that middles are structures which involve not just a *demotion* of the conceptual—and therefore the grammatical—status of effectors but a kind of aspectual conversion whereby a process is coerced into a stative eventuality. In fact this kind of conversion process is constrained externally by a double high-level metonymic clipping which has been labelled as "process for action for (assessed) result" (Ruiz de Mendoza and Mairal, 2006, 2007b), whereby an action ('*cutting meat*') is seen as a process (*the meat 'cuts'*) that is assessed in terms of the viability of the intended result ('*it is easy to cut the meat*').

A comparison with inchoative structures reveals that the effect of metonymy is not exactly the same. According to Ruiz de Mendoza and Mairal (2006, 2007b) the inchoativization of causative structures is based on one metonymy labelled PROCESS FOR ACTION: an action is treated as if it were a process that in turn stands for the action. Thus, in interpreting a sentence like *the glass broke* speakers know that there must be a cause for glasses to break (a person, the wind, etc.), so in the appropriate context it is possible to draw inferences as to the cause of the event. Imagine that the glass is near a window with curtains and that the window is open and the wind blows. In that context some plausible inferences are 'the wind broke the glass' or 'the curtain broke the glass'.

In Cortés-Rodríguez (2009) this high-level phenomenon is paralleled by a lower level internal analogue in the so-called "Cause Expletivization Constraint", which acts in the cases of subsumption-via-coercion between externally caused change of state verbs (i.e. causative structures) and the inchoative construction. The effect of this constraint becomes apparent if we apply a *by-self* test in a way similar to the *da se* test for Italian proposed by Chierchia (1989, 2004: 42ff; cf. Koontz-Garboden, 2008). The *by-self* phrase can be analyzed as a modifier of an underlying cause indicating that it is the sole cause of the event, as in:

(25) The door opened by itself

(26) The boat sank by itself

All this argumentation supports the view that the theme participant of inchoative structures is "involved" in the realization of the change of state or position (which is the essential feature of the notion "internal-causation"). It also pro-

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ves the impossibility of tracing an external causer back to inchoative-only structures like the following:

(27) The peach trees bloomed (*by the farmer)

(28) Many daisies have blossomed this morning (*by the gardener)

Middles behave differently; the effector is not expletivized, but simply left as syntactically "inert". This does not mean that it is not part of the semantic structure: "effectorhood" is distributed between the unexpressed external effector and the subject of the construction. This is the reason why the *by-self* test does not seem to work well in these cases (cf. Yoshimura and Taylor, 2004: 299-301):

(29) Dan Brown's novels sell well (*by themselves)

(30) Some bottoms terrify easily like virgin braggarts[14] (*by themselves)

Thus, there seems to be a rationale behind the analyses that assign a certain "arbitrary" feature to the effector (or "external argument" as usually described); such a proposal can be found in Fagan (1992), Ackema and Schoorlemmer (1994, 1995), Chung (1996), or Lekakou (2002), among many others. These analyses consider that the arbitrary agent licenses the unrestrictive or generic meaning of middle structures. In our template, suffice to maintain the eventive activity structure with a non-saturated first argument to capture this factor. If we compare the Middle and the Inchoative Templates, we can see that the last one is clearly an intransitive unaccusative structure, whereas the Middle Template still retains some transitivity, and patterns like an active construction[15].

4.2.2. Constraints on the subject of middles

We have mentioned above that the scope of the middle alternation is wider than that of the causative/inchoative with regard to candidate verb classes. This correlates logically with a wider spectrum of types of thematic roles for the subject arguments in middles: whereas the subject of inchoative clauses is consistently an affected entity (e.g. *the glass shattered*), this restriction does not hold in middles, as the following examples show:

(31) [T]hey must include items which are easily understood and which translate easily from relatively casual observation of the child (BNC CG6)

(32) This book reads poorly (Chung, 1996: 301)

(33) Despite worries to the contrary, pressed flowers photograph well and make a refreshing change from more conventional forms of artwork (BNC CE4)

Thus, the Affectedeness Condition proposed in some analyses (Keyser and Roeper, 1984; Hale and Keyser, 1987; Zubizarreta, 1987) to account for the agrammaticality of *hit* or *touch* verbs in middle sentences (**the ball hits well; *the wall touches easily*) had to be later abandoned. The ineffectual quality of this Condition is even more patent in the following cases in which (i) similar verbs behave differently with regard to middle-subsumption, or (ii) the same verb allows subsumption on some occasions but not others[16]:

(34) This book sells well / *This book buys well

(35) John persuades easily / *To enroll in this course persuades easily / *That John took this course persuades easily (Chung, 1996: 309)

Therefore, other solutions were sought to explain the feasibility of (31-33) and (34-35). As a case in point, Van Oosten (1977: 462-465) alluded to a pragmatic explanation for these cases: a sentence like *this book buys well* is unacceptable because only the buyer is "responsible" for the buying event, whereas in the case of *this book*

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14 From http://gwinstonjames.com/content/writings/fiction/john/ (accessed 19 August, 2010).

15 In this regard, English differs from languages like Italian, Spanish or Greek, where middle clauses are formally closer to passive structures (cf. Lekakou, 2002; Mendikoetxea, 1999). At the same time, English lies closer to Dutch in apparently exhibiting properties of unergatives, as shown in Ackema and Schoorlemmer (1994, 1995).

16 There are other issues that reveal the inadequacy of this constraint; cf. Yoshimura and Taylor (2004: 297-299) for an account of such shortcomings.

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sells well the concept of "responsibility" is not exclusive of the seller but also falls upon the entity denoted by the subject; this communicative value is essential to license middle construction. Probably, the description of the meaning of middles by Dowty (2001: 11-12) may bring some more light as to what type of involvement is required on the part of the subject argument in this construction (the emphasis is ours):

> The meanings of the verbs of the *Break*-Class and the *Cut*-class all entail the causing of a physical change in all or part of the direct object referent (the Patient), cf. *break the vase, cut the bread*. Therefore, <u>inherent physical properties of the Patient can affect the ease/difficulty of bringing about this physical change in it</u>. Thus, the Middle Construction is meaningful with these verbs, cf. *Crystal breaks easily, The bread cuts easily*.

> The meanings of the verbs of the *Touch*-Class and *Hit*-Class do not entail that any physical change must be produced in the Patient argument (as Levin noted), Therefore, <u>inherent physical properties of the Patient argument should not affect the ease/difficulty of performing this kind of action on the Patient</u>. And thus, the Middle Construction should be semantically anomalous with these verbs, cf. **The wall touches easily, *The wall hits easily*.

In other words, the subject argument of middles—irrespective of its role—must have some inherent properties that enable the event depicted within the construction to be obtained. This is captured in our Middle Template by means of the constant/primitive **Able** that functions as a restrictor over the subject[17]. This constant has

been borrowed from Meaning Text Theory's Lexical Functions (Mel'cuk, 1989, 1996), and is described as a *qualifier for potential actants* such that **Able₂** (*envy*) = *enviable* (Alonso Ramos and Tutin, 1996: 153). Again, the comparison with the restriction upon the subject of the Inchoative Template will bring light to the different semantic import of both types of arguments:

(36) [BECOME/ INGR **pred'** (x ‹CausFact›)]

As described in Cortés-Rodríguez (2009), the argument of inchoative sentences has as restrictions the Lexical Functions *CausFact*. This involves, in the cases of alternations with causative structures, that the original external argument is "erased" not only syntactically but also semantically, which is the reason of the so-called "expletivization" constraint upon this alternation. In other words, the change of state encoded in inchoatives is conceptualized as the result of internal causation. The unexpressed external effector in middles is left in a kind of syntactic "inertia" (the term is borrowed from Lekakou, 2002) but is still present in the semantic territory of the construction[18]. The subject is not an internal causer, but merely a kind of static cause. Taking into account these differences and the ones mentioned above about passives, we can device a kind of cline of features for the three constructions[19] (see Table 2).

This graphic reflects Kemmer's (1993:73; 1994: 181) description of middles, together with reflexives, as semantic categories intermediate in transitivity between one-participant and two-participant events.

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17   In fact, this correlates with a certain degree of feasibility of many middle structures to be paraphrased by means of derived *-able/-ible* adjectives. E.g., *This book reads easily→ it is easily readable; this table cloth folds nicely→ it is very foldable indeed! That kind of books is hardly sellable*. Note that this Lexical Function captures the alleged modal ability or capacity meaning of middles (cf. Lekakou, 2002).

18   Langacker (1991: 335) considers that this argument remains as an unprofiled constituent in the base of the predication.

19   Batiukova (2006: 315) offers a similar comparison for Spanish structures, although her classification of types of 'cause' is different to ours. She proposes a first division between external and internal causation and within this last one she distinguishes dynamic and static causes. These differences are grounded on distinctions between unergative and unaccusative structures and on how they are related to different qualia roles (ibid. pp. 234-235). Our proposal makes a tripartite division expressed in lexical and constructional templates by means of different primitives: CAUSE stands for external causation; the Lexical Function *Caus* stands for internal causation and acts as a restriction on arguments; and the Lexical Function *Able* stands for static cause, and also acts as a restriction on certain arguments.

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TABLE 2
Causativity/Transitivity Cline

PASSIVE +Transitivity ←	MIDDLE	→ INCHOATIVE - Transitivity
+effector external cause 2 arguments	±effector static cause 2/1 arguments	-effector internal cause 1 arguments

The restrictions on the subject in the Middle Template include a logical connection between the Lexical Function *Able* and some semantic properties of the entity (Qα→*Able*); following the latest contributions within the LCM with regard to semantic representation (Cortés-Rodríguez and Sosa, 2008; Mairal and Ruiz de Mendoza, 2008), qualia structure as described in the Generative Lexicon Theory (Pustejovsky, 1995, 2000; de Miguel, 2008) will be used to encode such properties.

Qualia structure captures the set of semantic constraints by which we understand a word when embedded in the language, which is the purpose of the semantic module of lexical templates in the LCM as well. Thus, when a nominal denotes an entity it can be done by referring to any of its qualia properties; as Yoshimura (1998: 116) explains, the thing denoted by the noun *car* can be specified in terms of its different qualia:

(37) The car is heavy $\rightarrow Q_C$ ("material", "weight")

(38) The car is colorful $\rightarrow Q_F$ ("shape", "color")

(39) The car carries six $\rightarrow Q_T$ ("transportation")

(40) This car is a new design $\rightarrow Q_A$ ("artifact")

We can now explain the formula "(y‹Qα→*Able*›)" in the Middle Template: it makes explicit reference to the semantic features encoded in some of the qualia (Qα) of the nominal as the facilitating properties to obtain the state-of-affairs depicted in the embedded process ((([**do'**(Ø, … **pred**$_1$' (…,y)). That is, the formula reads as *if Qα then Able*, since the logical connector

"→" means conventionally 'if… then….'

Subsumption processes are thus heavily constrained since middles will be licensed only insofar as there is a proper semantic matching between the verb's meaning and one of the qualia of its subject. Furthermore, middle subsumption will be motivated by a process of semantic composition between the subject and the verb; that is, between the qualia of the nominal and the verb semantics.

The explanatory power of qualia for middle construction has already been attested for Spanish by Batiukova (2006: 301-315), and for English by Yoshimura (1998) and, to a lesser extent, by Bassac and Bouillon (2002). Following the proposal for Spanish in Batiukova (2006), middles can be classified according to the Quale that is selected for semantic composition:

(41) Telic Quale Middles
(a) Dan Brown's novels read easily
(b) This piano plays beautifully
(c) […] all-terrain Pinzgauers vehicles which can climb embankments, *drive smoothly* over the roughest of ground and keep going in water (BNC K4W)
(d) The door shuts badly (Yoshimura, 1998: 123)

(42) Agent Quale Middles
(a) Wholegrain cakes bake slowly / Additionally, any loose flour will remain thus, *and will not bake out*[20]
(b) A sonnet does not write so easily
(c) This kind of portable cabinet assembles without much difficulty

(43) Formal Quale Middles
(a) This apple sauce will digest rapidly (Van Oosten, 1977: 462)
(b) Bohemian glass shatters at the slightest touch
(c) Does the material *Rayon shrink a lot* when you wash it?[21]
(d) A rubber ball bounces well (Hajicová, 1979: 181)

(44) Constitutive Quale Middles

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20   From http://www.thefreshloaf.com/node/18844/challah-braids-losing-definition-during-rise-amp-bake (accessed 19 August 2010).
21   From http://www.chacha.com/question/does-the-material-rayon-shrink-a-lot-when-you-wash-it (accessed 19 August 2010).

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(a) This dress buttons at the back

(b) Jigsaw puzzle pieces assemble without any effort

(c) My car steers smoothly (Yoshimura, 1998: 123)

(d) Parmesan cheese is a very dense cheese therefore *it does not slice easily* but rather chunks of cheese[22]

Formal and telic qualia middle tend to be more productive than the others; in the first case, this is due to the wide availability of physical features of objects that the formal quale can encode; in the second case, the productivity of telic middles lies in the fact that these qualia are central in the description of artifactuals, since they designate their purpose, which is what is usually assessed in middle structures.

Agent quale middles are more restricted: they have effected subjects and they are constructed with creation verbs since they denote the process of production of the object. One interesting feature of subjects in this type is that they must have a generic or non specific reference; compare:

(45) ??This specific house builds easily – This type of houses builds easily

Since an object can be created only once, it is difficult to make a generic statement of the specific creation act of one particular individual.

4.2.3. Constraints on the secondary predicate

The last element that forms part of the Middle Template is the secondary predicate that is usually expressed by an adverbial. The meaning of the adverbial provides a kind of assessment on the quale on which the middle structure is construed. The assessment tends to evaluate the event in terms of true/false values as in (46-47) or implies a scale of evaluation with other objects (either implicitly or explicitly) as in (48):

(46) *Linen clothes shrink a lot*

(47) *Her poems don't sell*

(48) *Color canvas wears faster than white canvas*

The range of manner adverbs that function as secondary predicates in middles tends to be restricted in number (*easily, well, quickly, slowly*) and if other expressions are used they are a sort of contextual equivalents of these adverbs.

Even though Ackema and Schoorlemmer (1994: 72) do not consider especially relevant the grammatical status of these adverbials for the analysis of middles, it is undeniable that they play a fundamental function: many middle clauses would simply be ungrammatical in the absence of the adverbial, since they would become informationally empty:

(49) *Wholegrain cakes bake

(50) *My car drives

(51) * The book reads

This is especially true in the case of the so-called functional qualia middles (telic and agent qualia) which seem to refer to more "obvious" features than natural qualia (formal and constitutive). Functional qualia middles need some kind of specification on the process and/or the subject to avoid being informationally irrelevant (cf. Batiukova, 2006: 312-314; de Miguel, 2009: 355); compare the above examples with the following natural qualia middles:

(52) Bohemian glass breaks

(53) The shirt buttons/zips

4.2.4. Discourse conditions (contextualization)

It seems that contextualization has also a role in middle construction. Let us consider the following somewhat paradoxical examples:

(54) *Thunder hears easily (Dixon, 1991: 330) / The bass notes don't hear very clearly (González, 1998: 90)

(55) *The baby will wash easily / A baby washes

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more easily than an armadillo (van Oosten, 1986: 631)

(56) *This sonata plays easily (Fellbaum, 1986: 13) / This sonata plays well on the piano (Chung, 1996: 310)

We can find that the same verb, even with the same type of entity, can yield either a grammatical or an ungrammatical middle, depending on the situational context. As Yoshimura (1998: 35) rightly observes, even though qualia are "intrinsic and rather fixed to the semantic component of a nominal; [...] qualia can be added by contextualization including adjuncts, sentence stress, and other pragmatic inferences –while others are suppressed or overridden." Yoshimura and Taylor (2004: 312) repeat this same idea. The following examples illustrate this phenomenon[23]:

(57) Bureaucrats bribe easily (Yoshimura, 1998: 134)

It would be natural to see that the people denoted by *bureaucrats* first and foremost do not exist in order to be bribed. This indicates that there is hardly a quale in the semantics of this noun that refers to the event of 'bribing'. However, the qualia of professions can be "construed" in different ways from person to person, and in fact for various informants, bureaucrats may strongly evoke a sense of greediness associated to occasional corruption. For those informants (57) sounds good since they can construe *bureaucrats* in terms of their greediness; consequently, cospecification with the semantics of *bribe* becomes viable.

(58) [conversation between the staff in bookshop on a book that is newly-published]

A: Which corner shall we use to display the book?

B: I think,... *That corner sells well.* It's far better than this one (Yoshimura and Taylor, 2004: 312)

No intrinsic quale of *corner* can contribute to the interpretation of this sentence. However, contextual information helps construing a telic quale for *corner* in relation with one of *book*: in this situation the corner is a location in which something is displayed for the benefit of sale; that is, a Q_T 'selling' is contextually added and foregrounded for the subject argument.

(59) A hungry lion came across two men in the jungle. One was reading a book and the other was writing a book. The man reading the book was quickly devoured while the writer was ignored. Even a lion knows that *readers digest* and that *writers cramp.* (Otago Daily Times; 23/9/1997; in Yoshimura, 1998: 135)

The speaker of (59) has used contextual information to provide a perspectivization of the *lion* as carnivorous, and this helps assigning some extraordinarily unconventional qualia roles to both subjects NPs; that is, the digestibility of readers and the crampability of writers. This interpretational dependence upon the context of situation also explains the usual variability of informants' judgements about the acceptability of one and the same middle structure.

5. Conclusions

This paper has offered an analysis of middle constructions in English in which the most relevant conditions for lexical-constructional subsumption have been accounted for. From the analysis of middles some interesting conclusions can be drawn:

The semantic interpretation of sentences is based on the interrelation of two representational structures, the lexical and the constructional template. Both are central to the LCM. Such an interrelation is based on a process of subsumption which is subject to a set of internal and external constraints. External constraints are based on cognitive mechanisms that make use of conceptual metaphor and metonymy. In the case of middles, a double metonymy of PROCESS FOR ACTION FOR (ASSESSED) RESULT is at work on every occasion.

External constraints usually find lower-level

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23   These examples and their corresponding interpretations based on the contribution of context to foreground some non-intrinsic qualia properties are summarized from Yoshimura (1998).

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correlates in internal constraints. Thus, the double metonymy finds its correlate in the fact that English middles involve a double coercive process of detransitivization and aspectual conversion of eventive transitive predicates.

Finally, the fact that constructional and lexical templates are represented semantically by a unitary system makes it more feasible to design internal constraints, as they are also devised in the same format, thus rendering a more elegant and coherent explanation. This has been especially manifest in our description of the set of restrictions affecting both the type of predicates and the arguments involved in middle structures. The unfolding of such restrictions has lead us to emphasize the inherent nature of middles as a strictly syntactic-semantic process, and not as a voice modulation phenomenon.

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