

# Introduction to Formal Semantics: Some Notes on Pronominal Anaphora

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# Meaning and Syntax

1. The role of hierarchical relations
2. The role of grammatical features
3. The role of syntactic dependencies
4. The role of set-theoretic concepts
5. The role of syntactic pre-encoding of interpretive dependencies

# Semantic computations and pronominal anaphora

1. Grammatical constraints on the interpretation of pronouns are limited to pronouns interpreted as bound variables
2. Semantic computations and language acquisition: the delay in the acquisition of Principle B of Binding Theory

# Bound variable reading and coreference

- (1) Every student thinks that Mary likes him
- (2)  $\forall x$  (x thinks that Mary likes x)
  
- (3) The professor who interviewed every student thinks that Mary likes him
- (4)  $*\forall x$  (the professor who interviewed x thinks that Mary likes x)
  
- (5) The professor who interviewed no student thinks that Mary likes him
- (6)  $*\forall x$  (the professor who did not interview x thinks that Mary likes x)
  
- (7) The professor who did not interview Charles thinks that Mary likes him
  
- (8) The professor who interviewed him thinks that Mary likes no student
- (9)  $*\forall x$  (the professor who interviewed x thinks that Mary does not like x)
  
- (10) The professor who interviewed him thinks that Mary does not like Charles

# Bound variables without quantifiers

- (1) Verona is loved by its inhabitants, Torino is not
- (2) Verona [ $\lambda x$  ( $x$  **is loved by the inhabitants of**  $x$ )]  
Torino [ $\lambda x$  ( $x$  **non is loved by the inhabitants of**  $x$ )]
- (3) The people who live in Verona love it, but the people who live in Torino do not
- (4) Verona [ $\lambda x$  (the people who live in  $x$  **love**  $x$ )]  
\*Torino [ $\lambda x$  (the people who live in  $x$  **love**  $x$ )]

Conclusion: The bound variable reading is available even with proper names; it follows that in the case of (5):

- (5) Charles likes him

The coreference restriction may be interpreted as a restriction on the bound variable reading.

## The delay in Principle B acquisition (Grodzinsky&Reinhart 1993, Baauw&Delfitto 2005)

1. a. The boy touched him (around 50% adult-like)  
b. The boy touched himself (almost 100% adult-like)
2. Every boy touched him (85% adult-like)
3. La niña la señala (90% adult-like)
4. a. Do you know what Mary and John have in common? Mary admires him and John admires him too
5. Zelda's husband is him
6. A. Is this speaker Zelda? B. How can you doubt it? She praises her to the sky. No competing candidate would do that
7. It is not really true that everyone likes John. JOHN does not like him!

# Kaplan: objectual and indexical sense

“If I see, reflected in a window, the image of a man whose pants appear to be on fire, my behavior is sensitive to whether I think, ‘His pants are on fire’, or ‘My pants are on fire’, though the object of thought may be the same (i.e., the proposition expressed may be the same, P.S.)”  
(Kaplan 1990)

‘My pants are on fire’ and ‘His pants are on fire’ have the same Content, but different Characters.

# Fixity Thesis

## **Fixity Thesis:**

The semantic value of an indexical is fixed solely by the context of the actual speech act, and cannot be affected by any logical operators.

1. *Abigail thought that I left*

Can the indexical nature of a thought or discourse be retained in an indirect report?

Standard Answer is: NO!

2. *Abigail thought that she left*

# Possible worlds and contexts

- (1) *John says that  $\varphi$*  is true in context  $c$  at time  $t$  in world  $w$  just in case every context compatible with what John asserts at  $t$  in  $w$  is one in which  $\varphi$  could be uttered truly
- (2) *John says that  $\varphi$*  is true in context  $c$  at time  $t$  in world  $w$  just in case every world compatible with what John asserts at  $t$  in  $w$  is one in which  $\varphi$  is true

# Logophoric pronouns

1. a. John thinks that he is a hero  
b. John thinks that **he himself** is a hero
2. a. Pavarotti crede che i suoi pantaloni siano in fiamme  
b. Pavarotti crede che i **propri** pantaloni siano in fiamme
3. Me oravit ut **se** defenderem
4. Caesar mandavit legatis suis ut quae diceret Ariovistus ... ad **se** referrent
5. Kofi<sub>i</sub>        be        **yé<sub>i/\*j</sub>**        -dzo        (*Ewe*)  
K                say        LOG            left  
“Kofi said that he left”
6. Heene        jon        Pol<sub>i</sub>        gá        **sé<sub>i/\*j</sub>**        lé'        cégè (*Tuburi*)  
fear            has        Paul        that        LOG        fall        sick  
“Fear grips Paul that he will fall sick”

# Shifted indexicals in attitude reports

- Amharic

jon jəgna nə-ññ yil -all  
John hero be.PF-1sO 3M.say-AUX.3M  
“John says that he is a hero”

- Tamil

a. kumaar<sub>i</sub> taan<sub>i</sub> varreeNNu sonnaan  
Kumar self come-prst-1p-that say-prst-3p

b. kumaar<sub>i</sub> naan<sub>i/j</sub> varreeNNu sonnaan  
kumar I come-prst-1p-that say-prst-3p

- Aghem, Bantu

wo

[woman that] said to him [that LOG-3 much like you]

the woman said to him “I like you” a lot

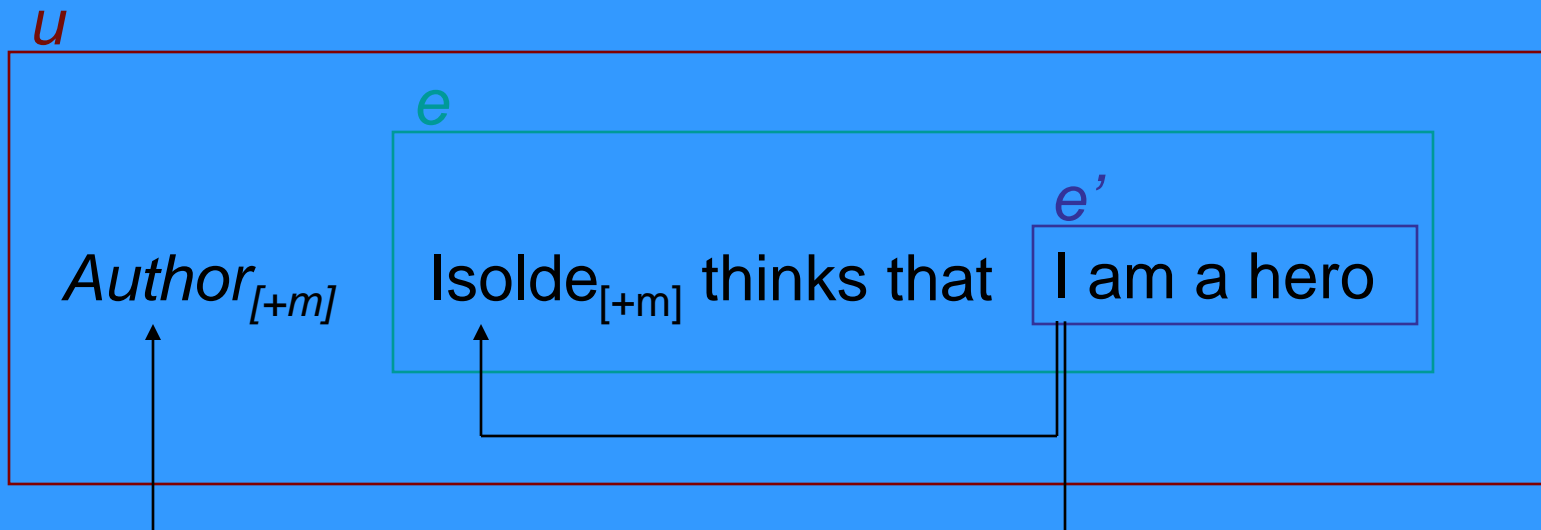
# The $\theta$ -system

- $[+c, +m]$  = agent
- $[+c, -m]$  = instrument
- $[-c, +m]$  = experiencer
- $[-c, -m]$  = theme/patient
- $[+c]$  = cause
- $[+m]$  = sentient
- $[-m]$  = subject matter/locative source
- $[-c]$  = goal/benefactor

# Person

*1<sup>st</sup> person*

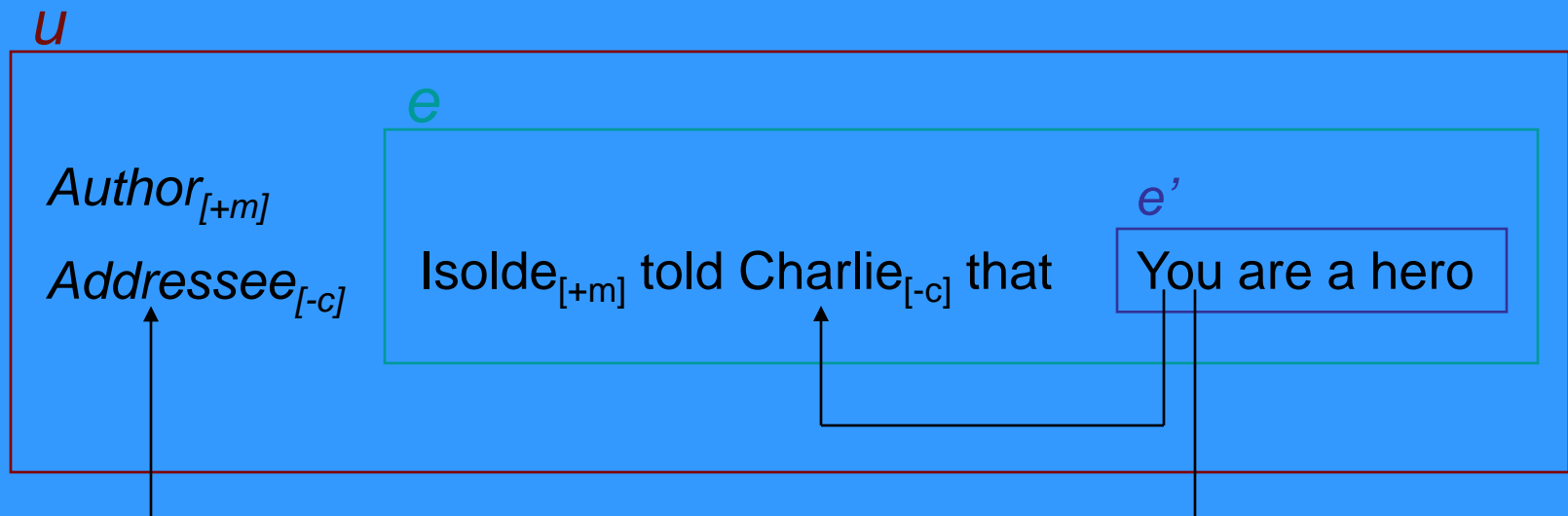
$\lambda x \lambda y \lambda e \lambda e' [x = \text{||pro}_{1\text{st}}\text{||} \wedge e \neq e' \wedge \theta(x, e') \wedge \theta_{[+m]}(y, e) \wedge x = y_{+m}]$




# 2<sup>nd</sup> person

## 2<sup>nd</sup> person

$\lambda x \lambda y \lambda e \lambda e' [x = \|\text{pro}_{2\text{nd}}\| \wedge e \neq e' \wedge \theta(x, e') \wedge \theta_{[-c]}(y, e) \wedge x = y_{-c}]$



# Non-interpretable person features (*AGREE*) on the noun/verb as an alternative to shifted 1st and 2nd person

1. He believes that his voice sounds aggressive (*ambiguous*)
- 2a. He<sub>Int</sub> believes that his-3p<sub>Int</sub> voice sounds aggressive (*DE RE*)
- 2b. *x believes that the voice of y sounds aggressive*
- 3a. He<sub>Int</sub> believes that his-3p<sub>Agr</sub> voice sounds aggressive (*DE SE*)  

- 3b. *x believes that the voice of x (as the bearer of the mental state of believing) sounds aggressive*
- 4a. John said that Mary was-*past*<sub>Agr</sub> ill
- 4b. John said that Mary left-*past*<sub>Int</sub>
- 5a. John said that Mary would-*past*<sub>Agr</sub> leave
- 5b. John said that Mary will<sub>Int</sub> leave

# The *locus* of parametric variation

## 1. **Universal:**

Pronominalize in order to encode reference (person features are interpreted)

## 2. **Parameter:**

Pronominalize in order to encode an interpretive dependency (= thematic feature sharing)

Indo-European languages select the positive value of the parameter, whereas languages such as Amharic (Semitic; Leslau 1995), Engenni (Kwa; Thomas 1978), Aghem (Bantu; Hyman 1979) and Tamil (Dravidian; Annamalai 2000) select the negative value. Note that phenomena of “shifted” use of 1st and 2nd person pronouns are also observed in some sign-languages (such as LSC, LIS, and ASL; see Quer 2005 and Zucchi 2004).

In the languages that select the positive value of the parameter strategy 2 is more economical than strategy 1: given an interpretation  $\alpha$ ,  $\alpha$  cannot be expressed by using interpretable person features if  $\alpha$  can be expressed by using non-interpretable person features (i.e. Agreement).

## Bound variables as “minimal” pronouns

- (1) Only I thought that my pants were on fire
- (2) I thought that my pants were on fire  
but John didn't
- (3) Only Isolde thought that her pants were on fire

*The view that BVR is syntactically encoded through the mechanism of feature copying is found, among others, in Heim (1991; 2002), in Kratzer (1998; 2006), and in Rullmann (2003).*

# BV-reading and DE SE reading

## **BVR does not imply DE SE**

1. Each veteran believes that he is a hero

## **DE SE does not imply BVR**

2. John thinks that he is a hero,  
but George doesn't

**Conclusion:** BV readings and DE SE readings are orthogonal to each other

## **BVR without agreement**

3. Κάθε κορίτσι στην τάξη μας φροντίζει υπερβολικά τον εαυτό της/ του.  
[every girl in the class ours]<sub>neu</sub> takes-care too-much [the-self-her]<sub>fem</sub>  
/its<sub>neu</sub>]  
“Every girl in our class takes too much care of herself”

# 'Vehicle change'

- (1) Abigail said that Isolde was aggressive, but Isolde did not [say that \*Isolde/she was aggressive]
- (2) Bill said that Isolde was aggressive, but she did not [say that \*Isolde/she was aggressive]
- (3) I thought that my pants were on fire but John didn't

Critical combinations:

DE SE/strict and DE RE/sloppy

# DE SE as property-ascription (1)

John thought that he was a hero

DE RE - *thought* (John, John was a hero)

DE SE - *thought* (John,  $\lambda x$  (x was a hero))

## *SELF-ASCRPTION*

An n-place relation R is self-ascriptive iff it (asymmetrically) licenses the following entailment:

$$R(\dots x \dots Q \dots) \rightarrow R(\dots x \dots Q(x) \dots)$$

# DE SE as property-ascription (2)

1. Lucie believes that she sounds too aggressive, and Anna believes it too  
it= (Lucie sounds too aggressive)  $\Rightarrow$  strict  $\Rightarrow$  DE RE  
it=  $\lambda x$  (x sounds too aggressive)  $\Rightarrow$  sloppy  $\Rightarrow$  DE SE
  
2. John told Mary that she should go  
*tell* (John, Mary,  $\lambda x$  (x should go))  
  
John told Mary: “Mary should go”  
John told Mary: “You should go”
  
3.
  - a. That he will be remembered as a war hero is strongly believed by the president
  - b. That the president will be remembered as a war hero is strongly believed by him

# Consequences for the nature of pronominal dependencies

Pronominal anaphora depends on the presence of non interpretable person features realized on the pronoun and corresponds to a process of thematic feature sharing according to which the object referred to by the pronoun is assigned the same thematic features proper to the antecedent.

# Prediction: in agreement configurations the 1p interpretation is not necessarily deictic!

1. I believed that I was a war hero
2. I-1p<sub>Int</sub> believed that I-1p<sub>Int</sub> was a war hero  
*The author of the present sentence believed that the author of the present sentence was a war hero*
3. I-1p<sub>Int</sub> believed that I-1p<sub>Agr</sub> was a war hero  
*The author of the present sentence believed that the bearer of the belief was a war hero*
4. I imagined that I was flying through space
5. I believe that I am a war hero  
*The author of the present sentence believes that the author of the present sentence is a war hero*

**CONCLUSION:** DE RE / DE SE ambiguities are not a prerogative of the 3p.  
Subjectivity is not a prerogative of the 1p (*pace* Benveniste)

# For a new view of pronominal anaphora (1)

## Contexts of compulsory anaphora

1. È stato sciocco da parte di Giovanni tradire sua moglie  
*It was stupid by the side of Giovanni to betray his wife*
2. Het was dom **van Jan** dat **hij** zijn vrouw bedrogen heeft
3. \*Het was dom **van Jan** dat zijn vrouw **hem** bedrogen heeft
4. \*Het was aardig **van Jan** dat zijn vrouw **met hem** jarenlang werkte
5. This is a big butterfly
- 5a. This is a butterfly and this is big (as a butterfly)
- 5b. Butterfly (this) & Big (this<sub>Butterfly</sub>)
- 6a. John betrayed his wife and he was stupid in that he betrayed his wife
- 6b.  $\lambda x$  (x betrayed x's wife) (John) & Stupid (John <sub>$\lambda x$  (x betrayed x's wife)</sub>)