

Dimensions of variation in the expression of functional features: modelling definiteness in LFG

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Introduction

Issues

- What is the range of variation in the exponence of functional features?
- What properties must a theoretical model have in order to capture the range of variation?

Definitions

Dedicated definiteness marker (DDM)

linguistic material which marks only definiteness
[DEF ±] (and possibly PERS/NUM/GEND
features)

Functional definiteness marker (FDM)

a DDM whose presence is sufficient to induce
definite reference, that is it maps to an f-structure
feature [DEF ±] which feeds in to the semantics

A referential noun phrase is one that involves an FDM
in the languages we are considering here

DDMs and FDMs can find exponence in different dimensions
traditionally: word, affix, clitic etc.

Syntax vs morphology

Compare Icelandic and English:

(1) hungraða hundinn
 hungry dog.DEF
 'the hungry dog'

(2) **the** hungry dog

⇒ In English, the word *the* has (\uparrow_{DEF})=+ in its lexical entry.

⇒ In Icelandic, (\uparrow_{DEF})=+ is introduced by the morphological rule that creates *hundinn* from the stem *hund*

Morphological marking not on noun

In Latvian, the only FDM is on the adjective:

- (3) a. koks
tree
'tree' / 'a tree' / 'the tree'
- b. lielais koks
big.DEF tree
'the big tree'

⇒ Definiteness on adjective needs to be constructive
(Nordlinger 1998)

Prosodic dependence

Danish *den*: prosodically independent

- (4) Han købte det (røde hus).
he bought DEF red house
'He bought it / the red house.'

English *the*: prosodically dependent, left edge, rightwards
dependent

- (5) He bought the *(red house).

Prosodic dependence

Lakhota *kj*: prosodically dependent, right edge, leftwards dependent

- (6) a. c'ogɪ' ša-ša kj
pith red-RED DEF
'the red pith' (Pustet 1995:182)
- b. wic'a'hpi k'ya' Wic'a' Ak'i'yuhapi eci'ya-pi
star LNK.PL Big Dipper AGR.name-PL
kj
DEF
'the constellation called the Big Dipper' (Pustet 1995:182)

Prosodic dependence

K^wak^w'ala: prosodically dependent, left edge, leftwards dependent

- (7) a. mæx'id-ida bæg^wanəm-a-ɣa gənanəm.
hit-DEM(3) man-DEM(3.INV)-DEM.OBJ child
'The man hit the child.' (Anderson 2005:104)
- b. *(yi)-ɣuxda gənanəm
(∅)-DEM child
'(It's) that child' (Anderson 2005:19)

⇒ Non-constituent in c-structure, but phonological word in p-structure

Single vs multiple instantiation

In Hebrew definite noun phrase, most constituents are marked for DEF:

- (8) ha-sefer ha-gadol ha-ze
DEF-book DEF-big DEF-DEM
'this big book'

All are instances of an FDM:

- (9) ha-gadol
DEF-big
'the big one'

⇒ Agreement needs to be captured

⇒ Definiteness on adjective needs to be constructive

Single vs. multiple instantiation

Different ways of viewing agreement:

- directional agreement between items: controller ~ target
- non-directional agreement between items: co-variation (cf Pollard & Sag 1994:60–7)
- agreement with phrase (cf Lehmann 1982)

Single vs. multiple instantiation

In construct state noun phrases, the AP agrees with the phrase, not with the head:

(10) beyt Sophie ha-gadol
 house(M).CON Sophie DEF-big.M
 'Sophie's big house'

⇒ Agreement needs to be stated as a relation between terminal nodes and the phrase as a whole

Semantic contribution

The adjectival ending in Swedish does not contribute to f-structure [DEF ±], it is not an instantiation of an FDM:

- (11) a. *Jag köpte röd / röda.
I bought red.INDEF red.DEF
- b. Jag köpte en röd / den röda.
I bought INDEF red.INDEF DEF red.DEF
'I bought a red one.'

⇒ The feature associated with the adjective must not feed in to the semantic interpretation of the phrase.

- The feature on the adjective is not actually [DEF±]
 - Traditionally referred to as [WEAK/STRONG].
 - In Old Norse and Old Swedish not complete correspondence [WK/STR] ~ [DEF±].

- (12)
- | | | | |
|----|------|--------------|------------------------------------|
| a. | sá | gamall | hestr. |
| | DEM | old.STR | horse |
| | | | 'that old horse' |
| b. | hans | sjukt | ben. |
| | his | diseased.STR | leg |
| | | | 'his diseased leg.' (Delsing 1994) |

Semantic contribution

- The feature on the adjective is not actually [DEF±]
 - Traditionally referred to as [WEAK/STRONG].
 - In Old Norse and Old Swedish not complete correspondence [WK/STR] ~ [DEF±].
 - BUT in Present-Day Swedish, there is complete correspondence.

- (13)
- | | | | | |
|----|-------|--------------|--------|--|
| a. | *den | gammal | hästen | |
| | DEM | old.STR | horse | |
| b. | *hans | sjukt | ben. | |
| | his | diseased.STR | leg | |

Semantic contribution

- *The feature on the adjective is not actually [DEF±]
 - The feature is [DEF±], but does not feed into the semantic interpretation
 - [DEF±] is not present in f-structure associated with the noun phrase
 - it is an m-structure feature (Butt et al 1996, Frank & Zaenen 2002)
 - a restriction operator has applied so that it is not projected to phrasal level (Kaplan & Wedekind 1993, Wedekind & Ørsnes 2003, but in order to ensure agreement, the feature must be present at phrasal level)
 - feature is present in f-structure but not visible to semantics?
- ⇒ Some [DEF] on modifiers is not constructive, though it still needs to agree

Prosodic vs segmental

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In Ossetic (Iron variety, Abaev 1959, Bagaev 1965), the core noun phrase has phrasal stress which falls either on the first or second syllable:

- if the vowel of the first syllable is strong (/i, e, a, o, u/), then stress on first syllable
- if the vowel of the first syllable is weak (/æ, ə/), then stress on second syllable

There is no segmental marker of definiteness, but definiteness is indicated by a shift of stress to the noun-phrase initial syllable.

Prosodic vs segmental

- (14) læppú ~ læppu
boy boy.DEF
'a boy' 'the boy'

Operates at phrasal level:

- (15) a. c'æx áxoræn ~ c'æx axoræn
blue paint blue.DEF paint
'blue paint' 'the blue paint'
- b. sáw axoræn
black paint
'black paint' / 'the black paint'

Prosodic vs segmental

Unassimilated Russian loan words can have the stress on some subsequent syllable even if the first one has a strong vowel and hence the stress shift can apply:

(16) **specialí**st ~ sp**é**cialist
 'a specialist' 'the specialist'

⇒ the f-structure feature DEF requires reference to both c-structure and p-structure.

Standard vs special placement

The Bulgarian FDM appears to be a second position prosodically dependent element (“special clitic” according to Anderson 2005:111):

- (17)
- a. knigi-te
books-DEF
'the books'
 - b. interesni-te knigi
interesting-DEF books
'the interesting books'
 - c. mnogo-to interesni knigi
many-DEF interesting books
'the many interesting books'

Standard vs special placement

However:

- the Bulgarian FDM shows morphophonological irregularities not predicted by this approach
 - the form of the FDM is dependent on partially arbitrary lexical, morphological and phonologic criteria
 - the FDM can trigger stem allomorphy (see Bermúdez-Otero & Payne (2011:74–5) and Stojanov (1964))

- (18)
- | | | | |
|----|--------------------|-----|--------------------|
| a. | gräk ~ gǎrk-ăt | vs. | străk ~ străk-ăt |
| | Greek Greek-DEF | | stalk stalk-DEF |
| b. | gnjav ~ gnev-ăt | vs. | bljan ~ bljan-ăt |
| | anger anger-DEF | | dream dream-DEF |

Standard vs special placement

However:

- the Bulgarian FDM shows morphophonological irregularities not predicted by this approach
- the positioning cannot be defined straightforwardly with respect to 'first word' (or even 'first phrase')

- (19)
- a. naj-blizka-ta do pošta-ta kăšta
SUPERL-close-DEF to post office-DEF house
'the house closest to the post office'
- b. tvărde interesna-ta kniga
very interesting-DEF book
'the very interesting book'

Standard vs special placement

However:

- the Bulgarian FDM shows morphophonological irregularities not predicted by this approach
 - the positioning cannot be defined straightforwardly with respect to 'first word' (or even 'first phrase')
- ⇒ An account needs to be able to make reference to 'head of leftmost daughter' for placement and needs to account for morpho-phonological interaction with host.

Conclusions 1

- A feature such as [DEF±] can find its exponence in many different dimensions or in some combination of dimensions.
- A parallel correspondence approach such as LFG provides a good architecture for doing this.
- However, there are issues beyond the relatively simple mapping between two dimensions:
 - constructive [DEF] feature on ADJUNCTS
 - agreeing definiteness marking on ADJUNCTS, which is not constructive
 - reference to both c-structure and p-structure required for mapping to f-structure

A specification language approach

A specification language consists of propositions about tree structures. The statements we require will be axioms which hold for a particular language. (Blackburn & Gardent 1995, Kaplan 1995, Potts 2002)

A specification language approach

Hebrew definite-marked adjectives

$$(20) \quad (\text{NP} \wedge \langle d^* \rangle (\text{Adj} \wedge \text{def} \wedge \langle M \rangle \langle \text{ADJUNCT} \rangle) \\ \rightarrow \langle M \rangle \langle \text{DEF} \rangle +)$$

If there is an NP node which dominates a node which is an adjective, *def* and maps to an f-structure attribute ADJUNCT, then this NP node maps to an f-structure attribute DEF with value +.

The feature *def* in this case works constructively: if it is present on an adjectival attribute then the NP will be DEF +.

A specification language approach

Hebrew definite-marked adjectives

To get adjective agreement, we require additionally:

$$(21) \quad (NP \wedge \langle M \rangle \langle DEF \rangle + \wedge \langle d^*_k \rangle (Adj \wedge \langle M \rangle \langle ADJUNCT \rangle)) \rightarrow \langle d^*_k \rangle \textit{def}$$

If there is an NP node which maps to the f-structure attribute DEF with value + and which dominates a node k which is an adjective which maps to an f-structure attribute ADJUNCT, then this node k is labelled *def*.

A specification language approach

Scandinavian definite-marked adjectives

$$(22) \quad (\text{NP} \wedge \langle \text{M} \rangle \langle \text{DEF} \rangle + \wedge \langle d^*_k \rangle (\text{Adj} \wedge \langle \text{M} \rangle \langle \text{ADJUNCT} \rangle)) \rightarrow \langle d^*_k \rangle \text{def}$$

If there is an NP node which maps to the f-structure attribute DEF with value + and which dominates a node k which is an adjective which maps to an f-structure attribute ADJUNCT, then this node k is labelled *def*.

Here we just have the agreement implication. In effect an adjective must agree with a definite NP, but the adjective itself does not construct a definite NP.

A specification language approach

Ossetic definite-marked stress-shift

Ossetic requires an additional modality $\langle P \rangle$ which maps c-structure nodes to p-structure nodes.

$$(23) \quad (\text{NP} \wedge \langle P \rangle \langle \sigma_1 \rangle \langle \text{STRESS} \rangle + \\ \wedge \langle d_1^* \rangle \langle P \rangle \langle \sigma_1 \rangle \langle \text{STRESS} \rangle -) \rightarrow \langle M \rangle \langle \text{DEF} \rangle +$$

If there is an NP node which maps onto a phonological unit (phrase) whose first syllable is stressed and this NP dominates a leftmost node which maps onto a phonological unit (word) whose first syllable is unstressed, then this NP node maps to an f-structure attribute DEF with value +.

A specification language approach

Bulgarian definite marking

$$(24) \quad (NP \wedge (< d_1 > def \vee < d_1 > < d^* > (head \wedge def))) \rightarrow \\ < M > < DEF > +$$

If there is an NP node in which either the first daughter is labelled *def* or the head of the first daughter is labelled *def*, then this NP node maps to an f-structure attribute *DEF* with value +.

Modification for set-valued adjunct

The specifications above are simplified. In order to function with a set-valued feature adjunct, the following replacements need to be made:

For (20)

$$(25) \quad (\text{NP} \wedge \langle d^* \rangle (\text{Adj} \wedge \text{def} \wedge \langle M \rangle n'_k \wedge n'_k \in \{\text{ADJUNCT}\})) \rightarrow \langle M \rangle \langle \text{def} \rangle +$$

If there is an NP node which dominates a node which is an Adjective, *def*, and maps to an **f-structure** n'_k which is in the **ADJUNCTS** set, then this NP node maps to an f-structure attribute **DEF** with value +. Similarly for (21) and (22).

Conclusions 2

- The parallel architecture approach of LFG nicely enables us to separate the different dimensions of information required to handle the variation in the exponence of definiteness.
- We need however to state interactions between multiple dimensions, and also account for edge-based placement.
- A specification language approach allows us to formulate such statements.
- Distinction constructive vs non-constructive feature captured neatly.

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Thank you!