

# Domain restriction and quantification in L1A

## The case of *many* versus *all*

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# Outline

## Background

### Quantifiers and domains

Domain restriction

The partitive construction

The weak-strong distinction

### The acquisition of the weak-strong distinction

Geurts (2003)

Hollebrandse and Smits (2005)

### Experiment

Goal and hypothesis

Procedure and setup

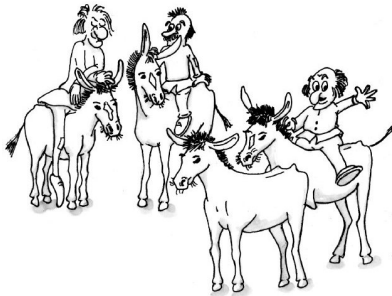
Items

Results

### Summary



# The acquisition of quantification

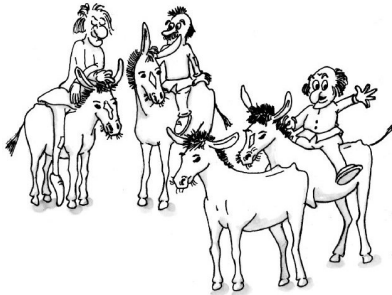


*Is every farmer riding a donkey? (picture taken from Guasti (2002))*

Child answer: **no**, not that one (pointing at the donkey without a farmer)



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## Several accounts

- ▶ Roeper and DeVilliers (1993): Spreading
- ▶ Philip (1995): Event Quantification
- ▶ Drozd (2001) Weak Quantifier Hypothesis
  - ▶ Westerståhl (1985): Many Scandinavians have won the Nobel prize in literature



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## Quantifiers and domain restriction

► Quantifiers obey conservativity:

(1) All parrots are wearing hats  $\Leftrightarrow$  All parrots are parrots that are wearing hats

► However: Westerståhl (1985)

(2) Many Scandinavians have won the Nobel price in literature

$\Leftrightarrow$  Many Scandinavians are Scandinavians that have won the Nobel price in literature

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## However... (1)

### ► OBSERVATION

The effect disappears when a partitive construction is used:

- (3) Many of the Scandinavians have won the Nobel price in literature  $\Leftrightarrow$  Many of the winners of the Nobel price in literature are Scandinavians



## However... (2)

► Milsark (1977):

- (4) There are many/some/three doctors in the room
- (5) \*There are all/every/each doctors in the room

► **OBSERVATION**

The effect disappears when a strong quantifier is used:

- (6) All Scandinavians have won the Nobel price  $\Leftrightarrow$  All winners of the Nobel price are Scandinavians



## Geurts (2003)

- ▶ Weak processing account:
  - ▶ Every boy is riding a horse
    - (7)  $[x : \text{boy}(x)] \langle \text{every} \rangle [y : \text{horse}(y), x \text{ rides } y]$
    - (8)  $*\langle \text{every} \rangle [x, y : \text{boy}(x), \text{horse}(y), x \text{ rides } y]$
    - ▶ (9)  $[\dots : \dots] \langle \text{every} \rangle [x, y : \text{boy}(x), \text{horse}(y), x \text{ rides } y]$
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## Hollebrandse and Smits (2005)

- Acquisition of the strong (10) and weak readings (11) of the Dutch quantifier *allemaal*.

(10) De meisjes dansen allemaal  
The girls are dancing all  
 $\text{allemaal}_{strong} (A,B)$  is true iff  $A - B = 0$

(11) Er fietsen allemaal papegaaien  
There are bicycling allemaal (many) parrots  
 $\text{allemaal}_{weak} (A, B)$  is true iff  $|A \cap B| \geq 2$



## The acquisition of *allemaal*

- ▶ **Hypothesis:** Difficulties with understanding quantified sentences can not only be found in children unable to correctly localize the domain of the quantifier, but also in children unable to correctly interpret the domain of the quantifier (i.e. a consequent strong or weak reading)
- ▶ **Research question:** Is a child able to make a distinction between a weak and/or strong use of *allemaal*?
- ▶ **Expectation:** In line with earlier research (Drozd (2001), Geurts (2003)) children prefer a weak reading.



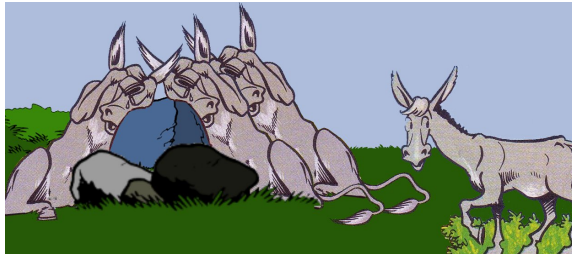
## Experimental design

- ▶ **Research question:**  
Is a child able to distinguish a weak used *allemaal* from a strong used *allemaal*
- ▶ **Experiment:**
  - ▶ Condition: syntactic position of the quantifier (prenominal or floated)
  - ▶ 39 children (range 4;11 to 6;7, 19 girls, 20 boys), TVJ task
  - ▶ Truth Value Judgment Task
  - ▶ Total of test sentences: 18 (12 test items, 3 no-fillers, 3 yes-fillers)



## Testitems

- ▶ De ezels huilen allemaal  
The donkeys cry all  
“The donkeys are all crying”

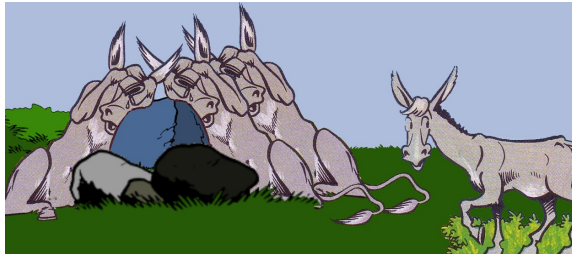


- ▶ Adult answer: no, no that one
- ▶ Child answer: yes (weak reading)



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“There are dancing many girls”



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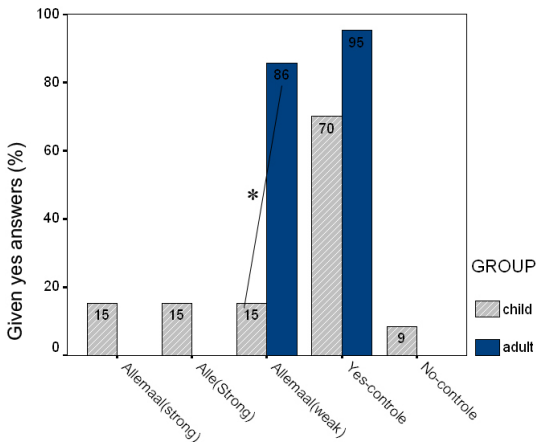
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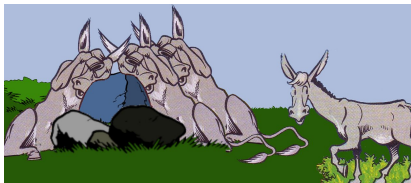
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Children significantly more often interpret *allemaal* as a strong quantifier, even in the case of an existential *there*-sentence



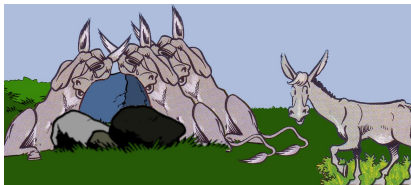
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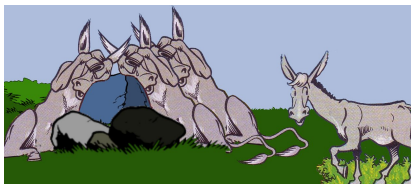
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## Goal and hypothesis

- Goal:** Under which conditions do children apply a strong reading to a weak quantifier and visa versa (or in other words: under which conditions do children apply the quantifier to the wrong noun)?
- H<sub>0</sub>:** The weak-strong distinction reveals a syntactic/semantic distinction that is essential in order to understand quantified sentences, i.e. to localize and interpret the relevant sets the quantifier is distributing over.



## Predictions

- ▶ Given the account of Drozd and Geurts, a preference for a weak reading of the quantifier (i.e. a similar reading as adults get with *many* in the Westerståhl sentences) and no effect of quantifier type



## Procedure

**Age:** 4 - 7

**Task:** Truth value judgment task

**Story:** *At the university, I have built this computer and as you will see, there are a lot of pictures on it, but it is also able to play sentences via those speakers! But the problem is, I don't know whether I build this computer entirely the right way. So, I need your help to check whether the computer has been built the right way or the wrong way. Do you want to help me? OK, well, I will show you the pictures I got on this computer and when I will show you a picture, you will also hear something. Now, if you just want to tell me if this matches the picture or not. All right?*

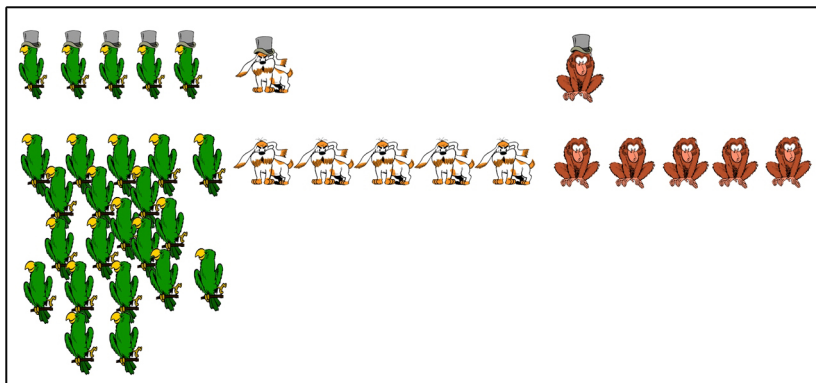


## Setup

### Starting point: Ambiguity of the Westerståhl sentences

- ▶ There is an effect of QUANTIFIER TYPE on the children's interpretation of strong and weak quantified sentences;
  1. Many
  2. Many of
  3. All
- ▶ There is an effect of the SELECTED DOMAIN on the children's interpretation;
  - ▶ Set of entities whose properties are denoted by the VP
  - ▶ Set of entities denoted by the NP
- ▶ Total of items: 25

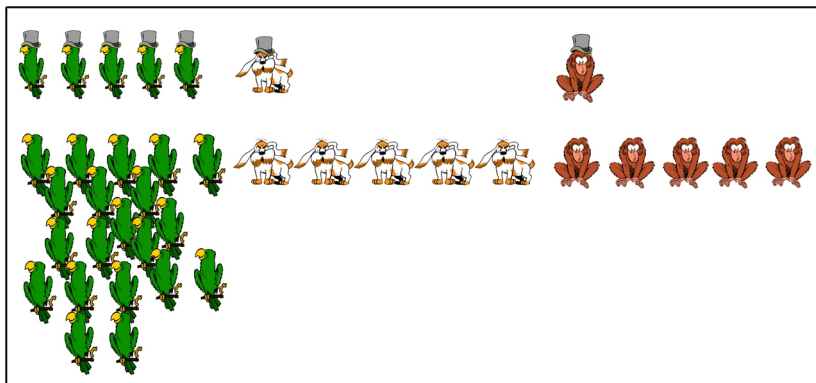




*(Many / Many of the) parrots are wearing hats*

- ▶ Adult answer: no / yes
- ▶ Child answer: **yes** (weak reading)

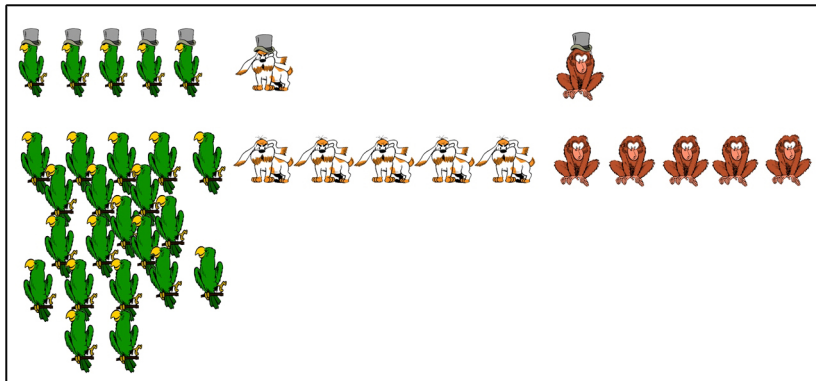




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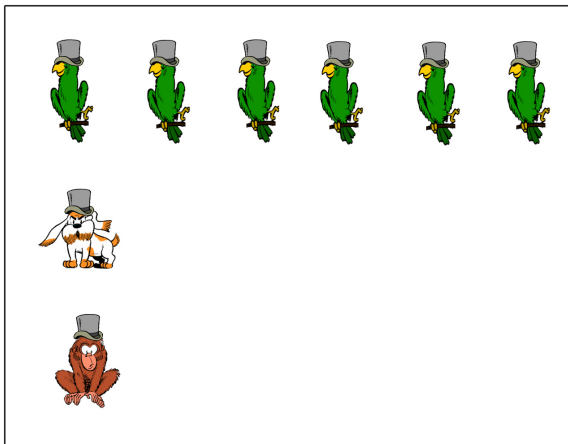




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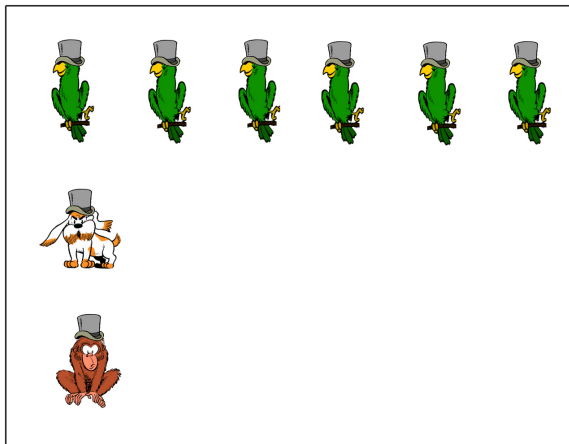
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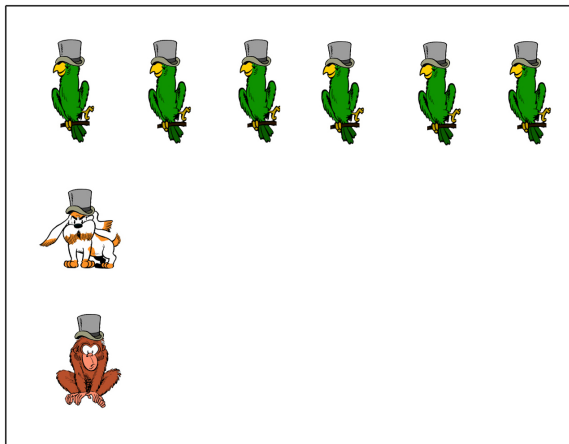
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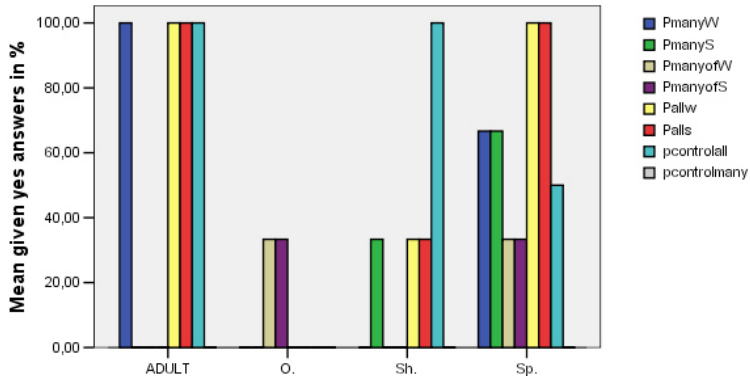
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*All parrots are wearing hats*

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## Preliminary results



## Observations

- ▶ Both Sp. and Sh. behave partly conform the hypothesis and quantify over the set of e.g. hat-wearers;
  - ▶ Child Sp. w.r.t. *many* and *many of*
  - ▶ Child Sh. initially w.r.t. *all*
- ▶ The children do notice the difference between the partitive and non-partitive case
- ▶ The children do notice that the experimenter selects different domains across test items.



## In sum

1. Whether the weak-strong distinction plays a key-role in the acquisition of quantification is still under discussion.
2. The child's understanding of sentences w.r.t. pictures that really match the Scandinavian cases is needed
3. Domain restriction needs more attention in the acquisition of quantification



## Acknowledgments

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