SPR4106 – Syntax and semantics in formal terms

Lecture III: Argument structure

16 February 2015

Intro: Valency in LFG

- Argument structure is an "interface" between semantics and syntax

$$\text{give} \left\langle \frac{\text{SUBJ}}{\text{AGENT}}, \frac{\text{OBJ}}{\text{THEME}}, \frac{\text{OBL}_{goal}}{\text{BENEFICIARY}} \right\rangle$$

- On the semantic side we have *thematic roles*
- On the syntactic side we have *grammatical functions*
- This sets LFG apart from other theories which case valency in terms of categories
- Another point of difference is that a-structure is viewed as lexical and presyntactic

Passives

(1) a. The hamster placed the cage in the garbage.
b. The cage was placed in the garbage by the hamster.

- A regular alternation found in many of the worlds languages, with many variants
- The crucial point is the demotion of the agent (from subject to oblique)
- We also often find promotion of a lower ranked argument

$$\begin{array}{lcl} (\uparrow \textsc{subj}) & \mapsto & (\uparrow \textsc{obl}|\emptyset) \\ (\uparrow \textsc{obj}) & \mapsto & (\uparrow \textsc{subj}) \end{array}$$

Causatives (Turkish data from Falk)

(2) a. Hasan öl-dü
Hasan die-PST
'Hasan died.'

b. Mehmet Hasan-ı öl-dür-dü
Mehmet Hasan-ACC die-CAUS-PST
'Mehmet caused Hasan to die.'

(3) a. Kasap et-i kes-ti
butcher meat-ACC cut-PST
'The butcher cut the meat.'

b. Hasan kasab-a et-i kes-tir-di.
Hasan butcher-DAT meat-ACC cut-CAUS-PST
'Hasan had the butcher cut the meat.'

$$(\uparrow \text{SUBJ}) \mapsto (\uparrow \text{OBJ})$$
$$(\uparrow \text{SUBJ}) \mapsto (\uparrow \text{OBJ}_2)$$

Applicatives (Chichewa data from Kroeger)

(4) a. Mbidzi zi-na-perek-a msampha kwa nkhandwe
zebras(10) SUBJ(10)-PAST-hand-ASP trap to fox
'The zebras handed the trap to the fox.'

b. Mbidzi zi-na-perek-er-a nkhandwe msampha
zebras(10) SUBJ(10)-PAST-hand-APPL-ASP fox trap
'The zebras handed the fox the trap'

(5) a. Fisi a-na-dul-a chingwe ndi mpeni.
hyena(1) SUBJ(1)-PAST-cut-ASP rope with knife
'The hyena cut the rope with a knife.'

b. Fisi a-na-dul-ir-a mpeni chingwe.
hyena(1) SUBJ(1)-PAST-cut-APPL-ASP knife rope
'The hyena cut the rope with a knife.'

$$(\uparrow \text{OBJ}) \mapsto (\uparrow \text{OBJ}_2)$$
$$(\uparrow \text{OBL}) \mapsto (\uparrow \text{OBJ})$$

Lexicality

- A fundamental tenet of LFG is that valency-changing operations happen in the lexicon
- The operations change the lexical properties of the verb, which in turn changes the sentences it can appear in
- Other theories often do valency-alternations in the syntax
- We will look at evidence for the lexicality of valency-changing operations, in particular the passive

Passive sentences are normal sentences with special linking

- Passive sentences follow the same basic word order pattern
- Passives feed a number of syntactic processes:
  - In Chicago, the President was invited to a Polish wedding.
  - Was the President attacked in the Rose Garden?
  - the garden in which the President was attacked
  - The nation was shocked at the President's being attacked in the Rose Garden.
- This contrasts with e.g. topicalization
  - *Did a terrorist as for the President attack him in the Rose Garden?
  - *the garden in which as for the President a terrorist attacked him
  - *The nation was shocked at as for the President, a terrorist attacking him

Movement paradoxes

- *capture* takes an object, which can be promoted in the passive
  - This theory captures that fact.
  - That fact is captured by this theory.
- In English, objects are DPs whereas subjects can also be CPs
  - That languages are learnable is captured by this theory.
  - *This theory captures that languages are learnable.
- If the subject of the passive was ever an object, we would predict ungrammaticality.

Adjectival passive formation is lexical

- In English, we can distinguish adjectives and verbs by various tests:
  un-prefixation *(un-)happy, (*un-)touch*
  prenominal modifiers *my supportive mother, *my support mother*
  degree adverbs *a very nice picture, John *very works*
- There is a process converting participles to adjectives; so we can distinguish verbal and adjectival passives:
  - He gave a very considered statement.
  - Nixon's statement was considered profound
  - *Nixon's statement was very considered profound.
- Adjectival passives feed lexical processes (e.g. *un*-prefixation, compounding) so must be lexical
  - $\text{eat}_V \rightarrow \text{eaten}_{Adj} \rightarrow \text{moth-eaten}_{Adj}$
  - $\text{wrap}_V \rightarrow \text{wrapped}_{Adj} \rightarrow \text{un-wrapped}_{Adj}$
  - contrast $\text{wrap}_V \rightarrow \text{unwrap}_V \rightarrow \text{un-wrapped}_{Adj}$

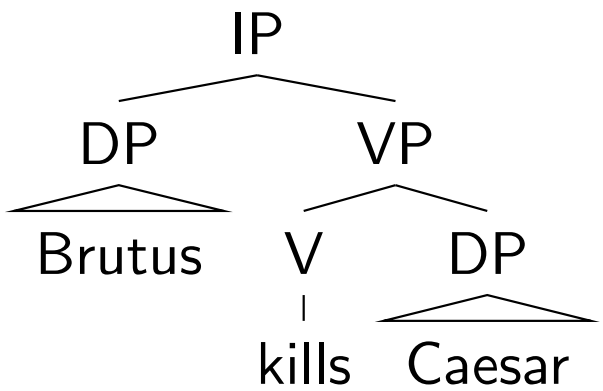
Passivization feeds adjectivization

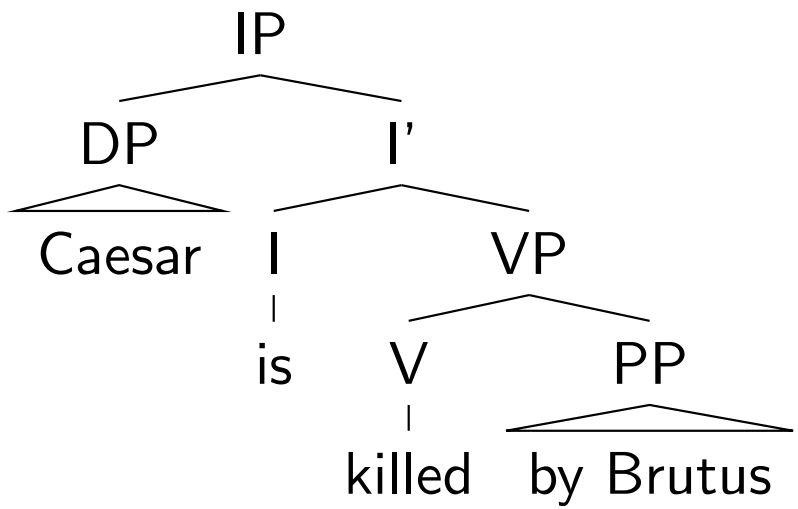
Now we must ask what the relation between passivization and adjectivization? The evidence is that passivization feeds adjectivization.

- Adjectival passives are always identical to verbal ones
- Verbs that have no passive have no adjectival passive
  - *Mr. Nixon is resembled by John, ??a widely-resembled face
  - *the necessary resources are lacked, *the lacked resources
  - *I am eluded by your humour, *the humour-eluded audience
- So passivization precedes adjectivization which precedes un-prefixation and compounding, which are lexical processes. Hence passivization is lexical
- Note that a coherent response is to claim that *un*-prefixation and compounding are syntactic

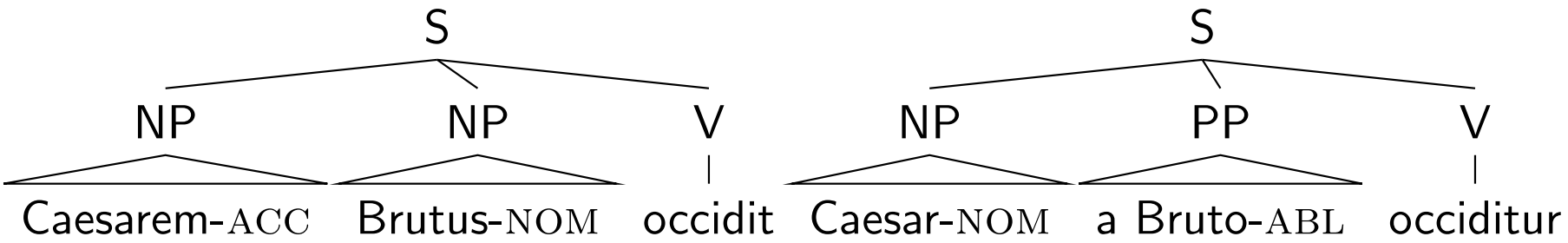
The English passive

- From the perspective of LFG, an advantage of the lexical analysis is that it leaves everything else intact and so generalizes to different passives





And the Latin one



- Only the alignment changes, the expression of grammatical relations remains the same

Lexical rules

- The traditional LFG analysis of valency alternation involves lexical rules
- These are special in that they "destroy" information

$$\text{give} \left\langle \frac{\text{SUBJ}}{\text{AGENT}}, \frac{\text{OBJ}}{\text{THEME}}, \frac{\text{OBL}_{goal}}{\text{BENEFICIARY}} \right\rangle \rightarrow \left\langle \frac{\text{OBL}}{\text{AGENT}}, \frac{\text{SUBJ}}{\text{THEME}}, \frac{\text{OBL}_{goal}}{\text{BENEFICIARY}} \right\rangle$$

- Another fundamental tenet of LFG is that syntax is *monotonic*
- As the string increases in length, the c-structure becomes more complex
- As the c-structure grows, the f-structure becomes more specific
- Plausible processing constraint

Linking

- Two problems with lexical rules
  - Why is there no simple mapping rule $(\uparrow \text{SUBJ}) \rightarrow (\uparrow \text{OBJ})$?
  - Where do the initial representations come from?
- We seem to be missing generalizations

Thematic roles

- Agent > Patient/Beneficiary > Theme > Path/Location
- We will refer to the most prominent argument in a given fram as $\hat{\theta}$

	[-o]	[+o]
[-r]	SUBJ	OBJ
[+r]	OBL_θ	OBJ_2

Mapping θ- to a-structure

- Some generalizations
  - Themes and Patients are mapped to SUBJ or OBJ
  - Non-Theme/Patients are not mapped to OBJ
  - Secondary Theme/Patients are mapped to OBJ_2
- Or in LMT speak:
  - Patients and themes map to [-r]
  - Non theme/patient arguments map to [-o]
  - "Secondary" patients/themes map to [+o]
- So *place* <agent, theme, loc>→ <[-o], [-r], [-o]>

Mapping a- to f-structure

- The principles:
  1. A [-o] which is $\hat{\theta}$ maps to SUBJ
  2. [-r] can map to SUBJ
  3. Add positive values wherever possible
  4. Every verb must have a subject
- Let us see how this works for *place* <[-o], [-r], [-o]>
  - *place* <SUBJ, [-r], [-o]> by 1
  - *place* <SUBJ, OBJ, [-o]> by 3
  - *place* <SUBJ, OBJ, OBL> by 3

The passive revisited

θ-structure	agent	patient	location
a-structure	[-o]	[-r]	[-o]
f-structure	$\emptyset$	SUBJ	OBL

- By suppression (the passive rule)
- By principle 2
- By principle 3

Chichewa: Active

(6) mbidzi zi-na-perek-a mpiringidzo kwa mtsikana
zebras SM-PAST-hand-textscfv crowbar to the girl
'The zebras handed the crowbar to the girl.'

θ-structure	agent	recipient	theme
a-structure	[-o]	[-o]	[-r]
f-structure	SUBJ	OBL_r	OBJ

Chichewa: Passive

(7) mpiringidzo zi-na-perek-a kwa mtsikana
crowbar SM-PAST-hand-PASS-FV to the girl
'The crowbar was handed to the girl.'

θ-structure	agent	recipient	theme
a-structure	[-o]	[-o]	[-r]
f-structure	$\emptyset$	OBL_{goal}	SUBJ

Read more

- You will find an accessible introduction to LFG (including LMT) in Danish at `http://www.nys.dk/article/viewFile/13458/11465`