

Feature resolution via lists

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Introduction

- ▶ Agreement in French proceeds along the featural dimensions of person, number and gender
- ▶ Number agreement with coordinated controllers typically reflects the plurality of the aggregate

(1) Le chien et le chat dorment.

the dog.SG and the cat.SG sleep.PRS.3PL

‘The dog and the cat sleep.’

(2) Le chien et le chat endormis se réveillent.

the dog.SG and the cat.SG asleep.PL.M REFL awaken.PRS.3PL

‘The dog and the cat that were asleep are waking up.’

Gender agreement

- ▶ Gender agreement found both in attributive and predicative constructions:
 - ▶ attributive adjectives
 - ▶ predicative adjectives and certain participles (reflexives & be+participle)

- (3) a. Les chevaux sont partis.
the horse(M).PL be.PRS.3PL leave.PL.M
'The horses left.'
- b. Les tortues sont parties.
the turtle(F).PL be.PRS.3PL leave.PL.F
'The turtles left.'
- (4) a. Les frelons sont dangereux.
the hornet(M).PL be.PRS.3PL dangerous.PL.M
'Hornets are dangerous.'
- b. Les guêpes sont dangereuses.
the wasp(F).PL be.PRS.3PL dangerous.PL.F
'Wasps are dangerous.'

- ▶ Gender and number distinctions systematically made in written French
- ▶ Audible differences quite common with adjectives (/зенева/ vs. /зенево/
M.PL), occasional with participles /екви/ vs. /еквит/

Gender agreement in coordinate structures

- ▶ Gender agreement carries over to coordinate structures
- ▶ Aggregates of like gender trigger agreement in the corresponding gender

- (5) a. Le cheval et l'âne sont partis / *parties.
the horse(M) and the donkey(M) be.PRS.3PL leave.PL.M leave.PL.F
'The horse and the donkey left.'
- b. La tortue et la salamandre sont parties / *partis.
the turtle(F) and the salamander(F) be.PRS.3PL leave.PL.F leave.PL.M
'The turtle and the salamander left.'

- ▶ Aggregates of mixed gender triggers default masculine gender grammatical rather than semantic resolution strategy

- (6) a. Les chevaux et les ânesses sont partis / *parties.
the horse(M).PL and the donkey(F).PL be.PRS.3PL leave.PL.M
'The horses and the female donkeys left.'
- b. Les juments et les ânes sont partis / *parties.
the mare(F).PL and the donkey(M).PL be.PRS.3PL leave.PL.M
'The mares and the donkeys left.'

Gender agreement in coordinate structures

- ▶ A single masculine NP in a coordination triggers (default) masculine agreement
- ▶ Masculine NP may be arbitrarily deeply embedded in a coordination
- ▶ Resolution pattern applies across local and non-local dependencies

(7) a. Les juments, les ânesses et les poneys sont partis
the mare(F).PL the donkey(F).PL and the pony(M).PL be.PRS.3PL leave.PL.M
/ *parties .

‘The mares, the female donkeys and the ponies left.’

b. Le chien et la tortue, qui étaient endormis, se sont
the dog(M) and the turtle(F) who be.IPFV.3PL asleep.M.PL be.PRS.3PL
réveillés / *réveillés .
awaken.PL.M

‘The dog and the turtle, who were asleep, woke up.’

Person resolution

- ▶ Person resolution slightly more complex than gender resolution
- ▶ Resolution follows the person hierarchy (Zwicky, 1977): 1>2>3
 - ▶ any first person conjunct triggers first person agreement;
 - ▶ in the absence of any first person conjunct, any second person conjunct triggers second person agreement;
 - ▶ otherwise (i.e. if all conjuncts are third person), third person agreement is used.
- ▶ Pattern quite well-attested cross-linguistically (King and Dalrymple, 2004)
- ▶ Decisive NP may be deeply embedded

(8) 1>2

- a. Toi et moi allons bien nous entendre.
you and I will.PRS.1PL well get.along.INF.1PL
'You and I will get along well.'
- b. *Toi et moi allez bien vous entendre.
you and I will.PRS.2PL well get.along.INF.2PL
- c. *Toi et moi vont bien s'entendre.
you and I will.PRS.3PL well get.along.INF.3PL

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(8) 1>3

- a. Les enfants et moi allons bien nous entendre.
the child.PL and I will.PRS.1PL well get.along.INF.1PL
'The children and I will get along well.'
- b. *Les enfants et moi vont bien s'entendre.
the child.PL and I will.PRS.3PL well get.along.INF.3PL

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(8) 2>3

- a. Toi et les enfants allez bien vous entendre.
you and the child.PL will.PRS.2PL well get.along.INF.2PL
'You and the children will get along well.'
- b. *Toi et les enfants vont bien s'entendre.
you and the child.PL will.PRS.3PL well get.along.INF.3PL

Discussion

- ▶ In contrast to LFG f -structures, semantic representations in HPSG tend to be much more layered, e.g. MRS
- ▶ Strong notion of locality and compositionality (Copestake et al., 2001)
- ▶ Feature resolution should be done in tandem with syntactic structure

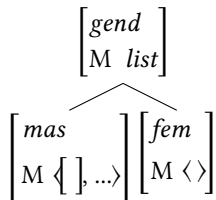
(9) MRS for *la girafe et l'éléphant* (quantifiers omitted)

$$\left[\begin{array}{l} \text{mrs} \\ \text{HOOK} \left[\begin{array}{l} \text{INDEX} \left[\begin{array}{l} \text{ref-ind} \\ \text{NUM } pl \end{array} \right] \\ \text{LTOP} \quad [l] \end{array} \right] \\ \text{RELS} \left\langle \begin{array}{l} \left[\begin{array}{l} \text{PRED} \quad \text{and_coord_rel} \\ \text{ARG0} \quad [c] \\ \text{LBL} \quad [l] \\ \text{L-INDEX} \quad [g] \\ \text{R-INDEX} \quad [e] \end{array} \right], \left[\begin{array}{l} \text{PRED} \quad \text{girafe_n_rel} \\ \text{LBL} \quad \text{handle} \\ \text{ARG0} \left[\begin{array}{l} \text{ref-ind} \\ \text{NUM } sg \\ \text{GEND } f \end{array} \right] \end{array} \right], \left[\begin{array}{l} \text{PRED} \quad \text{éléphant_n_rel} \\ \text{LBL} \quad \text{handle} \\ \text{ARG0} \left[\begin{array}{l} \text{ref-ind} \\ \text{NUM } sg \\ \text{GEND } m \end{array} \right] \end{array} \right], \dots \end{array} \right. \end{array} \right]$$

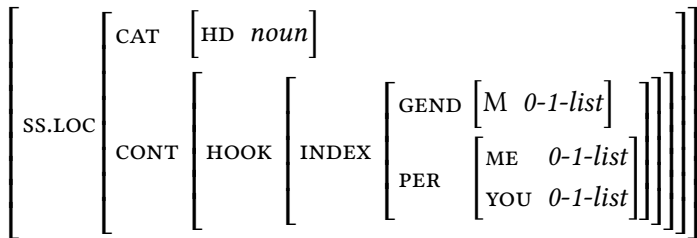
- (10) Elle, son frère et moi nous sommes bien entendus.
3SG.F her brother(M.SG) and 1.SG be.PRS.1PL well get.along.PL.M
'She, her brother, and I got on well.'

Representation of gender

(11) Type constraints for gender

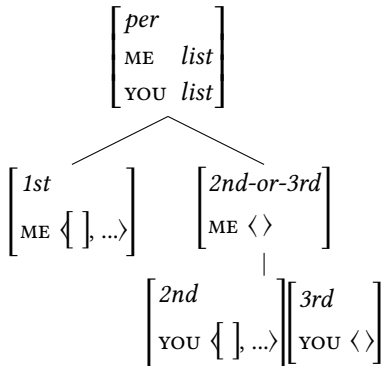


(12) *basic-noun-lex* →



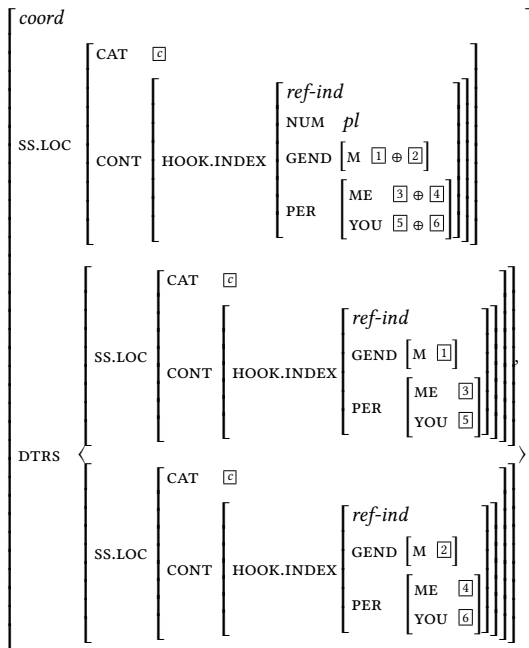
Representation of person values

(13) Type constraints for person



Feature resolution by lists

(14)



Gender resolution by concatenation

(15) a. $\left[\text{GEND } m \left[M \left\langle \left[\right] \right\rangle \right] \right] + \left[\text{GEND } m \left[M \left\langle \left[\right] \right\rangle \right] \right] = \left[\text{GEND } \left[M \left\langle \left[\right] \right\rangle, \left[\left[\right] \right] \right] \right] \approx m$

b. $\left[\text{GEND } m \left[M \left\langle \left[\right] \right\rangle \right] \right] + \left[\text{GEND } f \left[M \langle \rangle \right] \right] = \left[\text{GEND } \left[M \left\langle \left[\right] \right\rangle \right] \right] \approx m$

c. $\left[\text{GEND } f \left[M \langle \rangle \right] \right] + \left[\text{GEND } m \left[M \left\langle \left[\right] \right\rangle \right] \right] = \left[\text{GEND } \left[M \left\langle \left[\right] \right\rangle \right] \right] \approx m$

d. $\left[\text{GEND } f \left[M \langle \rangle \right] \right] + \left[\text{GEND } f \left[M \langle \rangle \right] \right] = \left[\text{GEND } \left[M \langle \rangle \right] \right] \approx f$

The problem with difference lists

- ▶ List concatenation cannot be done with diff-lists
- ▶ Agreement targets must have underspecified list length
- ▶ Underspecified length precludes concatenation

(16) a. Non-empty difference list underspecified for length

$$\left[\begin{array}{l} \text{LIST} \left[\begin{array}{l} \text{FIRST} \left[\quad \right] \\ \text{REST} \quad \textit{list} \end{array} \right] \\ \text{LAST} \quad \textit{list} \end{array} \right]$$

b. Empty difference list

$$\left[\begin{array}{l} \text{LIST} \left[\quad \right] \\ \text{LAST} \left[\quad \right] \end{array} \right]$$

c. Unifying a non-empty list onto an empty difference list

$$\left[\begin{array}{l} \text{LIST} \left[\quad \right] \left[\begin{array}{l} \text{FIRST} \left[\quad \right] \\ \text{REST} \quad \textit{list} \end{array} \right] \\ \text{LAST} \left[\quad \right] \end{array} \right]$$

List concatenation (Emerson, 2017)

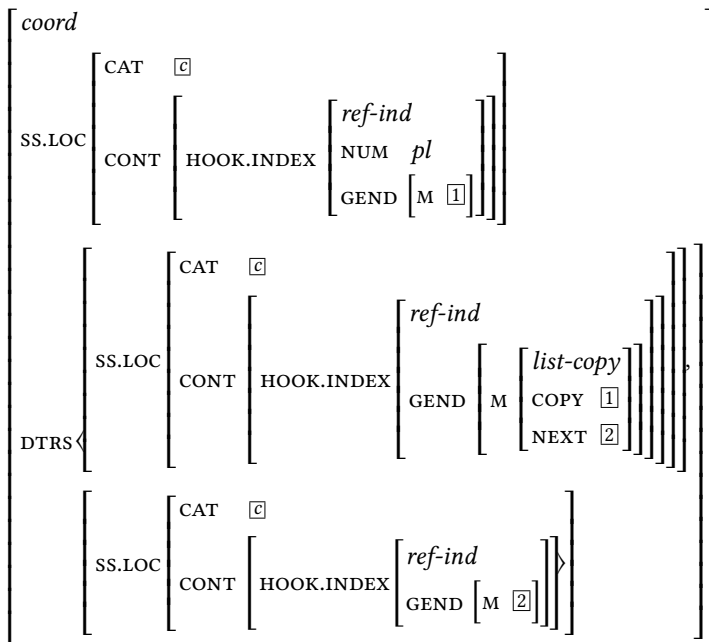
$$(17) \quad \textit{list-copy} := \textit{list} \wedge \begin{bmatrix} \text{COPY} & \textit{list} \\ \text{NEXT} & \textit{list} \end{bmatrix}$$

$$\textit{elist-copy} := \textit{list-copy} \wedge \textit{elist} \wedge \begin{bmatrix} \text{COPY} & \boxed{n} \\ \text{NEXT} & \boxed{n} \end{bmatrix}$$

$$\textit{nelist-copy} := \textit{list-copy} \wedge \textit{nelist} \wedge \begin{bmatrix} \text{FIRST} & \boxed{f} \\ \text{REST} & \begin{bmatrix} \textit{list-copy} \\ \text{COPY} & \boxed{r} \\ \text{NEXT} & \boxed{n} \end{bmatrix} \\ \text{COPY} & \begin{bmatrix} \text{FIRST} & \boxed{f} \\ \text{REST} & \boxed{r} \end{bmatrix} \\ \text{NEXT} & \boxed{n} \end{bmatrix}$$

Coordination rule type w/ Emerson-lists

(18)



References

- Clocksin, W. F. and Mellish, C. S. (1981). *Programming in Prolog*. Heidelberg: Springer.
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