INTRODUCTION

Intermodality

Two Languages But One Computation: Code-Blending in Bimodal Bilingual Development

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INTRODUCTION

Intermodality

Studies of intermodal language development can help us better understand the architecture of the human capacity for language.

There is little conflict between the articulatory mechanisms of signed and spoken languages, so it is an excellent population in which to test questions of language design.

THEORETICAL FRAMEWORK

• One Computation
  — Lillo-Martin, Quadros, Koulidobrova & Chen Pichler (2009)

• MacSwan’s (2000, 2005) Minimalist Model of Code-Switching


A minimalist model of code-switching

MacSwan (2000, 2005)

Code-switching can be accounted for using only the mechanisms needed to describe monolingual competence

MacSwan’s model as illustrated by Cantone & Müller (2005)
Distributed Morphology

One Computation

Important Notes:
• In the first steps, there are only abstract hierarchical
  features and roots with no phonological material (no
  language specification).
• At VI, elements from either language can be inserted as long
  as the Vocabulary Items match (do not conflict) in features
  (may lead to code-switching or cross-linguistic influence).
• Elements from both languages may be inserted if they do
  not compete for articulation (code-blending).

Predictions
• One proposition may be expressed in either or
  both modalities
• Bilinguals will not produce two different
  utterances simultaneously – i.e., will not produce:
  – One proposition in sign while two are produced in
    speech (or vice-versa)
  – One proposition in sign while a different one is
    produced in speech (or vice-versa)

BINATIONAL STUDY OF BIMODAL BILINGUAL LANGUAGE ACQUISITION
We examine the development of a sign language and a spoken language in two language pairs:
– Brazilian Sign Language (Libras) and Brazilian
  Portuguese (BP)
– American Sign Language (ASL) and English (E)

Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Lang’s</th>
<th>Age Range</th>
<th>Sess’ns</th>
<th># Coded Utterances</th>
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</thead>
<tbody>
<tr>
<td>Igor</td>
<td>Libras / BP</td>
<td>2;01 – 2;11</td>
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<td>3610</td>
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<tr>
<td>Ben</td>
<td>ASL / AE</td>
<td>2;01 – 2;06</td>
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<td>994</td>
</tr>
<tr>
<td>Lex</td>
<td>ASL / AE</td>
<td>3;03 – 3;09</td>
<td>2</td>
<td>608</td>
</tr>
<tr>
<td>Tom</td>
<td>ASL / AE</td>
<td>2;04 – 2;07</td>
<td>2</td>
<td>398</td>
</tr>
</tbody>
</table>

Data analyzed for the current presentation

All participants have at least one Deaf parent and relatively equal
exposure to both sign and spoken languages.

Bimodality under
One Computation

• Modality
  – Speech
  – Sign
  – Bimodal
    • Bimodal Types
    • Bimodal Overlap
    • Bimodal Redundancy
Quadros, Lillo-Martin, & Chen Pichler

**Modality**

- Speech
- Sign
- Bimodal

<table>
<thead>
<tr>
<th>Modality</th>
<th>Speech Target</th>
<th>Sign Target</th>
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</thead>
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<tr>
<td></td>
<td>BEN_02;01</td>
<td>TOM_02;04</td>
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<tr>
<td></td>
<td>BEN_02;06</td>
<td>TOM_02;07</td>
</tr>
<tr>
<td></td>
<td>LEX_03;03</td>
<td>LEX_03;09</td>
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</tbody>
</table>

**Bimodal Types**

- Sign
- Target
- Speech
- Target

<table>
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<tr>
<th>Bimodal Types</th>
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<th>Sign Target</th>
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</thead>
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<tr>
<td>Full</td>
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<td>TOM_02;04</td>
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<tr>
<td></td>
<td>BEN_02;06</td>
<td>TOM_02;07</td>
</tr>
<tr>
<td></td>
<td>LEX_03;03</td>
<td>LEX_03;09</td>
</tr>
</tbody>
</table>

**Bimodal Overlap**

- Full
- Partial Included
- Multi Included
- Partial Mismatch
- Multi Mismatch

**Bimodal Redundancy**

- Redundant
- Not redundant

<table>
<thead>
<tr>
<th>Bimodal Redundancy</th>
<th>Speech Target</th>
<th>Sign Target</th>
</tr>
</thead>
<tbody>
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<td>TOM_02;04</td>
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<td></td>
<td>BEN_02;06</td>
<td>TOM_02;07</td>
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<td>LEX_03;09</td>
</tr>
</tbody>
</table>

**Potential Counterexamples – 1**

- Timing overlap – Multis

Igor (2;10)
Lengthening

- Holding or repeating of the sign or word
- Used as a conversational strategy
  - Holding attention
  - Maintaining the topic
  - Cohesion across utterances
  - Repairs
- (Bennet-Kastor 1994; Huang 2010)

Potential Counterexamples – 2

- Timing overlap – Mismatches

Ben (2;01)

Potential Counterexamples – 3

- Non-redundancy

Ben (2;01)

Igor (2;07)

Ben (2;01)

Coordination

- Children are still developing the ability to coordinate well manual and vocal outputs
- Repetition is used to repair the ill-coordinated timing

One Proposition

- According to our model, these are not counterexamples as long as combined they express one proposition
  - Look, she’s sick
  - This one is black.
  - I want that toy.

CONCLUSIONS

- Multiple kinds of blending are possible with multiple articulators.
- Our model, incorporating MacSwan’s proposals for code-switching and concepts from Distributed Morphology, can capture these possibilities.
CONCLUSION

One proposition is one computation with intermodal expression.

Selected Bibliography