Constraints on Code-blending: Distributions of Pointing Subjects and Objects in Bimodal Bilingual Children

[GALA 13]

Generative Approaches to Language Acquisition

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Acknowledgements

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Goal

- To understand syntactic constraints on code-blending, and hence grammar
  - By investigating distributional differences between:
    - Subject points and
    - Object points
- in the productions of Bimodal Bilingual (BiBi) children.

Contents

- Background on bimodal bilinguals
- Some questions about the derivation of code-blending
- This study
  - Methodology
  - Results
  - Analysis
- Summary & conclusion

Background: Bimodal Bilinguals

Hearing children with at least one Deaf parent (Coda, Koda)

- Bilingual
  - two languages from birth
- Bimodal
  - a sign language
  - and a spoken language

Background: Bimodal Bilingual Code-blending

- Code-blending is the natural and spontaneous use of speech and sign together.
  - It should not be confused with Simultaneous Communication (Sim-Com), an artificial and forced attempt to speak and sign at the same time.

Code-blending

Simultaneous production of sign and speech

(1)

ASL:	IX(dog)	CUTE
English:	doggie	cute

Ben, 2;00

Video

Derivation of Code-blending

One or two derivations?

- The Language Synthesis Model

  Lillo-Martin et al. (2012, 2016), Koulidobrova (2012)

  - Two lexicons but only one computational system

- Multi-derivation alternative

  Donati & Branchini (2013); Branchini & Donati (2016)

- **Code-blending thanks to derivation by phase**

  Berent (2013)

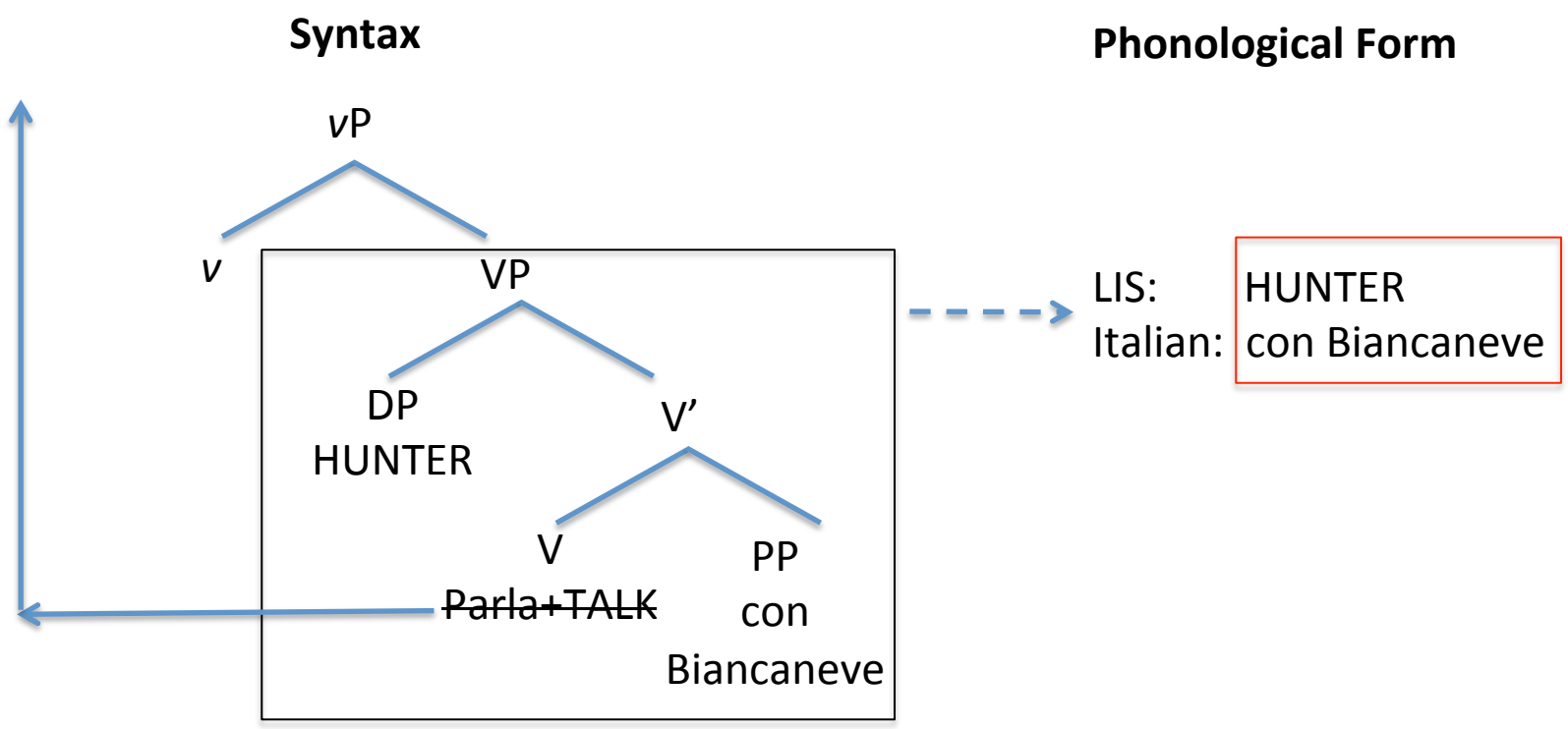
Elements in the same spell-out domain can be code-blended (Berent 2013)

(2)

LIS:	TALK	HUNTER
Italian:	Parla	con Biancaneve

"The hunter talks with Snow White." (Donati and Branchini 2009)

(3)



The present study

- Can we find additional evidence for a phase-based approach?
- Examine the distribution of IX
  - pointing sign used as pronominal
  - compare subjects (assumed to be in higher phase) and objects (all types, assumed to be in lower phase with the predicate)

Methodology

- **Filming (longitudinal spontaneous production)**
  - Sign Target Sessions
    - children play and converse with one of the Deaf parents or a Deaf research assistant
  - Speech Target Sessions
    - children play and converse with a hearing research assistant
  - Children use pointing signs in
    - their blended utterances or
    - their sign utterances
- **Coding**
  - Every point was coded no matter if it showed up in blending or in sign only
    - Assumption: there is a single computational system responsible for both kinds of utterances

Participants: Bilingual and interlocutors

		# Sessions	Age range	# Points
US	Ben	8	2;00 – 3;00	294
	Adults to Ben (H)	4		97
	Adults to Ben (D)	4		218
	Adult1 Bibi*	1		45
BR	Edu	6	2;00 – 3;03	45
	Adults to Edu (H)	3		331
	Adults to Edu (D)	3		57
	Igor	6	2;02 – 3;01	119
	Adults to Igor (H)	3		134
	Adults to Igor (D)	3		122
	Adult2 Bibi*	1		53

*Quadros et al. (2016)

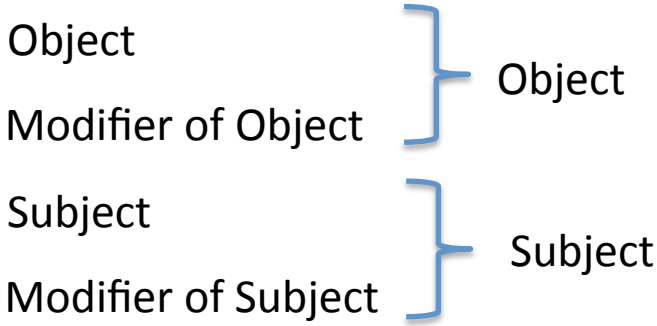
Participants: Monolingual and interlocutors

		# Sessions	Age range	# Points
US	Aby (D)*	5	2;02 – 3;03	119
	Adults to Aby (D)	3		128
	Alex (H)**	5	2;00 – 3;05	25
	Adults to Alex (H)	5		12
	Lily (H)**	3	2;00 – 3;00	56
	Adults to Lily (H)	3		90

- Assume non-signers are using points gesturally; see if there are differences
- Use the terms 'subject' and 'object' for all, though assume linguistic difference

*SLAAASh project, Lillo-Martin & Chen Pichler (2008)
**CHILDES, MacWhinney (2000), Providence corpora, Demuth et al. (2006)

Coding: Function



Coding: Distribution

Pre-predicate:	… Argument {Subject or Object} … Predicate …
Post-predicate	.. Predicate … Argument {Subject or Object} …
Overlapping	… Argument {Subject or Object} … … Predicate

Example:
Pre-predicate Subject

(4) ASL: IX(truck) TRUCK

English: truck

Ben, 2;00

Video

Example:
Pre-predicate Object

(5) ASL: IX(train) HELP. IX(train) MOVE.

"Help with it. Move it." Ben, 2;06

Video

Example:
Post-predicate Subject

(6) ASL:	IX(CM)	COOKIE[/]	COOKIE	MONSTER	IX(CM)	
English: cookie	monster	cookie[/]	cookie	monster		

"This is Cookie Monster." Ben, 3;00

Video

Example:
Post-predicate Object

(7) ASL: IX(kitty-cat) WANT | IX(kitty-cat)
English: | kitty cat

"I want the kitty-cat" Ben, 2;03

Video

Example: Overlapping Subject

(8) ASL: IX(rabbit)

English: That's rabbit

Ben, 3;00

Video

Example: Overlapping Object

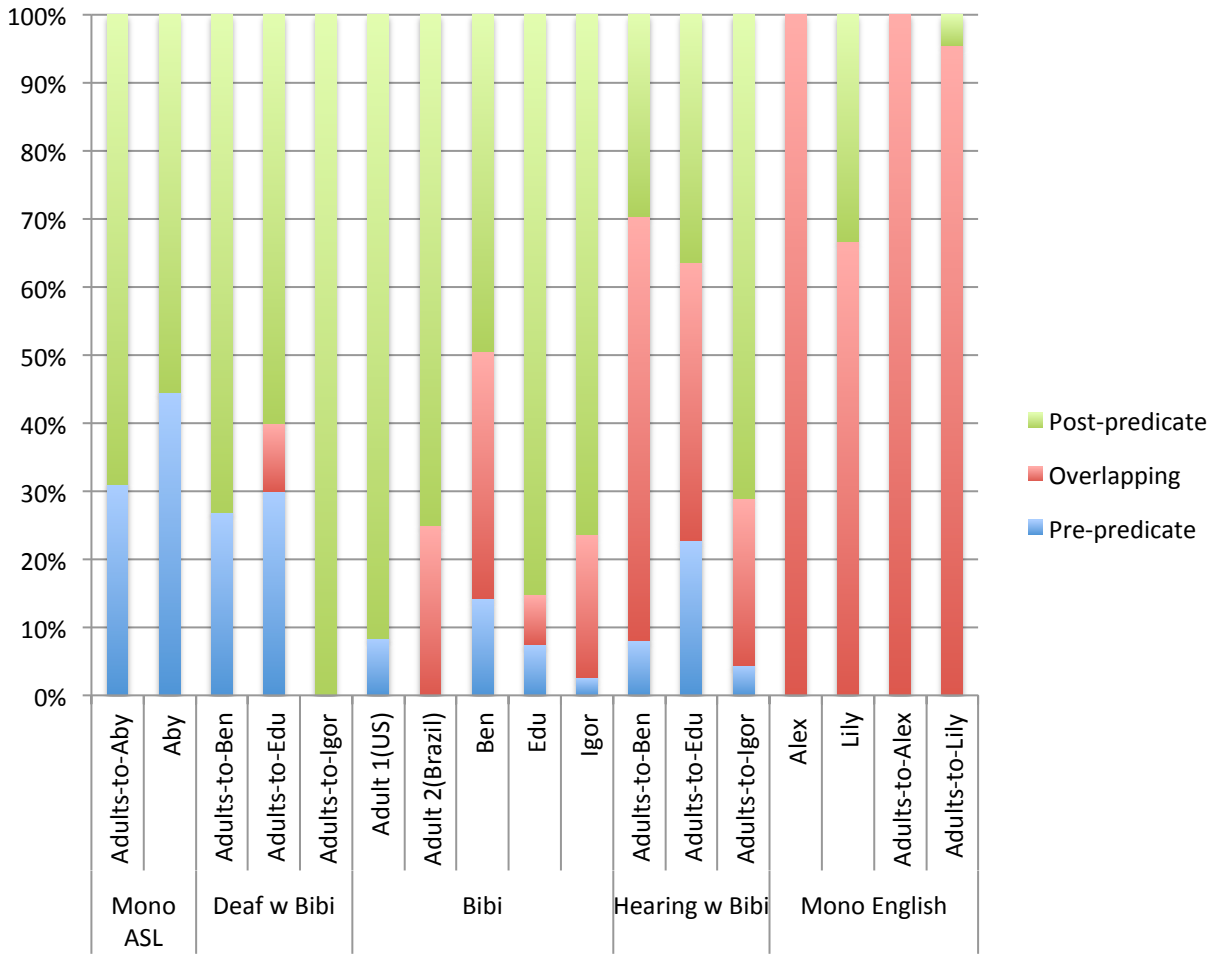
(9) ASL: IX(doggie)

English: Look at the doggie Ben, 3;00

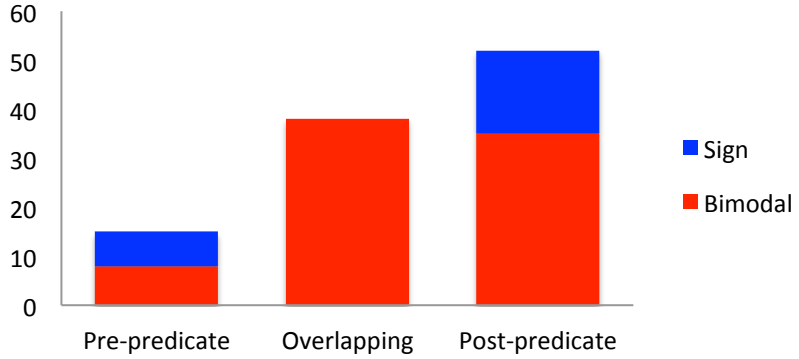
Video

RESULTS:
Object Points

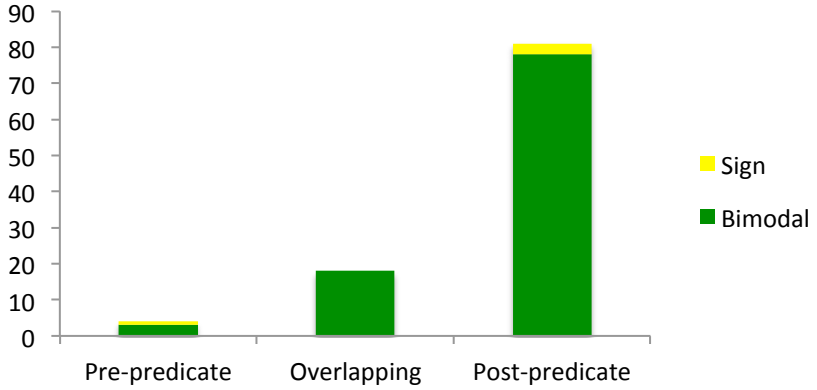
Distribution of object points by participant



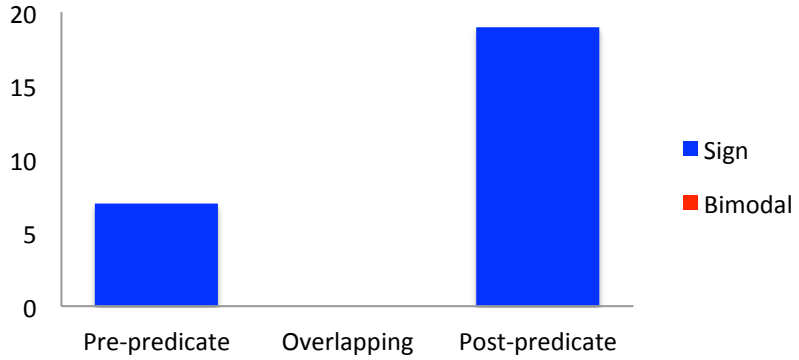
BEN OBJECT POINTS



EDU & IGOR OBJECT POINTS



BEN DEAF ADULTS OBJECT POINTS



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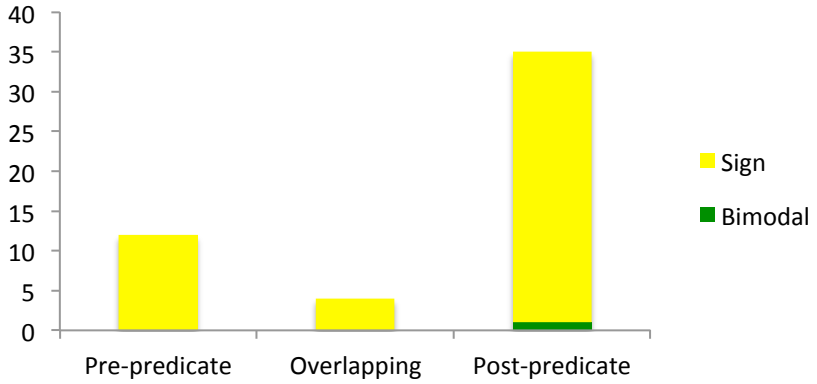
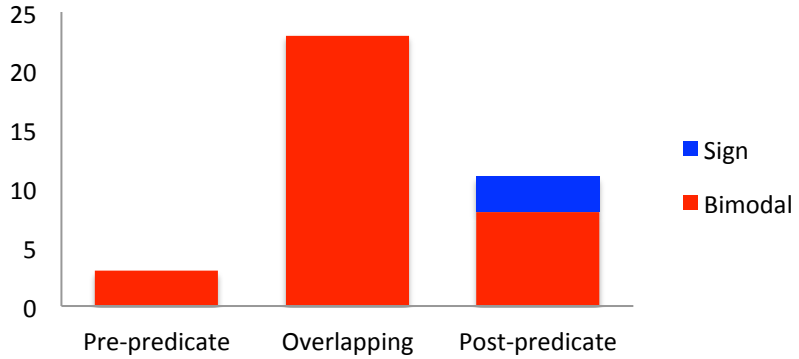


BEN HEARING ADULTS OBJECT POINTS



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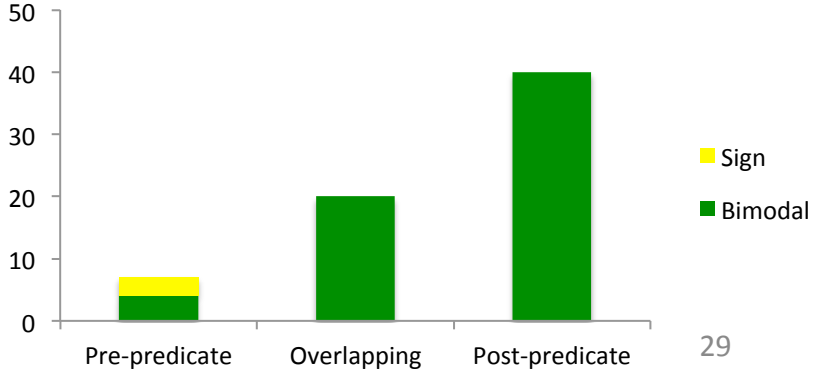


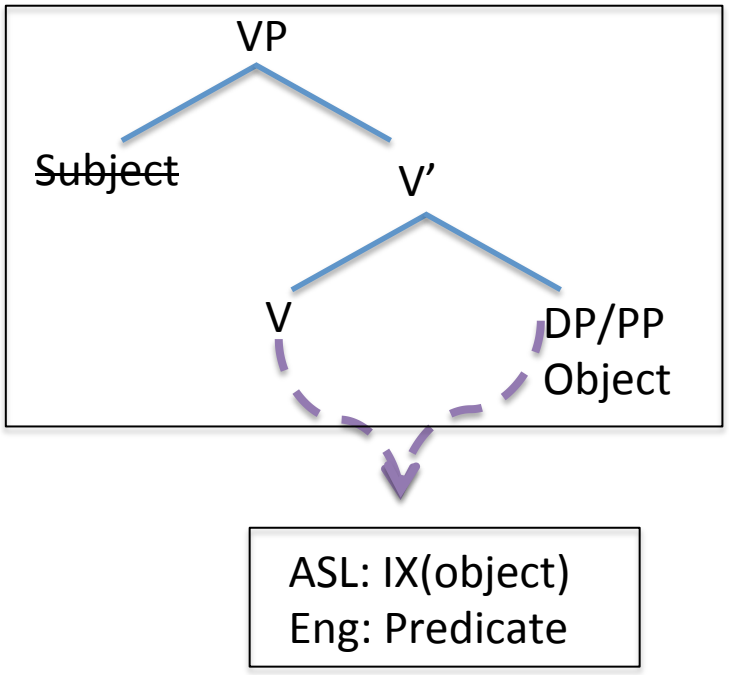
Analyses

- In ASL and Libras, the unmarked order is SVO → post-predicate objects

- Processes of topicalization (O, SV) and object shift (SOV) produce pre-predicate orders by moving arguments to higher syntactic positions → pre-predicate objects

Analyses

- Overlapping objects are predicted to be available

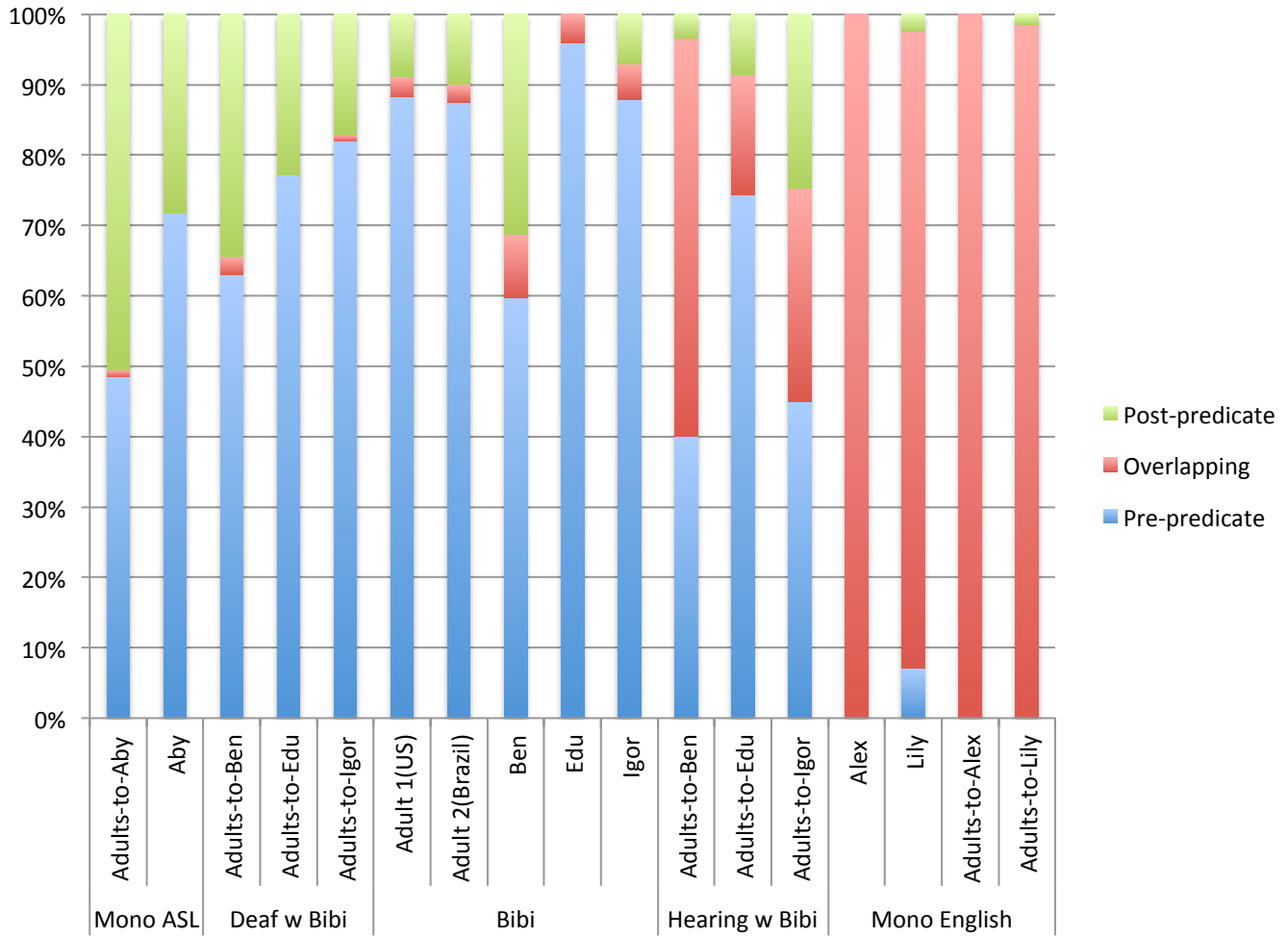


Predicate and Object are in the same spell-out domain

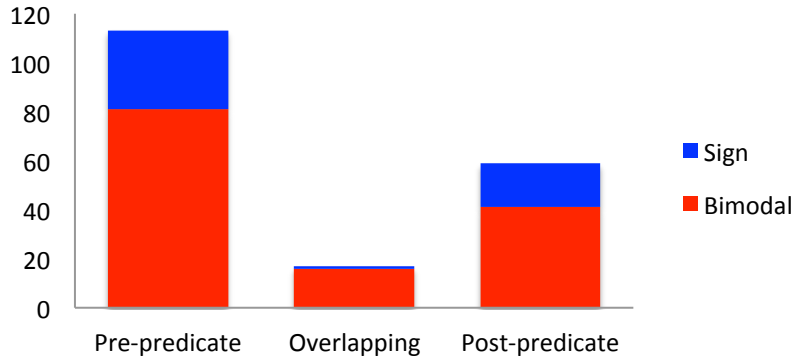
They can be blended

RESULTS:
Subject Points

Distribution of subject points by participant



BEN SUBJECT POINTS



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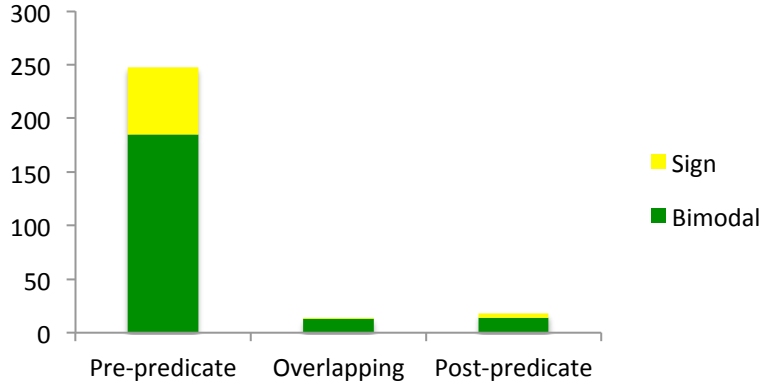
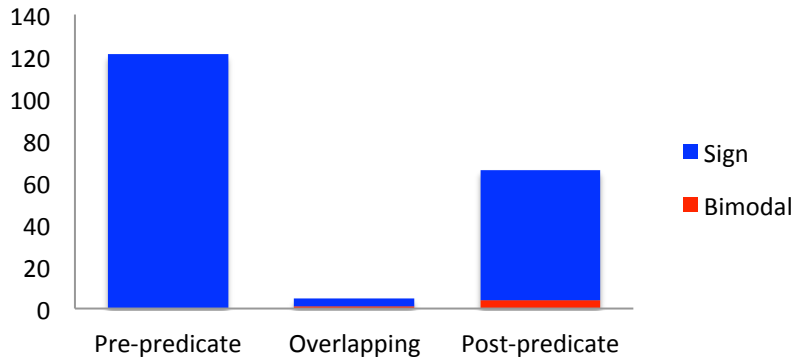


BEN DEAF ADULTS SUBJECT POINTS



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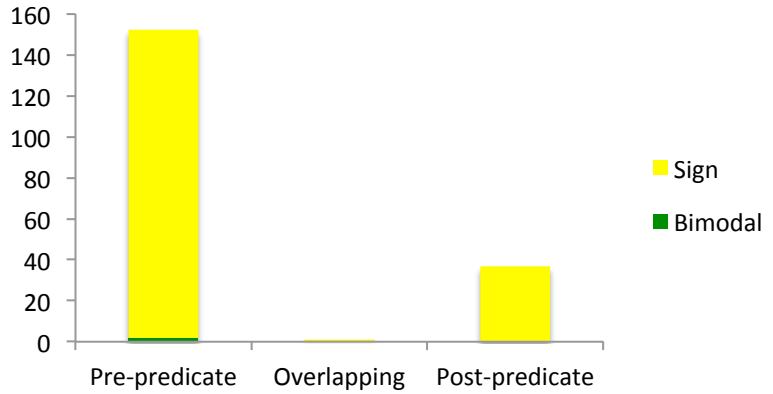
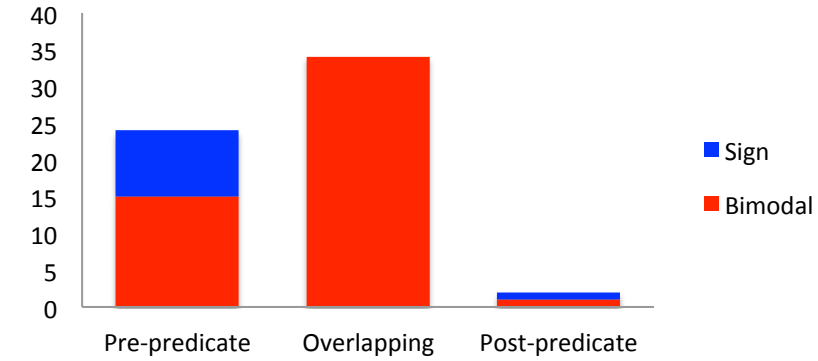


BEN HEARING ADULTS SUBJECT POINTS



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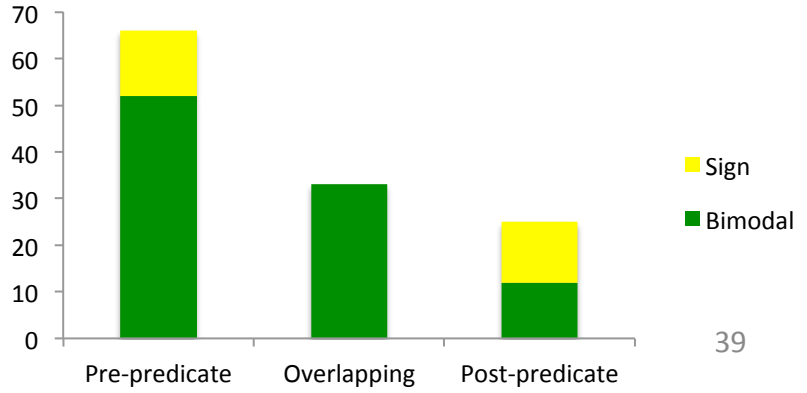


Analyses

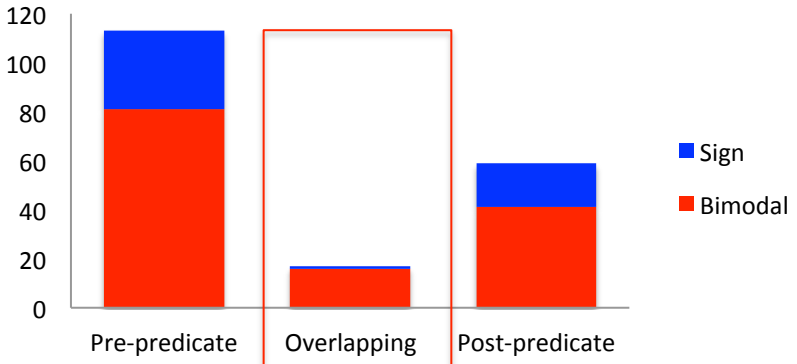
- In ASL and Libras, the unmarked order is SVO. We assume this is derived by raising the subject to [Spec, TP] (or a similar position) → pre-predicate subjects

- A process known as subject pronoun copy (SPC) derives post-predicate order for subjects by moving them to a (possibly quite high) sentence-final position → post-predicate subjects

Overlapping subjects

- Our syntax-phonology mapping algorithm predicts them NOT to occur.
- The difference in use of overlapping between subject and object points is highly significant (using χ^2, $p < .0001$ for Ben, Edu & Igor)
- But obviously we do have some in the data.
- Why?

BEN SUBJECT POINTS



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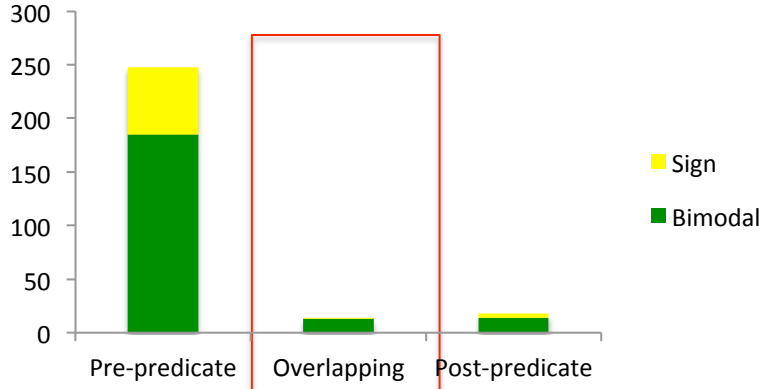

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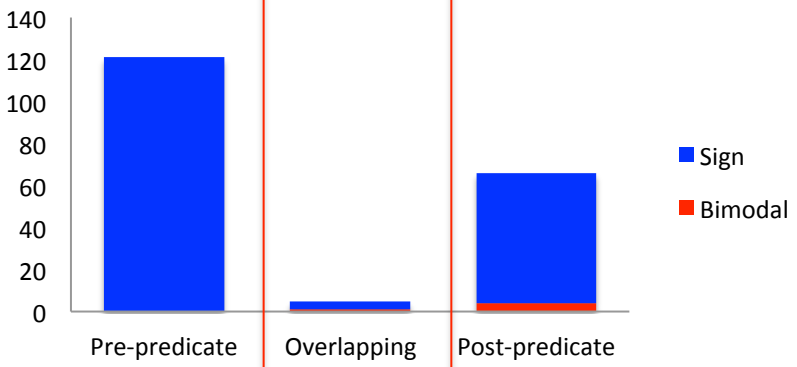

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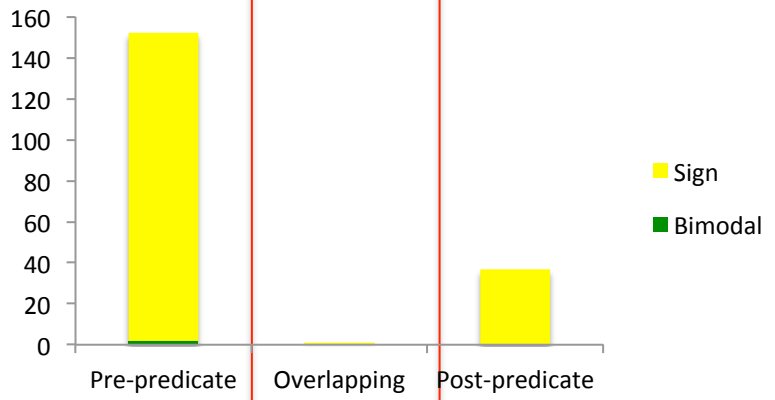
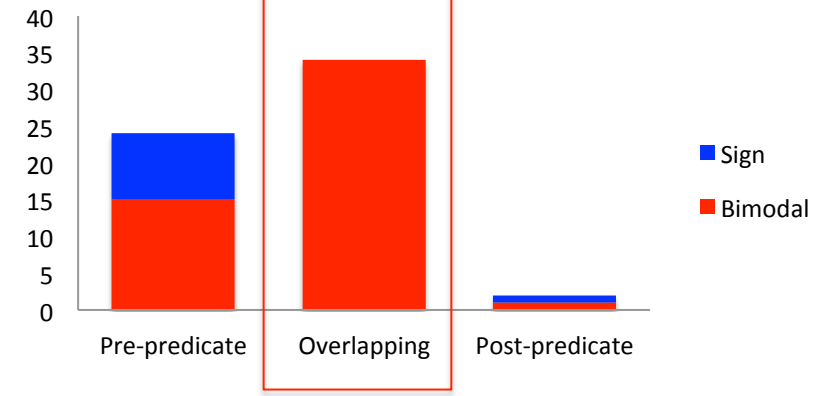
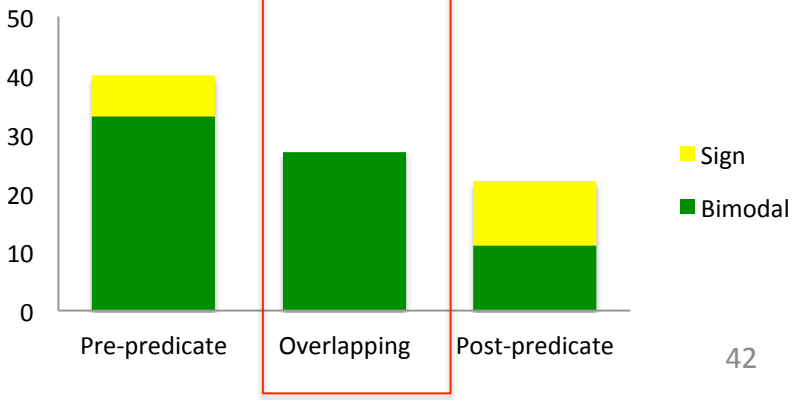


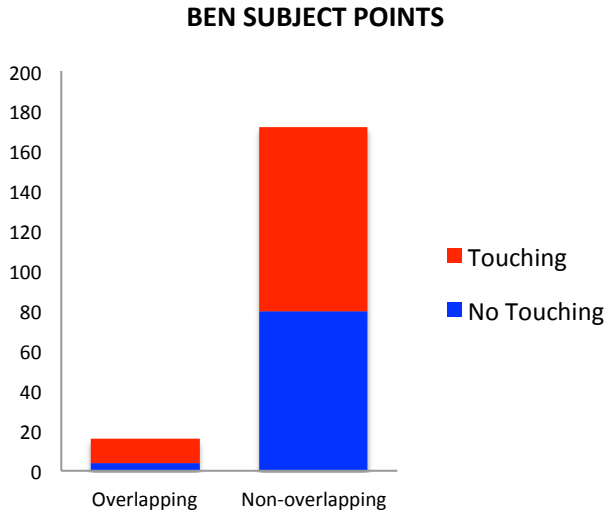
BEN HEARING ADULTS SUBJECT POINTS

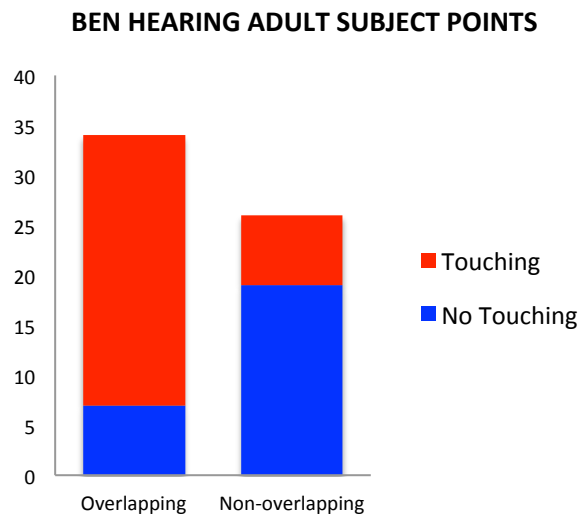


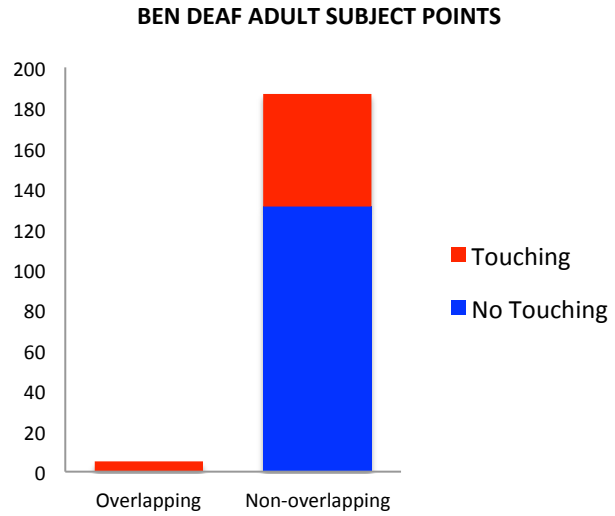
IGOR HEARING ADULTS SUBJECT POINTS

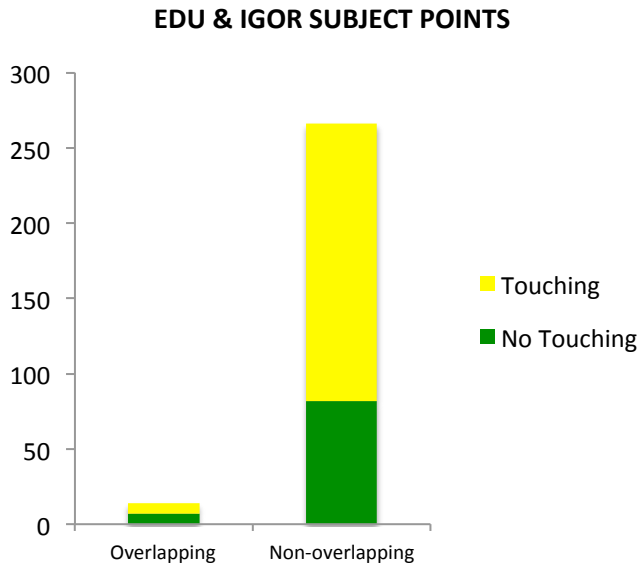


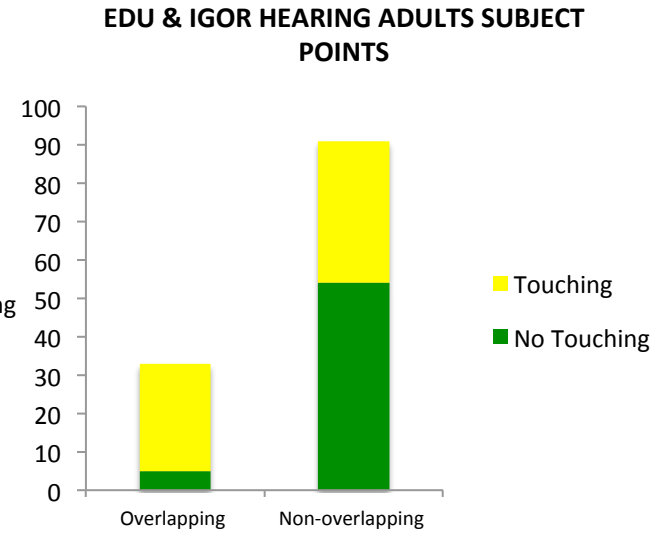
Overlapping subjects' distribution by touching

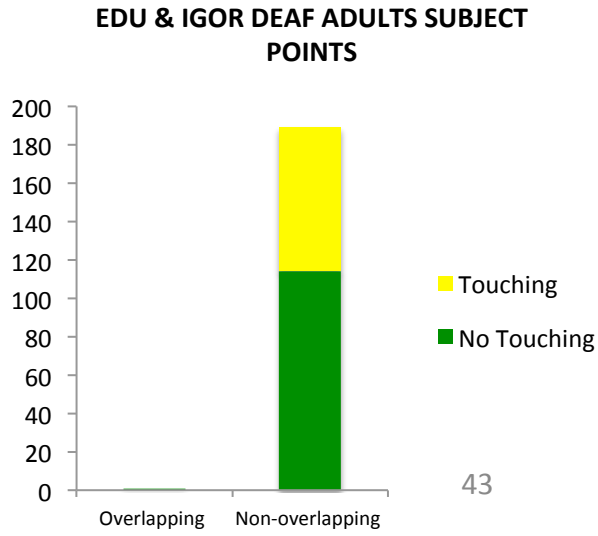












Example:
Overlapping Subject with Touching

(15) ASL HAND 1: IX(cake) …….

ASL HAND 2: HAVE FIVE

Deaf adult

Video

Example:
Overlapping Subject with Touching

(16) ASL: IX(airplane)

English: This is the dad

Hearing adult

Video

Overlapping Subject with Touching

(17) ASL: IX(rabbit)

English: That's rabbit Ben, 3;00

Video

What touching shows

- The BiBi children are still learning to coordinate their hands and mouth
  - Contact may work against pulling their hand back immediately after they produce the subject
- Adults may be using touching and sometimes longer holds for
  - capturing and keeping joint attention
- Non-native BiBi adults might violate production constraints

Summary

- For bimodal bilinguals, there is an asymmetry in the production of subject and object points:
  - while object points can be produced simultaneously with a predicate, (non-touching) subject points are not.
- The asymmetries between the distribution of pointing subjects and objects in the productions of BiBi children can be accounted by assuming a phase-based derivation
  - **Object** in the same spell-out domain with the predicate by default
  - **Subject** in a different spell-out domain than the predicate by default

Conclusion

- Bimodal bilingual code-blending, like unimodal bilingual code-switching, follows from the nature of the language faculty and so can inform us about its architecture

THANK YOU