

Asserting and presupposing grammatical number

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The problem

- Early mastery of number marking in verbs and nominals in spontaneous speech but arguments for number gap in production
- Early sensitivity to number in comprehension but persistent inability to choose scenarios according to the grammatical number contrast

Goals

☑ To examine gap in number comprehension in two languages with differences in morphological encoding of number

- English $[_{dp} D N\#] [_{np} V\# \dots]$
- Spanish $[_{dp} D\# N\#] [_{np} V\# \dots]$

☑ To explore potential explanations for the number gap

English

- Early sensitivity to number with simple presentational sentences (Kouider et al 2006)
 - a. Look, there **are some** blickets/There **is a** blicket.
 - b. Look at the blick**ets**/the blick**et**
- Older children often fail to chose correct picture on the basis of verb-only or verb & subject encoding of plural (Johnson et al 2004)
 - a. **The cat is/the cats are** sleeping on the bed.
 - b. The cat **sleeps**/the cat **sleep** on the bed.

In Spanish

- Aguado Orea (2004): Low productivity, but achieve target rates of use early (before 2;5)
- Casla, Aguado-Orea & Pine (2005) children avoid using plurals in stories depicting multiple participants in same event (2;10- 4;0)
- Pérez-Leroux (2005) replicated Johnson et al. with comparable data: no discrimination under 4, accuracy in the 60-70% range for 5-6 year olds.

Questions

- Why do children perform so low in these comprehension tasks?
 - Methods: A task effect?
 - Performance: Processing of the morphology (amount of information)?
 - Input: How transparent is number?
 - Grammar: The semantics of number (presupposition?/implicature?/assertion?)

Plural problems

- Generic contexts:
Squirrels live in trees (no quantity)
- Negative determiners:
No chairs are available (=not 1)
- Questions:
do you have brothers? (=true if 1)

Singular problems

- **Dependent plurals** (Kamp & Reyle 1993)
Three of the lawyers hired a secretary. (3 or 1?)
- **Romance inalienable possession** (Gueron 1985)
Dos niños movieron la cabeza.
Two children shook the head (=2)
- **Incorporated nouns** (Farkas & deSwart 2003)
Mari b elyeget gy ujt.
Mari stamp.Sg.Acc collect (>1)

What is number?

- A presupposition (strong theory)
 - Singular is strong (cardinality=1)
 - Plural (cardinality =more than 1)
- Asymmetric contributions. Weak theory
 - Sing presupposes =1, Pl does not have presuppositions. The interpretation (>1) is an implicature.
 - “..pragmatic principles block the use of the plural in cases where the singular is appropriate, rather than its inherent semantic content.” (Sauerland 2003)

Hypothesis

- H1: results are task-related. Methodological improvements will improve performance
- H2: Lexical number (one/many) will be easier to process for either semantic reasons (=assertion) or processing (a full word)
- H3: Only processing. Different encodings of grammatical number will fully determine results

Study



- Offline version of picture selection task, after Johnson et al.
Show me “the birds are...”
- 3 or more participants in collective event
- Number production control checks (1 sg/1 pl item). *“What is going on in this picture?”*
⇒ 100% correct
- Addition of lexical number condition (*one/many*)

In Spanish

- Explicit grammatical number [_{dp} D# N#] [_{np} V# ...]
Los pajaros se bañan en la fuente /
El pajaros se baña en la fuente
- Masked nominal number [_{dp} Ø] [_{np} V# ...]
Se bañan en la fuente / se baña en la fuente
- Lexical number
Muchos pájaros.../Un pájaro

In English

- Explicit grammatical number $[_{dp} D N\#] [_{np} V\# \dots]$
The birds are splashing in the fountain / The bird is...
- Masked nominal number $[_{dp} D N] [_{np} V\# \dots]$
The birds ∇ splash in the fountain / the bird splashes
- Lexical number
Many birds / One bird

English Study

- 41 English-speaking children
 - 3 year olds (N=12), 2;7-3;8
 - 4 year olds (N=14), 4;1-5;0
 - 5 year olds (N=15) 5;1-6;0

English/lexical number

- High accuracy with lexical condition

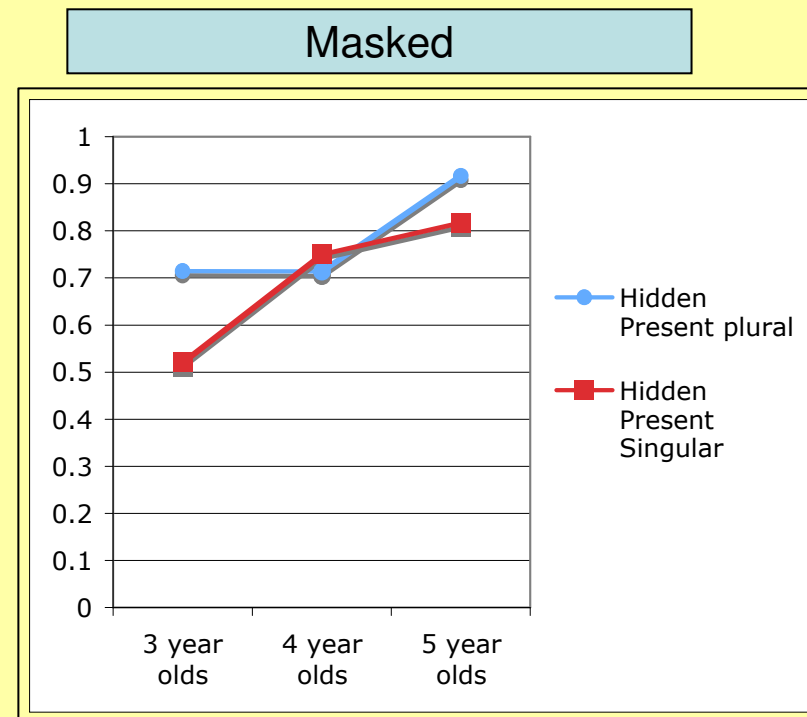
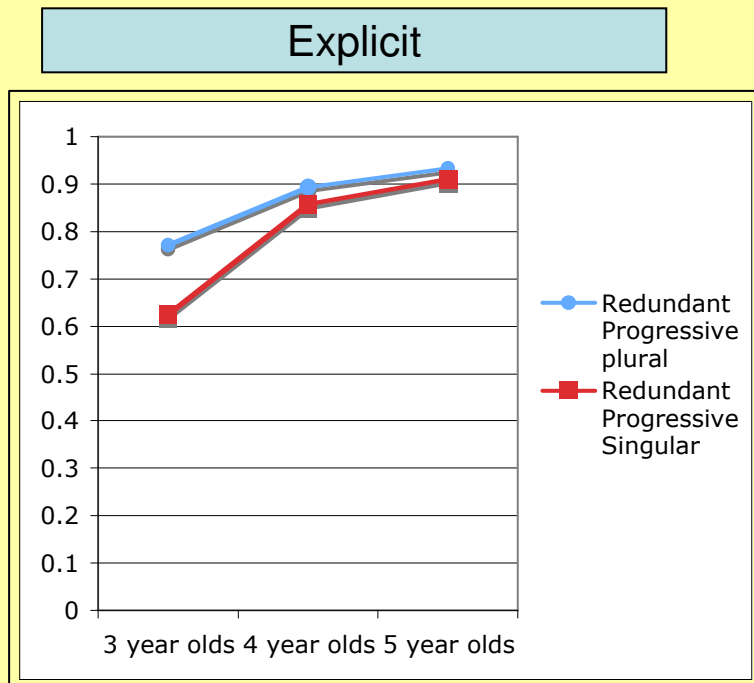
*Group $F_{2,38}=4.39$, $p=.02$; Number $F_{1,38}=3.93$, $p=.06$

Table 1: Accuracy with lexical quantifiers across groups

	Plural	Singular
3 year olds	0.75	0.917
4 year olds	0.893	0.964
5 year olds	1	0.967

English grammatical number

- **Group ($F_{2,38}=9.68, p=.000$) **Condition ($F_{1,38}=13.62, p=.000$); number missed significance at .08)



Spanish study

- 25 Spanish speaking children aged 4;2-6;1.
 - 4-5 year olds (N=13), 4;2-5;4
 - 5-6 year olds (N=12), 5;5-6;10

Spanish/Lexical number

- High accuracy with lexical condition
- No differences with these older children

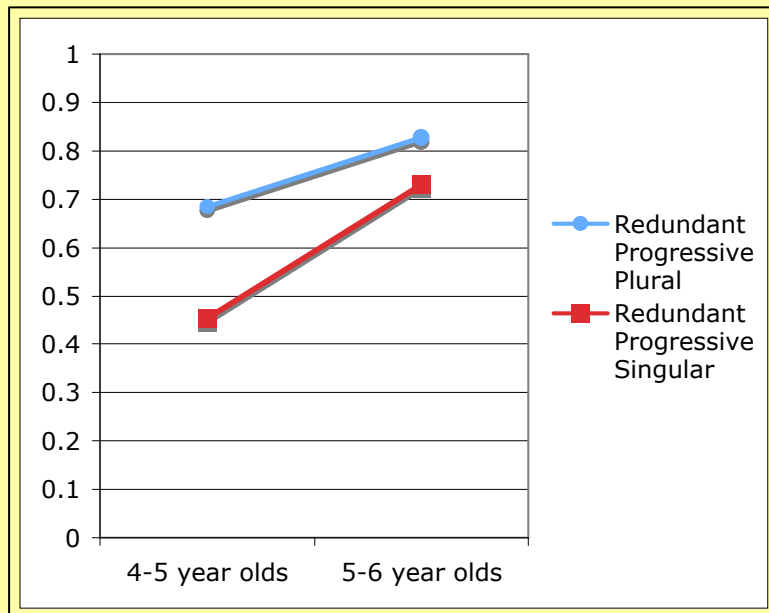
Table 3: Accuracy with lexical quantifiers in Spanish

	Plural LexQ	Singular LexQ
4-5 year olds	0.885	0.846
5-6 year olds	1	0.91

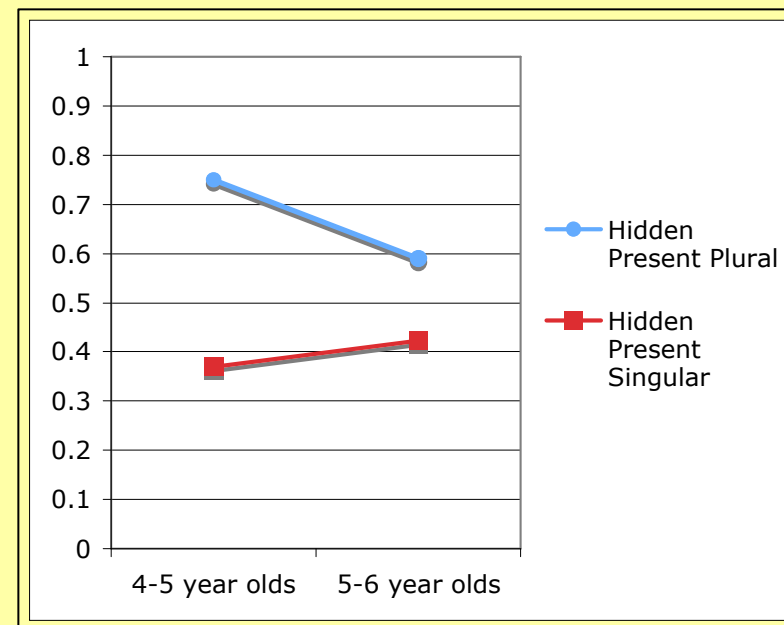
Spanish grammatical number

- *Group ($F_{1,23}=4.92, p=.04$); *Condition ($F_{1,23}=12.92, p=.002$); number ($F_{1,23}=7.7, p=.01$); Condition x Group ($F_{1,23}=9.12, p=.006$);

Explicit



Masked



Summary

- Children's errors are replicated (!)
- Task improvements do not lead to improved results; the production controls confirm the asymmetry comprehension/production
- Lexical (i.e., asserted) number is unproblematic for all children
- Significant effect of condition (processing plays a role?)
- No great advantage of Spanish

- Significant development in the ages examined (no discrimination at 3, pl/sg differences at 4)
- In English, number approached significance but the trends were opposite for lexical than for morphological number
- Spanish at ceiling for lexical number, plural advantage for grammatical number

Therefore...

Fully inflected
languages like
do not particular
advantage

Morphological
explicitness
a factor but unlikely
to be the full story

Lexical number
unproblematic,
Grammatical number
retains a
substantial
comprehension gap

We need

- Models to detect presupposition failure
- Models to distinguishing acquisition of a presupposition or development of implicatures