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RuG

Pronouns:
A case of production-before-comprehension

A study on the the comprehension and production of pronouns and reflexives in Dutch children

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Lisbon workshop on production versus comprehension in the acquisition of syntax – June 7, 2005

Outline

- Production and comprehension of pronouns/reflexives
- General research question
- New data:
  - DeVilliers and Cahillane (2004)
- Recent account:
  - Hendriks and Spenader (2004)
- Optimality Theory and the Pronoun Interpretation Delay

- Experiment:
  - Design
  - Test items
  - Results

- Conclusions / discussion

Comprehension versus production

- Starting point: Chien and Wexler (1990)
  - Children perform **well** on reflexives in comprehension (85% correct):
    (1) Here is Papa bear and Baby bear
    Papa bear is touching himself (T/F?)
  - Children perform **poor** at comprehending pronouns (50% correct):
    (2) Here is Papa bear and Baby bear
    Papa bear is touching him (T/F?)
- **BUT:**
  - Some evidence from corpus-research that children perform well in production of **first** person reflexives and pronouns (Bloom et al., 1994)
  - Recent experimental data that shows that children also perform well in production of **third** person reflexives and pronouns (DeVilliers and Cahillane, 2004)

Research question

Our research question:

- Is there a similar asymmetry between production and comprehension of third person pronouns in Dutch as in English, and if yes, what is the explanation?

Our solution:

- Takes into account the comprehension data as well as the production data
- Assumes a single grammar
- Distinguished between speaker's perspective and hearer's perspective

De Villiers & Cahillane (2004)

Comprehension:

- Embedded clauses made comprehension of reflexives harder
- Embedded clauses improved pronoun comprehension relative to single clause sentences.

Production:

- Pronoun production almost perfect
- Production of reflexives harder than production of pronouns
- Embedded clauses made production of reflexives harder

Is production superior to comprehension and if so why?

- Hendriks & Spenader (2004) give a bidirectional Optimality Theory explanation of the pronoun comprehension problem;
- Children's problems in comprehension are argued to be due to their inability to consider unsaid alternatives, that is, consider the speaker's production from the perspective of the hearer

Optimality Theory (OT)

- Introduced into linguistics by Prince & Smolensky (1993).
- Optimization over possible outputs.
- Parallel evaluation of candidate outputs.
- Violable and potentially conflicting constraints.
- Ranking of the constraints determines their strength.

- Speaker's perspective: input is meaning, output is optimal form.
- Hearer's perspective: input is form, output is optimal meaning.
- Able to model speaker/hearer asymmetries (cf. Hendriks & Spenader, 2004).

Optimality Theory and pronouns/reflexives

- Chomsky (1981):
  Principle A:
  - Reflexives must be bound locally.

- Burzio (1998):
  Referential Economy:
  - Reflexives >> Pronouns >> R-expressions

- Principle A >> Referential Economy

Our assumption:

Principle A is a constraint on forms as well as on meanings,
Referential Economy a constraint on forms only

Explanation of the child language acquisition data

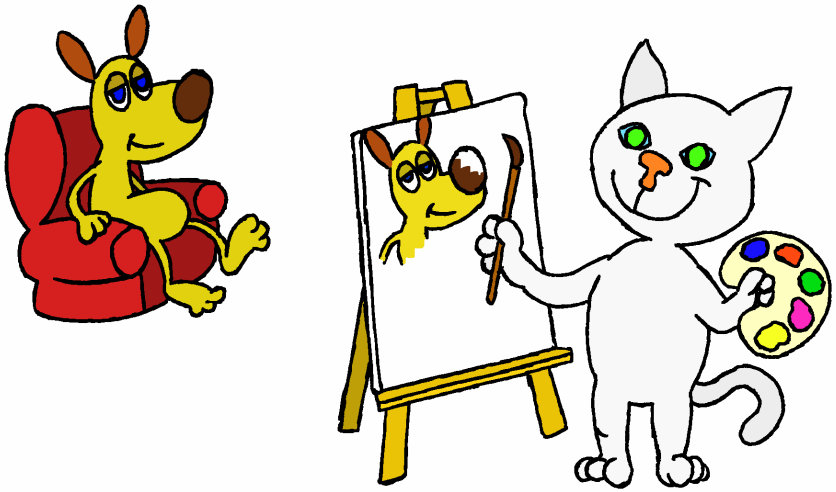
- Optimization from **meaning** to **form** (cf. Burzio):
- Production of a coreferential meaning.
- Production of a disjoint meaning.

- Optimization from **form** to **meaning**:
- Interpretation of a reflexive form.
- Interpretation of a pronominal form.

Production of coreferentiality (children)

Input: coreferential meaning	Principle A	Referential Economy
☞ reflexive form	✓	✓
pronominal form	✓	*!

Production of disjointness (children)



Input: disjoint meaning	Principle A	Referential Economy
reflexive form	*!	✓
☞ pronominal form	✓	*

Interpretation of reflexives (children)

Input: reflexive form	Principle A	Referential Economy
☞ coreferential meaning	✓	
disjoint meaning	*!	

Interpretation of pronouns (children)

Input: pronominal form	Principle A	Referential Economy
☞ coreferential meaning	✓	
☞ disjoint meaning	✓	

Bidirectional optimization (adults)

- Considers production and comprehension simultaneously, i.e. a combination of the unidirectional approaches of form and meaning
- Optimizes over form-meaning **pairs**

- Super-optimal pairs are pairs for which there does not exist another super-optimal pair with a better form OR a better meaning (Blutner, 2000)

- Two rounds of optimization:
    1. <reflexive, coreferential> is super-optimal because it has the best form and the best meaning
    2. <pronoun, disjoint> is the second super-optimal pair because there is no super-optimal pair with a better form OR better meaning

First round of optimization

	Principle A	Referential Economy
<reflexive,coreferential>		
<reflexive, disjoint>		
<pronoun, coreferential>		
<pronoun, disjoint>		

First round of optimization

	Principle A	Referential Economy
<reflexive,coreferential>		
<reflexive, disjoint>		
<pronoun, coreferential>		
<pronoun, disjoint>		

Second round of optimization

	Principle A	Referential Economy
~~<reflexive,coreferential>~~	✓	✓
~~<reflexive, disjoint>~~	*	✓
~~<pronoun, coreferential>~~	✓	*
<pronoun, disjoint>	✓	*

Hypothesis

- Adults' production and interpretation of pronouns and reflexives can be explained by **bidirectional** optimization (i.e. reasoning about alternatives not present in the current situation)

- Children's production and interpretation of pronouns and reflexives can be explained by **unidirectional** optimization.

Prediction:

- When two interpretations are optimal (as in children's unidirectional interpretation of pronouns), the result is chance performance. ➔ Pronoun Interpretation Delay

Experiment

Experimental design

- Correct production of third person form *hem* ('him') will precede correct interpretation of this form.

- Experiment:

  6 verbs which can occur with both a pronoun ("hem") and a reflexive ("zichzelf")

- Two conditions:
  1. Classical Chien & Wexler:

     (1) Here is Papa Bear and Baby Bear
     Baby Bear is washing him/himself

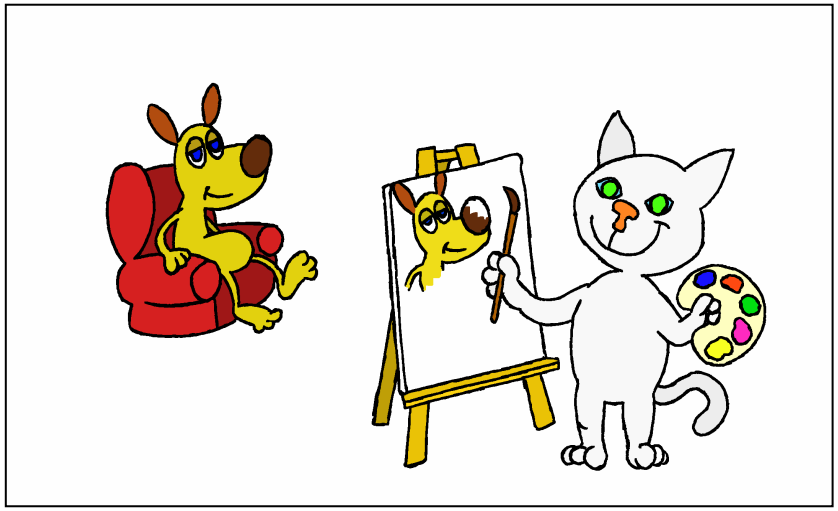
  2. Embedded sentence
     (2) Papa Bear says that Baby Bear is washing him/himself

Setup experiment

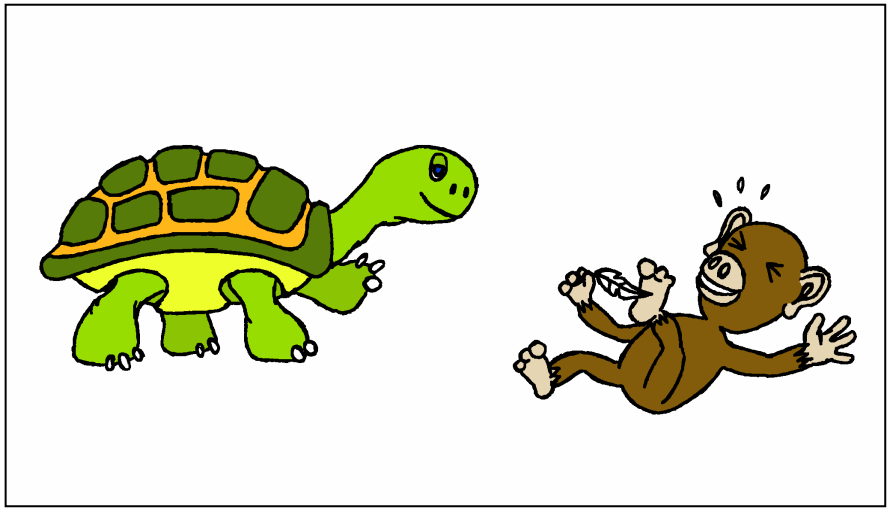
- 26 subjects (age 4 to 7)
- Total of test sentences:
  - Comprehension: 18 sentences (3 no-control items, 3 yes-control items, 6x reflexive, 6x pronoun)
  - Training session: 4 sentences (2x reflexive, 2x pronoun)
  - Production: 10 sentences (5x reflexive, 5x pronoun)
- Each child tested on only 1 condition, but on both comprehension and production

Test items condition 1 - reflexives

- **Hier zie je een hond en een kat**
  'Here are a dog and cat'
  De kat schildert zichzelf (T/F)
  'The cat is painting himself'



- **Hier zie je een schildpad en een aap**
  'Here are a turtle and a monkey'
  De aap kietelt zichzelf (T/F)
  'The monkey is tickling himself'



Test items condition 1 - pronouns

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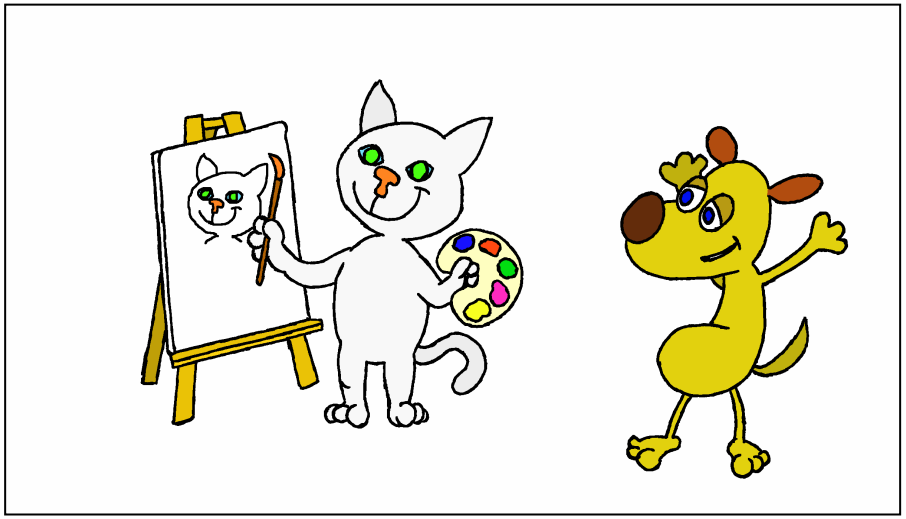
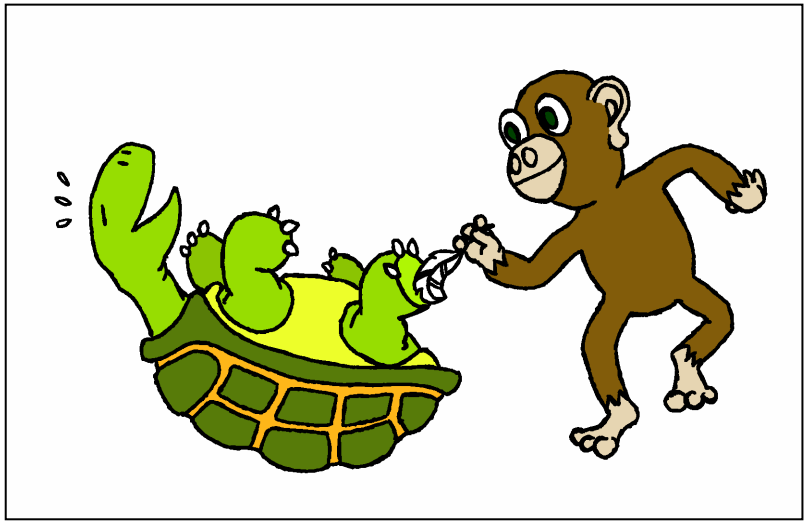
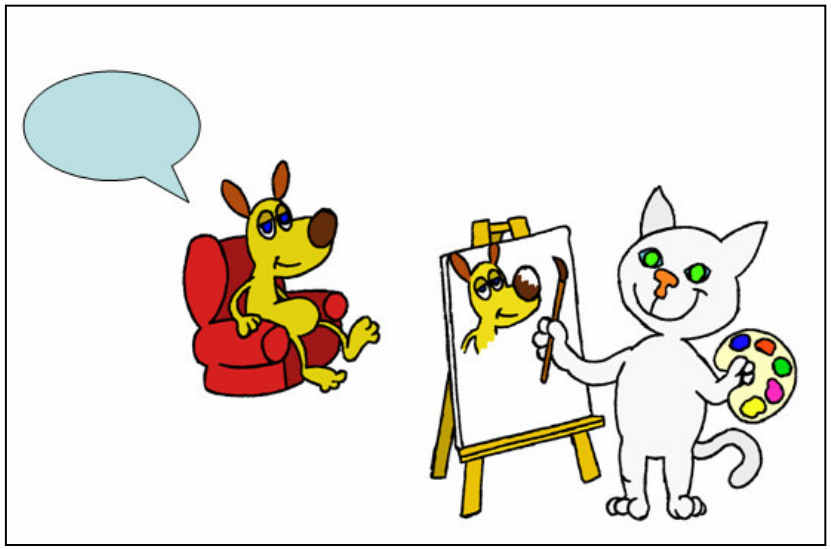


- **Hier zie je een schildpad en een aap**
  'Here are a turtle and a monkey'
  De aap kietelt hem (T/F)
  'The monkey is tickling him'

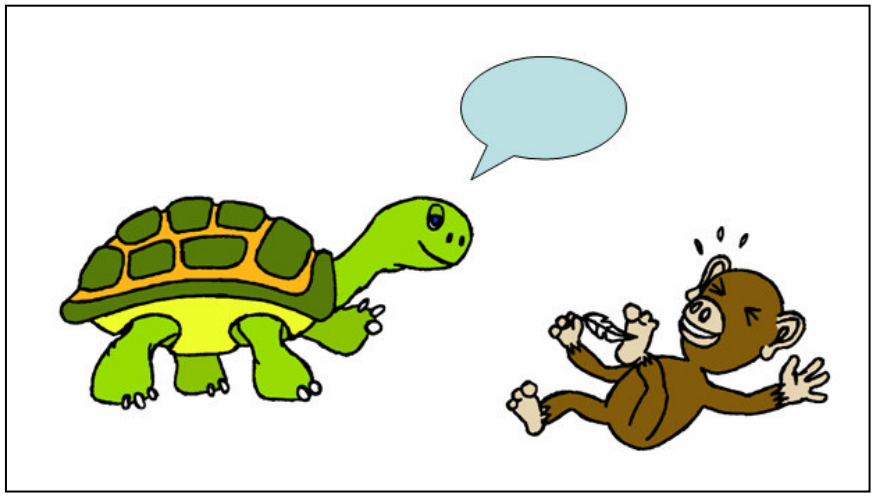


Test items condition 2 – reflexives

De hond zegt dat de kat zichzelf schildert (T/F)
'The dog says that the cat is tickling himself'

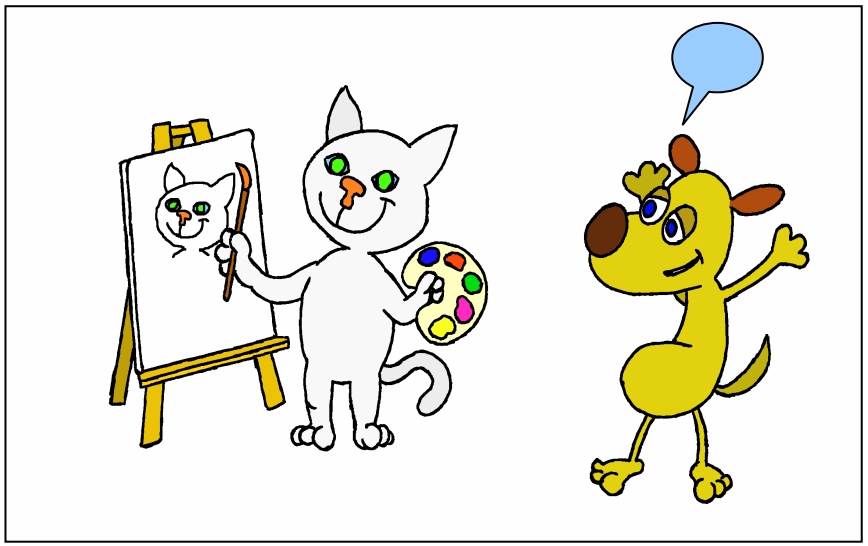


De schildpad zegt dat de aap zichzelf kietelt (T/F)
'The turtle says that the monkey is tickling himself'

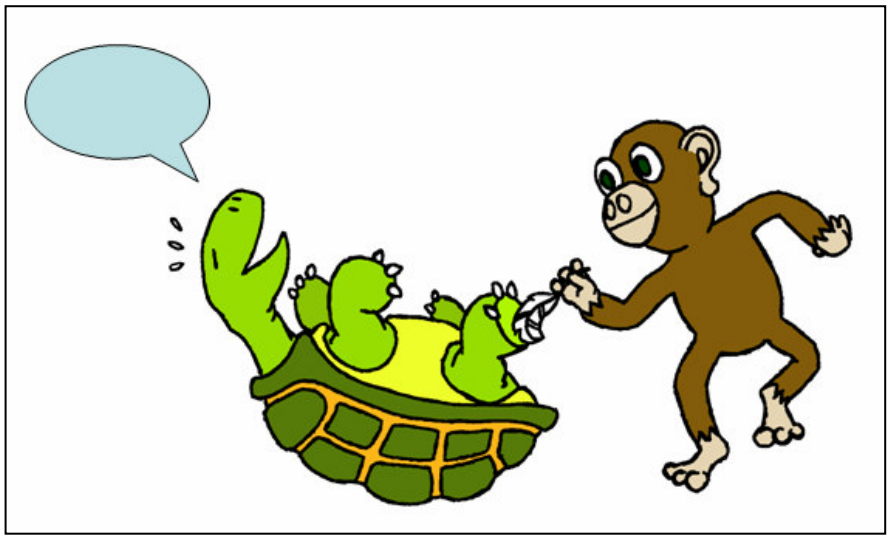


Test items condition 2 - pronouns

De hond zegt dat de kat hem schildert (T/F)
'The dog says that the cat is painting him'



De schildpad zegt dat de aap hem kietelt (T/F)
'The turtle says that the monkey is tickling him'

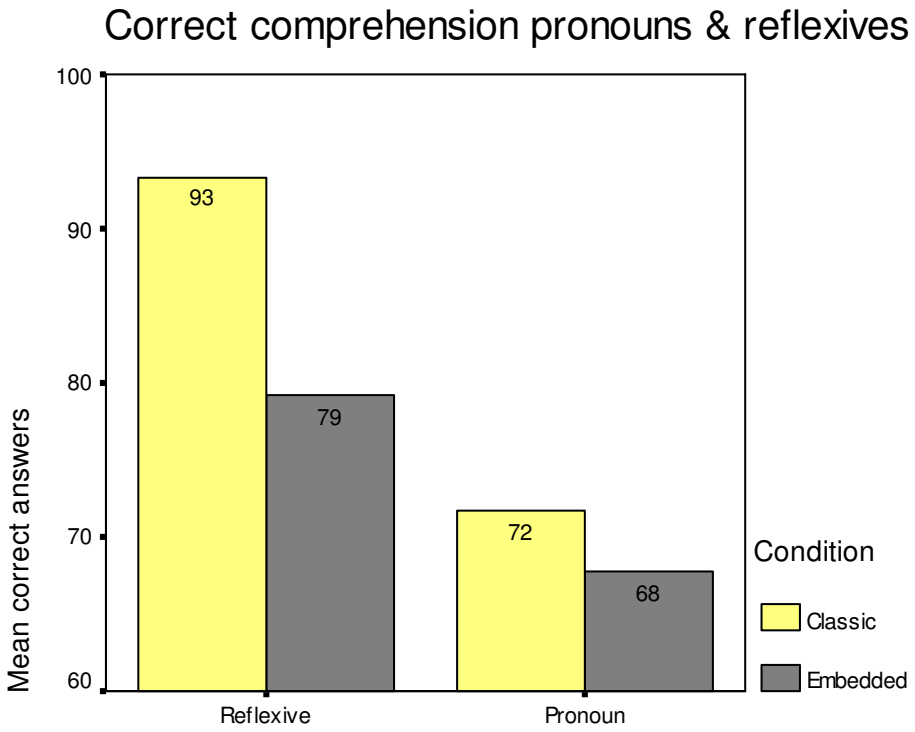


Procedure (cf. DeVilliers & Cahillane (2004))

A laptop and touchscreen were introduced to the child by the experimenter. Whether the computer was build the wrong way or the right way (i.e. whether prerecorded sentences matched displayed pictures or not), was doubted by a puppet. The child was asked to also take a look at the computer and help us.

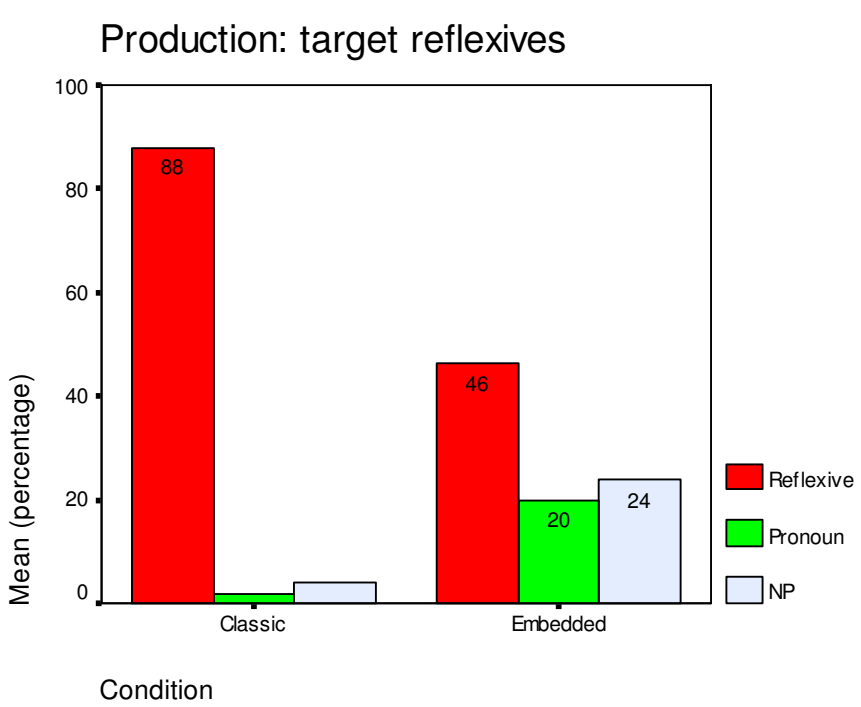
- **Comprehension**:
  - Children have to choose between a green, happy face (the picture describes the prerecorded sentence) and a red, unhappy face (the picture does not describe the picture)
- **Training session:**
  - Children listen to 4 correct items, 2x reflexive pronoun (“zichzelf”), 2x pronoun (“hem”)
- **Production**:
  - “The computer would be much better and nicer if we use your voice. Do you want to help us improve the computer? Let’s record your voice.”

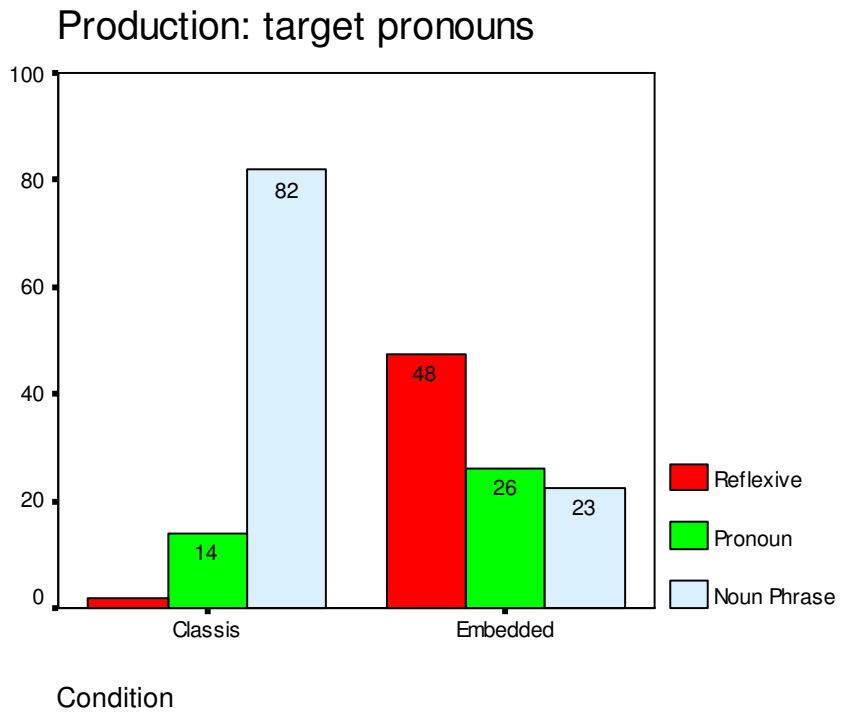
Preliminary results comprehension



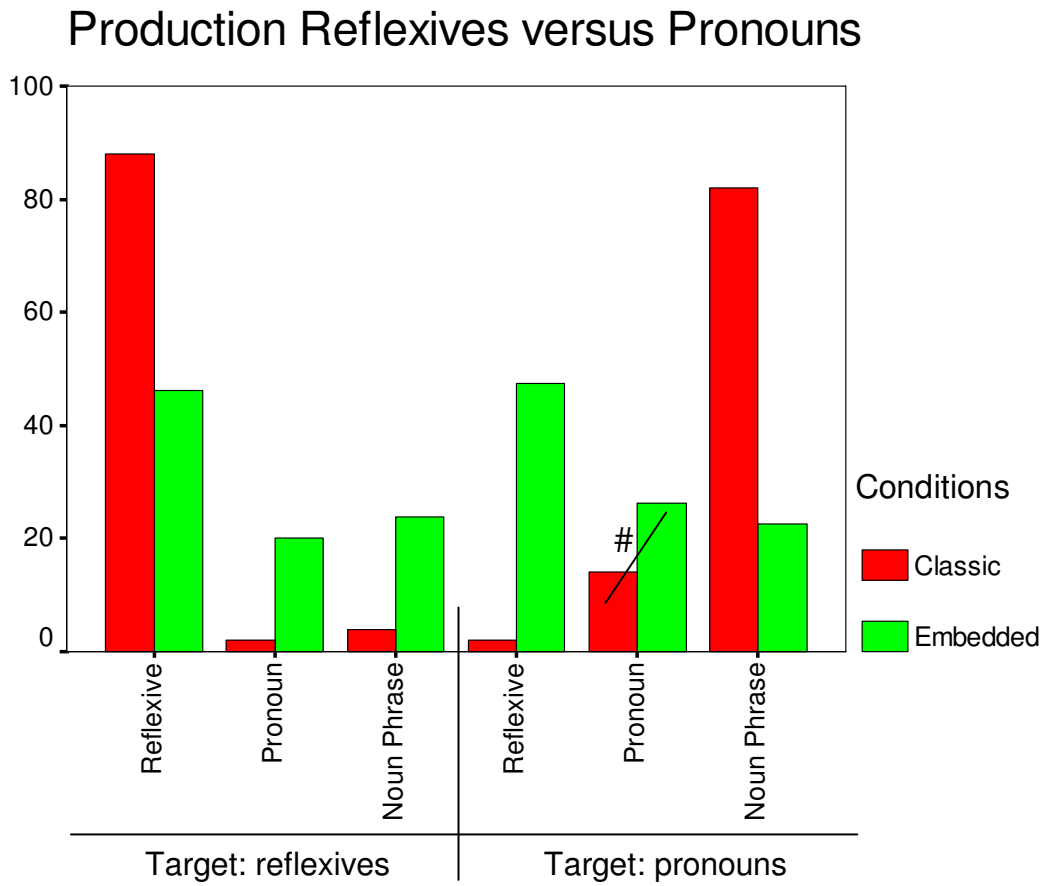
- Reflexives are comprehended correctly in 85% of the time
- Pronouns are comprehended correctly in 69% of the time

Production pronouns versus reflexives





Production pronouns and reflexives



Preliminary results

Comprehension:

- Pronouns are comprehended correctly in 69% of the time
- Reflexives are comprehended correctly in 85% of the time

- Embedded sentences did not made comprehension of reflexives OR pronouns easier.
- Reflexives are easier to interpret than pronouns

Production:

- Children use a NP in stead of a pronoun significantly more in a non-embedded sentence than in an embedded sentence.
- Embedded clauses made production of reflexives harder

Conclusions

- Children have problems with the correct comprehension of third person pronouns
- Children produce pronouns correctly between 4 and 7, but choose significantly more often for an alternative strategy in the case of a non-embedded sentence.
- The observed asymmetry between children's production and comprehension of pronouns can be explained by a single grammar under an Optimality Theory account