

MORE ISSUES ON THE ARGUMENT STRUCTURE OF PRIMARY COMPLEMENTS

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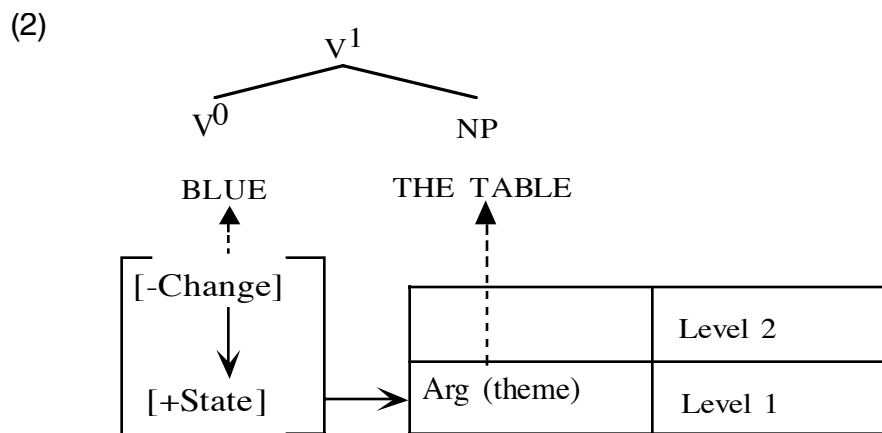
1. Introduction

In this paper we will examine further the relation between conceptual features and argument structure. Specifically, we will propose that theta roles of a verb are determined by certain features inherent in the verb.

The conceptual feature [+State] (based on Jackendoff 1987: 374-377) implies a theme. The default is for the theme to be assigned to the level 1 position in argument structure (a variation of Grimshaw 1990) which corresponds to the direct complement. It was shown in Hedberg and DeArmond (2002) that the theme is projected directly into the complement position of the verb. We propose, then, the feature [-State], which we assume without argument here is a prime. [+State], corresponding to the aktionsart state, assigns only one argument theme:

- (1) a. The table is blue.
 b. [BLUE, [+State]] (TABLE) --> [AP [BLUE] [NP [TABLE]]]

In Hedberg and DeArmond (2002) an alternate configuration to represent Figure (1b) is proposed:



On the left side of the rectangle the lexeme is divided into those features that determine the argument structure of the lexeme, which appears within the rectangle. The predicate and its arguments are projected up to the syntactic representation, at which point the rules of syntax apply.

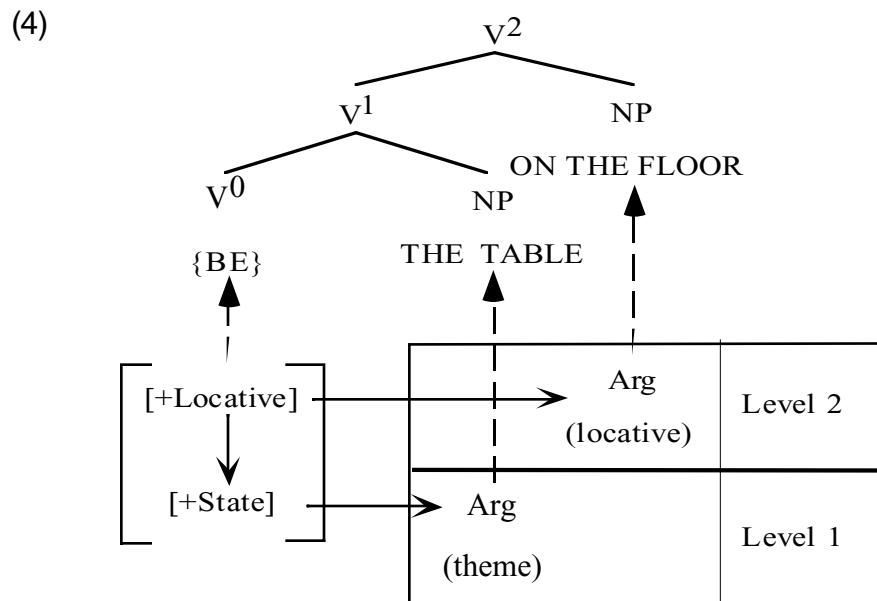
1.1 Location

Next we propose the feature [-Locative], which may also be a prime. On the one hand [+Locative] implies [-State]. On the other hand [-State] does not imply a location. For example, (1a) does not imply a location; the fact that the table is blue has nothing to do with location. In example (3a) a state is implied and in example (3b) an event is implied:

- (3) a. The table is on the floor.
 b. Mary is working in the kitchen.

[+Locative] takes an argument--the location of the object that the state or event (i.e., eventuality) implies. *The floor* is the argument of *on*, which marks [+Locative].

In Hedberg and DeArmond (2002) a configuration based on figure (4) was proposed to represent the argument structure of (3a). Figure (4), which represents the argument structure of example (3a) includes an arrow the head of which points to the argument of the predicate:



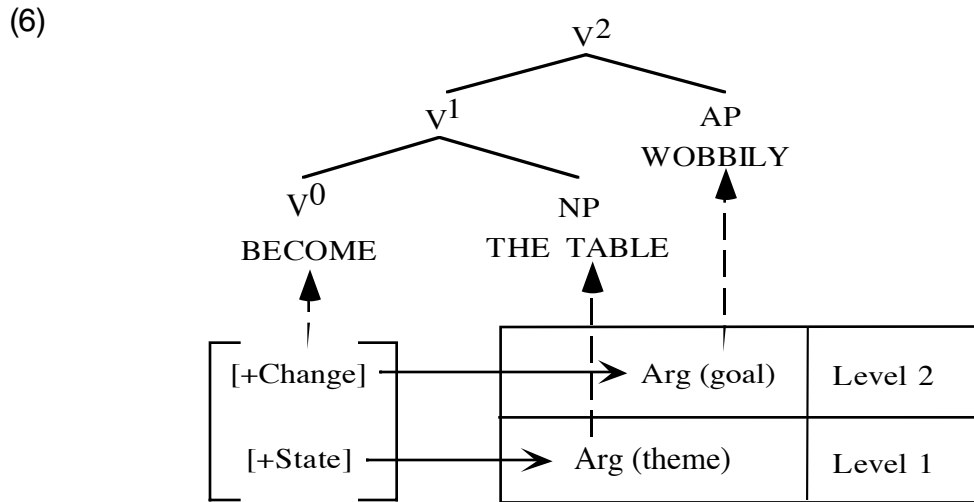
The feature [+Locative] implies an eventuality. [+State] assigns the argument theme, and [+Locative] assigns the theta role locative which is realized as the preposition *on*. The solid head arrow projects up to the appropriate node in the syntactic representation. The node labelling system we use is based on the system where V^0 is a head. V^1 directly dominates an argument in level 1, and V^2 directly dominates an argument in level 2.

1.2 Change

Next we propose the feature [-Change]. One of its arguments is [-State]:

- (5) a. John turned into respected scholar.
 b. The table became wobbly.
 c. The ice melted.

Consider (5b). Although *table* is the argument of a steady state, there is also implied a change of state: from steady to wobbly of the table. [+Change] refers to this change of state. Here, [+Change] is a lexico-semantic feature of BECOME. The goal here presents the final state (of sturdiness) of the theme:



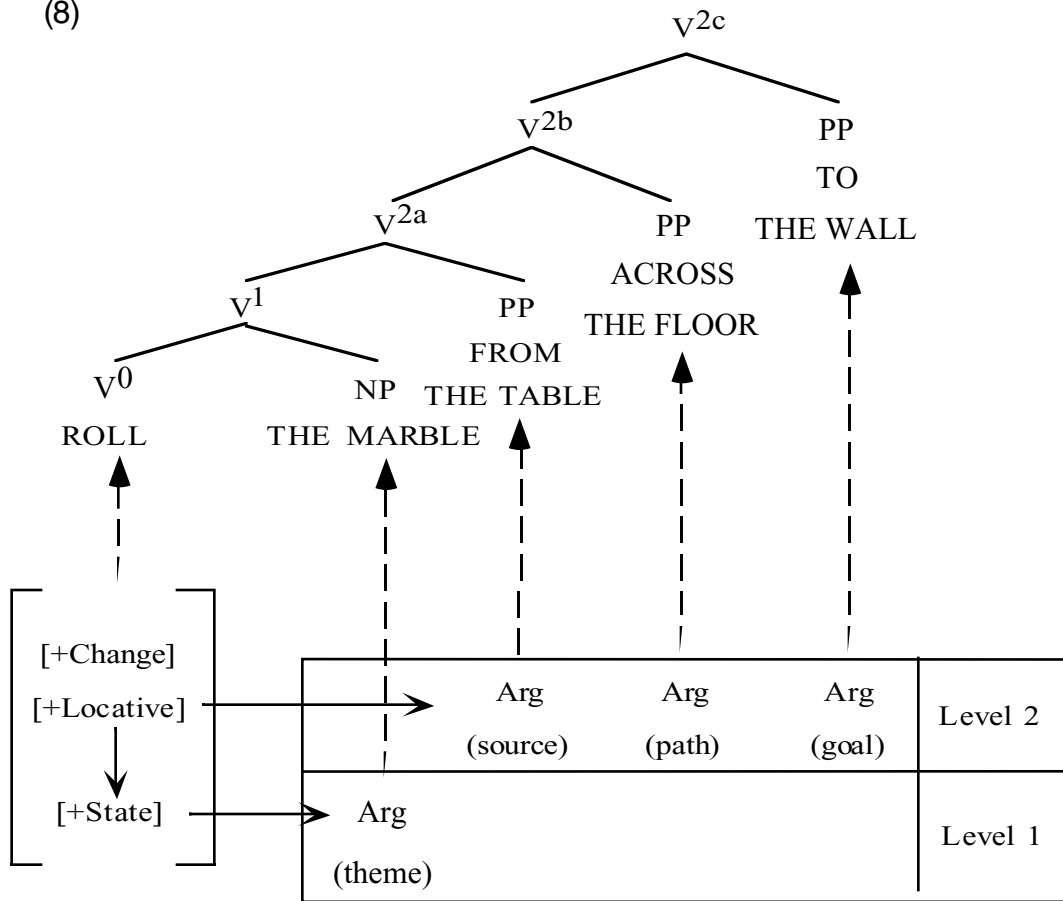
[+Change] can take other arguments as well. In Figure (6) dashed arrows with solid heads represent projecting an argument to the appropriate position in the syntax. Projection of arguments to the appropriate position in the syntax is explained in Hedberg and DeArmond (2002). The open arrow with the solid lines point to the argument of the predicate and implied features of a head feature.

In (7) *the marble* is the theme, and the remaining arguments denote source, path, and goal:

(7) The marble rolled from the table across the floor to the wall.

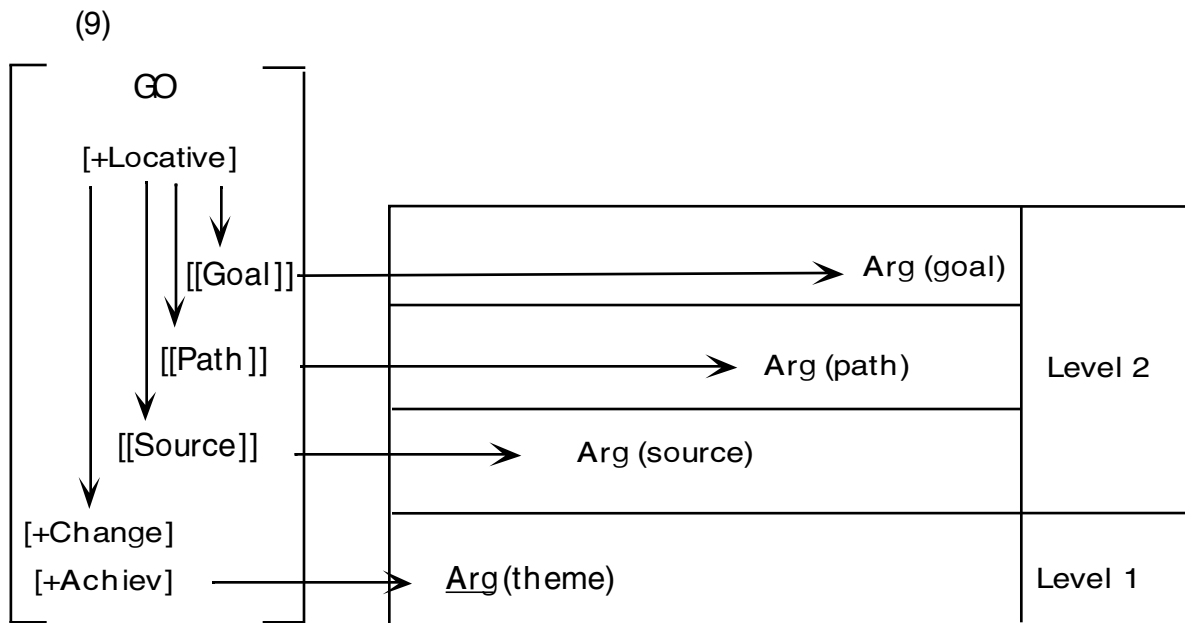
In Hedberg and DeArmond (2002) we showed that the locative arguments source, path, and goal all occur in Level 2. Here [+Change] refers to a change in location. First we show [+Locative, +Change] pointing to the second level:

(8)



The superscripts a, b, and c in Figure (8) represent the arbitrary ordering of source, path, and goal in English, proposed in Hedberg and DeArmond (2002).

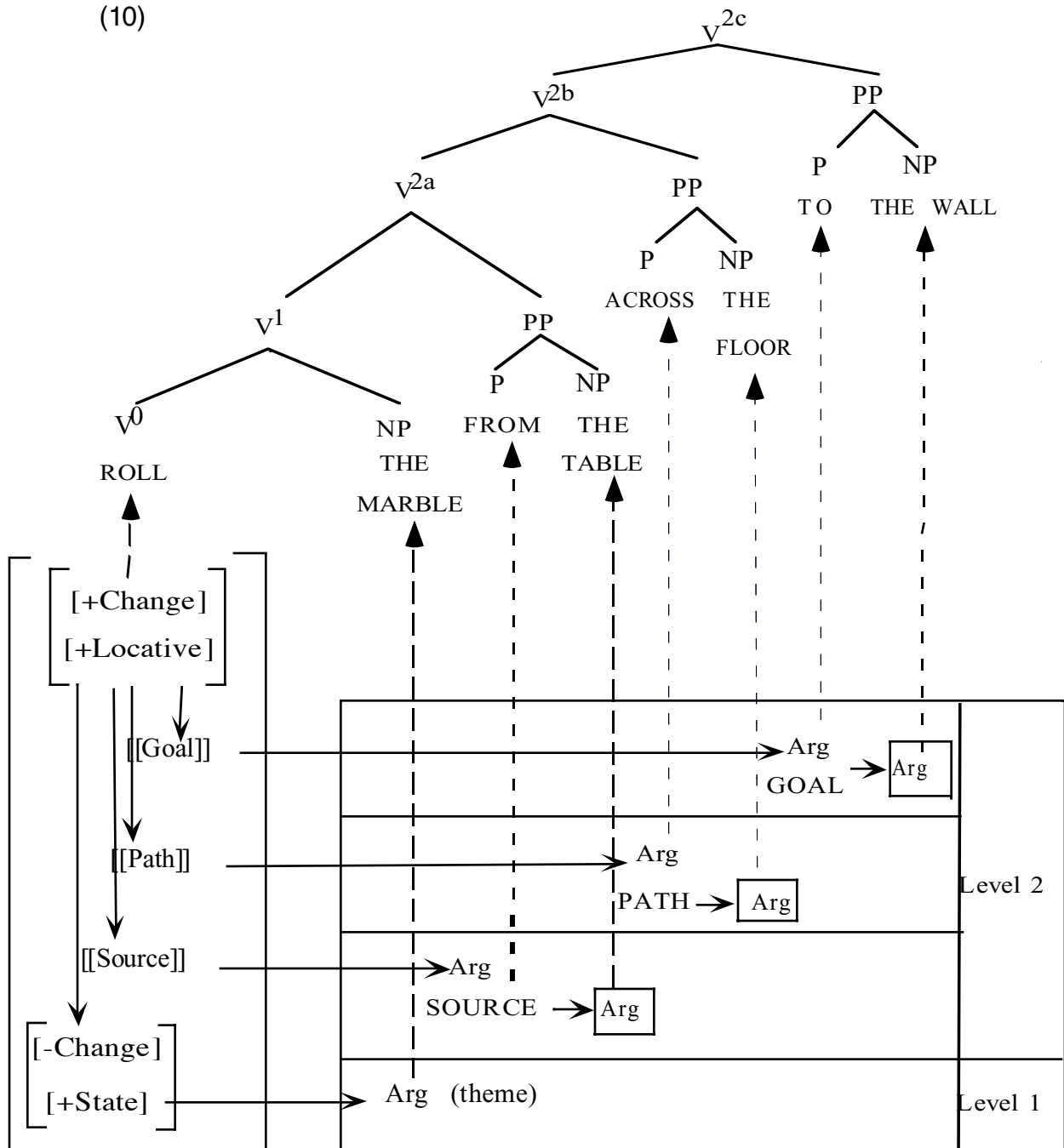
The argument structure can be expanded to more correctly show the relationship between the arguments and the features of the selected verb, ROLL. [+Change] implies the feature [+Locative] as above. The lexico-semantic features of source, path, and goal, implied by [+Change], each imply their own argument: the location of the theme at its source, path, and goal, respectively. Figure (9) represents the revision of Figure (8):



The features Goal, Path, and Source are related to [+Change] in a way that is different from how [+Locative] is related to [+Change]. At this time they seem to be unary features; we enclosed these features in double brackets.

However, the PPs in (8) were never expanded. Each PP is a substate. That is, source, path, and goal are each a basic locative state--one that is not modified by a verbal operator such as tense or relevance (the perfect). Example (9) is expanded to show each basic state and its argument:

(10)



Note that it is impossible to express source, goal, and path as full states in the intended meaning:

- (11) a. *The marble is from the table.
b. *The ball is across the floor.
c. *The ball is to the wall.

However, Level 1 locatives can be expressed as a state as shown in (3a). The best evidence supporting our argument is shown in the above figure, how each predicate projects to a verb (state) or a preposition (location).

1.3 Time

The feature [+State] also extends to [-Time]. [-Time] occurs in all the above examples. [+Time] would include adverbs such as *today*, *tomorrow*, *yesterday*. [+Time] projects up to [-Change]. [+Change] would occur in examples such as:

- (12) a. John worked from dawn until dusk.
b. It took Mary an hour to complete her exam.

In (12a) the temporal PPs modify the activity, but they are not arguments of the activity (WORK). The same holds true in (12b). The time measurement is not a level one argument of the achievement verb (TAKE.); Mary is the object, but there is no corresponding passive:

- (13) a. *Mary was taken an hour to complete her exam.
b. *An hour was taken Mary to complete her exam.

It is not optional (in the temporal sense intended):

- (14) *It took Mary to complete her exam.

The change here implies a goal (her exam).

Similar to the PPs marking locative substates in (7), the prepositions in (14) mark temporal substates.

1.4 Experiences

In DeArmond and Hedberg (2000), it was proposed that argument structures of abstract verbs (Gruber 1972) follow a similar pattern. This can be extended to the more specific model being proposed here. For example, consider (15):

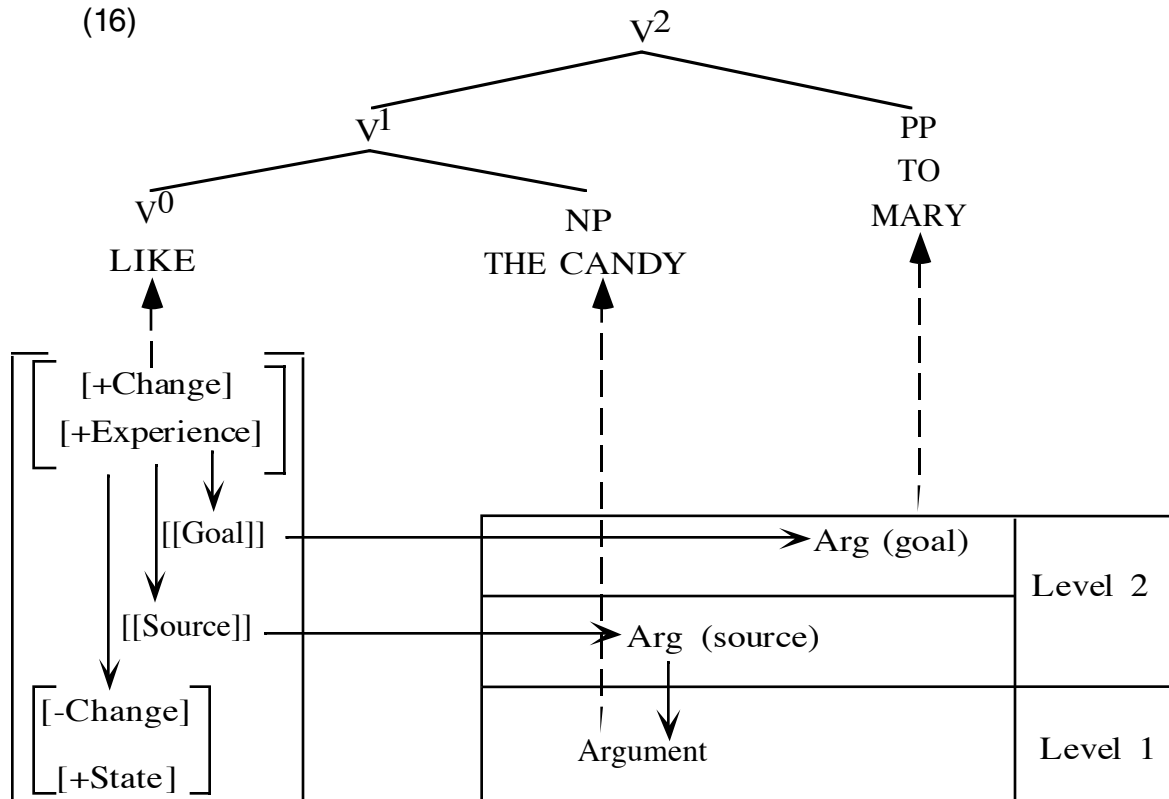
- (15) Mary likes candy.

The argument expressing theme is incorporated into a verb whose form is LIKE. *Candy* is the source of the experience, and *Mary* is the goal of the experience. The theme here is abstract the experience of liking. This notion is developed in Gruber (1972). Candy is the source in that the experience of liking starts at candy. In a very abstract sense the experience is going from the source to the goal. The lexico-semantic feature [+Like], the base of *liking*, is realized as the predicate. This must be the theme. Now we have a verb that contains the feature [+Experience] plus [+Like]¹ forming the verb *like* in English. Other experience predicates are similar:

1. Note that it is possible to create a synonymous but cumbersome sentence:

i. Mary is the experiencer of liking candy.

Other similarly cumbersome sentences are also possible.



Here, we assume the feature [-Experience] and it is modified by [+Change]--the Experience going from *the candy* to *Mary*. The source is promoted (in the sense of Perlmutter and Postal (1983) to Level 1, since there is no argument in that position (Hedberg and DeArmond 2002). From Level 1 it is projected to the direct object position of the verb in the syntax. The biggest problem remaining is how account for the goal, MARY. In Figure (16) it is promoted directly to the expected syntactic position for goals from the goal argument-position, given the subject internal hypothesis (Koopman and Sportiche 1991). However, it is unclear how it is promoted to the subject position, since PPs cannot be promoted to the subject position, a Case-marked position. We are not inclined to favour the above but to favour an alternative theory where the goal is directly promoted to the subject position from the goal argument position. We leave this for further research.

2. Theta Roles

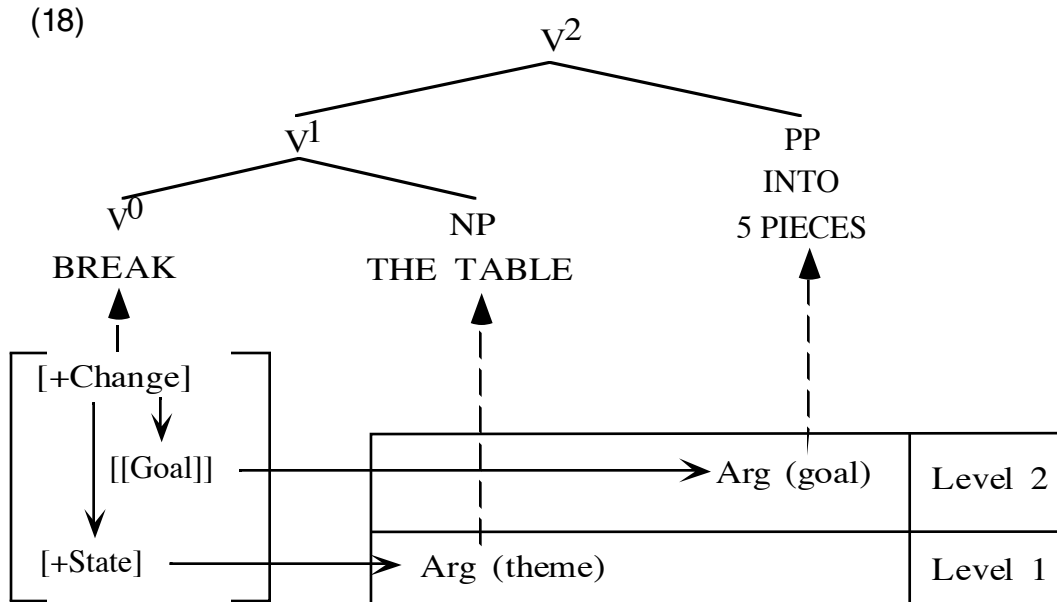
Theta roles are viewed here as the names of arguments, and these arguments are determined by the internal features of the predicate. Perhaps this approach will open up a way out of the conundrum of various claims of what theta roles are and how many of them there are (Dowty 1991).

Note that the Level 1 position has been constantly a theme except in Figure (16) where we assume the theme has been incorporated into the verb. In other constructions implying a change of state, the theta role patient has sometimes been proposed. As we have argued above, a change of state implies both Level 1 and Level 2. Level 2 includes goal as well as other locative arguments denoted a change of location.

First, consider both example in (17):

- (17) a. The table broke
 b. The table broke into five pieces.

The goal argument is not expressed in (17a) but it is in (17b). The goal represents the final state of the table. The final state is assigned to Level 2. Level 1 is the default position for themes:



There appears to be no compelling reason to create a patient theta role. A patient implies a theme (level 1) undergoes some sort of physical change and an implicit goal (17a) or explicit (17b) goal (level 2). The source is nearly always implicit, but it can be explicit:

- (19) The table broke from one large beautiful piece into five smaller and ugly pieces.

Thus, a patient is a theme that undergoes a change of physical state.

In Figure (9) it is clear that the semantic features of source, path, and goal are pointing to three arguments with the same names, respectively. The correlation between a semantic feature and the name given to the argument the feature is pointing to is one to one.

For experiential verbs as in (15), we noted that in the case of LIKE, there is a source (CANDY) and a goal (MARY). The goal here corresponds to the proposed theta-role experiencer. We can now define experiencer in terms of GOAL and experiences. This can be applied to such verbs as SEE, HATE, DETEST, LOOK AT, DESPISE, VIEW, HOPE (FOR), KNOW, BELIEVE, ASSUME, and so forth. No extra theta roles are required here.

In the above set of verbs the goal becomes the subject. For a smaller set of experiential verbs, the source becomes the subject:

- (20) a. Candy pleases almost everyone.
b. Desserts are pleasing to people in many cultures.
c. The snake frightened some of the children in class.
d. Rap music doesn't appeal to many of us.
e. Those books belong to that student over there.

So far, it appears that theta roles are names for various arguments of predicates. Next, we will discuss adjuncts.

3. Adjuncts

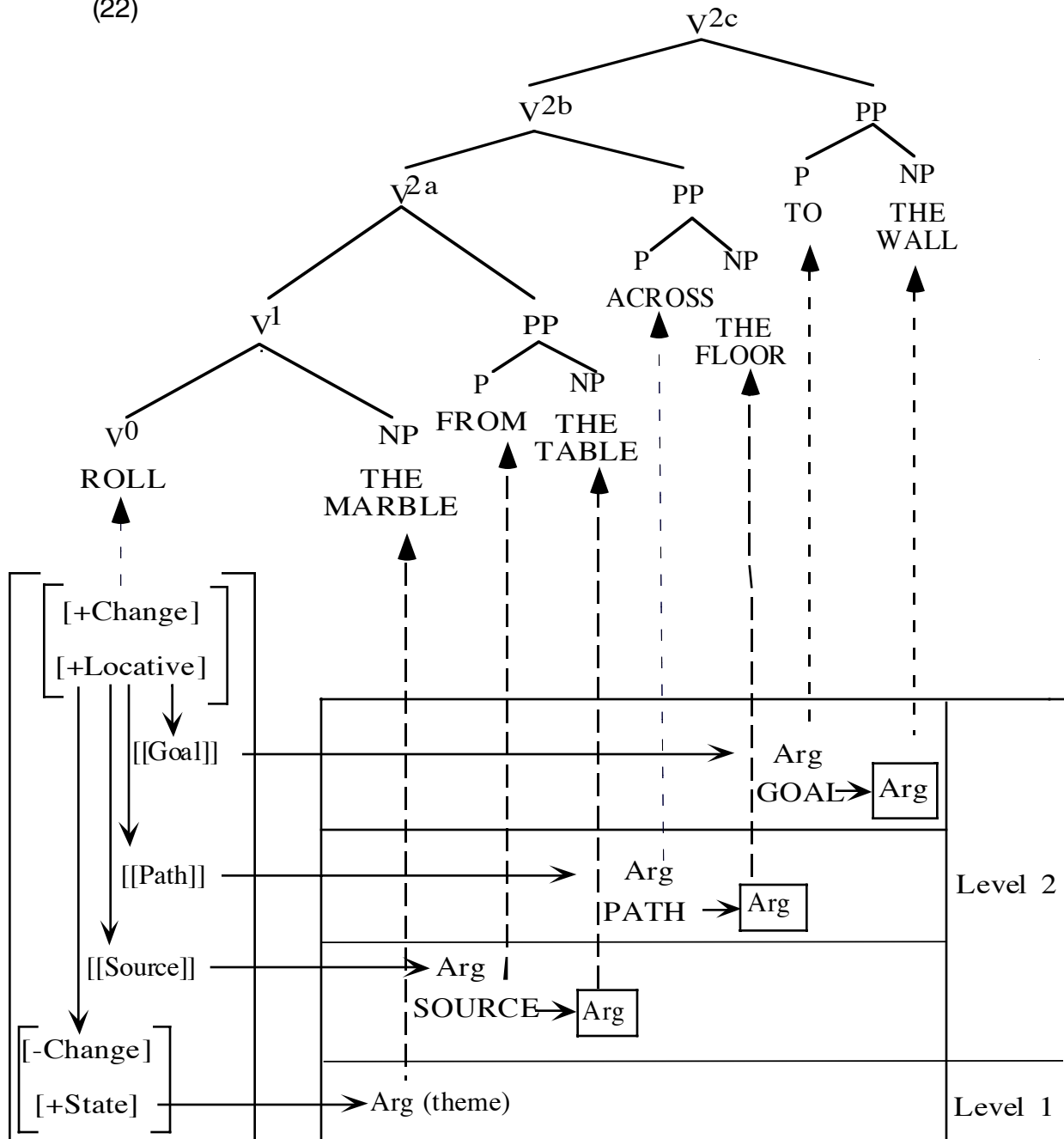
In DeArmond and Hedberg (1998) we discussed the properties of adjunct phrases to verbs and nouns, respectively. We now examine the argument structure of those. First consider example (21):

- (21) Lyle sliced the onions in the kitchen.

Example (21) is ambiguous--the PP *in the kitchen* either modifies and is adjoined to *the onions* describing the location of the onions, or it modifies and is adjoined to the VP *sliced the onions*, modifying the location of the event. We will discuss the former first, the latter below later.

The argument structure of (21) includes two subevents: the slicing of the onions and the location of the event. The argument of the locative state is based on Figure (4):

(22)



SLICE contains the feature [+Change], but neither argument is specified. Consequently, Level 2 is left blank. IN does not contain or imply [+Change]; hence no Level 2. SLICE and IN are distinct eventualities, but the locative state is adjoined to the verb, and as a small clause, it cannot be modified by any operators.

4. Causatives

We discussed causatives in DeArmond and Hedberg (1998), but this is too complex a construction to discuss here adequately. We will make two observations and leave a proper analysis for another paper. First, CAUSE-1 takes an agent argument, which appears to be source--that the command is coming from the agent implies that the

agent is a source. Second the instrument appears to be basically the argument of USE, which can only be a theme:

(23) Seymour used a knife to slice the salami.

The knife or any other meat-slicing instrument is not undergoing a physical change. Therefore, it must be a level 1 argument, we are calling a theme.

5. Conclusion

In our continuing research on argument structure including complementation and adjunction, we have provided evidence that theta roles are nothing more than names for various arguments of predicates, and that there is no need for the Theta Criterion. More research into this area is still required, especially in abstract predicates and in such complex verbs as the verbs of exchange.

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