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Syntactically-based Lexical Decomposition: The Case of *Climb* Revisited*

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1. Introduction. Jackendoff's conceptual analysis of *climb*

The main purpose of this paper is to show the theoretical and empirical plausibility of an approach to argument structure which involves a minimal lexical-syntactic decomposition analysis of predicates. In doing so, I will also take pains to show the problems of drawing argument structures from pure, non-linguistic conceptual structures. In particular, I will be dealing with cases involving multiple argument structures, which will be analyzed from a lexical-syntactic perspective (cf. Hale & Keyser 1993, 1998; HK henceforth).

In order to exemplify my proposal, I will concentrate on the case study of the verb *climb*, whose lexical representation is analyzed by Jackendoff (1985, 1990); (J henceforth). Let us then review his analysis of this verb. Consider the examples in (1), drawn from J (1990: 76).

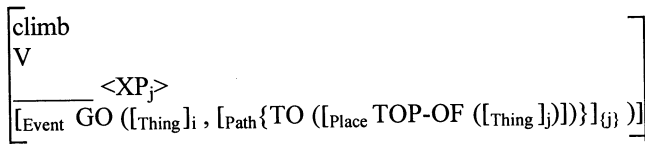
- (1) a. Joe climbed (for hours).
b. Joe climbed the mountain.
c. Joe climbed

down the rope. along the ridge. through the tunnel. etc.

In his lexical analysis, J proposes the unification device in (2) to account for the argument structure alternations in (1). According to his notation, the Path-constituent in (2) abbreviates the two possibilities in (3): (3a) corresponds to (1b), and (3b) corresponds to (1a) and (1c). In (1a), the Path is said to be unspecified.

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(2)



- (3) a. [Path TO ([Place TOP-OF ([Thing]_j))]
 b. [Path]_j

Furthermore, J refines upon the conceptual analysis of *climb* in (2) in order to capture the prototypicality effects shown by this lexical element: See the examples in (4), drawn from J (1990: 35). As stressed by J, the conceptually-based lexical decomposition is not to be based on traditional feature systems nor guided by the criterion of necessary and sufficient conditions. Rather, it is to be based on a 'preference rule system'.

- (4) a. Bill climbed (up) the mountain.
 b. Bill climbed down the mountain.
 c. The snake climbed (up) the tree.
 d. ?* The snake climbed down the tree.

The preference features that J assumes to be involved in *climb* (i.e. traveling *UPWARD* and motion through *CLAMBERING*) are both present in (4a) and (4b), which are examples of 'stereotypical' climbing. When only one condition is respected (e.g. (4c)), the example is judged to be sufficient for a positive judgement as well. When both conditions are violated, the instance cannot at all be characterized as climbing (e.g. (4d)).

To be sure, the conceptual analysis of (2) *plus* its associated prototypicality effects relate well with our intuitions about our background knowledge concerning *climb*. In this paper, I do not pretend to deny the value of J's insights on the conceptual analysis. My main concern here will be that of analyzing the status of argument structure in linguistic theory. It is precisely in this point where my approach diverges greatly from J's. Quite importantly, with HK (1993), I claim that argument structures are not to be drawn from pure, non-linguistic conceptual structures, but from linguistically motivated lexical-syntactic structures, which in turn can be argued to be directly associated with semantic structures, perhaps in an isomorphic way (cf. Bouchard (1995), Baker (1997), and Mateu (1999) for discussion on the homomorphism between syntactic and semantic structures).

2. Argument structure meets homomorphism

The purpose of this section is to show that there is a strong homomorphism between the syntax and semantics of argument structure. My present proposal partakes of both HK's (1993) paper, where certain meanings were associated with

certain syntactic structures, and their more recent (1998) paper, where a refinement of the basic argument structure types is presented. According to HK (1998), the argument structure relations a head *X* can enter into are those in (5): In (5a) *X* only takes a complement; in (5b) *X* takes both a complement and a specifier; in (5c) *X* only takes a specifier; finally, in (5d) *X* is a non-relational element. Moreover, it is important to note that the universal argument structure categories in (5) must not be mixed with their language-specific *morphosyntactic* realizations: Their morphosyntactic realization in individual languages as Vs, Ps, and so on, is a parametric issue (see HK (1998)). Due to my concentrating on the relation between the syntax and semantics of argument structure, here I will not be concerned with the morphosyntactic realizations of the LRS elements.

- (5) The Structural Types of Lexical Relational Structures (HK (1998))
 a. [_X X Y] b. [_X Z [_X X Y]] c. [_α Z [_α α X]] d. X

In order for my proposal concerning homomorphism to come to the fore, an important reduction or modification of (5) appears to be necessary. In Mateu & Rigau (2000), it is claimed that the lexical head *X* in (5c) is not a primitive element of the argument structure theory, as in HK's approach, but a composite unit. The secondary lexical category *Adjective*, which semantically expresses a state, can be argued to be decomposed into two elements: a non-relational element (similar to that instantiated by *N*) *plus* a relational element (similar to that instantiated by *P*), the former being incorporated into the latter. That is, our claim is that the structural combination in (5b) can also be argued to account for the argument structure properties of Adjs. Accordingly, the argument structure of the *small clause* involved in two examples like those in (6a-6b) turns out to be the same, that in (6c). Crucially, the incorporation of *Y* into *X* in (6c) accounts for both the *relational* nature of Adjs, which these share with *P*, and their *nominal* properties in languages like Latin, where these are marked with morphological case.

- (6) a. is [the cat [in the room]] b. is [the cat [happy]] c. is [_X Y [_X X Y]]

Quite probably, HK would not be happy with such a modification or reduction, since the causative/inchoative alternation is presented by them as an important point for maintaining the distinction between the denominal verbs that involve the merge of (5b) into (5a) (see (7a)), and the deadjectival verbs that involve the merge of (5c) into (5a) (see (7b)). According to them, this explains why the former are always transitive, whereas the latter have an intransitive variant (the α verbal head being then inflected with Tense).

- (7) a. *([_V [_V e]) [_P N [_P e] [_N shelf]]) John shelved the books; *the books shelved
 b. ([_V [_V e]) [_V N [_V e] [_A clear]]) John thinned the sauce; the sauce thinned

However, as pointed out by Kiparsky (1997), HK's structurally-based generalization is not fully well-grounded: Denominal verbs *can* participate in the causative/inchoative alternation if they denote events which can proceed without an explicit animate agent (e.g., *pile (up)*, *carbonize*, *oxidize*, etc.) On the other hand, there are deadjectival verbs that *cannot* participate in such an alternation (e.g., *legalize*, *visualize*, etc.).

Given this, the relevant conclusion for our present purposes is the following: The fact that transitive denominal verbs do not enter into the causative alternation is not due to a structural reason, as HK propose, but to the fact that they usually involve an animate agent. Therefore, the main objection that HK could entertain with respect to my eliminating the apparently basic combination of (5c) vanishes into thin air. This reduction accepted, the basic, irreducible argument structure types turn out to be those in (8):

- (8) The Structural Types of LRSs revisited
 a. $[_X X Y]$ b. $[_X Z [_X X Y]]$ c. X

The reduction of (5) to (8) allows homomorphism to come to the fore, this being expressed in (9). Given (9), the relational syntax of argument structure can be argued to be directly associated to its corresponding relational semantics in quite a uniform way.

- (9) a. The lexical head X in the syntactic configuration in (8a) is to be associated to an *eventive relation*.
 b. The lexical head X in the syntactic configuration in (8b) is to be associated to a *spatial relation*.
 c. The lexical head X in the syntactic configuration in (8c) is to be associated to a *non-relational element*.

In turn, the eventive relation, which is uniformly associated with the X in (8a), can be instantiated as two different semantic relations (see (9a')): If there is an external argument in the specifier position of the relevant F (unctional) projection (e.g., v in Chomsky (1995) or *Voice* in Kratzer (1996)), the eventive relation will be instantiated as a causal relation, the external argument being interpreted as Causer or Originator. Quite crucially, I will assume that both transitive and unergative verbs are lexically marked with a strong $[v]$ feature to be checked in the relevant Functional projection introducing the external argument. The so-called 'assignment of theta-role to the external argument' can then be said to be licensed through this checking process.

If there is no external argument, the eventive relation will be instantiated as a transitional relation. The transitional relation always selects a spatial relation, whose specifier and complement can be said to be interpreted as Figure and Ground respectively (this terminology being adapted and borrowed from Talmy (1985)).

- (9) a'. The lexical head *X* in the syntactic configuration in (8a) is to be associated to an *eventive relation*: if there is an external argument, it is interpreted as a *causal relation*; otherwise, it is interpreted as a *transitional relation* (See Harley (1995) for a similar view).

Let me then comment on briefly some relevant aspects of the resulting argument structures in (10).

- (10) a. transitive structure: $[Z_1 [{}_F F [X_1 X_1 [X_2 Z_2 [X_2 X_2 Y_2]]]]]$
 b. unergative structure: $[Z_1 [{}_F F [X_1 X_1 Y_1]]]$
 c. unaccusative structure: $[X_1 X_1 [X_2 Z_2 [X_2 X_2 Y_2]]]$

The main structural difference between transitive structures (see (10a)) and unergative structures (see (10b)) is based on the type of complement selected by the causal relation (X_1): While a spatial relation (X_2) is selected in (10a) as complement, it is a non-relational element (Y_1) that is selected in (10b). Moreover, notice that the transitive structure in (10a) can be argued to partake of both an unergative structure (notice that it includes the causal relation to be associated with an external argument Z_1 via F) and an unaccusative structure (note that it includes the spatial relation X_2).

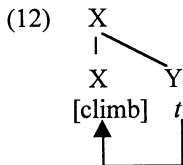
3. Argument structure and lexical decomposition: the case of *climb* revisited

With this sketchily reviewed theoretical background in mind, let us now deal with our particular case study. Quite importantly, I claim that the minimal lexical decomposition in order to draw argument structures is *guided* by syntax, an enterprise not to be mixed with that carried out by Generative Semanticists *in illo tempore*: that is, we do *not* pretend to syntacticize semantic intuitions or encyclopedic knowledge! Intuitions and background knowledge are put aside, and only linguistic/syntactic facts must be taken into account when working out argument structures via lexical decomposition. For example, let me exemplify it with the analysis of *climb* in (1a), repeated below. The three 'unaccusative diagnostics' in (11) (auxiliary selection in (11a), postverbal subjects without determiner in (11b), and absolute participial clauses in (11c)) should be enough to show that *climb* in (1a) projects an unergative structure.

- (1) a. Joe climbed.
- (11) a. Gianni ha/*è scalato. (cf. ^{ok}Gianni è arrivato) Italian
 Gianni HAS/*IS climbed Gianni IS arrived
 a'. dat Jan geklommen heeft/*is (cf. ^{ok}dat Jan gevallen is) Dutch
 that Jan climbed HAS/*IS that Jan fallen IS

- b. *Escalan niños . (cf. ^{ok}Legan niños) Spanish
 climb-3rd.pl boys arrive boys
 c. *Una vez escalados los invitados, ... (cf. ^{ok}una vez llegados los invitados,...)
 once climbed the guests,... once arrived the guests,...

As noted in section 2, I assume that unergative verbs like *climb* in (1a) project the LRS in (12), the argument *Joe* being truly external to the LRS (see (10b)). Following HK (1998), I also assume that the empty phonological matrix associated to *X* forces the copy of the phonological label of *Y* into *X*.



On the other hand, if we are willing to respect the homomorphism between the syntax and semantics of argument structure, it would seem more appropriate to associate (12) with an internal causal relation (say *DO*) plus its complement, which expresses the caused event (cf. (13a)), rather than with the semantic/conceptual functions typically associated with the vast majority of unaccusative verbs, as in J's analysis (cf. (13b)).

- (13) a. [_{DO} *DO CLIMB*]
 b. [_{Event} *GO* ([_{Thing} *i*, [_{Path}])]]; cf. (2)-(3b)

As far as the argument structure is concerned, it is then important to note that the syntactically motivated lexical decomposition of (1a) stops at the coarse-grained level of (13a).

Moreover, note that there is no morphosyntactic evidence in (1a) nor in (1b), repeated below, which forces us to refute Talmy's (1985) claim that physical paths do not conflate into the verb in English (Latinate words being put aside, in English abstract paths can be argued to do so in so-called 'change of state' verbs).

- (1) a. Joe climbed.
 b. Joe climbed the mountain.

Indeed, in (1b) *Joe* can be said to be the entity that has moved to the top of the mountain through his climbing, as is partly reflected in J's CS analysis in (3a):

- (3) a. [_{Path} *TO* ([_{Place} *TOP-OF* ([_{Thing} *j*])]]]; cf. (1b)

However, I want to argue that the description of this fact has been ‘construed’ not in (1b), but in (14).

- (14) Joe climbed to the top (of the mountain).

To put in Langacker’s (1987) insightful terms of (15), both (1b) and (14) can be argued to refer to a similar conceptual scene, but they represent two different construals of such a conceptual scene.

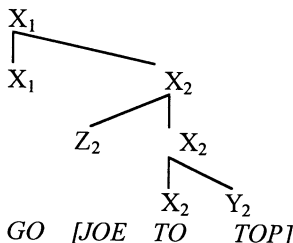
- (15) “Meaning is a function of both conceptual content and *construal*”.

It is then important to note that I am not just claiming that (1b) and (14) differ with regard to syntactic structure. Due to my assuming an homomorphism between the syntax and semantics of argument structure, I am also led to conclude that (1b) and (14) differ semantically as well. As a result, their corresponding analyses are the following: (1b) is to be associated with the transitive causative LRS in (16a), this LRS being related to the semantics in (16b) in quite a uniform way.

- (16) a. $[Z_1 [F F [X_1 X_1 [X_2 Z_2 [X_2 X_2 Y_2]]]]]$
 b. [JOE [CAUSED [THE MOUNTAIN [CLIMBED]]]]

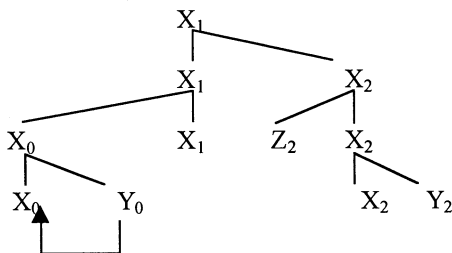
On the other hand, my claim is that (14) involves the ‘conflation’ (to use Talmy’s (1985) term) of two different LRSs: The main unaccusative LRS in (17a) (that corresponding to the semantics in (17b)) is conflated with the subordinate unergative LRS of (12) by means of a ‘generalized transformation’ (see HK (1997)), this kind of transformation being now revived in the strongly derivational model adopted in Chomsky’s (1995) ‘Minimalist Program’. Since the empty phonological matrix corresponding to the transitional relation X_1 is not saturated by its complement X_2 (this being due to the fact that physical paths do not incorporate into the verb in English (Talmy (1985))), a complex head from an independent LRS (e.g., that in (12)) is then allowed to do so (see (18)).

- (17) a.



- b.

(18) a.



b. [DO CLIMB] [GO [JOE TO TOP]] ('Joe climbed to the top')

Notice that the present generalized transformation is nothing but an instance of the Merge operation (see Mateu & Rigau (2000)), by means of which the complex head of the unergative LRS in (12) comes to be adjoined to the empty phonological head X_1 of the unaccusative LRS in (17a). As a result, the phonologically full head of the former provides the empty head of the latter with phonological content.

The conflation in (18a) appears to be motivated by morphophonological reasons, in particular, by a principle like 'Avoid empty matrices at PF' (see HK (1998)). Of course, when the transitional relation head X_1 has phonological content, there is no conflation involved, (19a) being the analytical variant corresponding to (14).

As shown by Mateu & Amadas (1999), morphophonological reasons can also be appealed to in order to explain Talmy's (1985) observation that Romance languages do not have confluations of the English kind, witness (19b)-(19c). It is usually the case that the directional path is incorporated into the verb in these 'verb-framed languages' (Talmy (1991)), this provoking the lexical saturation of the phonological matrix associated with the verb (see (20b)). As a result, the conflation of this verb with an independent complex head expressing 'manner' turns out to be excluded in these languages. See Mateu & Amadas (1999) for more discussion.

(19) a. Joe went to the top climbing.

b. *Joe escaló a la cima (cf. (14))

Spanish

c. *La botella flotó a la cueva. (cf. (20a))

(20) a. The bottle floated into the cave

b. La botella entró a la cueva flotando

Spanish

The bottle went+into to the cave floating

Talmy (1985)

With HK, I argue that the confluations discussed by Talmy (1985) (e.g., conflation of 'motion' with 'manner' in English, and conflation of 'motion' with

'path' in Romance) do not take place at a pure semantic or conceptual level, but at a lexical-syntactic level, the latter being the locus of parameterization of morphosyntactic facts concerning argument structure. To be sure, J (1990) and Goldberg (1995) are right when saying that conflations like those involved in (14) or (20a) have semantic restrictions. This notwithstanding, with HK (1997), I posit that conflation is a syntactic process which, as shown above, can be argued to satisfy external conditions like that of avoiding phonologically empty matrices at PF.

Moreover, it is not clear to us whether semantic approaches like the 'projectionalist' one put forward by Levin & Rappaport Hovav (1998), or the 'constructionalist' one developed by Goldberg (1995), can provide a principled explanation of the parameterization issue involved in the conflation processes under study, e.g., that distinguishing English from Romance with respect to the conflation of 'motion' with 'manner'. For example, let me comment on Levin & Rappaport Hovav's (1998: 256) LCS-based analysis of the descriptive generalization, according to which English manner of motion constants can be associated with both activity and accomplishment lexical semantic templates, while Romance allows such constants to be associated only with activity lexical semantic templates. See (21):

(21) a. Joe climbed

Activity *climb*

ACT (x)
|
[CLIMB]_{MANNER}

b. Joe climbed to the top

Accomplishment *climb*

GO (x, y)
|
[CLIMB]_{MANNER}

From our present perspective (which could be wrong, to be sure), semanticocentric approaches neglect the important morphosyntactic explanation of why Romance languages prevent the so-called 'manner of motion verbs' like *walk* or *climb* from appearing in accomplishment structures. If my lexical-syntactic analysis is along the right lines, we have an explanation of why Romance languages do not have the 'descriptive' association in (21b). Furthermore, if my proposal is correct (cf. (18)), the syntax and semantics of (21b) turns out to be much more complex than that of (21a): in particular, I have posited that (21a) is somehow included into (21b): i.e., *Joe climbed to the top* means *Joe went to the top by doing climbing*. See Mateu & Amadas (1999).

Finally, I would like to conclude the present paper by commenting on the fact that the conflation depicted in (18) takes place only when the verb appears with what Aske (1989) calls 'a telic path phrase'. Aske, in a qualification to Talmy's

(1985) typology, pointed out that there are two types of path phrase, those in (22):

- (22) a. A *one-dimensional locative path phrase* adds the “location” (i.e., the path or one-dimensional region) in which the activity took place.
 b. A *telic path phrase* predicates an end-of-path location/state of the Figure.

Both types are possible in English (see (23a)-(23b)), but only the former is possible in Romance (see the Spanish example in (23a')).

- (23) a. Joe climbed {along / through} the tunnel
 b. Joe climbed {onto the wall / out of the tunnel}
 a'. Sp. Joe escaló {por/ a través de} el túnel

Aske's insight could be explained within the present lexical-syntactic approach by postulating that 'telic paths' like *onto the wall* occupy a complement position in the unaccusative LRS (see (17a)), whereas 'atelic paths' like *along the tunnel* are adjuncts to the unergative LRS (see (12)).

4. Conclusions

In this paper, I have argued that a minimal lexical-syntactic decomposition is necessary in order to work out the relevant argument structures (see H&K(1998)). My approach to lexical decomposition contrasts with both the Generative Semantics program and J's Conceptual Semantics theory. Unlike the former, I think that only a minimal lexical decomposition can be carried out by syntactic means. Unlike the latter, I think that argument structures are not to be drawn from pure conceptual structures, but from linguistically-motivated lexical-syntactic structures. For example, I have taken pains to show why we cannot assign the same thematic structure to *Joe climbed the mountain* and *Joe climbed to the top of the mountain*. Quite importantly, the homomorphic nature of the relation between the syntax and semantics of argument structure (cf. Baker (1997), Mateu (1999)) led me to conclude that both sentences differ not only syntactically but semantically as well, even though they can be argued to refer to similar conceptual scenes.

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