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

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Kadir Gökgöz
Ronice Quadros
Diane Lillo-Martin
Deborah Chen-Pichler
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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) Syntax

Phonological Form

LIS: HUNTER
Italian: con Biancaneve

Parla+TALK

HUNTER

V

DP

V'

V

PP

con

Biancaneve
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

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*Quadros et al. (2016)
Participants:
Monolingual and interlocutors

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<th># Sessions</th>
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<td>Adults to Lily (H)</td>
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– 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

Object
Modifier of Object
Subject
Modifier of Subject

Object
Subject
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 monster

“This is Cookie Monster.”

Ben, 3:00

Video
Example:

Post-predicate Object

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

English: “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
Analyses

• In ASL and Libras, the unmarked order is SVO \( \rightarrow \) post-predicate objects

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

ASL: IX(object)
Eng: Predicate
RESULTS:
Subject Points
Distribution of subject points by participant
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 \( \chi^2 \), \( p < .0001 \) for Ben, Edu & Igor)
• But obviously we do have some in the data.
• Why?
Overlapping subjects’ distribution by touching

**BEN SUBJECT POINTS**

- Touching
- No Touching

**BEN HEARING ADULT SUBJECT POINTS**

- Touching
- No Touching

**BEN DEAF ADULT SUBJECT POINTS**

- Touching
- No Touching

**EDU & IGOR SUBJECT POINTS**

- Touching
- No Touching

**EDU & IGOR HEARING ADULTS SUBJECT POINTS**

- Touching
- No Touching

**EDU & IGOR DEAF ADULTS SUBJECT POINTS**

- Touching
- No 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

Video

Hearing adult
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