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Lexical Conceptual Structure and Syntactic Arguments

1. Introduction[1]

In this article, I will discuss linking between thematic arguments (Agent, Theme, Goal, Source, etc.) and syntactic arguments (Subject, Object) within the framework of conceptual semantics (Jackendoff 1983, 1987a, 1990, 1992; Nikanne 1990, 1995). I will present a theory of argument linking of non-modal verbs that shifts a great deal of argument linking to the lexicon. I will claim that the "subject argument" and the "object argument" of the verb are determined in the lexicon and the determination is based on the lexical conceptual structure of the verb.

I will argue that the argument places are derived in the lexicon from the Lexical Conceptual Structure. In addition, I will claim that thematic arguments are not directly linked to syntax. There is an intermediate level of argument linking that determines the linking to subject and object of the sentence. This linking

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[1] This paper has benefitted the insightful comments of Ray Jackendoff, Emile van der Zee, Henrietta Hung, Maria Vilkuna and Chris Beckwith. In addition, the anonymous referee of the SKY journal had valuable and helpful comments on the earlier version of this article. I have presented the material of this paper at the University of Kansas in January 1993, at the University of Helsinki in February 1993 and at the University of Umeå in May 1993. I would like to thank the audiences of these talks for their comments. Of course, I am the one to blame for all the paper's flaws.

SKY 1997: The 1997 Yearbook of the Linguistic Association of Finland, 81-118

device is also derived in the lexicon.

The theory is an alternative way — for instance to mainstream generative syntax — to look at theta-role assignment and the theta-theory in general. As well, the theory can be seen as a lighter version of the f-structure assumed in Lexical Functional Grammar.

At the end of the article I will briefly discuss the possibility of linking non-overt conceptual arguments to syntax without using null syntactic arguments.

One purpose of this article is to discuss the nature of the lexical interface between conceptual structure and syntax. Following Jackendoff (1983, 1990, 1992a, 1996), I assume that conceptual structure is an autonomous level of mental representation and functions as the level of understanding of linguistic information. The lexicon is a part of the linking rule system between language and conceptual structure. Unlike many other theories (e.g. Langacker 1987, 1991, Bierwisch & Lang 1989, Pinker 1989), no separate language-specific "semantic" representation is assumed to be located between syntax and conceptual structure.

2. Thematic Structure

According to Jackendoff (1987, 1990), there are at least two major types of tier in conceptual structure. *The thematic tier* deals with relations such as 'being in a place', 'moving along a path', 'causing something', etc. The other major type of tier is *the action tier*. The action tier expresses dominance relations. Nikanne (1995) shows that — unlike Unlike for instance Foley and Van Valin (1984) and Jackendoff (1990) assume — the action tier roles (Actor, Patient, Undergoer, Beneficiary) do not have a role in argument linking. Consequently, we will concentrate on the thematic tier in this paper.

In Nikanne (1990), the thematic tier functions are divided into three 'positional' groups, *zones*. Causative and inchoative functions are in zone 3, non-causative Situation functions (GO,

BE, etc.) in zone 2, and Place- and Path-functions in zone 1. The zones, the thematic tier functions and the thematic roles of each zone are given in (1).

(1)

Zone 3 (*The causative zone*)	*Zone 2* (*The figure zone*)	*Zone 1* (*The location zone*)
Non-monadic fncs: CAUSE	*Non-monadic fncs:* BE	*Monadic fncs:* AT, IN, ON,
	GO	UNDER, ...
Monadic fncs: INCH	STAY	(i.e. place-functions);
	EXT	TO, TOWARD,FROM,
	ORIENT	AWAY- FROM, VIA
		(i.e. path-functions)
	Monadic fncs: CONF	
	MOVE	
Thematic role: Agent	*Thematic role:* Theme	*Thematic role:* Reference object (i.e. Location, Goal, Source, Route, Recipient,...)

The structure of the thematic tier is based on dependency relations between the functions (Nikanne 1990). The chain of embedded functions is called *function chain* or briefly *f-chain*. I use a double line to indicate head-complement relations. This is illustrated in (2b), which is the thematic structure of the sentences in (2a). The selection goes from left to right within the f-chain, and from the functions to their thematic arguments. The arguments are marked above the f-chain in (2c).

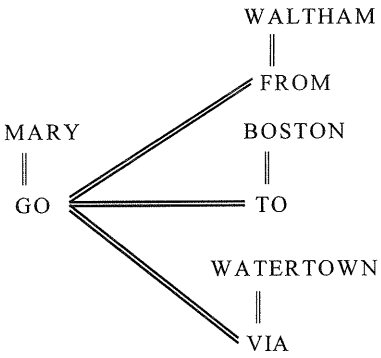
(2) a. Tom sent Mike into the house.
Tom made Mike go into the house.
Tom got Mike into the house.

b. TOM MIKE HOUSE
‖ ‖ ‖
CAUSE===GO==TO==IN

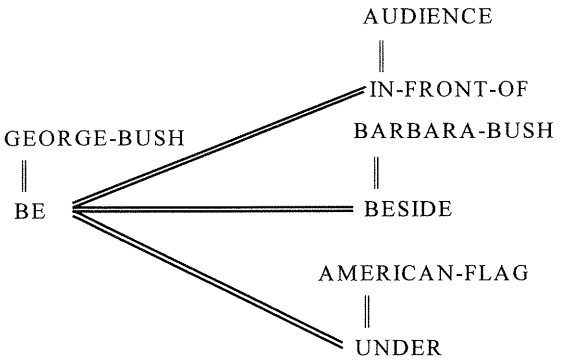
c. CAUSE===GO==TO==IN

The main division among functions in the same zone is between monadic and non-monadic functions. Monadic functions can have only one complement, either another function (notated to its right) or an argument (notated above it). The non-monadic functions can have more than one complement, even more than two, consider (3a,b):

(3) a. Mary drove from Waltham to Boston via Watertown.



b. George Bush was standing in front of the audience, beside Barbara Bush, under the American flag.



The well-formedness of f-chain is based on the principle in (4). "f" stands for any function. Numbers 1, 2, and 3 indicate the zone. The star (*) indicates that there may be none, one, or more occurences of the type of function in the f-chain.

(4) f3*==f2==f1*

The principle in (4) rules out anomalies like that in (5) because the order of the functions is not correct.

(5) TOM MIKE HOUSE
‖ ‖ ‖
*GO====CAUSE======IN

The principle in (4) rules out structures like the one in (6) because it has two zone 2 functions. (7) is ruled out because of it has no zone 2 functions at all.

(6) TOM MIKE MARY HOUSE
‖ ‖ ‖ ‖
*CAUSE===GO===STAY===IN

(7) TOM HOUSE
‖ ‖
*CAUSE===IN

For the present purposes, we can assume the principle in (8) (for a theory of the properties of this filter, see Nikanne 1990).

(8) Zone 2 functions GO, EXT, and ORIENT carry the feature [directional]. A function carrying the feature [directional] must be followed by a Path-function in the f-chain, and a function not carrying the feature [directional] cannot be followed by a Path-function in the f-chain.

This filter rules out f-chains like the ones in (9):

(9) *GO==AT
*BE==TO
*ORIENT==IN

The theta-arguments are selected by the f-chain. This selection is constrained by principles called *Theta-Level Formation Principles*, given in (10).

(10) Theta-level formation principles
All non-monadic functions must have a theta-argument.
All functions of zone 2 must have a theta-argument.
No function can have more than one theta-argument.

For instance, the function CAUSE must have one theta-argument because it is a non-monadic one. The functions GO, STAY, BE, EXT, and ORIENT must have one theta argument because they are (i) non-monadic and (ii) because they are zone 2 functions. The functions CONF and MOVE must have a theta-argument because they are zone 2 functions. Place- and Path-functions (AT, IN, ON,...; TO, TOWARD, FROM, VIA,...), which are all monadic, have the freedom to take either a theta-argument or another function.

3. Lexical argument linking

According to Jackendoff (1990), there is no one-to-one mapping between thematic roles and grammatical functions. Argument linking has two parts:

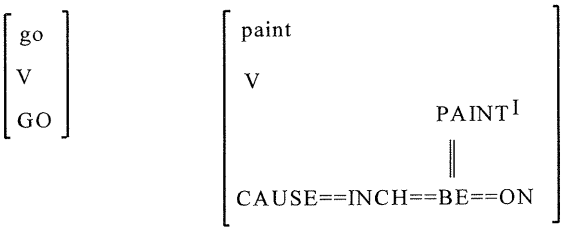
1. To determine which conceptual arguments, in general, can correspond to syntactic arguments.
2. To determine which syntactic argument is linked to which conceptual argument.

I suggest that we should not try to link thematic roles directly to the syntax. Instead, I will argue for a subsystem that determines the syntactic possibilities of each argument within a lexical item of the predicate. When the syntactic possibilities of the conceptual arguments are determined, the arguments can be linked to the actual syntactic structure. This linking uses a couple of default rules and a lot of structure-specific linking rules.

I will start this discussion with the term 'direct syntactic argument' (from now on 'direct argument' or 'DA'). The term stands for a word's syntactic argument which is not licensed by any adjunct rule or other structure specific linking rule.

We can use two simple examples to illustrate how the potential DAs of the verbs *go* and *paint* are determined. The lexical entries of these verbs are given in (11). The superscript index I indicates that the argument is specified to be implicit. The "I-marking" corresponds to to the A-marking in Jackendoff's (1990) notation: in Jackendoff's notation, all the conceptual arguments that *are* linked to syntax are marked with the index A. And those conceptual arguments that do not require a syntactic counterpart — i.e. implicit arguments — are left unindexed. In the present notation, only the implicit arguments are indexed in the lexicon. I-marking emphasizes the idea that implicitness is exceptional and thus specified in the lexicon whereas it is a default principle that all conceptual arguments have a counterpart in syntax.

(11)



The verb *go* has only one DA because its lexical thematic structure only contains one function. It must have a theta-argument (Theme) because (i) it is a non-monadic function, and (ii) it is a zone 2 function.

The verb *paint* has two DAs: (i) the function CAUSE, as a non-monadic function, must have a theta-argument (Agent); (ii) the theta-argument of GO, the Theme PAINT, is specified as implicit and is not a DA; (iii) the function ON has a theta-argument, Location, which is not specified as implicit and is, thus, a DA.

The principles that give us the DAs are given in (12). Note that DAs are determined within a lexical item, not in syntax.

(12A) If a function in the lexical f-chain requires a theta-argument, then this theta-argument is a potential DA.

However, (12A) is restricted by the principle in (12B):

(12B) If a theta-argument is marked implicit (I) in the Lexical Conceptual Structure (LCS), it is not a potential DA.

I assume that an LCS cannot have more than two DAs at least in our example languages, Finnish and English. It follows from this assumption that the third argument of the ditransitives in English must always be licensed by structure-specific linking rules.

In accusative languages like English and Finnish DAs most normally appear in the syntactic structure as subjects and objects.

That DA that normally appears in syntax as the subject of the sentence is called *DA1*. The possible other DA is called *DA2*.

It sometimes happens that the argument that would be able to be a subject is nevertheless found in the object position. This is assumed to be the case for instance with the unaccusative structures in Italian (Burzio 1986). However, I assume that there are two hierarchies in the lexicon, a syntactic one (given in 13) and a semantic one (given in 14) (cf. Jackendoff 1990, Maling & Zaenen & Thrainsson 1985, Grimshaw 1990, etc.).[2]

(13) DA1 > DA2

(14) Potential DAs from left to right

The default linking is presented in (15) (the dotted line indicates a link between a DA and a syntactic argument):

(15) DA1 DA2
: :
subject object

As Holmberg and Nikanne (1994, 1997) show, the Finnish subject is not always in the same position in syntax, and the object may sometimes be raised out of the VP. The syntactic functions 'subject' and 'object' may well be primitive categories, as assumed in the LFG. In any case, the the most unmarked positions for subject and object are Spec(IP) and Compl(VP), respectively (cf. Vilkuna 1989). In order to avoid too complicated a notation in this article, I will link the DAs directly

[2] The semantic hierarchy in (14) differs from Jackendoff's account in that it does not include action tier roles (Actor, Undergoer, Patient, Beneficiary). This is because (i) An implicit argument introduced with an adjunct can be an Undergoer, and Undergoerhood has no effect in direct argument linking (consider: *What John did to **the bullet** was shoot Bill **with it***). (ii) Actor is always the leftmost argument and will be linked to DA1 anyway. For more details, see Nikanne (1995).

to these default positions in the analyses that follow.

In addition to the default rule, the grammars of languages have more specified linkings for DA1 and DA2. For instance, in Finnish, DA1 can be an object if it is quantitatively indefinite (see Nikanne 1993; on the semantics of the indefinite quantity in these structures, see Larjavaara 1988, 1990; Vähämäki 1986). Consider the sentences in (16). The 3SG form is the neutral form of a finite verb. According to Vainikka (1989) the partitive is the unmarked case for objects of any syntactic category. The nominative is, of course, the case of the subject:[3]

(16) a. *Ihmiset*[DA1] kävelevät kadulla
people+PL-NOM walk+3PL street+ADE
'(The) people are walking in the street'

b. Kadulla kävelee *ihmisiä*[DA1]
street+ADE walk+3SG people+PL+PAR
'There were people walking in the street.'

c. Myös *oikeistolaiset* *valitsijamiehet*[DA1] äänestivät
also right-wing electors+PL-NOM vote-for+PST+3PL

Kekkosta[DA2].
Kekkonen+PAR
'Also (the) right-wing electors voted for Kekkonen'

[3] ACC = the accusative case, ADE = the adessive case, ALL = the allative case, ILL = the illative case, NOM = the nominative case, PAR = the partitive case, TRA = the translative case, PST = past, PTC = participle. The symbol + stands for morpheme boundary, and the morphological symbol is in parentheses if the morphological class is not overtly expressed.

d. *Kekkosta*[DA2] äänesti myös oikeistolaisia
Kekkonen+PAR vote-for+PST(3SG) also right-wing+PAR

valitsijamiehiä[DA1].
electors+PAR[4]
'There were also right-wing electors who voted for Kekkonen'

In (16b) kadulla 'in the street' and Kekkosta 'Kekkonen+PAR' in (16d) are moved to the Spec(IP) position because it is the topic of the sentence (Vilkuna 1989, Nikanne 1993)[5].

The specific rule of Finnish that allows these structures (called 'partitive structures' in Nikanne 1993) is roughly as follows:

(17) DA1
:
object

if DA1 is understood to be quantitatively indefinite.

As suggested earlier, no more than two DAs are allowed per lexical item. The indirect object or 'second object' is not a DA in this account. It is well known that the English indirect object is always highly specified; in most cases it is a possessive Goal or a possessive Source[6]. I would like to assume that the second object

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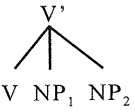
[4]The adjective *oikeistolaisia* (in the nominative *oikeistolainen*) 'right wing' is in the partitive because of Spec-Head case agreement.

[5]According to Vilkuna (1989), Spec(IP) is the position for Topic in Finnish, and the sentence would sound strange without a topic. The subject is a default topic and if the Spec(IP) position is not filled by the subject at S-structure, some other element can move there (Nikanne 1993).

[6] The term 'possessive' should be taken in a broad sense. According to Jackendoff (1976) communicational expressions are also possessive. Thus, you can say *I told him a joke.* For present purposes it does not really matter whether this or that expression is possessive or not, the main point is that the interpretation of the indirect object is highly specified.

in English is licensed not by the general linking rules but by a structure-specific linking rule, something like (18), similar to Golberg's (1992) analysis:

(18) The structure 

is licensed if (i) and (ii).

(i) NP_1 corresponds to a possessive Goal or Source selected by the lexical f-chain of V
(ii) NP_2 corresponds to the Theme selected by the lexical f-chain of V.

There are obviously more rules that can license an indirect object in English but they are all highly specified. Even the rule in (18) is possibly too general. It may well be that licensing an indirect object is specified in particular lexical entries (i.e. the verbs *give*, *send* etc. but not *donate*). Another rule that can license the structure in (18) is the one where there is a predicate noun in the NP_2 position: *John considers Bill a jerk.*

The resultative adjunct can sometimes license an object that is not a DA: Mary laughed herself sick (see Jackendoff 1990; Carrier and Randall 1992; Nikanne 1990, 1997a).

The argument linking in the lexicon works in the order given in (19):

(19) 1. Find out the potential DAs following (12A) and (12B).
2. The first potential DA in the semantic hierarchy is DA1.
3. The next potential DA in the semantic hierarchy is DA2.
4. Any other syntactic arguments must be licensed by structure-specific linking rules.

Note that the f-chain formation, and thus the left to right order of thematic functions and their arguments, is based on zone principles.

4. Examples

In this section, I will analyze different types of verb in order to show how the theory works in practice.

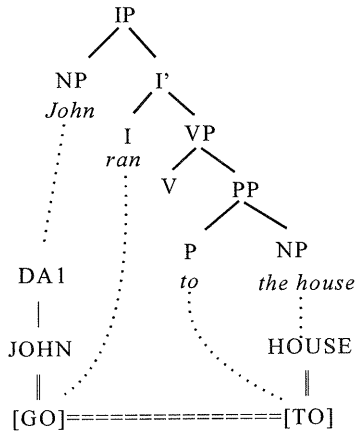
4.1. Examples of non-causative and causative verbs without implicit arguments

The verb *run* in (20) has only one potential DA, the Theme. The only potential DA is DA1. An example of *run* is given in (21):

(20)
$$\begin{bmatrix} \text{run} \\ \text{V} \\ \text{GO} \end{bmatrix}$$

The linking between syntax conceptual structures is marked with dotted lines. Linking between conceptual arguments and DAs is indicated by a single line.The part of the conceptual structure that corresponds to the LCS of a predicate is marked in brackets. Thus, in (21), the predicate verb *run* corresponds to the function GO, and the preposition *to* corresponds to the function TO.

(21) John ran to the house

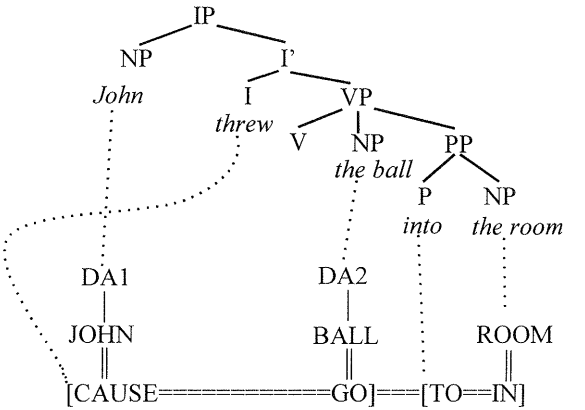


The verb *throw* in (22) has two potential DAs, Agent and Theme.

(22)
$$\begin{bmatrix} \text{throw} \\ \text{V} \\ \text{CAUSE==GO} \end{bmatrix}$$

Throw has only two DAs. The Agent gets the status of DA1 and the Themethe status of DA2, as shown in (23):

(23) John threw the ball into the room

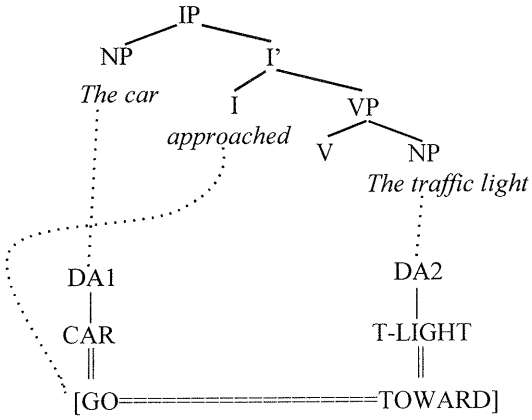


Approach in (24) has two potential DAs, the Theme and the Goal. As either of the arguments is implicit, both of them will be DAs.

(24)
$$\begin{bmatrix} \text{approach} \\ \text{V} \\ \text{GO==TOWARD} \end{bmatrix}$$

The Theme is to the left of the Goal and will be DA1. The Goal will have the status of DA2. This is shown in (25):

(25) The car approached the traffic light

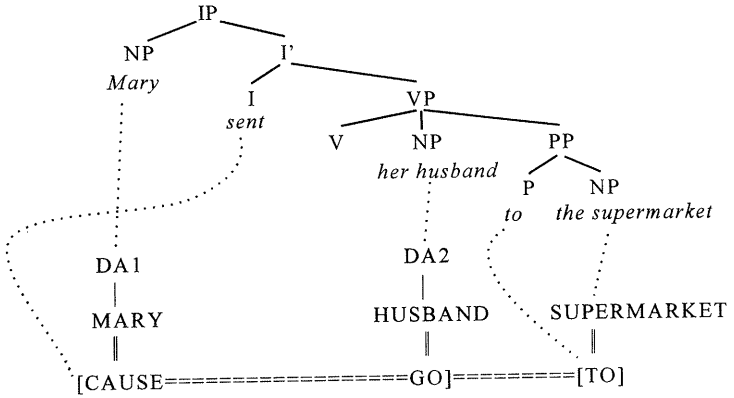


Send in (26) has three potential DAs: Agent, Theme and Goal.

(26)
$$\begin{bmatrix} \text{send} \\ \text{V} \\ \text{CAUSE==GO==TO} \end{bmatrix}$$

The Agent is the leftmost argument and will be DA1, Theme is the next one and will be DA2. The Goal must be expressed by a PP-structure. This is illustrated in (27).

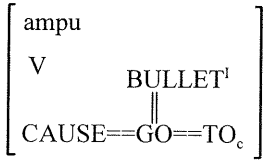
(27) Mary sent her husband to the supermarket.



4.2. Examples of verbs with implicit arguments

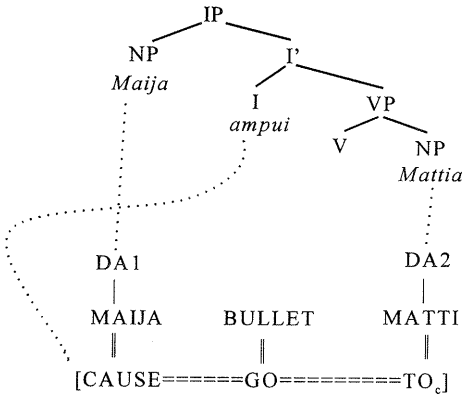
The Finnish verb *ampu* 'shoot' in (28) works like the English *paint*, as can be seen in (29). (The subscript 'c' in function TO indicates the feature [contact]. See Jackendoff 1990; and also Nikanne 1990 for the status of the feature [contact] in the feature hierarchy of zone 1.)[7]:

[7] The reason why the function TO_c cannot take another zone 1 function is because it carries the feature [contact]. According to Nikanne (1990) [contact] is one of the so called 'relation features' that make it impossible for a (zone 1) function to have any other complement than a theta-argument. For more discussion see Nikanne (1990).

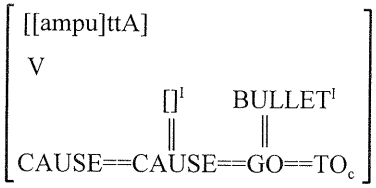
(28)


Here is the analysis of linking the sentence *Maija ampui Mattia* 'Maija shot Matti.'

(29) Maija ampui Mattia
Maija(NOM) shot+PST(3SG) Matti+PAR
'Maija shot (at) Matti'

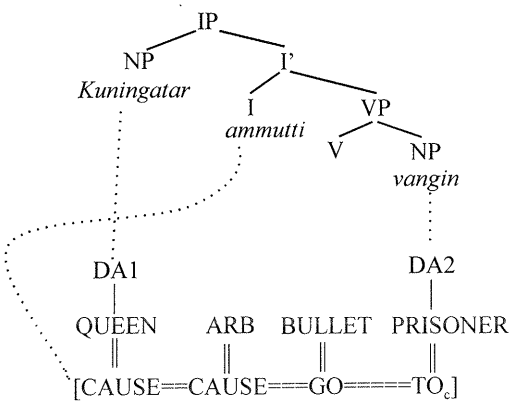


One can derive a double causative verb from the verb causative ampu using the causative suffix ttA. The lexical entry of the verb *ammutta* 'make x shoot y' is in (30).

(30)


Out of the four arguments of the lexical f-chain of the verb ammutta two are implicit, the second Agent and the Theme. Thus, ammutta has two potential DAs, the first Agent and the Goal. The first Agent is the leftmost of them and gets the DA1 status. The Goal is DA2. The relevant example is in (31):

(31) Kunigatar ammutti vangin
queen(NOM) made-shoot prisoner+ACC
'The queen had the prisoner shot'



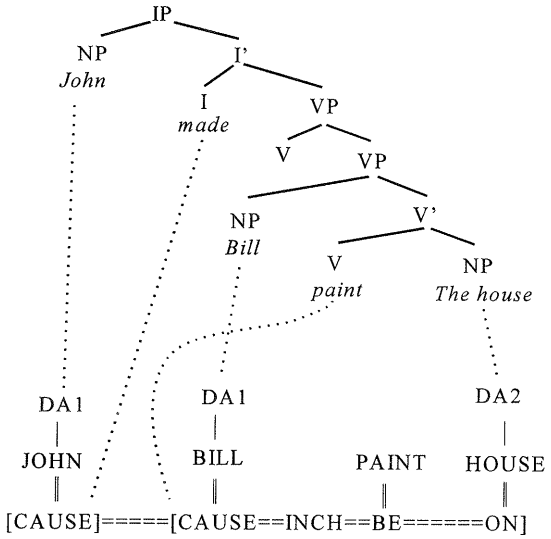
The plain causative reading of the verb *make*, given in (32), has one potential DA, and it gets the status of DA1.

(32) $\begin{bmatrix} \text{make} \\ \text{V} \\ \text{CAUSE} \end{bmatrix}$

Because CAUSE is a non-monadic function, it must select another function which, according to (4), must belong either to zone 3 or zone 2. This means that the verb *make* must select another verb (or a phrase headed by a verb) as its complement.

(According to Nikanne (1990, 1997b), a word is probably a verb if the f-chain of its lexical entry contains a function of zone 2 or a non-monadic function.) See the example in (33):

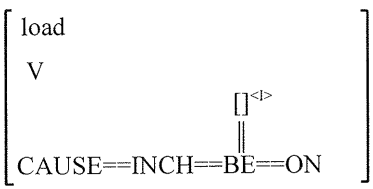
(33) John made Bill paint he house



Note that the DA1 of the complement infinitival verb appears in syntax as an object of the matrix verb in English. This is a property of these causative verbs in English (among other languages), and it applies categorically to all DA1s of the selected infinitival verbs. Thus, it is not a problem for our theory.

One problematic verb group is the so called 'load-verbs' (e.g. *load*, *spray*, and *cover*). I accept the analysis of the thematic structure of the load-verbs suggested by Jackendoff (1990). The lexical entry of the verb *load* is given in (34).

(34)



Consider the examples in (35):

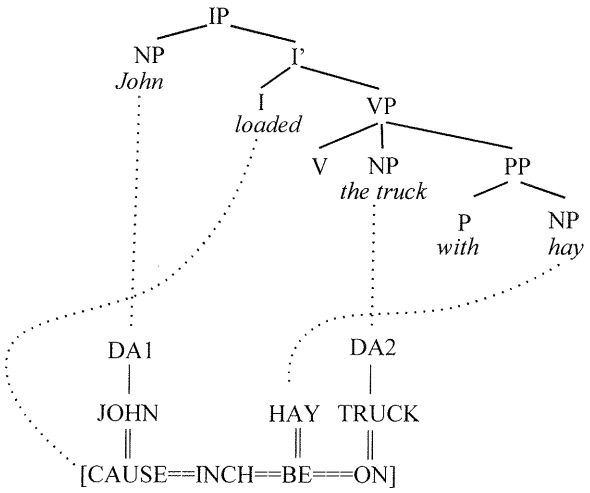
(35) a. John loaded the truck (with hay).
b. John loaded the hay on the truck.
c. *John loaded the hay.

In (35a), the Theme HAY must be expressed using an adjunct because it is implicit. In this case, the adjunct is the with-Theme adjunct suggested by Jackendoff (1990). The with-Theme adjunct can be formalized as follows:

> The conceptual interpretation of the NP in a syntactic structure of the form $[_{VP}$ [V]...$[_{PP}$ $[_{P'}$ $[_{P}$ with] $[_{NP}$]]]...] can be fused with the implicit Theme of the V.

The argument linking of (35a) — load with an implicit Theme — is illustrated in (37). The Goal (*truck*) gets the status of DA2 because the Theme is implicit. The Theme can be expressed in syntax using the with-Theme adjunct (*with hay*), in which case, according to (36), the NP complement of the preposition *with* is linked to the implicit Theme:

(36)

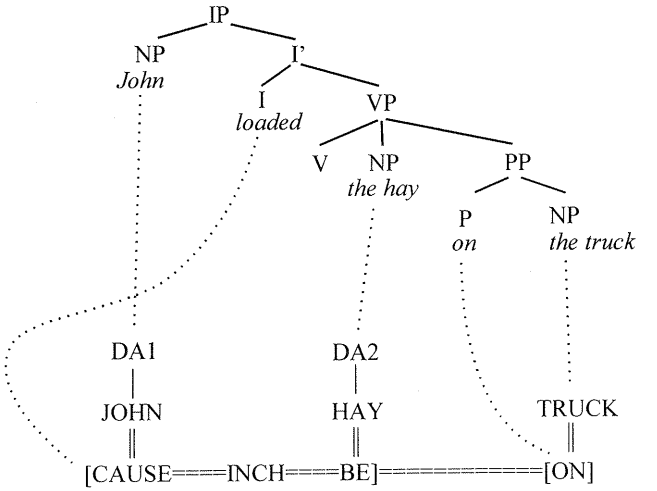


The syntactico-conceptual linking of (35b) with the verb *load* with no implicit arguments as follows: The Agent, as the leftmost argument, is DA1 and the Theme is DA2 because it is the next non-implicit argument cs-commanded by the Agent. The zone 1 structure

TRUCK
‖
ON

must be expressed using a PP because only two DAs are allowed. This is illustrated in (37):

(37) John loaded the hay on the truck



4.3. The Theme-fusion adjunct

Consider the examples in (38):

(38) a. Kunigatar ampui/ammutti hopealuodin
queen shot/made-someone-shoot silverbullet
vankiin.
prisoner+ILL
'The queen shot/made someone shoot a silverbullet at the prisoner'

b. The queen shot an arrow at the prisoner.

In these examples the implicit Theme seems to have the status of DA2, despite of its implicitness. Nikanne (1990, 150-153) calls this phenomenon the 'Theme fusion adjunct'. The implicit second Agent cannot be expressed as an object:

(39) *Kunigatar ammutti sotilaan vankiin.
queen shoot+CAU soldier+ACC prisoner+ILL
(Ok only with the interpretation that the soldier is used as a bullet.)

There are two ways to approach this problem: (i) We could assume that the Theme is never obligatorily implicit but the implicitness of the Theme is always optional. (ii) We can assume that there is a productive optional rule that can erase the implicitness index of a Theme under some conditions. Because the phonomenon seems to be general (see e.g. Nikanne 1990; Jackendoff 1990), it seems better to go with option (ii) and not mark the implicitness optional for every single verb that has an implicit Theme.

We can translate Nikanne's (1990: 153) formalization of the Theme-fusion rule as in (40). (X stands for any features associated with the implicit Theme.)

(40) The Theme-fusion rule

[X]
‖
...f2... –> ...f2...

The condition under which (42) can apply is that somehing is added to the content associated with the implicit Theme of the verb (Jackendoff 1990).

Since the implicitness index is erased from the Theme, it will be a potential DA, according to the rules discussed earlier. The content of the NP used as a syntactic argument is fused with the content associated with the implicit Theme of the lexical entry of the predicate verb.

It is very possible that the application of the Theme-fusion rule is to some extent lexically determined. As Ray Jackendoff (p.c.) has pointed out to me, it cannot be applied to verbs like *fill* and *cover* : **John covered the table clothe on the table/*John filled the water in the bottle.*

4.4. Causative emotion verbs in Finnish

In Finnish, there is a group of verbs that seem to have an implicit Agent. The group consists of verbs like *kyllästyttää* 'bore/be bored,' *huvittaa* 'amuse/be amused', *nukuttaa* 'make someone sleep/feel sleepy,' etc. The verbs have a causative suffix *ttA* in their morphological structure (e.g. *kyllästy**ttää***). These verbs are called FLIP verbs by Hakulinen and Karlsson (1979: 244). These verbs can be used both in causative (e.g. 'bore') and non-causative meaning ('be bored'), as is shown in (41a–f):

(41) a. Juhla kyllästyttää Pekkaa.
party bore-3SG Pekka+PAR
'The party is boring Pekka'

b. Pekkaa kyllästyttää.
Pekka+PAR bore+3SG
'Pekka is bored'

c. Vitsit huvittavat Maijaa.
Jokes amuse+3PL Maija+PAR
'Maija is amused by the jokes'

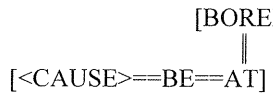
d. Maijaa huvittaa.
Maija+PAR amuse+3SG
'Maija is amused'

e. Minä nukutan lapsen.
I make-sleep+1SG child+ACC
'I make the child sleep'

f. Lasta nukuttaa.
child+PAR make-sleep+3SG
'The child is sleepy'

As the verbs seem to be optionally causative, the most natural way to analyze these verbs is to assume that they have an optional causative function. Thus, the LCS of for instance the verb *kyllästyttää* 'bore/be bored' is as follows:

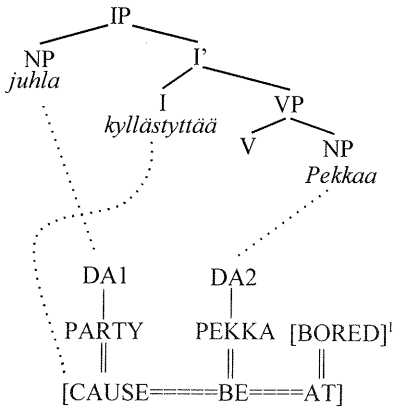
(42)



Thus, the argument of AT is implicit and the function CAUSE is optional.

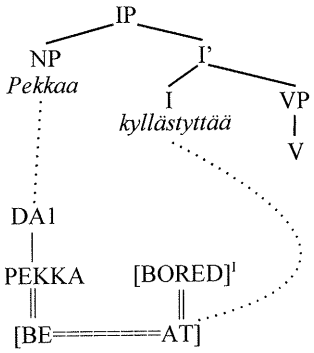
If the function CAUSE is not implicit, the Agent will be assigned the status of DA1 and the Theme the status of DA2. The analysis of (41a) is given in (43):

(43)



If the CAUSE is absent, the Theme will be assigned the function DA1. And, because the only other potential DA, the Reference object BORED, is implicit, the verb has only one DA. The analysis of (41b) is as follows:

(44)



When used in the non-causative meaning, the subject of the verb is in the partitive case (as shown in examples 41b, d, and f) which can be seen as an instance of lexical subject case marking.

It is also possible to assume, following Hakulinen and Karlsson 1979: 244) that there is a derivation relation between the causative and non-causative meaning of the same verb. In other words, there are two distinct sets of lexical entries in the lexicon, one for the causative verbs and one for the non-causative verbs of this group. If this is the case, the lexical case marking on the subject of the non-causative verb is easier to explain. However, also under this assumption, the argument linking works exactly as described above.

4.5. Verbs with exceptional DA-specification

Verbs like *get*, *receive*, and *have* are exceptional because their subject is a Goal (*get*, *receive*) or a Location (*have)* and their object is a Theme. For this reason, Grimshaw (1990), for instance, assumes that Goal and Location are higher in the hierarchy of thematic arguments than Theme. On the other hand, there are verbs like approach, enter, leave, occupy, etc. whose subject is the Theme and the object is the Source, Goal or Location. As Jackendoff (1990) points out, one of these groups

must have something exceptional in it. I take the same position as Jackendoff and assume that the Theme is before the Reference objects. Here the theory decides: the thematic hierarchy in the present theory is not just a list of roles but it follows directly from the principle in (4). For this reason, I take the position that DA1 and DA2 arguments are specified exceptionally with verbs like *get*, *receive*, and *have*.

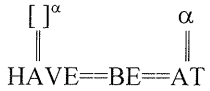
Because of these exceptions, the notions DA1 and DA2 cannot be completely reduced any thematic hierarchy, and therefore we must assume that they are primitive categories.[8]

5. Null arguments other than lexically determined implicit arguments

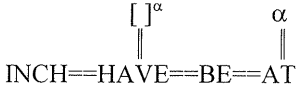
Sometimes DAs do not show up in syntax. In this section I will discuss these cases. The discussion is brief and rather sketchy and it only gives an idea of the possible analysis of these arguments. My goal is to show that there is no need for phonologically empty arguments in syntax in these cases.

---

[8] It is also possible (Pinker 1989, Jackendoff p.c.) that the lexical f-chain of the verbs *have, get,* etc. are governed by another zone 3 function, HAVE. According to this assumption, the verb *have* has the following thematic structure:



The thematic strucrure of the verb *get* is as follows:



If this is correct, then the notions DA1 and DA2 are not primitives but completely predictable from the LCS of the verb.

I start this discussion with cases where the DA1 does not appear in syntax, even if it is not implicit. In most GB and minimalist accounts and also for instance in Bresnan and Kanerva (1989:28) there is a well-formedness condition that requires a syntactic subject. If there seems not to be a subject, its empty position in most theories is assumed to be occupied by some empty argument, like 'pro', 'pro-arb', 'PRO', 'PRO-arb' etc.

The motivation behind the empty arguments is basically to have some element to carry an understood thematic role. However as Jackendoff (1983, 1987a, 1987b, 1990) shows, and as assumed in this paper, the thematic roles are properties of the conceptual structure. According to Nikanne (1997a), as long as the syntactic structure is such that syntactico-semantic linking is possible, there is no need to assume that all the thematic arguments are present in syntax.

The lexically determined DA1 and DA2 do not have to be realized in the syntactic structure of language L if the grammar of L allows them to be left out. No empty arguments are needed in syntax when the lacking DAs can be interpreted by the syntactico-semantic linking rules of the grammar of L.

Sometimes (e.g. Sigurdsson 1991, Farrel 1992) binding phenomena are used in argumentation for empty arguments. However, Jackendoff (1992) and Jackendoff and Culicover (1993) show that a great deal of binding probably belongs to conceptual structure. If this is right, then empty arguments do not have much justification in syntax.

Consider the Finnish examples in (45):

(45) a. sataa.
rain+3SG
'it is raining'

b. sataa lunta / vettä.
rain+3SG snow+PAR / water
'it is snowing/raining'

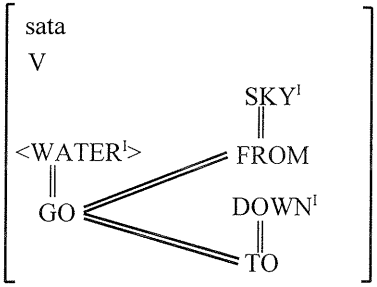
c. peltikatolle sataa
tin-roof+ALL rain+3SG
'it is raining on the tin roof'

d. lumi /vesi /lunta /vettä sataa
snow(NOM)/water(NOM) /snow+PAR/water+PAR rain+3SG

maahan /katolle
ground+ILL /roof+ALL
'the snow/the rain falls on the ground/on the roof'

The LCS of *sata* 'rain' is something like that shown in (46) (cf. Nikanne 1987) .

(46)



If the Theme is implicit, as in (45a) we have no DAs. To express the implicit Reference objects we can use a PP-adjunct as is done in (45c,d). If the Theme is not implicit, as is the case in (45b,d), we have one DA, which of course, is DA1.

According to the linking principle in (17), in Finnish the DA1 can appear in the partitive case in the object position if it has a reading of indefinite quantity. The alternation between the partitive and the nominative in (45d) is related to quantitative definiteness effects. The nominative indicates that all the snow/water relevant in the situation came down whereas the partitive indicates that the amount of the snow/water is

indefinite.[9]

In standard Finnish the first and second person subject may be dropped. See the examples in (47):

(47) a. minä menin /sinä menit /me menimme/te menitte
I went+1SG /you went+2SG /we went+1PL/you went+2PL
kotiin
home+ILL
'we went home'

b. menin /menit /menimme /menitte kotiin
went+1SG /went+2SG /went+1PL /went+2PL home+ILL
'we/you(SG)/we/you(PL) went home'

The optional rule can be formalized something like that in (48). The conceptual representation of 1st and 2nd person subjects is marked informally as SPEAKER, SPEAKER-RELATED GROUP, LISTENER, or LISTENER-RELATED GROUP.

(48) SPEAKER(-RELATED GROUP) /
LISTENER(-RELATED GROUP)
|
DA1 of V
:
ø

(V in the 1st or 2nd person.)

---

[9] In a situation where people are discussing the origin of some definite amount of snow or water, the nominative is possible even if the Goal is not specified by a PP-adjunct:

A: Mistä tämä lumi on tähän tullut? (Where did this snow come from?) [Pointing to a pile of snow on the sidewalk.]
B: Se / Tämä lumi satoi.
it(NOM) / this(NOM) snow(NOM) rain+PST+3SG
'It / This snow fell'

In Finnish, in the third person, DA1 can be dropped when the interpretation of it is generic, 'whoever'. Consider the the examples in (49).

(49) a. Kyllä tätä sapuskaa syö.
yes this+PAR food+PAR eat+3SG
'One sure can eat this stuff'

b. Sanovat että olen käynyt vanhaksi.
say+3PL that be+1SG become old+TRA
'They say / It is said that I have become old'

Not only DA1, but also DA2 can be dropped when the interpretation is generic, see the examples in (50):

(50) a. Minä lyön.
I hit+1SG
'I hit'

b. Tämä hammaslääkäri ei puuduta
This dentist not(3SG) anesthetize
'This dentist doesn't anesthetize'

If the meaning of the verb is very general, the generic reading is hard to find for pragmatic reasons. Consider, for instance, the example in (51) (pragmatic oddness is marked with '#'):

(51) #Saima käyttää
Saima use+3SG

In some contexts even (51) may be acceptable. For instance if the topic of the conversation is drugs, (51) may be used to express that Saima is using drugs.

We can assume that there is an optional principle (52) in Finnish (the abbreviaton ARB stands for 'arbitrary') and it licenses (and gives the interpretation for) the null-arguments in (49-51):

(52) ARB
|
DA
:
ø

In the English passive structure, as in the passive construtions in many other languages, DA2 is linked to the subject position. Very roughly, the English passive linking rule is in (53):

(53) The English passive:

DA1	DA2
:	:
ø	subject

NB! The syntactic structure contains the Aux *be* or *get* and the past participle of the predicate verb as the complement of it.

For instance, see (54):

(54) Agent – Theme
| |
DA1 DA2
: :
ø :
The house was/got painted.

Consider example (55). The verb receive is one of the exceptional verbs whose DA1 and DA2 are not determined by the thematic hierarchy.

(55)

I'm in trouble because my letter was received by the wrong person.

The passive respects not the thematic hierarchy but the exceptional determination of DAs.

The passive by-adjunct in Jackendoff's (1990) theory is an adjunct that is applied to lexical entries that are modified by the passive operation. Jackendoff assumes that the passive operation takes place in the lexicon: it makes the first argument implicit. We have, however, concluded that the passive applies to DA1, and that implicit arguments cannot be DAs. I assume, thus, that the passive adjunct rule is a syntactic, not a lexical linking rule.

As Jackendoff (1990: 180) points out, we cannot include the verb *be* in the passive by-adjunct rule because we want to cover also cases like *The ship sunk by the Air Force miraculously appeared in Harry's bathtub*. We must deal with the participle only. To keep the syntax as consistent as possible, we can assume that participial phrases are always of the same form. The participial phrase is a part of the passive structure. We can assume that the passive by-phrase rule recognizes this syntactic structure. (56) is a possible by-adjunct rule. PtcP stands for "Participial Phrase." The form of the PtcP in (56) is not a strong theoretical claim. However, I do not want to go into the details of the syntactic constituent structure. Readers can translate the PtcP into any form that fits their own ideas of syntax.

(56) The conceptual interpretation of the NP in a syntactic structure of the form $[_{PtcP}$ [V+Ptc]...$[_{PP}$ $[_{P'}$ $[_{P}$ by] $[_{NP}$]]]...] must be fused with the DA1 of the V in the same structure if the V has two DAs.

Active sentences like **John has shot his boss by Bill* are ungrammatical because of the conflict of the linking principles:

both the subject John and the NP Bill in the by-adjunct should be linked to the DA1 of the verb shoot.

6. Conclusions

There is a subsystem of argument linking that operates within a lexical item. In this subsystem, potential direct syntactic arguments are determined on the basis of (the thematic tier part of) the lexical conceptual structure.

Conceptual arguments of the lexical conceptual structure are given a lexical-syntactic status — the first or the second direct argument — on the basis of a thematic hierarchy, where the thematic hierarchy is based on the zone structure of the f-chain.

The first argument is by default linked to the subject and the second argument to the object of the sentence. The grammars of particular languages can specify conditions under which other kinds of linking are licensed.

Further syntactic arguments can be licensed by construction-specific rules.

Just like LFG-accounts, the thory presented in this article recognizes the special status of subject and object arguments, in my approach I call them 'DA1' and 'DA2'. However, I do not think that DA1 and DA2 are properties of any syntactic representation (cf. the f-structure in LFG). Rather, they are properties of a very specific argument linking subsystem. All linking between conceptual structure does not go through this subsystem.

When it comes to mainstream generative accounts (GB, minimalism), my 'DA-analysis' corresponds to their theta-theory. It seems to me that what is called 'theta-roles' in these syntactic accounts are, most of the time, not real theta-roles (Agent, Theme, etc.) at all. They are merely talking about DAs.

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