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Accounting for the Alternating Behaviour of Location Arguments from the Perspective of Role and Reference Grammar

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This paper presents a description of the alternations in which the location argument participates in English and accounts for its various realizations from the point of view of Role and Reference Grammar. The analysis of the multiple alternating behaviour of the location argument in various transitive and intransitive alternations in English is mostly related to marked macrorole assignment typically to undergoer, such as in *He loaded the truck with hay*—as compared with the kernel construction *He loaded hay on the truck*—but also to actor as, for instance, in the LOCATION SUBJECT alternation, in which the location argument occupies the subject position, e.g., *The bag carries all your belongings*, a construction which implies the loss of one of the arguments in the kernel structure, *You can carry all your belongings in the bag*. Additionally, the syntactic behaviour of location arguments in marked constructions very often conveys a change of *Aktionsart* ascription with respect to the kernel construction, as in the SWARM alternation in which the predicate in the kernel construction is analysed as an activity, e.g., *Bees swarmed in the garden*, whereas in the marked construction it changes to a state, *The garden is swarming with bees*. This investigation also provides an analysis of the *with*-phrase that is often encoded in the marked constructions where the location argument is codified as a core argument.

Keywords: alternations; constructions; location argument; Role and Reference Grammar; macroroles

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Explicación del comportamiento alternante de los argumentos locativos desde la perspectiva de la Gramática del Papel y la Referencia

Este artículo presenta una descripción de las alternancias en las que participa un argumento locativo en lengua inglesa y explica sus distintas realizaciones desde el punto de vista de la

Gramática del Papel y la Referencia. El análisis del comportamiento alternante múltiple del argumento locativo en las distintas alternancias transitivas e intransitivas está principalmente vinculado a una asignación marcada del macropapel, típicamente a padecedor, tal y como se da en *He loaded the truck with hay*—en comparación con la construcción matriz *He loaded hay on the truck*—pero también a actor, como por ejemplo en la alternancia en la que el argumento locativo ocupa la posición del sujeto, por ejemplo en *The bag carries all your belongings*, una construcción que implica la pérdida de uno de los argumentos en la estructura matriz, *You can carry all your belongings in the bag*. Además, el comportamiento sintáctico de los argumentos locativos en las construcciones marcadas puede a menudo conllevar un cambio de ascripción de *Aktionsart* con respecto a la construcción matriz, tal y como ocurre en la denominada alternancia SWARM, en la que el predicado en la construcción matriz es analizado como una actividad, como en *Bees swarmed in the garden*, mientras que en la construcción marcada cambia a estado, *The garden is swarming with bees*. Así mismo, esta investigación ofrece un análisis de la frase introducida por *with* que se encuentra a menudo codificada en las construcciones marcadas en las que el argumento locativo aparece codificado como un argumento central.

Palabras clave: alternancias; construcciones; argumento locativo; Gramática del Papel y la Referencia; micropapeles

1. Introduction

If asked to think about an example in which a location argument participates, it is very likely that the locative alternation would immediately be given as an answer.[1] In fact, the locative alternation, typically exemplified in sentences such as *He loaded hay on the truck* and *He loaded the truck with hay*, has been attested not only in English but also in many other languages and has been widely analysed following different methods, among them a lexical semantic approach (Rappaport and Levin 1998), a conceptual one (Jackendoff 1990), a lexical-aspectual approach (Tenny 1994) and Adele Goldberg's research conducted within the Construction Grammar model (1995; 2006).[2] More recently, we should highlight two lexical-constructional accounts of the locative alternation in English, one by Hans Boas (2003) and another by Seizi Iwata (2008), as well as Rolf Kailuweit's study of the locative alternation in English, French, German and Italian (2008) within the framework of Role and Reference Grammar (henceforth RRG).

However, apart from the locative alternation, there are other alternations in which a location argument— the one referring to the surface or container which is involved in the event—is also implied, such as those examples related to verbs of creation or image impression in which a construction such as *The jeweller inscribed the name on the ring* can alternate with *The jeweller inscribed the ring with the name* (Levin 1993, 66). As Robert Van Valin and Randy LaPolla state, "English is particularly rich in location-theme-type alternations," whereas many other languages such as German or Indonesian can only show this alternation by lexical means (1997, 657).

This rich possibility of codifying the location argument in English in different argument positions has led me to further investigate this matter. Thus, in this paper, we aim to analyse the alternating behaviour of the location argument not only in transitive examples such as those exemplified above but also in intransitive sentences in English by using the analytical descriptive tools of Role and Reference Grammar (Van Valin and LaPolla 1997; Van Valin 2005), a functional theory which assumes that lexical meaning conditions the morphosyntactic structure of sentences and that this relationship can be explained by describing the interface mechanism which links meaning to syntactic structure.

In order to bring together those constructions in which location arguments participate and show an alternating behaviour, we have made use of Beth Levin's taxonomy (1993), which presents an inventory of the alternations verbs can take part in by considering their similar semantic components together with their similar syntactic behaviours (17). Thus, section two in this paper will describe the different realizations of location arguments as exemplified in Levin's classification of

[1] Financial support for this research has been received from the Spanish Ministry of Economy and Competitiveness (Project identification number: 848253814-53814-4-14).

[2] For a thorough list of the studies conducted from the 1990s on the locative alternation, see Mateu (2000) and Bleotu (2014).

alternations. Section three will provide a brief overview of the RRG analytical tools that will be used in this analysis. In section four, the different constructions in which a location argument participates showing an alternating behaviour will be analysed within the RRG framework, paying special attention to macrorole assignment in the logical structure. The final section will include the conclusions of this research. The examples that illustrate the alternating behaviour of location arguments have been mostly taken from the *British National Corpus* (2007; henceforth BNC), and only a few cases have been taken from the Internet.

2. Location Argument Realizations

In order to gather the cases in which the location argument alternates in two different but related constructions, we have made use of Levin's taxonomy (1993) and reviewed the alternations in which a location argument is involved.

On the one hand, Levin describes a large group of alternations that are all subsumed under the term "locative alternation," which depicts types of alternation that affect arguments within the verb phrase but do not imply a change in the transitivity of the verb. The locative alternation is related to certain verbs of *putting* and some verbs of *removing* and is further subdivided into different subtypes: the SPRAY/LOAD alternation, the CLEAR alternation, the WIPE alternation and the SWARM alternation. In these alternations, it is common to find two types of argument that relate to the surface that is affected by the event and to the entity that is moved, which have been termed the "location argument" and the "locatum argument," respectively, by Eve Clark and Herbert Clark (1979). Thus, in the pair of sentences exemplified in (1) and (2) below, the location and locatum arguments alternate in such a way that in the kernel structure (1)[3] the location argument is realized as an oblique argument introduced by the preposition *into* and the locatum argument is realized as the direct object. In the alternating construction (2), however, it is the location argument that is now realized as a core argument and the locatum argument is codified as an oblique argument introduced by the preposition *with*:

(1) [S]he loaded the bags of goodies into her BMW. (BNC/CH6W_newsp_tabloid)
(2) Suzy and Seth loaded the van with food and clothes. (BNC/ABS_W_pop_lore)

Much has been said about the semantic properties attributed to the location argument when it participates in the locative alternation (Kailuweit 2008). As first observed by Stephen Anderson (1971), when the location argument is encoded as a core argument, it is often claimed to show the "holistic effect," which describes the fact that,

[3] The concept of kernel construction in this paper refers to the basic types of constructions that every verbal predicate is provided with at the core grammar level, and which are built in terms of *Aktionsart* ascriptions and the corresponding lexical template—see Periñán-Pascual (2013) and Periñán-Pascual and Arcas-Túnez (2014).

in the alternating construction, it is understood to be in some way completely affected by the action reported by the verb—in our example, the van is perceived as being full of food and clothes—an interpretation that is not perceived in the kernel construction.

Table 1 compiles the different types of locative alternations, as presented in Levin's taxonomy (1993), where the first example shows the kernel construction and the second the alternating one.

TABLE 1. Summary of Levin's locative alternations (1993, 50-55)

SPRAY/LOAD alternation	
Examples	Jack sprayed paint on the wall. Jack sprayed the wall with paint.
Verb class	SPRAY/LOAD verbs: *brush*, *crowd*, *dust*, *heap*, *inject*, *load*, *pile*, *plaster*, *rub*, *scatter*, *shower*, *spray*, *spread*, etc.
CLEAR alternation	
Examples	Henry cleared dishes from the table. Henry cleared the table of dishes.
Verb class	CLEAR verbs: *clean*, *clear*, *drain*, *empty*, etc.
WIPE alternation	
Examples	Helen wiped the fingerprints off the wall. Helen wiped the wall (*off fingerprints).
Verb class	WIPE verbs: (i) "means" subclass—e.g., *squeeze*, *wipe*, etc.—and (ii) "instrument" subclass—*brush*, *comb*, *hoover*, etc.
SWARM alternation	
Examples	Bees are swarming in the garden. The garden is swarming with bees.
Verb class	• LIGHT EMISSION verbs, e.g., *beam*, *flash*, etc. • SOUND EMISSION verbs, e.g., *bang*, *murmur*, etc. • SUBSTANCE EMISSION verbs, e.g., *radiate*, *squirt*, etc. • SOUND EXISTENCE verbs, e.g., *echo*, *resonate*, etc. • ENTITY-SPECIFIC MODES OF BEING verbs, e.g., *quiver*, *tremble*, etc. • SWARM verbs, e.g., *abound*, *swarm*, etc.

However, not all the alternating realizations of the location argument are restricted to instances of the locative alternation. The LOCATION SUBJECT alternation (Levin 1993, 82) involves an oblique subject and is related to alternations without a change in transitivity but with a change in the number of noun phrases found with the verb, specifically, one less noun phrase in one of the variants. Table 2 illustrates this alternation:

Table 2. Levin's LOCATION SUBJECT alternation (1993, 82)

LOCATION SUBJECT alternation	
Examples	We sleep five people in each room. Each room sleeps five people.
Verb class	FIT verbs: *carry*, *fit*, *feed*, *hold*, *house*, *seat*, *serve*, *sleep*, *store*, *take* and *use.*[4]

There is still another type of alternation that, as Levin herself points out (1993, 67), resembles the SPRAY/LOAD alternation from the syntactic point of view but differs in the sense that semantically the verbs participating in it belong to a different verb class, namely IMAGE-IMPRESSION verbs (table 3), and the location argument, when encoded as the direct object, does not seem to receive the holistic interpretation (67).

Table 3. Levin's IMAGE IMPRESSION alternation (1993, 66)

IMAGE IMPRESSION alternation	
Examples	The jeweller inscribed the name on the ring. The jeweller inscribed the ring with the name.
Verb class	IMAGE-IMPRESSION verbs: *engrave*, *imprint*, *inscribe*, *mark*, *sign*, *stamp*, *tattoo*, etc.

In the following sections, we aim to analyse the various alternating realizations of the location argument in the constructions illustrated in the three tables presented above by using the analytical tools of RRG.

3. Brief Overview of the RRG Analytical Tools Used in this Research

In our analysis, we will use the analytical tools of Role and Reference Grammar (RRG), which will allow us to account for the interface mechanism that links semantics and syntax. In this regard, we should begin by ascertaining the verb class the predicates in question can be ascribed to by adopting the theory of verb classes presented by Van Valin and LaPolla (1997, 90-102) and Van Valin (2005, 31-42). *Aktionsart* distinctions[5] are important in the sense that together with the holistic effect attributed to the location argument in the alternating constructions, they play an important role in constructing

[4] We have excluded the verb *contain* from Levin's list since this predicate cannot alternate as the others do: **I can contain three books in the box* vs. *The box contains three books*. In contrast, other verbs, such as *accommodate*, could be added to this list: *The Studios can accommodate up to 300 guests* (BNC/B3K_W_advert) vs. *We can accommodate up to 300 guests in the Studios.*

[5] For a recent study on the reorganization of the aspectual parameters that structure the *Aktionsart* typology of lexical classes, see Cortés-Rodríguez (2016).

the meaning of the different alternations (Mateu 2000, 6). The *Aktionsart* classes that are distinguished in RRG, and which are additionally linked to their causative counterpart, are those presented in table 4:

TABLE 4. *Aktionsart* classes in RRG (Van Valin 2005, 33)

Aktionsart class	Semantic parameters			
(a) State	[+ static]	[- dynamic]	[- telic]	[- punctual]
(b) Activity	[- static]	[+ dynamic]	[- telic]	[- punctual]
(c) Achievement	[- static]	[- dynamic]	[+ telic]	[+ punctual]
(d) Semelfactive	[- static]	[± dynamic]	[- telic]	[+ punctual]
(e) Accomplishment	[- static]	[- dynamic]	[+ telic]	[- punctual]
(f) Active accomplishment	[- static]	[+ dynamic]	[+ telic]	[- punctual]

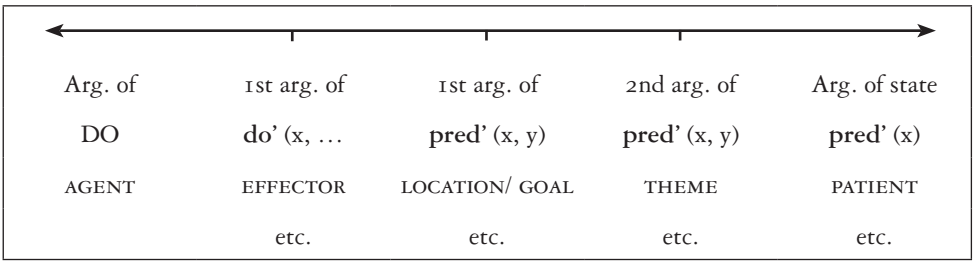
Each of these *Aktionsart* classes is represented in the form of a logical structure (LS) (table 5) in which the following components are distinguished: (i) *constants*, which are part of the semantic metalanguage used in the decomposition and are written in boldface followed by a prime (’); (ii) *variables*, presented in normal font and filled in by predicates from the language being analysed; and (iii) *operators*, the elements in capital letters that function as modifiers of the predicate in the LS, and encode instantaneous changes (INGR), changes over some temporal span (BECOME) and punctual events that have no result state (SEML) (Van Valin and LaPolla 1997, 102-104; Van Valin 2005, 32-45). The complex structure of causative verbs is represented by the operator-connective CAUSE which links the predicate representing the causing action to the predicate showing the resulting state (Van Valin 2005, 42).

TABLE 5. Lexical representations of *Aktionsart* classes (Van Valin 2005, 45)

Aktionsart class	Logical structure
(a) State	**pred’** (x) or (x, y)
(b) Activity	**do’** (x, [**pred’** (x) or (x, y)])
(c) Achievement	INGR **pred’** (x) or (x, y) INGR **do’** (x, [**pred’** (x) or (x, y)])
(d) Semelfactive	SEML **pred’** (x) or (x, y) SEML **do’** (x, [**pred’** (x) or (x, y)])
(e) Accomplishment	BECOME **pred’** (x) or (x, y) BECOME **do’** (x, [**pred’** (x) or (x, y)])
(f) Active Accomplishment	**do’** (x, [**pred**$_1$’ (x, (y))]) & INGR **pred**$_2$’ (z, x) or (y)
(g) Causative	α CAUSE β, where α, β are logical structures of any type

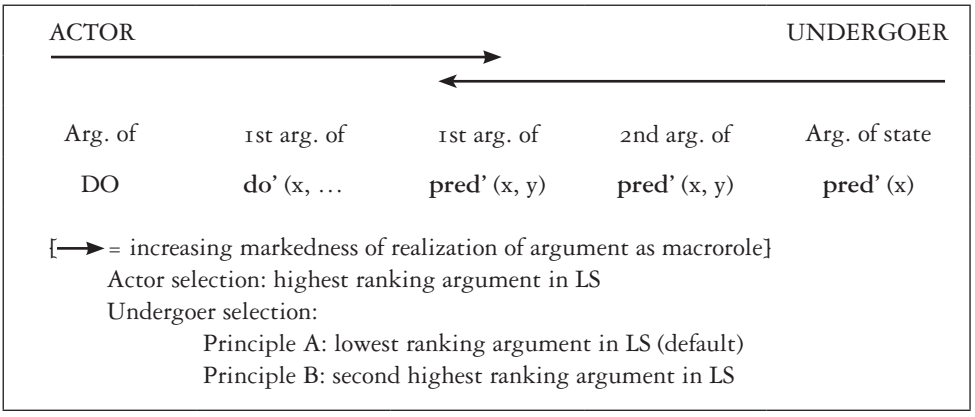
Each of the five different argument positions in the logical structures is ascribed to different thematic relations (Figure 1) according to the "thematic relations continuum" (Van Valin 2005, 58-60):

FIGURE 1. Thematic relations continuum (Van Valin 2005, 58)



We now need to follow the interface mechanism propounded in RRG in terms of macrorole (MR) assignment in order to account for the linking of the semantics of verbs to their syntax. RRG distinguishes two macroroles, actor and undergoer, which are conceived as generalizations of the different types of semantic roles and are associated with the two primary arguments of transitive and intransitive predications. They can be said to correspond to what has traditionally been called *subject* and *object* in syntactic terms, where actor is the most agent-like argument and undergoer the most patient-like argument. Thus, the different possibilities of MR assignment will account for different syntactic realizations following the selection principles of the actor-undergoer hierarchy (Figure 2), which, for instance, predicts that the first argument of an activity predicate will be the default actor—**do'** (x, …)—or that the only argument of a state predicate—**pred'** (x)—will be assigned the macrorole of undergoer:

FIGURE 2. Selection principles of the actor-undergoer hierarchy (Van Valin 2005, 61, 126)



After this brief overview of the analytical tools that will be used in our description, we will move on to analyse the realizations of the location argument in the alternations described so far.

4. An RRG Account for the Multiple Realizations of the Location Argument

For the RRG analysis of the constructions presented in section two, we will first analyse the *Aktionsart* class that can be ascribed both to the kernel construction and to the alternating construction, in order to check whether the alternating construction involves a change of *Aktionsart* class or not. We will then analyse the thematic roles assigned to the arguments and will finally conduct a macrorole assignment analysis with the aim of corroborating whether the different realizations of the location argument can be explained as instances of marked macrorole assignment to undergoer, and whether there are cases of marked actor assignment.

4.1. Transitive locative alternations

The transitive SPRAY/LOAD alternation and the transitive CLEAR alternation can both be accounted for in the same way, even though they are ascribed to different verb classes— PUTTING and REMOVING verbs, respectively. The verbs associated with the CLEAR alternation should be regarded as a subtype of REMOVING verbs, constituted by only four members: *clean*, *clear*, *drain* and *empty*.[6]

The *Aktionsart* ascribed to the alternating constructions of these tri-valent verbs is causative accomplishment, paraphrased as "x CAUSES y and z to BECOME **be-Loc**'" which is in fact the same *Aktionsart* class that is assigned to the kernel structure, which reveals that in these examples the alternation does not imply a change of *Aktionsart* ascription. The semantic and argument structures of these predicates can be represented in the following LS, which also incorporates the thematic roles assigned to the arguments: the effector, the single argument of an activity verb with an unspecified action; the goal, the first argument in a two-place locative predication, and the theme, the second argument of the two-place locative predication referring to those entities that are placed or moved:

[**do'** (x_{EFFECTOR}, Ø)] CAUSE [BECOME (NOT) **be-Loc'** (y_{GOAL}, z_{THEME})]

This representation shows that there is an activity predicate as the first argument of the operator-connective CAUSE, represented by an embedded **do'** predication that

[6] This alternating possibility cannot be extended to other REMOVE verbs since they do not show the alternating construction, as in *He removed the dishes from the table* / **He removed the table of dishes* (Levin 1993, 51-52).

indicates the causing action and has an effector as first argument, leaving the second argument unspecified (Ø) because it will be specified accordingly depending on the meaning of the verb analysed. The second argument of CAUSE is an embedded locative predication showing the semantic properties of accomplishments, since it involves "both a process that takes place over time, and an inherent endpoint of the process leading to the resulting state of affairs" (Van Valin and LaPolla 1997, 43).

In terms of macrorole assignment, the kernel structure exemplifies the default linking: the first argument of the activity predicate (x) is assigned MR actor and the theme (z) becomes the undergoer, following the actor-undergoer selection principle that states that the rightmost argument in a **pred'** (y, z) will be the undergoer (Van Valin 2005, 61). There is also a third non-macrorole argument *y* (the first argument of a locative predicate), which is marked by a non-predicative locative preposition—*from*, *on*, etc. depending on the predicate—codified as an oblique core argument (OCA).

(3) She spread butter on a deliciously aromatic roll. (BNC/JY3_W_fict_prose)
[**do'** (x_{EFFECTOR}, Ø)] CAUSE [BECOME **be-on'** (y_{GOAL}, z_{THEME})]
[**do'** (she, [**spread'** (she, Ø)])] CAUSE [BECOME **be-on'** (roll, butter)]
(x) = actor, (z) = undergoer, (y) = OCA

(4) [T]hey are out spraying slogans on walls. (BNC/HWC_W_fict_prose)

(5) Babushka was outside busily clearing snow from her path. (BNC/G23_W_pop_lore)

(6) Drain the syrup from the tins of fruit. (BNC/G2D_W_pop_lore)

The locative construction, on the other hand, can be accounted for as an instance of marked linking to undergoer, as shown in the examples below for SPRAY/LOAD verbs:

(7) Suzy and Seth loaded the van with food and clothes. (BNC/ABS_W_pop_lore)

(8) [You] Spread the cake with cream. (BNC/ABB_W_instructional)
[**do'** (x_{EFFECTOR}, Ø)] CAUSE [BECOME **be-on'** (y_{GOAL}, z_{THEME})]
[**do'** (you, [**spread'** (you, Ø)])] CAUSE [BECOME **be-on'** (cake, cream)]
(x) = actor, (y) = marked undergoer, (z) = OCA

In the marked linking, it is now the *y* argument (goal) in the LS that will be encoded as a direct object, a circumstance that triggers the encoding of *z* (theme) as an oblique core prepositional argument introduced by the preposition *with*, according to the RRG rule for prepositional marking which states that if the most-right potential argument is not selected as undergoer, then it has to be marked by *with*: "Assign *with* to non-MR *b* argument if, given two arguments, *a* and *b*, in a logical structure, with (1) both as possible candidates for a particular macrorole and (2) *a* is equal or higher (to the left of *b*) on the AUH, *b* is not selected as that macrorole" (Van Valin 2005, 114).

As for the so-called CLEAR verbs exemplified by the CLEAR alternation, they can also be accounted for as examples of constructional variants with marked undergoer assignment, with the only difference being that the LS includes the segment BECOME NOT (representing the idea of removing), and, although the same prepositional rule for *with* applies, in this case the non-macrorole core argument is encoded as an *of*-PP, as stated in Van Valin (2005, 115):

(9) There was a long pause while she cleared the bed of her things. (BNC/H94_W_fict_prose)
[**do'** ($x_{EFFECTOR}$, Ø)] CAUSE [BECOME NOT **be-on'** (y_{GOAL}, z_{THEME})]
[**do'** (she, [**clear** (she, Ø)])] CAUSE [BECOME NOT **be-on'** (bed, things)]
(x) = actor, (y) = marked undergoer, (z) = OCA

To sum up, the locative construction triggers the preposition *with* or the preposition *of* depending on whether the predicate in question is a PUTTING or a CLEARING verb. Moreover, their marked undergoer assignment seems to be motivated by the fact that in the *with*/*of*-variant the location argument is completely affected by the event described by the verbal predicate, and this cognitive prominence is translated in the syntax as the marked assignment of the macrorole undergoer to the surface-argument.[7]

According to Levin, the WIPE alternation should also be found within this group of transitive locative alternations. However, a thorough analysis of this alternation has led us to conclude that the WIPE alternation should not be regarded as another prototypical case of locative construction, but rather as an instance of the caused-motion construction related to verbs of change with only two arguments (x, y), to which an argument, the *off/from* phrase, is added in the derived alternating construction. In fact, most verbs will accommodate as their kernel structure a transitive pattern—see example (10)—which shows macrorole default linking for both actor and undergoer. The alternating construction (11) is an instance of the caused-motion construction which adds an argument with the macrorole status of undergoer, outranking the original undergoer, which is still an argument of the predicate and is licensed by it, but is introduced by a non-predicative preposition (*off/from*) which marks the source argument. This view is supported by the fact that most of the examples that we have analysed are instances of the two-place construction, which backs up our assertion that this should be the kernel structure from which the alternating three-place construction is derived. Another argument in support of this interpretation is that these verbs can also appear in resultative constructions such as in (12), where *dry* shows the resultant state.

[7] Kailuweit's account of transitive three-place locative constructions (2008) is very much along this same line since, according to him, in order to account for the syntactic behaviour of these alternations the analysis has to be done at the level of the logical structure. In these "inverted constructions," as he calls them, the Theme is blocked as argument and the marked undergoer argument is responsible for the different semantic effects of the construction (329).

(10) Eileen remembers Selina as a bubbly girl who helped to scrub the floors. (BNC/ CEK_W_newsp_other_social)
(11) The Captain wiped the paint off his hands. (BNC/ CDN_W_fict_prose)
(12) After he had fed him he wiped his boots dry with an old rag. (BNC/ CAB_W_fict_pros)

4.2. Intransitive locative alternations

In this subsection, we deal with Levin's SWARM alternation, in which the kernel construction (13) alternates with what Levin calls the *with*-variant (1993, 54), illustrated in example (14). The verbs participating in this alternation are inherently intransitive predicates that appear with predicative locative prepositional phrases (adjuncts) that take as their argument the complete event in which they participate: **be-in'** ($x_{LOCATION}$, [**do'** ($y_{EFFECTOR}$, [**predicate'** (y)])]).

(13) [S]hoals of immature fish which swarm in the surface layers of the sea. (BNC/ CRJ_W_misc)
(14) [T]he place was swarming with tortoises. (BNC/HA0_W_fict_prose)

The *Aktionsart* class ascribed to the different types of verbs that are related to the SWARM alternation can be reduced to three classes:

States (e.g., *echo*):	**be-Loc'** ($x_{LOCATION}$, y_{THEME})
Activities (e.g., *swarm*):	**be-Loc'** ($x_{LOCATION}$, [**do'** ($y_{EFFECTOR}$, [**predicate'** (y)])])
Semelfactives (e.g., *sparkle*):	**be-Loc'** ($x_{LOCATION}$, [SEML **do'** ($y_{EFFECTOR}$, [**predicate'** (y)])])[8]

In all cases, however, the *with*-construction turns these three *Aktionsart* classes into a state, and the *with*-construction, again, shows the holistic variant in the sense that the location where the event takes place is perceived as being full of that event. Syntactically speaking, the construction allows the locative argument (adjunct) to be the subject as a result of marked macrorole assignment, which triggers the realization of the other non-selected potential macrorole argument as a prepositional phrase introduced by *with.*

We will now represent the analysis that corresponds to each of the three *Aktionsart* classes that participate in this alternation. Thus, as regards examples of ACTIVITY predicates, like the ones illustrated in (13) and (14), we observe that following the default actor selection principle, the highest argument in the LS is the *y* because it is the argument of the activity predicate **do'**, which would result in a sentence like (13), repeated here for convenience as (15), where the predicative preposition *in* takes the complete event in which it participates as its own argument, i.e., the representation of the predicate *swarm*:

[8] For simplicity reasons, the thematic relations of effector, location and theme will not be specified in the LS from here onwards.

(15) [S]hoals of immature fish which swarm in the surface layers of the sea.
be-in' (surface layers (x), [**do'** (fish (y), [**swarm'** (fish (y))])])
(y) = actor

The *with*-construction, on the other hand, shows marked macrorole assignment to undergoer. Thus, since the argument of the **do'** is not assigned MR actor, the other argument in the logical structure must be assigned a macrorole status. In this case, the potential variable corresponds to the location first argument of the logical structure of the locative predicate preposition, **be-in'** (x, y), and since it is not an activity predicate, the macrorole is undergoer. In terms of the actor-undergoer hierarchy, marked undergoer assignment corresponds to the "second highest ranking argument in LS" (=x) as stated in "selection principle B" (Van Valin 2005, 126). As a result, the non-selected macrorole argument (y) is realized by a *with*-phrase according to the rule for assigning prepositions in English, as seen in the LS below (16), which reproduces example (14):

(16) [T]he place was swarming with tortoises.
be-in' (place (x), [**do'** (tortoises (y), [**swarm'** (tortoises (y))])])
(x) = marked undergoer

The verbs participating in Levin's SWARM alternation that are ascribed to the semelfactive class are based on activities, and can also be accounted for as instances of different macrorole assignment.[9] The basic pattern, illustrated by the predicate *sparkle* in example (17), shows the default actor selection, whereas the *with*-construction is an example of marked macrorole assignment to undergoer (18), where the non-selected potential macrorole is codified as a *with*-phrase, following RRG rules for preposition assignment:

(17) [I]ce crystals sparkle on her […] crown. (BNC/CN1_W_misc)
be-on' (crown (x), [SEML **do'** (ice crystals (y), [**sparkle'** (ice crystals (y))])])
(y) = actor

(18) [T]he nearest weir was a tourist sight […], flashing with silvery leaps as the salmon climbed to their spawning-grounds. (BNC/ H8L_W_fict_prose)
be-on' (weir (x), [SEML **do'** (silvery leaps (y), [**flash'** (silvery leaps (y))])])
(x) = marked undergoer

[9] Semelfactive verbs describe punctual events of little temporal duration but do not have a result state (e.g., *tap*, *flash*, etc.) and can be based on states (e.g., *glimpse*), represented as SEML **predicate'** (x) or (x, y), or on activities (e.g., *cough*), SEML **do'** (x, [**pred'** (x) or (x, y)]) (Van Valin 2005, 32, 34).

In the instances in which STATE predicates participate in this alternation, there is no activity predicate, and as a result the following default macrorole assignment principle in RRG should be applied: "if the verb has no activity predicate in its logical structure, the macrorole is undergoer" (VanValin 2015, 63). Thus, undergoer selection principle A (default linking) establishes that the macrorole undergoer should be assigned to the "lowest ranking argument in LS," in our case to *y*:

(19) Floodlit tennis courts […] abound in Cancun. (BNC/ CEK_W_newsp_other_social)
be-in' (Cancun (x), [**abound'** (tennis courts (y))])
(y) = undergoer

Marked assignment corresponds to selection principle B, which indicates that undergoer should be ascribed to "second highest ranking argument in LS," that is, to the (x) argument, in which case the potential non-selected macrorole undergoer is encoded as a *with*-phrase following the rule for assigning prepositions in English:

(20) [T]he whole forest was echoing with the snorts and growls of the awesome creature. (BNC/ CH9_W_fict_prose)
be-in' (forest (x), [**echo'** (snorts and growls (y))])
(x) = marked undergoer

As can be seen, Levin's SWARM alternation can also be accounted for in RRG terms as examples of marked macrorole assignment to undergoer. Moreover, in all marked instances the location argument receives the holistic interpretation.

4.3. The LOCATION SUBJECT alternation

In Levin's taxonomy (1993, 82), the LOCATION SUBJECT alternation is linked to FIT verbs that show the capacity of the location (table 2) and that allow the location to fill the slot of the subject. This construction implies the loss of the first argument in the kernel structure, but there is no change in transitivity:

(21) At the scene of the attack police found a plastic bag holding the pint of milk and four sausages. (BNC/CH2-W_newsp_tabloid)
(22) A large cafeteria seating over 300 people. (BNC/ AM2_W_misc)

In terms of *Aktionsart* ascriptions, the alternating construction, apart from deleting one of the arguments of the kernel construction—the *x* in example (23)—also involves a change of *Aktionsart* class, since FIT verbs in the kernel construction are causative states (x does something that causes y be in z), whereas in the alternating construction they are states. Thus, in example (23), which would alternate with the kernel construction

in example (24), the first event in the logical structure is an activity that causes a second event, which is a state. In terms of macrorole assignment, the default linking assigns actor to the argument of the activity predicate (x) and undergoer to the right-most argument in the LS (y):

(23) You can carry all of your belongings in the bag.
do' (you, [**carry'** you (x)$_{\text{EFFECTOR}}$, belongings (y$_{\text{THEME}}$)]
CAUSE [**be-in'** (bag (z) y$_{\text{GOAL}}$, belongings (y)$_{\text{THEME}}$]
(x) = actor, (y) = undergoer

In the alternating construction, the "**do'** (Ø, […])" segment represents an unspecified activity that is not reflected in the syntax, and the second event shows the change of the *Aktionsart* ascribed to the predicate, which is now no longer an activity—as in the kernel construction—but rather a state predicate that takes two arguments: the first argument position (z) is related to a location argument whose capacity is specified by the second argument (y). In this case (24), following the default actor selection principle, the highest ranking argument in LS must be assigned actor (x), and the lowest ranking argument in the LS must be assigned undergoer (y), following the undergoer selection principle for default linking.

(24) This way, the bag carries all of your belongings. [http://thecyclistbags.com]
do' (Ø, […]) CAUSE **carry'** (bag (x)$_{\text{LOCATION}}$, belongings (y)$_{\text{THEME}}$]
(x) = actor, (y) = undergoer

It is necessary to highlight that the macroroles actor and undergoer are the logical subject and the logical object respectively, but "the semantic content of the macrorole with a particular verb is supplied by the position of the argument in the logical structure, not by its macrorole status" (Van Valin 2005, 62). Thus, the actor of *carry* in (24) does nothing; it is simply the participant responsible for the state of affairs, that is the logical subject. In a parallel fashion, the undergoer of *carry* does not undergo any change even though it is the logical object in the state of affairs (Van Valin 2005, 61).

As a general conclusion we might claim that when the location argument is realized as subject it seems to codify states, as in the case of the intransitive locative alternations described in section 4.2. As regards the holistic effect that is often attributed to marked location arguments, it does not apply in this alternation since the subject location argument is not analysed as an example of marked macrorole assignment.

However, in this section we should include another alternation not registered in Levin (1993), which also shows a location argument codified as subject, and which is associated with two-place locative constructions, as illustrated in Kailuweit's example *The tank filled with water* (2008, 338). This construction alternates with the kernel construction *Water filled the tank*. These verbal predicates are linked to COVER verbs,

which in turn show another possible syntactic realization codified as *I filled the tank with water*. This three-place construction should be taken as the most basic pattern from which the other two constructions derive. In RRG terms, the kernel three-place construction shows actor MR assignment to the first effector in a causal chain,[10] whereas the second alternating construction *Water filled the tank*, in which a locatum argument—the entity that is moved—is realized as subject, shows marked actor assignment to the second effector in that causal chain:[11]

(25) Water filled the tank.
[**do'** (Ø (x)), [**use'** (Ø, water (y)])]
CAUSE [[**do'** (water, [**fill'** (water (y), tank (z)])]
CAUSE [BECOME **be-in'** (tank (z), water (y))]]
(y) = marked actor, (z) = undergoer

This two-place marked construction can, at the same time, alternate with a stative construction (26), which can be accounted for as another instance of marked undergoer assignment, since the slot for the potential actor has not been filled, which as a result triggers the codification of this non-selected potential effector actor as an OCA introduced by the preposition *with*. This alternation involves a change in the transitivity of the verb—the marked construction is intransitive—and a change of *Aktionsart* ascription since the transitive two-place construction (25) is an instance of causative accomplishment, whereas the intransitive marked construction (26) includes a change of state verb:

(26) [T]he room filled with soldiers. (BNC/W_fict_prose)
[**fill'** (soldiers (y), room (z)])]
(z) = marked undergoer, (y) = OCA

Kailuweit (2008, 352) also conceives these instances of two-place intransitive locative constructions as instantiations of marked undergoer choice that entail marked actor choice, and underscores the fact that marked actor assignment has not been attested in RRG.

[10] In this three-place construction, the *with*-phrase is not related to the RRG rules for prepositional marking, but, instead, to the instrumental use of the preposition *with*: "*with* marks a potential actor which is not selected as actor" (Van Valin and LaPolla 1995, 378), as exemplified in *Tom cut the bread with the knife* vs. *The knife cut the bread*.

[11] The LOCATUM SUBJECT alternation—*I filled the pail with water* vs. *Water filled the pail* (Levin 1993, 81)—deals with the alternating behaviour of the locatum argument, whereas the location argument remains the same in the two constructional variants. For the study of a verb that participates in this alternation, see Rodríguez-Juárez (2016), which presents a detailed account of the verb *cover* within the framework of RRG and the Lexical Constructional Model—see, Ruiz de Mendoza Ibáñez (2013), Ruiz de Mendoza Ibáñez and Mairal Usón (2007; 2008) and Mairal Usón and Ruiz de Mendoza Ibáñez (2008; 2009).

4.4. The IMAGE-IMPRESSION alternation

As mentioned in section two, Levin's IMAGE IMPRESSION alternation (1993, 66) resembles the SPRAY/LOAD alternation in syntactic terms since, without changing the transitivity of the verb, the location argument can be realized either as an oblique argument in the kernel structure, typically introduced by *on* (27), or as a direct core argument in the alternating construction (marked linking), triggering the presence of an OCA introduced by *with* (28):

(27) Members queued to engrave their initials on the vast parchment. (BNC/CFH_W_pop_lore)
(28) They […] stamped my hand with "checked." (BNC/ HP6_W_misc)

Syntactically speaking, these alternating constructions can also be accounted for as examples of either default or marked undergoer assignment to the location argument, respectively. The difference with the transitive locative alternation seems to reside in the semantics of the IMAGE-IMPRESSION verbs, which in the first place are restricted to a limited set of fourteen verbs (see table 3) that resemble PUTTING verbs in the sense that something is placed on a surface, but differ in that as a result of the event described by the verb a new entity is created—a tattoo, an inscription, etc. In fact, this difference is reflected in the *Aktionsart* class ascribed to these verbs, namely active accomplishments, which are not causative in nature, and differ from plain accomplishments in that they are more active, and adverbs like *actively* or *intensively* can co-occur with them (Van Valin and LaPolla 1997, 101), distinguishing them from SPRAY/LOAD verbs and CLEAR verbs, which are causative. The logical structure of active accomplishments (table 5) includes two related predicates: an activity predicate (**pred**$_1$') and one showing the result state (**pred**$_2$') which are linked by the ingressive operator (INGR) showing the coming into existence of an entity: "**do**' (x, [**pred**$_1$' (x, (y))]) & INGR **pred**$_2$' (z, x) or (y)." The logical representation in (29), which reproduces example (27), shows the default linking of actor to the first argument of the activity predicate (x):

(29) Members queued to engrave their initials on the vast parchment.
do' (members (x), [**inscribe**$_1$' (members (x), (Ø) (y))]
& INGR **be-on**' (parchment (z), (initials (y))
(x) = actor, (y) = undergoer

Marked assignment to undergoer is exemplified in sentence (30), where the goal (z) has been given macrorole status, with the implied consequence that the other potential non-selected undergoer macrorole (y) is realized as an OCA introduced by *with*, as predicted in the RRG rule for prepositional assignment:

(30) They […] stamped my hand with "checked." (BNC/ HP6_W_misc)
do' (they (x)**, [stamp'** (they (x), (Ø) (y))])
& INGR **be-on'** (hand (z), ('checked' (y))
(x) = actor, (z) = marked undergoer, (y) = OCA

In the marked construction, the holistic effect attributed to the location argument is also perceived, contrary to Levin's belief (1993, 67), since the surface seems to be largely affected by the creation of a tattoo, inscription, etc.—e.g., *They inscribed the stone with their initials*—a perception that is not felt in the kernel construction, *They inscribed their initials on the stone*.

5. Conclusion

The aim of this paper has been to analyse the multiple realizations of the location argument in various alternations in English from the perspective of RRG theory. Thus we have observed how the location argument, which in the most basic alternation patterns is normally codified as either a third-argument in three-place predications or takes the second argument position in bivalent predications, when alternating in marked constructions is placed in second or even first argument positions. The marked constructions may also involve a change of the *Aktionsart* ascribed to the verbal predicate and variation in the semantic implications of the location argument, in the sense that the location argument is often perceived as receiving the holistic effect that predicts that the location entity is somehow completely affected by the event described in the predication. In terms of the RRG analysis, we have demonstrated that the alternating marked constructions typically involve marked macrorole assignment, normally to undergoer, and to a lesser extent to actor.

Particularly, and regarding tri-valent transitive marked constructions, in those cases in which the location argument in the marked construction occupies the object position, we have shown that the transitive locative alternation (SPRAY/LOAD and CLEAR verbs) and the image impression alternation (CREATION verbs) are both examples of marked undergoer assignment which do not imply a change of *Aktionsart* ascription with respect to the basic constructions under concern—causative accomplishments and active accomplishments, respectively—and that both marked constructions also show that the location argument receives the holistic effect.

As regards bivalent transitive marked constructions where the location argument is an instance of default actor assignment—thus occupying the subject position—as in the LOCATION SUBJECT alternation (FIT verbs), we have observed that the location subject argument seems to codify states, since there is a change in the *Aktionsart* ascription of the verbal predicate in the kernel construction (causative state), which also involves the deletion of the first argument of the three-place predication from which it derives.

With respect to the intransitive locative alternation, the three different *Aktionsart* classes that have been identified in the kernel constructions—activities, semelfactives and states—change to states in the marked constructions. These stative marked constructions can be accounted for as examples of marked undergoer assignment to the second highest argument in the LS, which results in the realization of the location argument as subject and in its being completely affected by the predicated event. The other potential non-selected macrorole argument is codified as a *with*-phrase, as predicted by the RRG rule for the marking of the preposition *with* (Van Valin 2005, 114). We should highlight that in the case where the location argument is realized as subject in the marked construction, this assignment seems to codify states, as was also attested in the LOCATION SUBJECT alternation.

Finally, the intransitive marked construction that can occur with COVER verbs such as *fill*, as in *The tank filled with water,* also implies a change of *Aktionsart* ascription, from causative accomplishment in the kernel transitive structure from which it derives—e.g., *Water filled the tank*—to states in which the location subject seems to be completely full of the event predicated by the predicate. In terms of macrorole assignment, here we have an example of marked undergoer assignment which results in an intransitive construction in which the potential non-selected actor macrorole argument has to be codified as a *with*-phrase as predicted by the RRG rule for prepositional marking.

The research presented here has shown that the RRG analysis of the different syntactic realizations of the predicates that take a location argument in their argumental realization should be conducted at the level of the logical structure, where marked macrorole assignment explains the different syntactic realizations of the location argument as object but also as subject. These marked instantiations very often entail a change in the semantics of the location argument in the sense that it is perceived as being completely affected by the event, which may also in some cases involve a change in the *Aktionsart* ascription of the verbal predicate, and even a change in the transitivity of the verb.

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