Symmetrical objects and the architecture of HPSG: Evidence from Moro

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"…[T]he goal of our enterprise…is to provide a basis for the description of all human languages…"

Sag (2012:70)

"Perhaps the most important goal of Sign-Based-Construction Grammar, which has emerged in the Formal Grammar community, is to provide a formalized framework in which Typological researchers can develop their ideas."

Sag, Boas, and Kay (2012:3)

Introduction

A common assumption in syntactic theory:

(1) Semantic asymmetries among predicate arguments mirrored by asymmetries in their syntactic realizations.

What these approaches have in common are the following assumptions:

(2)
i. Each semantic argument is associated with a unique syntactic role
ii. Each argument can bear only a single grammatical function or bear a single structural relation to the verb
iii. Every grammatical relation/syntactic role is restricted to a single appearance in a clause.

Introduction

Follows from fundamental Principles or architectures:

- STRATAL UNIQUENESS (Relational Grammar)
- FUNCTIONAL UNIQUENESS (Lexical Functional Grammar)
- UNIFORM THETA ASSIGNMENT HYPOTHESIS/Binary Branching (P&P/Minimalism)

Introduction

Central theoretical question examined in this talk:

- How to account for the evidence reflecting various types of *symmetrical object* behavior? (Duranti 1979, Kimenyi 1980, Bresnan and Moshi 1990, Alsina 1996, Baker 1988, Beck 2006, McKay and Trechsel 2008, Baker, Safir, Sikuku 2012, among others)
- Common cross-theoretical response: modify theory specific representations to account for symmetries in a way that preserves asymmetrical architecture supported by assumptions (2i–iii).

Introduction

Alternative approach:

- Unlike other lexicalist and non-lexicalist frameworks, HPSG has not argued for its theoretical assumptions on the basis of (a)symmetrical object behaviors.
- HPSG makes none of the assumptions in (2i–iii).
- This permits the flexibility to directly account for syntactic symmetries, while also allowing for asymmetrical behaviors.
- We argue for an HPSG analysis by examining multiple object constructions in Moro. (Thus far, little HPSG work on double objects).

Moro objects

- Moro is a Kordofanian language spoken in the Nuba mountains of Sudan.
- As Kordofanian languages are generally classified as part of the larger Niger-Congo family, Moro is probably related to Bantu languages; while there are almost no cognates between Moro and Bantu, they share striking similarities in phonology, morphology, and syntax.
- It has a basic SVO* word order.
- Partial Moro verb template:

(3) (SM)-CL-CLAUSE.TYPE-(OM)-STEM-(DIST)-(CAUS)-(APPL)-(PASS)-ASP.MOOD-(OM)-(OM)

Moro objects

Simple transitive clause:

(4) kúku g-a-ləvətʃ-ó ɲogopájá
CLg.Kuku CLg.SM-MAIN-hide-PFV CLɲ.cup
'Kuku hid the cups.'

When the OBJ is realized by a proper name, it optionally bears the case suffix:

(5) ŋálːo g-ʌrːʌŋətʃ-ú kúku-**ŋ**
CLg.Ngallo CLg.SM-teach-PFV CLg.Kuku-**ACC**
'Ngallo taught Kuku.'

Moro objects

Pronominal object arguments are realized by inflectional markers on the verb:

(6) kúku g-a-ləvətʃ-ə́-**lo**
CLg.Kuku CLg.SM-MAIN-hide-PFV-**3PL.OM**
'Kuku hid them.'

Objects can passivize, indicated on the verb by the passive suffix *-ən*:

(7) ɲogopájá ɲ-ʌ-ləvətʃ-**ən**-ú
CLɲ.cup CLɲ.SM-MAIN-hide-**PASS**-PFV
'The cups were hid.'

Moro objects

Object properties – an object will:

- occur in post-predicate position, if it is an overt, non-pronominal nominal
- bear accusative case, if it is a proper name
- be realized by an object marker, when pronominal
- be able to undergo passivization

Moro objects

Ditransitive clause

(8) é-g-a-natʃ-ó óráŋ ŋerá
1SG.SM-CLg-MAIN-give-PFV CLg.man CLŋ.girl
'I gave the girl to the man.' / 'I gave the man to the girl.'

Note that (8) is ambiguous – either nominal can bear either semantic role.

Moro objects

Both internal arguments of *natʃ* ‘give’ exhibit the full range of object properties:

(9) *accusative marking*

é-g-a-natʃ-ó ŋállo-**ŋ**
1SG.SM-CLg-MAIN-give-PFV CLg.Ngallo-**ACC**
kóʤa-**ŋ**
CLg.Kodja-**ACC**

‘I gave Ngallo to Kodja.’ / ‘I gave Kodja to Ngallo.’

(10) *represented as object markers*

é-g-a-natʃ-ə́-**lo** ŋerá
1SG.SM-CLg-MAIN-give-PFV-**3PL.OM** CLŋ.girl

‘I gave them to the girl’ / ‘I gave the girl to them.’

Moro objects

(11) *passivization*

óráŋ	g-ʌ-nʌtʃ-**ən**-ú	ówːá
CLg.man	CLg.SM-MAIN-give-**PASS**-PFV	CLg.woman

‘The man was given a woman.’ / ‘The man was given to a woman.’

Moro objects

Moro is a symmetrical language:

(12) a. *multiple object markers*

é-g-a-natʃ-ə́-**ŋó-lo**
1SG.SM-CLg-MAIN-give-PFV-**3SG.OM-3PL.OM**

'I gave him to them.'/'I gave them to him.'

b. *object marking* cum *passivization*

óráŋ g-ʌ-nʌtʃ-**ən**-ə́-**ŋó**
CLg.man CLg.SM-MAIN-give-**PASS**-PFV-**3SG.OM**

'The man was given to her.'/'She was given to the man.'

In (12a) the object markers are ordered according to a person and number hierarchies. Note that the sentence is ambiguous – hence, object marker order has no bearing on which pronominal bears which semantic role

Beneficiary applicatives

Applicative suffix *-(ə)t̪*:

(13) a. é-g-alaŋ-ó
1SG.SM-CLg-sing-PFV
'I sang.'

b. í-g-ʌləŋ-**əṯ**-ú óẃːá
1SG.SM-CLg-sing-**APPL**-PFV CLg.woman
'I sang for the woman.'

Beneficiary applicatives

Applicative arguments behave as objects:

(14) a. *accusative marking*

í-g-ʌləŋ-**ət̪**-ú káka-**ŋ**
1SG.SM-CLg-sing-**APPL**-PFV CLg.Kaka-**ACC**

'I sang for Kaka.'

b. *represented as object marker*

í-g-ʌləŋ-**ət̪**-á-**ŋó**
1SG.SM-CLg-sing-**APPL**-PFV-**3SG.OM**

'I sang for him.'

c. *passivization*

káka g-ʌləŋ-**ətʃ-ən**-ú
CLg.Kaka CLg.SM-sing-**APPL**-PASS-**PFV**

'Kaka was sung for.'

Beneficiary applicatives

When applicative arguments co-occur with a transitive verb, the result is a double object construction:

(15) k-ʌ-wːʌð-iṭ-ú ŋerá umːiə
CLg.SM-MAIN-find-APPL-PFV CLg.girl CLg.boy
'He found the boy for the girl.' / 'He found the girl for the boy.'

Beneficiary applicatives

Both internal arguments exhibit object properties:

(16) *accusative marking*

a. í-g-ʌ-rr-**ə̱t̪**-ú káka-**ŋ**
1SG.SM-CLg-MAIN-pound-**APPL**-PFV CLg.Kaka-**ACC**
ŋóréðá
CLŋ.sesame
'I pounded sesame for Kaka.'

b. í-g-ʌ-rʌb-**it̪**-ú emerṭá
1SG.SM-CLg-MAIN-pick up-APPL-PFV CLg.horse
ŋállo-**ŋ**
CLg.Ngallo-**ACC**
'I carried Ngallo for the horse.'

Beneficiary applicatives

(17) *represented as object markers*

a. í-g-ʌ-rː-**ə̪ṭ**-ə-**ŋ́ó**
1SG.SM-CLg-MAIN-pound-**APPL**-PFV-**3SG.OM**
ŋ́óréðá
CLŋ.sesame
'I pounded sesame for him.'

b. í-g-ʌ-rː-**ə̪ṭ**-ə́-**lo**
1SG.SM-CLg-MAIN-pound-**APPL**-PFV-**3PL.OM**
káka-ŋ
CLg.kaka-ACC
'I pounded them for Kaka.'

Beneficiary applicatives

(18) *passivization*

a. káka g-ʌ-rː-**ətʃ-ən**-ú
CLg.Kaka CLg.SM-MAIN-pound-**APPL-PASS**-PFV
ŋóréðá
CLŋ.sesame
'Kaka was pounded sesame for.'

b. ŋóréðá ŋ-ʌ-rː-**ətʃ-ən**-ú
CLŋ.sesame CLŋ.SM-MAIN-pound-**APPL-PASS**-PFV
káka-ŋ
CLg.Kaka-ACC
'The sesame was pounded for Kaka.'

Beneficiary applicatives

Simultaneous object properties:

(19) a. k-ʌ-wːʌð-**iʈ**-ə́-**ɲə́-lo**
CLg.SM-MAIN-found-**APPL**-PFV-**1SG.OM-3PL.OM**
'He found me for them.' / 'He found them for me.'

b. í-g-ʌ-wːʌð-**itʃ-ən**-ə́-**lo**
1SG.SM-CLg-MAIN-found-**APPL-PASS**-PFV-**3PL.OM**
'I was found for them.' / 'They were found for me.'

Beneficiary applicatives

Ditransitive predicates and applicative constructions can be combined to yield a total of three object arguments:

(20) í-g-ʌ-nʌʤ-**ət̪**-ú aljásər-**o**
1SG.SM-CLg-MAIN-give-**APPL**-PFV CLg.Elyasir-**ACC**
kúku-**ŋ** ŋállo-**ŋ**
CLg.Kuku-**ACC** CLg.Ngallo-**ACC**

This sentence is six-ways ambiguous:

(21) a. 'I gave Elyasir to Kuku for Ngallo.'
b. 'I gave Elyasir to Ngallo for Kuku.'
c. 'I gave Kuku to Elyasir for Ngallo.'
d. 'I gave Kuku to Ngallo for Elyasir.'
e. 'I gave Ngallo to Kuku for Elyasir.'
f. 'I gave Ngallo to Elyasir for Kuku.'

Beneficiary applicatives

Further evidence for simultaneous object status in triple-object constructions:

(22) *Object marking (goal or beneficiary):*

í-g-ʌ-nʌdʒ-**ət̪**-ə́-**ŋó**
1SG.SM-CLg-MAIN-give-**APPL**-PFV-**3SG.OM**
kúku-ŋ áḍámá
CLg.Kuku-ACC CLg.book

'I gave a book to him for Kuku.' / 'I gave a book to Kuku for him.'

Beneficiary applicatives

Further evidence for simultaneous object status in triple-object constructions:

(23) *Passivization of theme:*

áḍámá g-ʌ-nʌdʒ-**ətʃ-ən**-ú
CLg.book CLg.SM-MAIN-give-**APPL-PASS**-PFV
ŋálːo-ŋ kúku-ŋ
CLg.Ngalo-ACC CLg.Kuku-ACC

'The book was given to Ngalo for Kuku.' / 'The book was given to Kuku for Ngalo.'

Beneficiary applicatives

Further evidence for simultaneous object status in triple-object constructions:

(24) *Passivation of theme with object marker:*

áḍámá g-ʌ-nʌdʒ-**ətʃ-ən**-á-**ŋó**
CLg.book CLg.SM-MAIN-give-**APPL-PASS**-PFV-**3SG.OM**
ŋerá
CLŋ.girl

'The book was given to him for the girl.' / 'The book was given to the girl for him.'

Summary

- Evidence for symmetrical objects in Moro:
  - Inherent ditransitives
  - Applicatives
  - Causatives
- Both objects display the full range of object behaviors, both individually and simultaneously.
- Up to three symmetrical objects, all exhibiting object behaviors.
- In absence of other compelling factors, this argues that they should be treated identically in their syntactic encoding.

Minimalist accounts

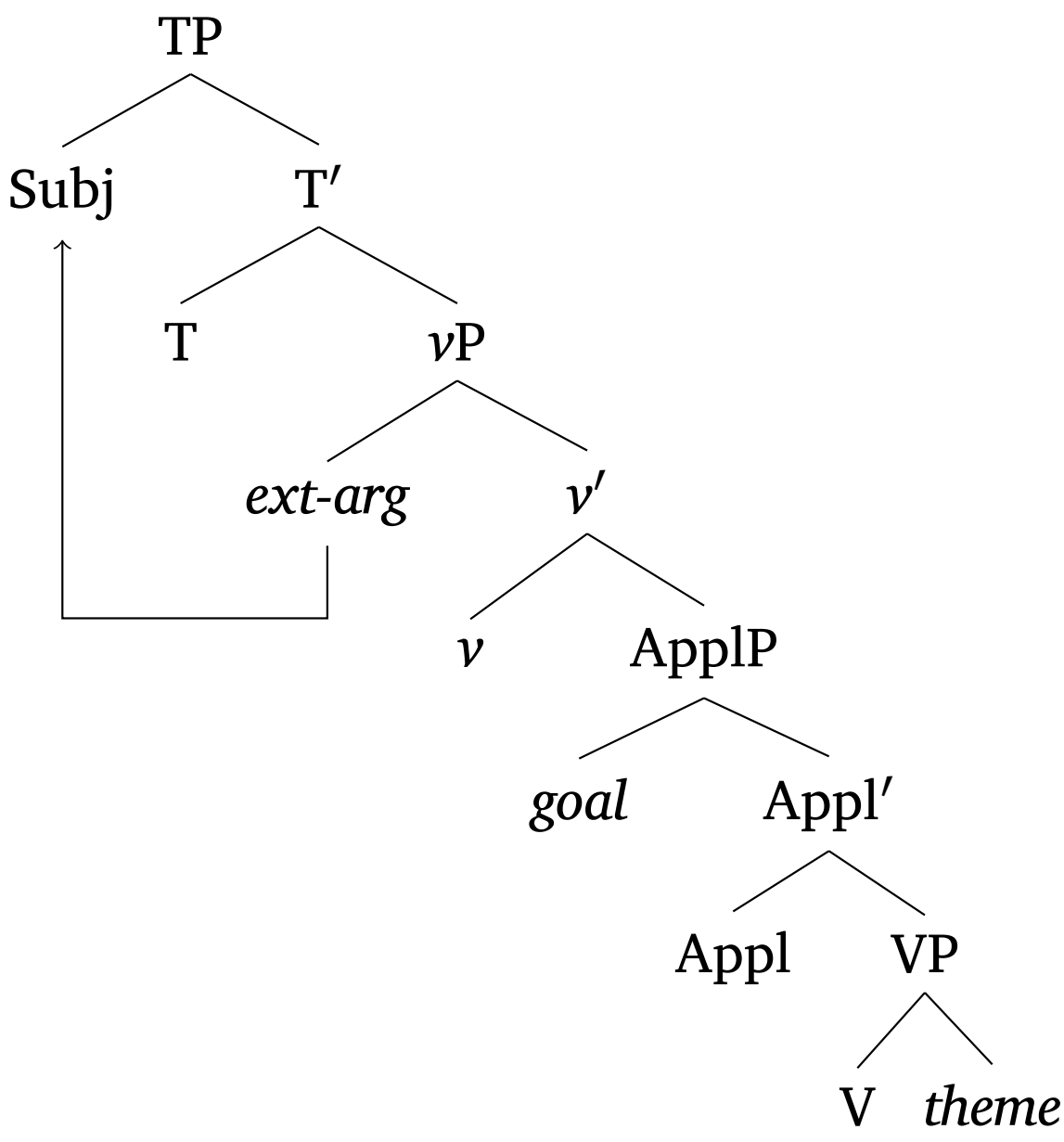
Two minimalist assumptions produce syntactic asymmetry between the 'multiple objects'

- Binary branching
- VP shells (Larson 1988, and Chomsky's 1995 generalization)

These assumptions have led to a clause structure where each syntactic argument is associated with a separate projection and thus double object constructions require three vP-internal projections.

Minimalist accounts

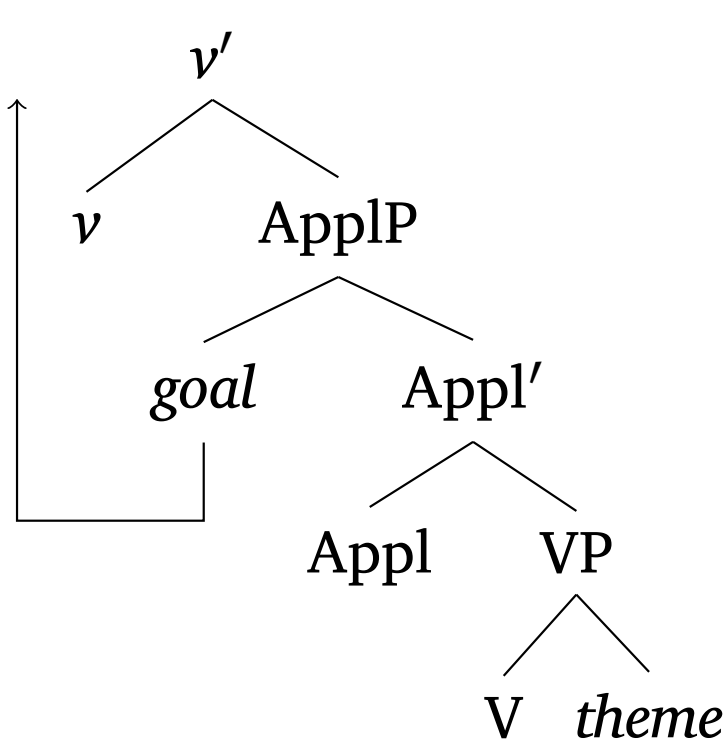
(25)



Minimalist accounts

The problem is that locality predicts that only the goal should be able to passivize:

(26)



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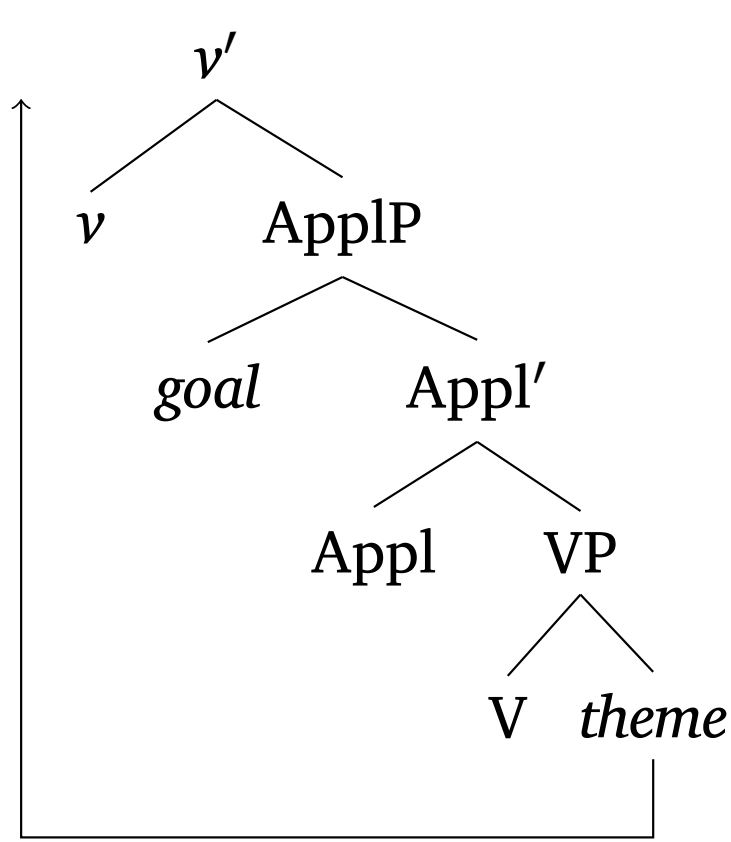


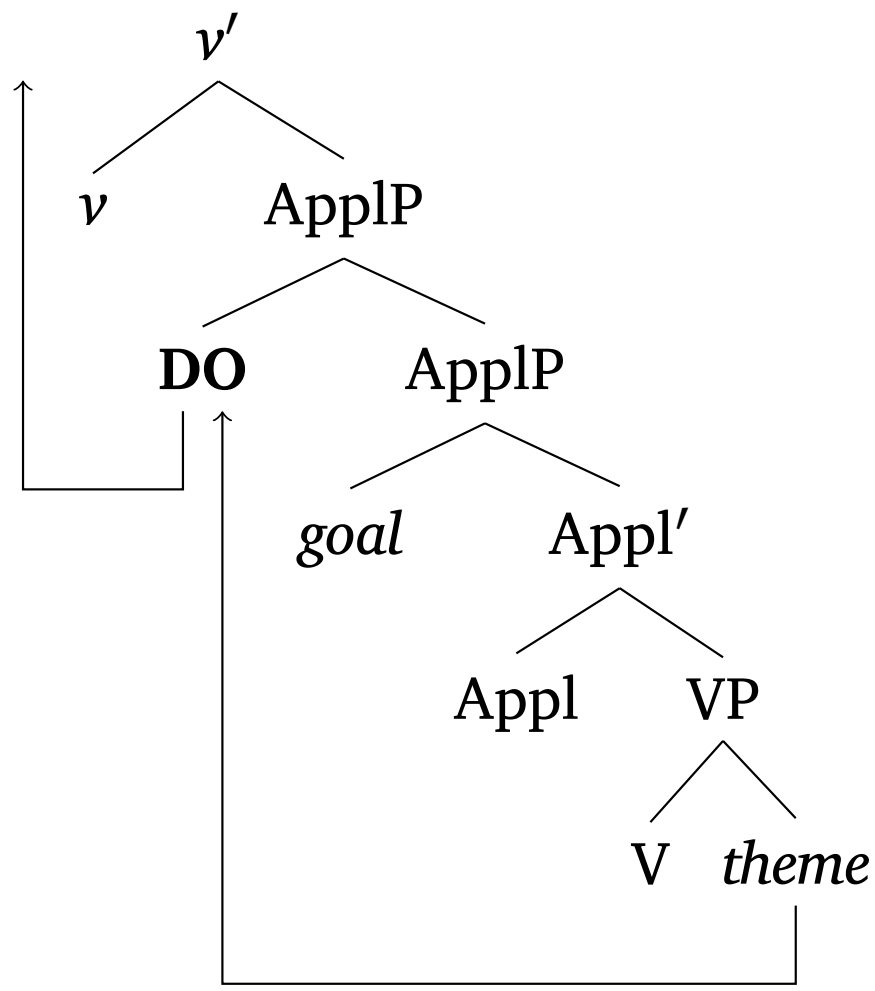
Minimalist accounts

- SHORTEST MOVE is a generalization of RELATIVIZED MINIMALITY (Rizzi 1990), which prevents an argument moving across another c-commanding specifier
- RELATIVE MINIMALITY, among other things, derived SPECIFIED SUBJECT CONSTRAINT effects (e.g., accounts for a cross-linguistic prohibition against SUPER-RAISING)
- However, when applied to a post-Larsonian clause structure, SHORTEST MOVE blocks intra-clausal movements – therefore, it predicts that themes should not be able to passivize across goal arguments
- Thus, the conceptually motivated extension of an empirically motivated principle results in inappropriate restrictiveness.

Minimalist accounts

A work-around allows a lower theme argument to move beyond a c-commanding goal:

(27)



Minimalist accounts

- In (27) we see the theme object moving across the goal (as a second specifer, which does not violate SHORTEST MOVE), from where it can further passivize
- Either because this movement is optional or because the two specifiers are equi-distant from the subject position, either the goal or theme can advance to subject via passivization
- Because the EPP feature that triggers the movement in (29) is language and/or construction specific, it is absent in languages or constructions that asymmetrically allow only the goal argument to passivize.
- Thus, (a)symmetrical constructions are tied to the presence or absence of the relevant EPP feature.

Minimalist accounts

- This requires a number of ancillary assumptions, including specific notions of equi-distance, multiple specifiers, tucking-in movements, whose sole purpose is to selectively circumvent the predictions of SHORTEST MOVE.
- The larger theoretical issue raised by this type of approach is clear: while binary branching, UTAH, and SHORTEST MOVE all have simple formulations, their actual formulations as applied in particular instances require elasticity.
- Given such necessary and complex modifications, are there simpler and more transparent ways to address cross-linguistic variation in the behavior of objects?

An HPSG proposal

For asymmetric languages like English, the ARG-ST is a totally-ordered list:

(28)
$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2}, \boxed{3} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1}\text{NP}_i, \boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k \rangle \\ \text{SEM} & \begin{bmatrix} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix}$$

An HPSG proposal

For a symmetric language, we can generalize the ARG-ST representation for symmetric languages to a strict partially ordered set:

(29)
$$\begin{bmatrix} \text{ARG-ST} & \text{NP}_i \prec \{\text{NP}_j, \text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{natʃ\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix}$$

An HPSG proposal

This modification to the ARG-ST then requires a slight reformulation to the Argument Realization Principle:

(30) **Argument Realization Principle**

$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \boxed{2} \end{array}\right] \\ \text{ARG-ST} & \boxed{3} \end{array}\right] \rightarrow \langle \boxed{1} \rangle \oplus \boxed{2} \text{ is a linear extension of } \boxed{3}$$

where a total order $<$ is a **linear extension** of a partial order $\prec$ on X if and only if for every x and y in X, if $x \prec y$ then $x < y$.

An HPSG proposal

For a symmetric language, two possible realizations corresponding to the alternative orderings of the patient and theme seen in (8):

(31)

$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{3}, \boxed{2} \rangle \end{bmatrix} \\ \text{ARG-ST} & \boxed{1}\text{NP}_i < \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{nat}\int\textit{\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix} \text{ or } \begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2}, \boxed{3} \rangle \end{bmatrix} \\ \text{ARG-ST} & \boxed{1}\text{NP}_i < \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{nat}\int\textit{\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix}$$

An HPSG proposal

Pronominal object marking, as in (6) or (12a), can be expressed using a lexical rule:

(32) **Object Pronominal Lexical Rule**

a. $\begin{bmatrix} \text{COMPS} & \langle \boxed{1}\text{NP} \rangle \oplus \boxed{2} \\ \text{ARG-ST} & \langle \ldots, \boxed{1}, \ldots \rangle \end{bmatrix} \Rightarrow$

$\begin{bmatrix} \text{COMPS} & \boxed{2} \\ \text{ARG-ST} & \langle \ldots, \boxed{1}\text{NP}_{pro}, \ldots \rangle \end{bmatrix}$

b. $\begin{bmatrix} \text{COMPS} & \langle \boxed{1}\text{NP}, \boxed{2}\text{NP} \rangle \oplus \boxed{3} \\ \text{ARG-ST} & \langle \ldots \{ \boxed{1}, \boxed{2} \} \ldots \rangle \end{bmatrix} \Rightarrow$

$\begin{bmatrix} \text{COMPS} & \boxed{3} \\ \text{ARG-ST} & \langle \ldots \{ \boxed{1}\text{NP}_{pro}, \boxed{2}\text{NP}_{pro} \} \ldots \rangle \end{bmatrix}$

An HPSG proposal

The Passive Lexical Rule removes the subject from the ARG-ST:

(33) **Passive Lexical Rule**

$$\left[\text{ARG-ST} \quad \langle \boxed{1} \rangle \oplus \boxed{2} \right] \Rightarrow \left[\text{ARG-ST} \quad \boxed{2} \right]$$

Applying (33) to (29) produces:

(34)
$$\left[\begin{array}{ll} \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{natʃ\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right]$$

An HPSG proposal

By the Argument Realization Principle (30), either the theme or the patient could be realized as the SUBJ, as in (11) or (18):

(35)

$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle \boxed{3} \rangle \end{bmatrix} \\ \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{natʃ\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix} \text{ or } \begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{3} \rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \end{bmatrix} \\ \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{natʃ\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix}$$

Conclusions

- In a framework committed to assumptions (2i–iii), symmetric languages lead to the question: “Why do some languages violate universal conditions on asymmetry?”
- An alternative HPSG analysis can address language variation without presuming that any variant is more or less natural in languages of the world.
- This leads to an alternate (and, we think, more fruitful) question: “Why are some languages symmetric and others asymmetric in the specific ways that they are?”
- The challenge arises of how to extend this type of proposal to account for the range of mixed (a)symmetrical behaviors.