Argument Structure

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1   Introduction

The structure of syntax is a **head**. A head is a prime unit and it cannot dominate anything. Heads may or must take an argument depending on the head. There are four basic kinds of heads: verb (V), noun (N), preposition (P), modifier (A). There are also operators which are heads. We will discuss operators below. Together a head and its arguments form a phrase. Even if the head has no arguments, it is dominated by a phrase. The only parts of speech which do not have arguments are the class of nouns which are called **objects**. Other parts of speech may have no argument in the syntax but they do have arguments in conceptual structure. These arguments are somehow incorporated into the head itself. For now, we will cover the basic heads and arguments.

Conceptually (see also *The Fundamental Relations of Syntax and Conceptual Structure*) the head of each sentence is a predicate. The predicate combined with its arguments to form a basic eventuality. A head is a syntactic term corresponding with the conceptual term 'predicate'. Consider the following sentence:

(1)   Bill dropped a cup.

Let us start with the basic head of the sentence: the verb *drop*. We represent the head here as DROP. In this discussion we consider DROP and all forms in CAPs only to be abstract morphemes (in the lexicon) which correspond in some way to conceptual (information-semantic). A head is a bundle of abstract semantic, morphological, and syntactic features:

(2)   DROP.

Every verb-head must have at least one argument. Arguments are extensions of a predicate, that are required a part of the meaning of the predicate. An argument refers to either the participants of the event, or it can refer to a proposition itself as we will see below. DROP implies two arguments: the one who drops something (Bill--the agent) and the object that is dropped (a cup--the theme). Arguments are enclosed in angled brackets:

(3)   <BILL> DROP <CUP>

Note that CUP is the central head of the argument' a cup.' The names for these arguments is covered in a later essay. They are called theta roles. The above form based on a predicate and its arguments is called a phrase. By convention, we prefer to place the predicate first, and the arguments after the predicate:

(4)   DROP <CUP> <BILL>

Furthermore, by convention, we prefer to place the internal argument first, the external argument last (see argument.assignment).

2   Argument Structure

There is another way to view (4). In this view the internal argument is placed in level 1 and the other arguments are in higher levels, which we will not label at this time. Let us start with a verbs that takes only one argument:

(5)   Mary died.

(6)
DIE $\longrightarrow$ | Arg (theme) | Level 1

In order to get (5) a noun phrase must be selected from the lexicon; in this case it is *Mary*:

(7)
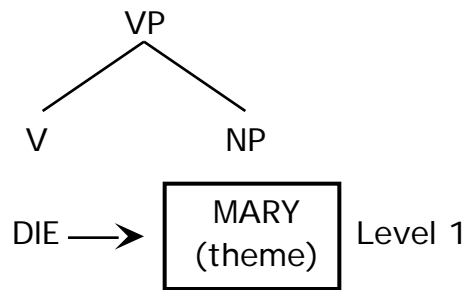DIE $\longrightarrow$ | MARY (theme) | Level 1

We are now ready to project this as a syntactic structure. DIE is a verb and its argument is the NP *MARY*:

(8)

```
              VP
             /  \
            V    NP
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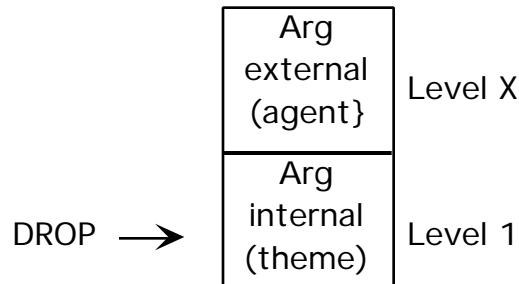
DIE ⟶ | MARY (theme) | Level 1

Normally, only the tree is written, but not the argument structure of each head.

If a verb takes a second argument, we place the second argument in a higher level which will merely label as X. the 'X' has no meaning here except that it is not Level 1:

(9)

| Arg external (agent} | Level X |
| Arg internal (theme) | Level 1 |

DROP ⟶

CUP is selected as the internal argument, and BILL as the external argument:

(10)

| BILL external (agent} | Level X |
| CUP internal (theme) | Level 1 |

DROP ⟶
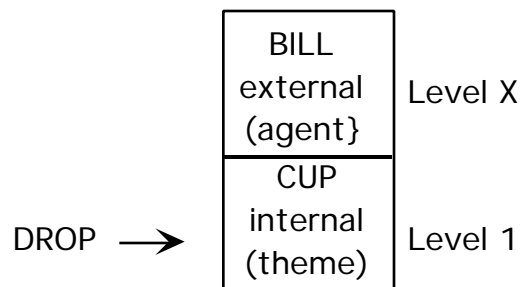
Once again the figure in (10) is projected to a tree structure (a phrase marker). In this case, however, the internal argument is assigned as a sister of the head. The head is formal written with a raised '0' after the head marker: V^0. The external argument is assigned as a sister to V^1; it is labelled as V^* The argumentation for the extra levels is given in my work on L222:[1]
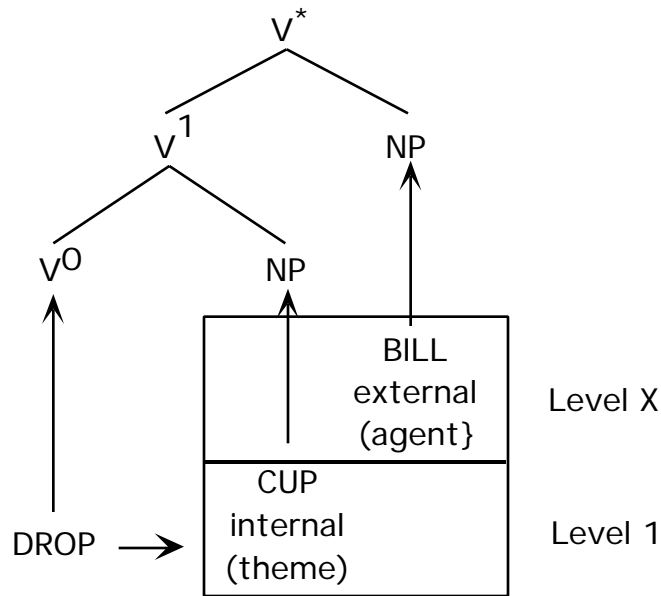

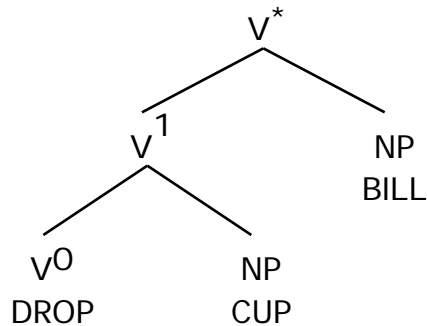[1] http://www.sfu.ca/person/dearmond/222/VP1%20-%20VP2%20-%20VP3.htm

(11)

V^*

V^1 NP

V^0 NP   BILL
                     external   Level X
                     (agent}

              CUP
DROP →   internal   Level 1
              (theme)

Figure (11) has the following form when the argument structure is not included:

(12)

V^*

V^1 NP
                BILL

V^0 NP
DROP   CUP

3   Arguments Continued

We have noted that the abstract lexical form DROP takes two arguments: <BILL> and <CUP>. Other predicates take one argument:

(13)   John slept.

There is no linear order in propositional and lexico-syntactic structure. As mentioned above we will put the head and predicate first, and the arguments after it:

(14)   a.   SLEEP <JOHN> ("SLEEP" <"JOHN">).
        b.   DROP <CUP> <BILL> ("DROP" <"CUP "> <"BILL">).

We have replaced this type of argument structure with the ones given in (6) and (10). Note that there is a hierarchical order which is not given in (14), which is one of the reasons for abandonning it.
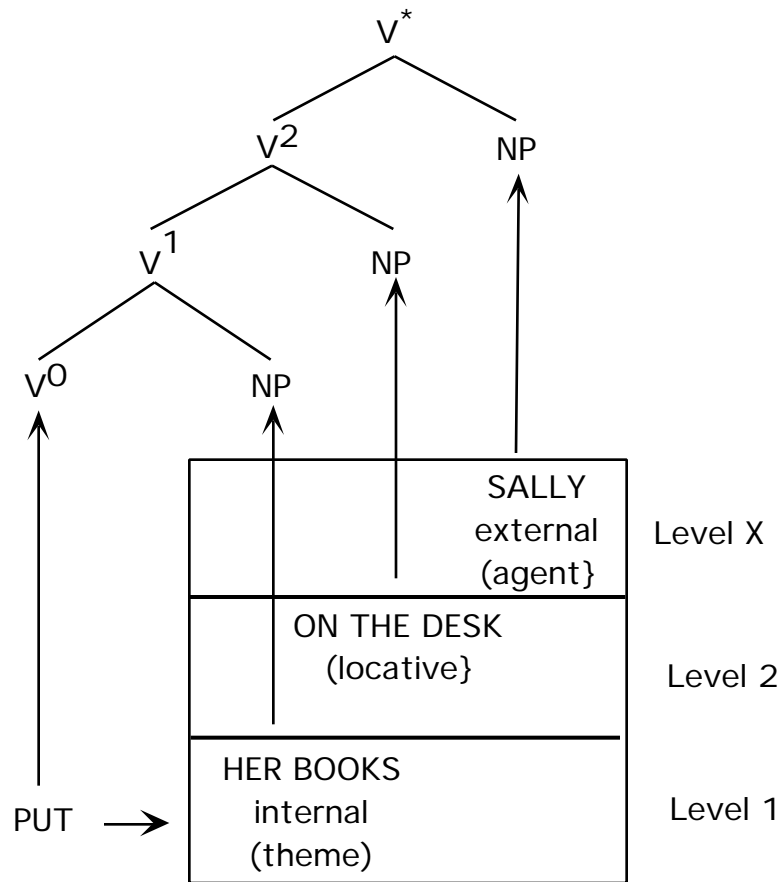
Some predicates assignment more than two arguments:

(15)   a.   Sally set her books on the desk.

        b.   PUT <HER BOOKS> <ON DESK> <SALLY>

        c.   Henry bought his car from Jane for $250.

        d.   BUY <HIS CAR> <FROM JANE> <$250> <HENRY>

The arguments of most verbs are objects.

Locative arguments are assigned to level 2. For example, (15b) is replaced with (16):

(16)

The explanation for the argument structure is too complex to go into here. A few basic points to remember: the theme is assigned to the first level, and the agent to the uppermost level (Level X). This is as far as we will take argument structure for now.

4   Operators

Consider sentence (1) again. If we extract the lexical proposition from it, what remains is the tense of the verb. Tense is an #operator. We will write operators in CAPS enclosed in square brackets:

(17)   [TENSE].

In English there are two tenses: present and past. We can represent tense in binary features:

(18)   [+Past], [-Past].

[+Past] refers to an event that precedes the speech event; [-Past] refers to an events the does not precedes the speech. Hence the [-Past] tense can be present or future. Click here to go to tense. The forms in (18) are called features. All operators contain a simple or complex set of features. Predicates can be decomposed in semantic features underlying lexical morphemes also. We will not attempt to do so here. Verb Phrase (VP) is an argument of [TENSE [+Past]]:
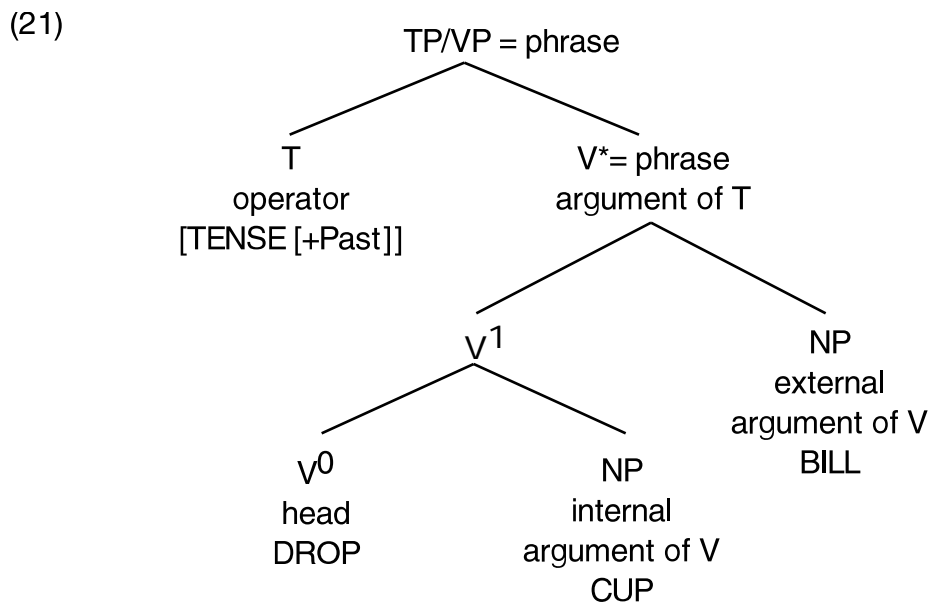
(19)   a.   [TENSE [+Past]] < VP>
        b.   VP = <BILL> DROP <CUP>

We represent (19) as (20):

(20)
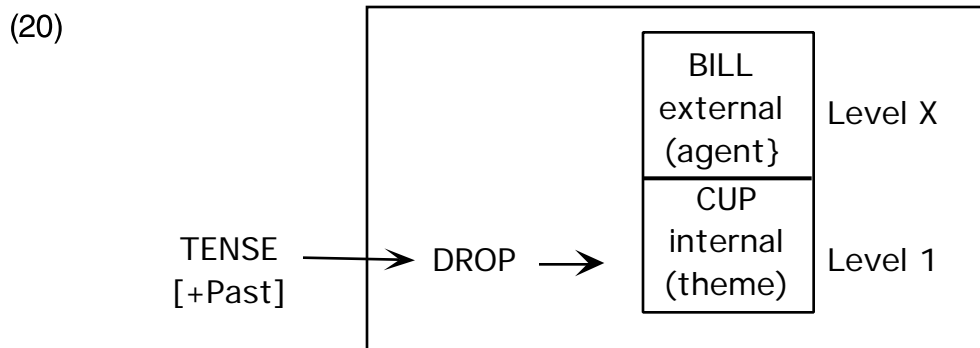
As you can see a complete argument structure of a sentence can become very large. We will limit the use of argument structures.

(20) is technically part of a proposition. We will cover some of the remaining operators that are required to make a complete proposition later. (Go to aspect.) The incomplete proposition (21) and even more complex propositions are difficult to read as they are drawn in a linear format. (21) can be redrawn in a tree-structure format, common to linguists. The incomplete proposition containing both [TENSE] and the E-proposition is a T-Proposition:

(21)

TP/VP = phrase

T
operator
[TENSE [+Past]]

V*= phrase
argument of T

V^1

V^0
head
DROP

NP
internal
argument of V
CUP

NP
external
argument of V
BILL

Normally, in syntax the labels 'phrase, operator, argument, and head' are not used. This is just a convention and it has no theoretical implication.

We will commence with tense in the next section.

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