Learnability in Romance
How indirect input helps children acquire the contrast between null and overt subjects

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Subject pronouns in pro-drop languages

What does a pronoun refer to?

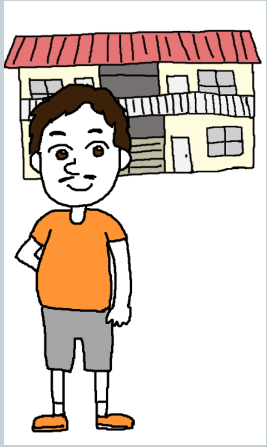
"… … … ***ellas*** … … … … … … … **ø** … … … … … … … … …
… … … … … … … … … ***él*** … **ø** … … … … …"

Clues:

- pronominal form
- phi-feature semantics
- real-world knowledge
- Principle B
- semantic relations between clauses
- prominence of potential antecedents

The null/overt distinction:

?



(1) a. *Juan llamó a Pedro cuando* ***ø*** *estaba en casa.*
Juan called Pedro when ___ was at home.

b. *Juan llamó a Pedro cuando* ***él*** *estaba en casa.*
Juan called Pedro when **he** was at home.

Who was at home?

ø **= *Juan***
él **= *Pedro***

"same-reference"

"switch-reference"

The information provided is probabilistic

(1) a. *Juan llamó a Pedro cuando ø estaba en casa.*
Juan called Pedro when ___ was at home.

P(ø = Juan) → high

b. *Juan llamó a Pedro cuando **él** estaba en casa.*
Juan called Pedro when **he** was at home.

P(***él*** = Juan) → low

The learning task: associate switch-reference with increased overt pronoun use

(1) a. *Juan llamó a Pedro cuando* {**ø : *él***} *estaba en casa.*
Juan called Pedro when ***pro:he*** was at home.

Juan at home → less ***él***

b. *Juan llamó a Pedro cuando* {**ø : *él***} *estaba en casa.*
Juan called Pedro when ***pro:he*** was at home.

Pedro at home → more ***él***

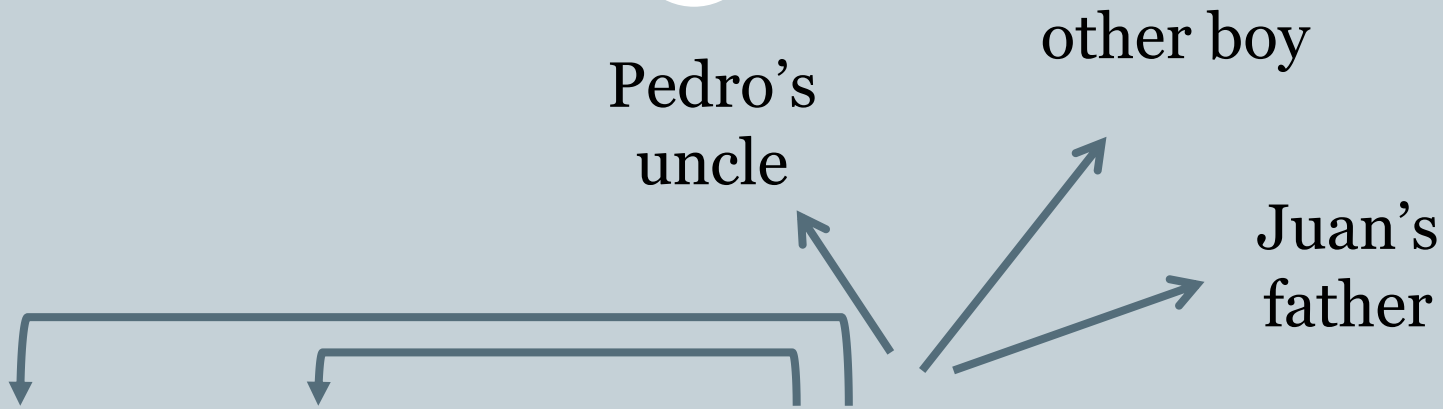
Problem: pronouns are underspecified

(2) *Juan llamó a Pedro cuando* {*Juan*} *estaba en casa.*
Juan called Pedro when Juan was at home.

Problem: pronouns are underspecified

(3) *Juan llamó a Pedro cuando* {*el nene*} *estaba en casa*.
Juan called Pedro when the boy was at home.

Problem: pronouns are underspecified



(3) *Juan llamó a Pedro cuando* {**ø** : ***él***} *estaba en casa.*

Juan called Pedro when *pro* : he was at home.

Problem: pronouns are underspecified

(3) *Juan llamó a Pedro cuando* {*ø* : *él*} *estaba en casa.*

Juan called Pedro when *pro* : he was at home.

real-world knowledge

Principle B

semantic relations between clauses

prominence of potential antecedents

Solution: 1st & 2nd person are *less* underspecified

- *I* – the speaker at the intended time/world
- *you* – the intended addressee at the intended time/world
- *he* – the intended sg, masc. person at the intended time/world

(4) *Tú llamaste a Pedro cuando* {*ø* : *tú*} *estabas en casa.*
You called Pedro when *pro* : you were at home.

(5) *María llamó a ti cuando* {*ø* : *tú*} *estabas en casa.*
Maria called you when *pro* : you were at home.

Proposal

- Question: How do children acquire the null/overt contrast?
- Proposal:
  - Step 1: Track the realization of 1st and 2nd person pronouns in same-reference vs. switch-reference contexts.
  - Step 2: Transfer this knowledge to the interpretation of null and overt 3rd person pronouns.

Roadmap

- Background: Acquisition of the null/overt distinction
- Q1: *Is the contrast between null/overt subjects evident in 1st and 2nd person pronouns in children's input?*
- Q2: *Do children show knowledge of this contrast in their own production?*

  Corpus Study
- *Can children use this knowledge to resolve 3rd person pronouns?*

  Comprehension Study

Acquisition of subject pronouns: production

Production

Comprehension

Overt DP subjects appear (Grinstead 2004)

~6% overt pronouns in overlapping env'ts

Realization is conditioned by same/switch reference. (Shin 2016)

~10% overt pronouns in overlapping env'ts (Shin 2012, 2016)

~20% in adults

Acquisition of subject pronouns: comprehension

Production

Comprehension

Adult-like felicity judgments of **overt** and **null** use (Sorace et al. 2009, Shin & Cairns 2012)

Persistent misuse by bilingual and L2 learners (Belleti e tal. 2007, Montrul 2004, 2014, White 2011, a.o.)

Acquisition background: pronoun resolution

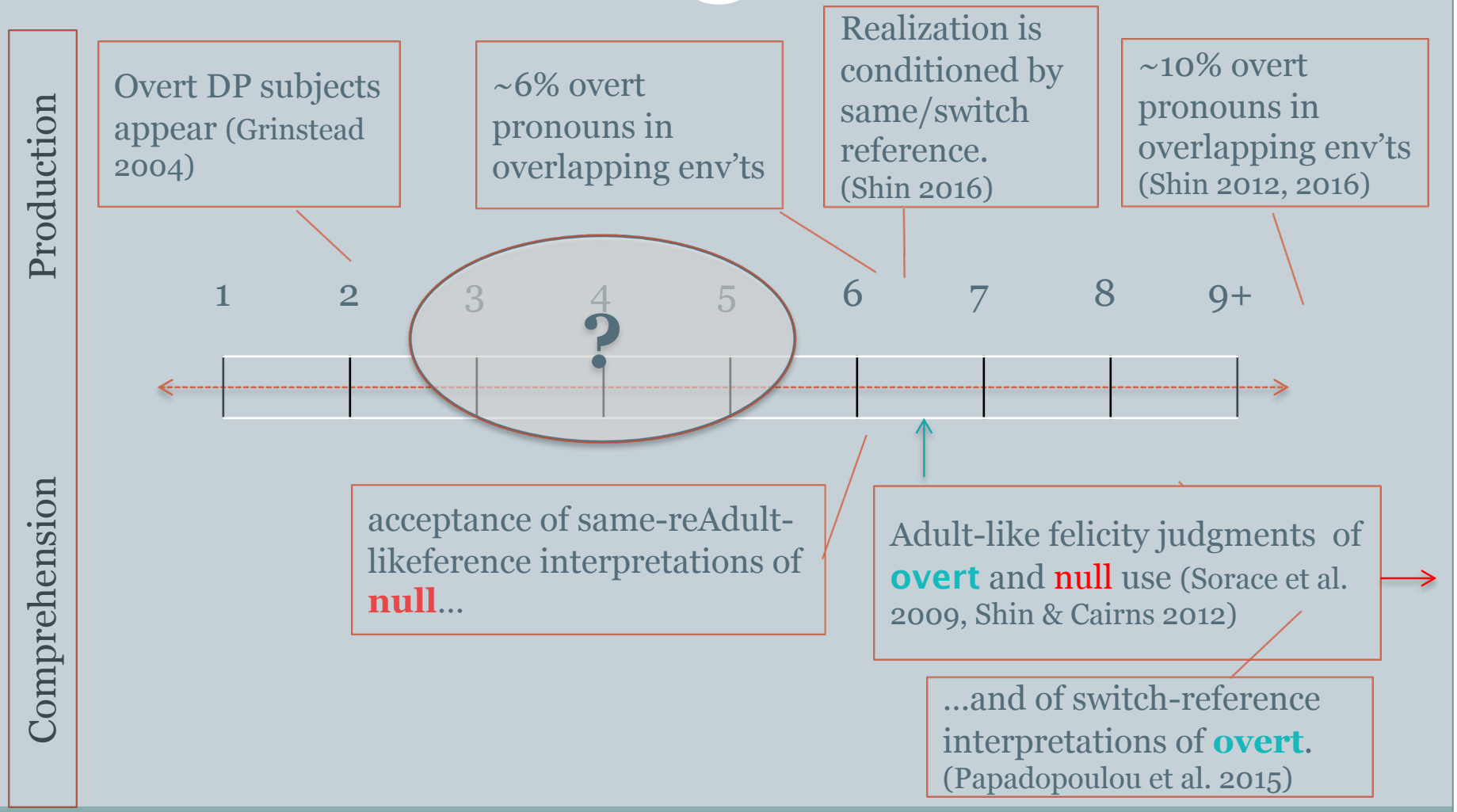
Production

Comprehension

Adult-like acceptance of same-reference interpretations of **null**…

…and of switch-reference interpretations of **overt**. (Papadopoulou et al. 2015)

Acquisition background: pronoun resolution



Production: Data Extraction (Schmitt-Miller Corpus)

CHI	Age	MLU	Total Input Word Count	Total Output Word Count
YGSZ	3;9	3.652	9,608	10,190
YBM	4;5	3.993	11,054	8,373
OMJ	4;8	3.87	11,934	7,314
KUC	5;1	4.522	11,721	9,393
JRC	5;11	3.735	13,114	10,548
	Mean: 4;9	Mean: 3.954	57,431	45,818

Data Coding

- What was coded: Subject of each tensed verb preceded by another tensed verb in the same turn (uninterrupted string of speech from a single individual)
- Factor 1: **overt** vs **null**
- Factor 2 reference:
  - **same** = subject of tensed verb refers to same entity as the preceding subject
  - **switch** = subject refers to different entity from previous subject
- Exclusions: non-alternating cases, inanimate (so that 3p was parallel to 1p and 2p), lyrics/reading, imperatives, repetitions, set phrases (*sale, viste,* etc.)

The null-overt choice is probabilistic

Talking about a trapeze artist…

Clause 0	*ø estuvo a punto de caerse,*
	(She) was about to fall,
Clause 1	*pero no, porque* {ø/*ella*} *es una experta bailarina*
	but no, because (she) is an expert dancer
Clause 2	*y* {ø/*ella*} *tiene todo el equilibrio para poder bailar en una cuerda floja!*
	and (she) has all the balance to be able to dance on a tightrope!

These environments promote the null subject.

The null-overt choice is probabilistic

Clause 0	*ø estuvo a punto de caerse,*
	(She) was about to fall,
Clause 1	*pero no, porque {ø / **ella**} es una experta bailarina*
	but no, because (she) is an expert dancer
Clause 2	*y {**ø** / ella} tiene todo el equilibrio para poder bailar en una cuerda floja!*
	and (she) has all the balance to be able to dance on a tightrope!

But either can be used.

The null-overt choice is probabilistic

Pretending to calm down some fierce lions with a lullaby…

Clause 0 *Cántasela,*

(you) sing it to them,

Clause 1 *para que* {ø/*yo*} *me siente un ratito*

so that (I) can sit down for a sec.

Pretending to be a doctor…

Clause 0 *Okey, entonces ø ya no le doy esta receta*

Okay, then (I) won't give you this prescription

Clause 1 *y ya* {ø/*usted*} *no va a comer lunetas nunca más en la vida*

and now (you) will never eat lunetas ever in your life.

These environments promote overt pronouns.

The null-overt choice is probabilistic

Pretending to calm down hungry lions with a lullaby…

Clause 0 *Cántasela,*

(you) sing it to them,

Clause 1 *para que* {ø / ***yo***} *me siente un ratito*

so that (I) can sit down for a sec.

Pretending to be a doctor prescribing cookies called lunetas…

Clause 0 *Okey, entonces ø ya no le doy esta receta*

Okay, then (I) won't give you this prescription

Clause 1 *y ya* {**ø** / *usted*} *no va a comer lunetas nunca más en la vida*

and now (you) will never eat lunetas ever in your life.

But either can be used

Results

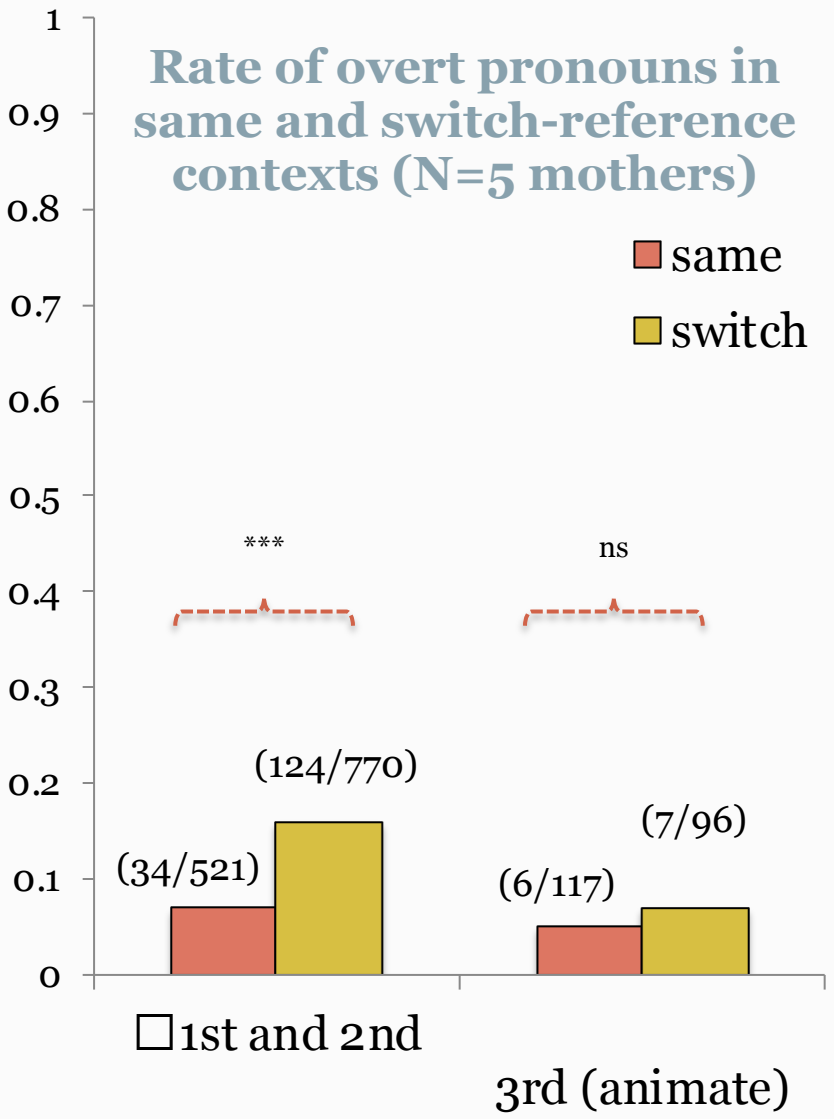
	% overt pronouns
Child-directed speech, Mexico City (this study)	12.7% (540/4,320)
Adult-directed speech, Mexico City (Lastra & Butragueño 2015)	21.7% (443/2,040)
Children 3-6 (this study)	12.6% (417/3,314)
Children 6-7, Querétaro & Oaxaca (Shin 2016)	6.3 - 8% (148/1,845)

Is the contrast between null/overt subjects evident in 1st and 2nd person pronouns in children's input?

Q1

Results: Mothers

- 1st & 2nd person: **Significant contrast** between same and switch-reference contexts ($\chi(1) = 25.4, p < 0.001$).
- 3rd person: Numerical difference in the same direction, not significant ($\chi(1) = 0.15, p = 0.70$).
- Conclusion: The input signal is not only **available** but **stronger** when looking at 1st and 2nd person pronouns.

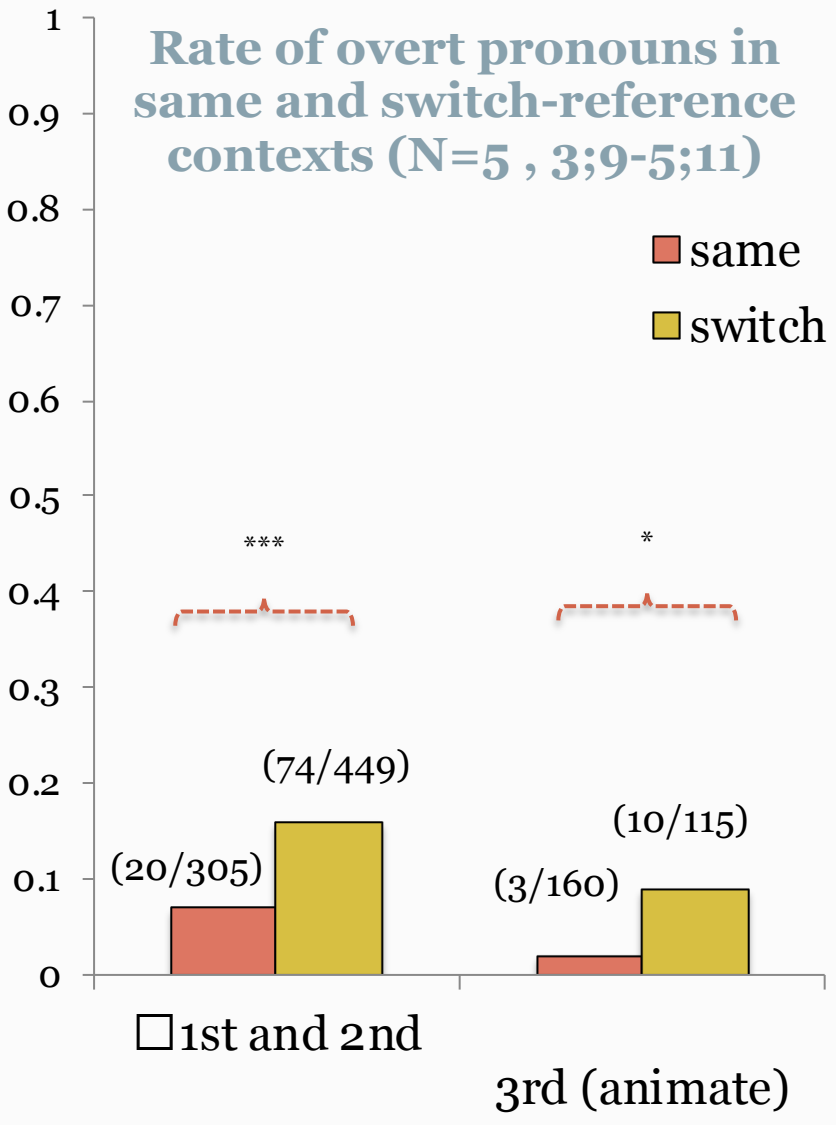


Do children show knowledge of the null/overt contrast in their own production?

Q2

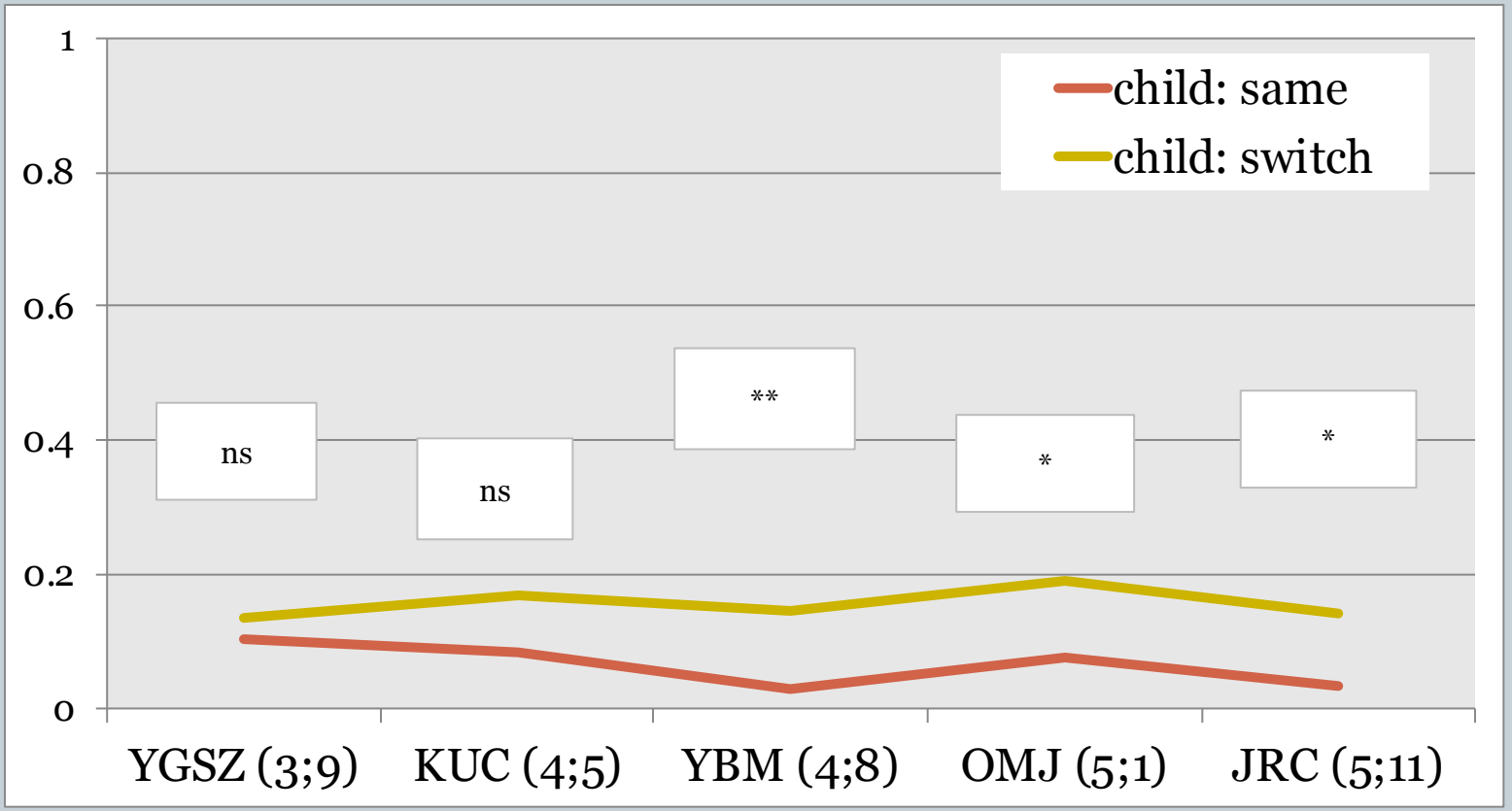
Results: Children

- Significant contrast in **both** 1st and 2nd person ($\chi(1) = 15.5$, $p < 0.001$) and 3rd person ($\chi(1) = 5.5$, $p = 0.02$)
- Conclusion: **Children under 6** show sensitivity to the null/overt contrast.



Production results by individual child

- Our sample suggests acquisition somewhere **between 4;5 and 4;8**.



Can children transfer their knowledge of the contrast between null and overt 1st & 2nd person pronouns to their interpretation of ambiguous 3rd person pronouns?

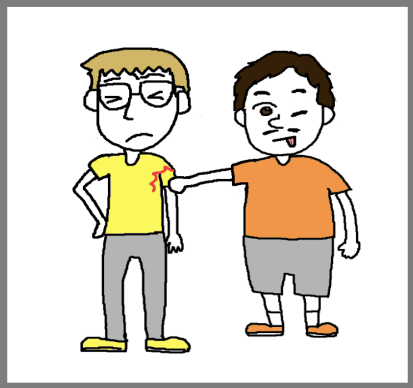
Q3

Comprehension study

- Methods: pronoun resolution using forced-choice picture selection
- Subjects:
  - adults: $N = 40$
  - younger children: 2;11-4;6, $N = 40$
  - older children: 4;7-6;4, $N = 33$

Methods

object referent →



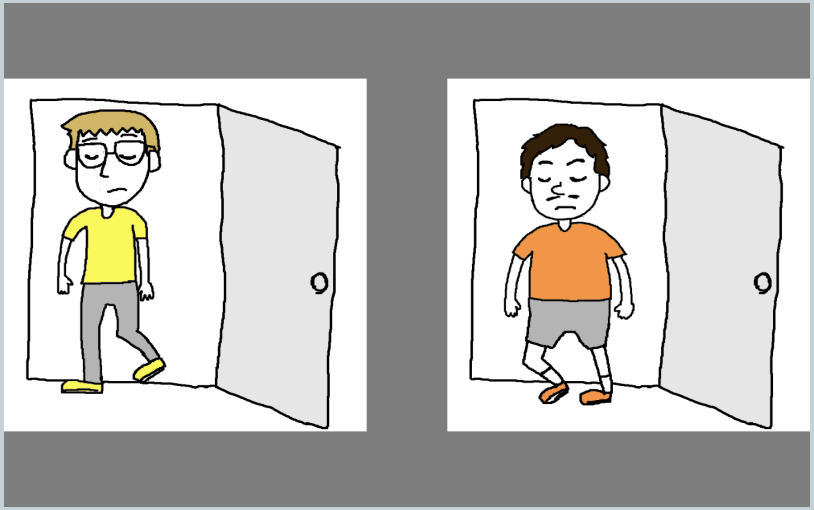
← subject referent

Juan le pega a Pedro

Juan hits Pedro

Methods

switch-reference (preceding object)



same-reference (preceding subject)

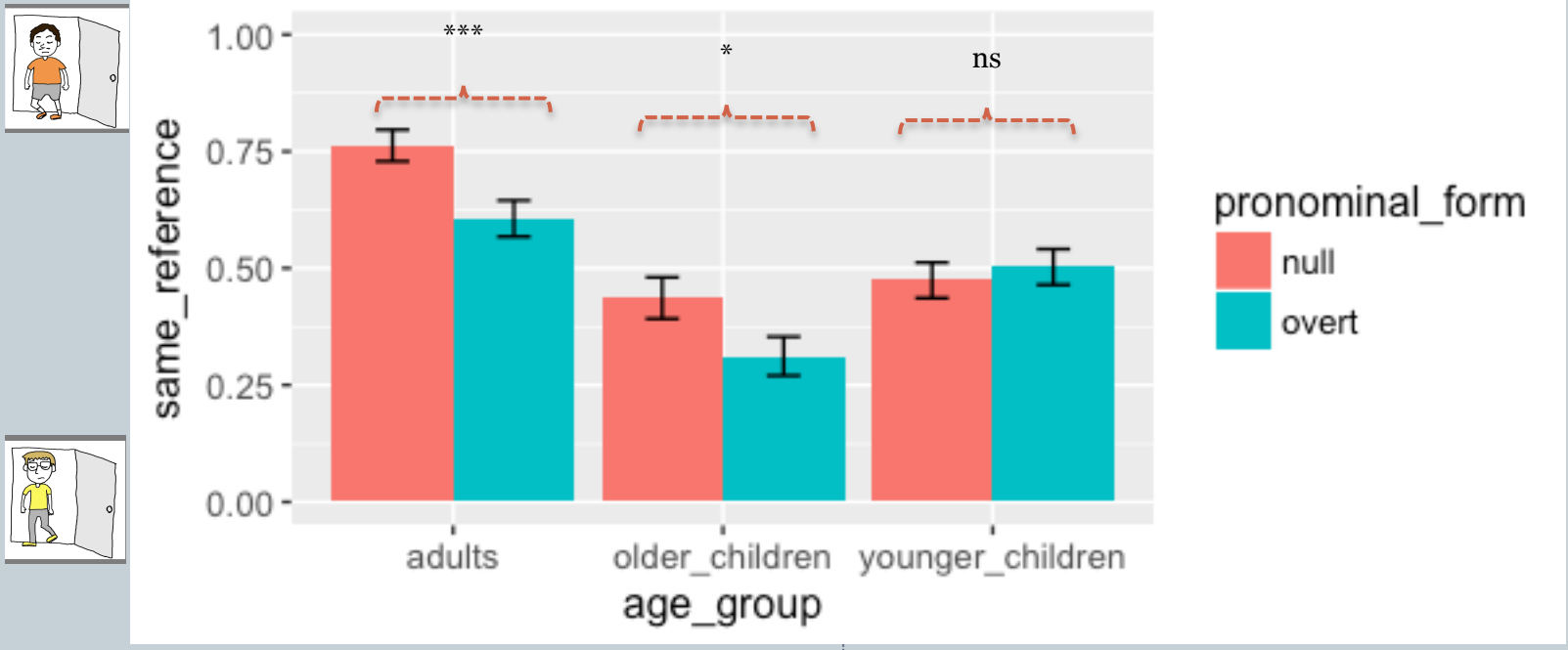
*…y después {**ø**/**él**} se va.*

…and then {*pro*/he} leaves.

Comprehension Results: *X hits Y and then…*

- Adults: significant difference between conditions.
- Older children: significant difference between ***null*** and **overt** conditions
- Younger children: no significant difference

Fig. 1. Proportion of same-reference responses by adults (N = 40), older children (4;7-6;4, N = 33), and younger children (2;11-4;6, N = 40), version 1

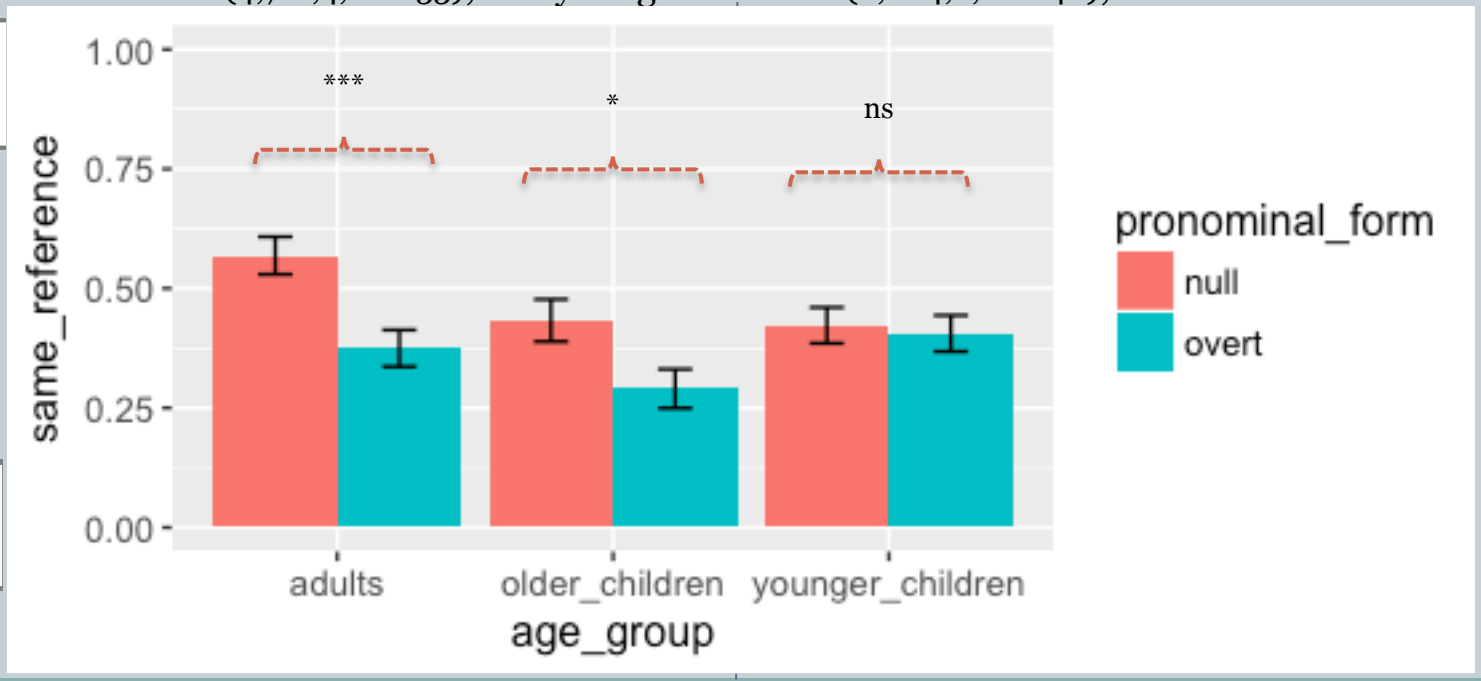


Comprehension Results: *X hits Y because of that…*

(6) *Juan le pega a Pedro y* ***por eso*** *ø/él se va.*
Juan hits Pedro and **because of that** he leaves.

- Same pattern of results.

Fig. 2. Proportion of same-reference responses by adults (N = 40), older children (4;7-6;4, N = 33), and younger children (2;11-4;6, N = 40), version 2



Discussion

- Children age 4;7 - 6;4 use the null/overt contrast to interpret 3rd person pronouns.

Summary of results

Q1: *Is the contrast between null/overt subjects evident in 1st and 2nd person pronouns in children's input?*

- Yes, in fact the statistical contrast is stronger in 1st & 2nd than 3rd.

Q2: *Do children show knowledge of this contrast in production?*

- Yes, by around 4½ years of age.

Q3: *Can children use this knowledge to interpret 3rd person pronouns?*

- Yes, at around the same age.

Thanks!

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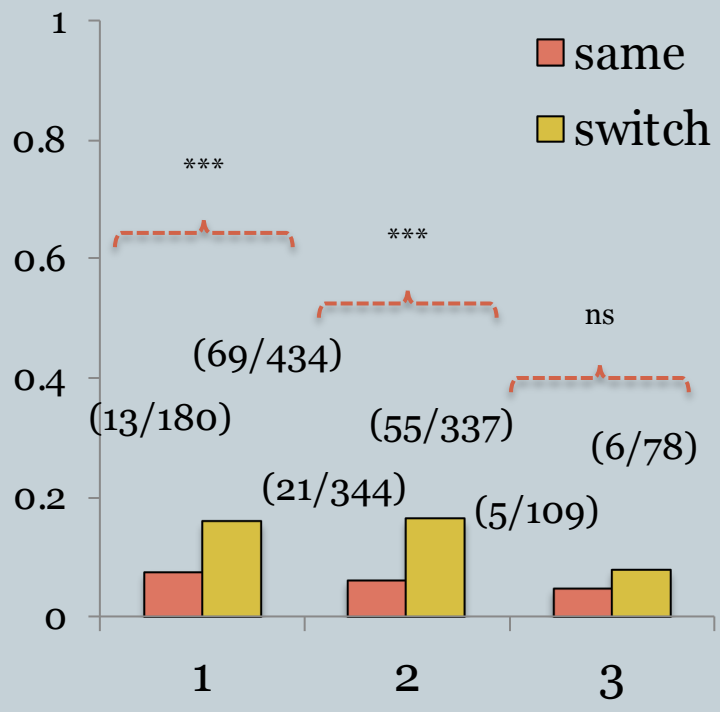
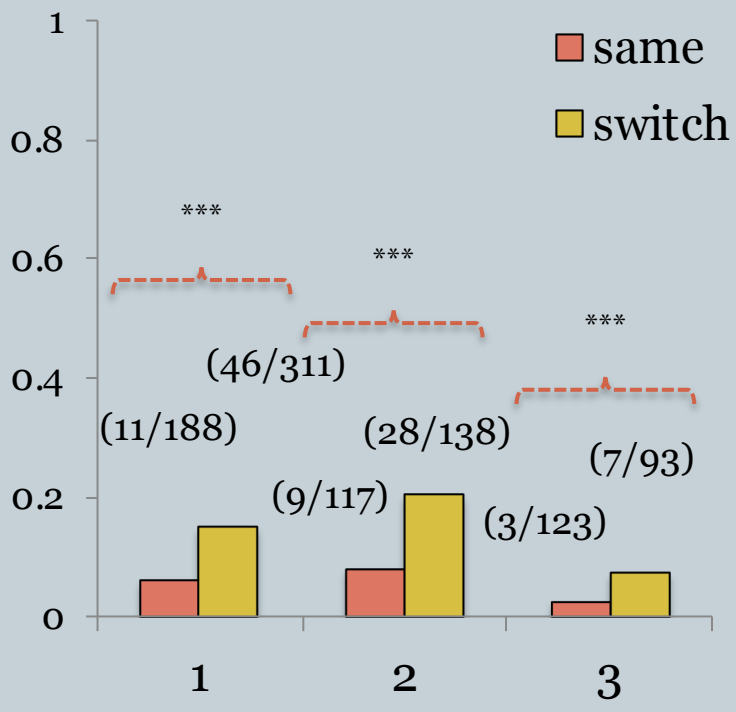
Parents and teachers at SEDI, Mexico City, director Patricia de la Fuente, and assistant Bety López Juárez.

1st, 2nd and 3rd person separately

Mothers



Children



Results: children and mothers

- Our sample suggests acquisition somewhere **between 4;5 and 4;8**.