Noun Phrases in Bimodal Bilingual Acquisition

Ronice Müller de Quadros  
Universidade Federal de Santa Catarina

Diane Lillo-Martin  
University of Connecticut

Helen Koulidobrova  
Central Connecticut State University

Deborah Chen Pichler  
Gallaudet University

Overview

- Background
  - Our approach to questions about bilingual effects
  - Bimodal bilinguals as a way to address these questions
  - Today's area of interest: the nominal domain
  - Previous studies on the nominal domain – monolingual and bilingual acquisition
  - Our current study

Research Questions

- How do the languages of a bilingual interact?
- How do children develop as bilinguals?
- How is this process different for bimodal bilinguals?

Here:

- Data from children acquiring ENGLISH and AMERICAN SIGN LANGUAGE (ASL); or BRAZILIAN PORTUGUESE (BP) and BRAZILIAN SIGN LANGUAGE (Libras).
- Model of Bilingual Language Synthesis, using concepts of Minimalism and Distributed Morphology.
- Conclusion: both languages are active and interact in multiple ways.

Acknowledgments

- Warm thanks to:
  - Bimodal bilingual children and their families
  - Research assistants and collaborators

- Financial support from:
  - Award Number R01DC009263 from the National Institutes of Health (National Institute on Deafness and Other Communication Disorders). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIDCD or the NIH.
  - The Gallaudet Research Institute.
  - CNPq (Brazilian National Council of Technological and Scientific Development) Grant #200031/2009-0 and #470111/2007-0.

BACKGROUND

Model – Language Synthesis

- Syntactic Derivation
- Vocabulary Insertion (L₁, U₁)
- Phonology (L₁, U₁)
- Phonological representation
- Meaning
Consequences of the model

- Roots and morphemes from both languages can contribute to a single output ➔ 'transfer'
- At Vocabulary Insertion, elements from either language can be inserted, as long as all featural requirements are satisfied ➔ code-switching
- When two independent sets of articulators are available, lexical items from both languages are possible ➔ code-blending

Language Synthesis

Binational Bimodal Bilingual (BiBiBi) Language Acquisition Project

- Simultaneous development of a sign language and a spoken language:
  - Brazilian Sign Language (Libras) and Brazilian Portuguese (BP)
  - American Sign Language (ASL) and English (E)
- Participants (kodas – kids of Deaf adults) - at least one Deaf parent; relatively equal exposure to both speech and sign.
- Longitudinal spontaneous production, ages 1;06-4;06 – weekly, alternating interlocutors
- Targeted experimental studies, ages 4-7

Testing the model

- Our previous findings show language synthesis in several domains:
  - Null arguments (Koulidobrova 2012)
  - Information structure (Lillo-Martin, Quadros, Koulibobrova & Chen Pichler 2010)
  - Cyclicity (Chen Pichler, Quadros & Lillo-Martin 2010)
- Current project – testing within the nominal domain
  - Presence/absence (appropriateness) of the determiner
  - Order of DP-internal elements

The nominal domain in four languages

<table>
<thead>
<tr>
<th></th>
<th>Articles</th>
<th>Modifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>overt</td>
<td>Adj-N</td>
</tr>
<tr>
<td>ASL</td>
<td>0</td>
<td>Adj-N, N-Adj</td>
</tr>
<tr>
<td>BP</td>
<td>overt</td>
<td>N-Adj, Adj-N</td>
</tr>
<tr>
<td>Libras</td>
<td>0</td>
<td>N-Adj</td>
</tr>
</tbody>
</table>
Article use – English

- Early emergence of first uses (as young as 1;04), but well-known omission of determiners in required contexts (Brown 1973; Demuth & McCullough 2009; Kupisch et. al 2009)
- Considerable variability, but use of articles in 80% of required contexts by 2;06
- Continuing problems with appropriate use of definite vs. indefinite articles (Ionin et al. 2004; Schaeffer & Matthewson 2005)
- Semantic/pragmatic factors

Article use – BP

- Adult BP permits bare singular count nouns (generic / existential)
- Children produce both bare Ns and DPs with a determiner from as young as 1;08 (Lopes 2006)
- Ungrammatical uses disappear by 2;03

Article use – cross-language findings

- Numerous studies show a difference between Germanic and Romance languages
- Children learning Romance languages reach ceiling performance much earlier than children learning Germanic languages

- Guasti et al. – Nominal Mapping Parameter (Chierchia 1998)
- Kupisch et al. – prosodic and other factors

Article use – bilingual children

- Some evidence that the contrast between Romance and Germanic patterns can be seen in bilinguals, with some facilitative effects of cross-language influence (Kupisch 2007)
- What if one language lacks a morphological realization of articles?
- One Serbo-Croatian / English bilingual child showed high rates of article omission in elicited production at 4;02 (Mede & Gürel 2010)
- 4-year-old Turkish / English bilingual children show high rates of article omission in English (Geckin poster on Thursday)

Modifier placement

- Children acquiring pairs of Germanic/Romance languages may show evidence of cross-linguistic influence in adjective/noun placement.
- 3- to 5-year-old French/English bilinguals showed more Adj/noun reversals in both English and French than monolinguals (Nicoladis 2006)
Research questions

• Is the acquisition of the nominal domain different for bimodal bilinguals as compared with monolinguals?
• Do bimodal bilinguals show bilingual effects similar to unimodal bilinguals?
• Are children’s productions as expected given the possibilities for language synthesis?

Possible areas of synthesis

Articles

• The sign languages do not have overt articles; the spoken languages do
• Possible synthesis: use of the sign language structures in the spoken languages, leading to:
  • lack of overt article
  • use of the incorrect article
  • mismatch of number / gender

Possible areas of synthesis

Adjectives

BP: Noun-Adj Libras: Noun-Adj

• Use of the sign language structures in the spoken languages
  • for ASL-Engl, N-Adj order
  • for Libras-Engl, Adj-N order only

• Use of the spoken language structures in the sign languages
  • for Engl-ASL, Adj-N order only
  • for BP-Libras, use of Adj-N order

Examples

Missing article
• I want truck
  TRUCK IX(tuck-book)
• I want different dNight
• Cow fell down
• The rooster stays on airplane
  [target: Essa é a mamãe, muito bem?]

Inappropriate article (doesn’t fit context)
• a cracker is over there
• he’s not the friend
  [target: o carrinho azul]

Gender error
• um television [target: uma television]
Articles – Summary

- BEN and TOM show high levels of article errors (omission and commission) up through age 3:00 at least
- IGOR uses a large number of bare nouns judged acceptable, but also unacceptable ones at rates higher than monolinguals
- In the longitudinal data, remaining nominal errors are mainly number / gender issues— including over-use of plural (in singular contexts) and wrong gender choice of articles (BP)

Modifier placement – SP

Analysis of spontaneous production data (English)
- examination of same sessions used for article study

<table>
<thead>
<tr>
<th>Age</th>
<th>DPs with mod</th>
<th>Non-target Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEN</td>
<td>2;00</td>
<td>4 0</td>
</tr>
<tr>
<td></td>
<td>2;06</td>
<td>21 0</td>
</tr>
<tr>
<td></td>
<td>3;00</td>
<td>37 0</td>
</tr>
<tr>
<td>TOM</td>
<td>2;01</td>
<td>3 0</td>
</tr>
<tr>
<td></td>
<td>2;03</td>
<td>6 0</td>
</tr>
<tr>
<td></td>
<td>2;05</td>
<td>5 0</td>
</tr>
<tr>
<td></td>
<td>2;06</td>
<td>6 0</td>
</tr>
<tr>
<td></td>
<td>3;01</td>
<td>26 0</td>
</tr>
</tbody>
</table>

Modifier placement – EP

Elicited production (English, ASL, BP, Libras)

- Method
  One experimenter shows child sheet with two pictures, one highlighted. Second experimenter has matching sheet without highlight. Child must describe picture so that E2 can select appropriate picture.
  12 items; all utterances containing an Adj and Noun scored for word order

Participants

- Kodas – larger group of children ages 4-7 (with at least one Deaf parent; relatively equal exposure to both languages); and four Deaf children with Deaf parents, using a cochlear implant for spoken language

Number at each age range:

<table>
<thead>
<tr>
<th>Language</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7+</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>2</td>
<td>10</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>ASL</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>BP</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Libras</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Results – US

<table>
<thead>
<tr>
<th>Language</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4-5-6-7</td>
</tr>
<tr>
<td>ASL</td>
<td>4-5-6-7</td>
</tr>
</tbody>
</table>

Results – Brazil

<table>
<thead>
<tr>
<th>Language</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portuguese</td>
<td>4-5-6-7</td>
</tr>
<tr>
<td>Libras</td>
<td>4-5-6-7</td>
</tr>
</tbody>
</table>
Modifiers – Summary

- Overwhelmingly, the children use only the target language structures for Adj~Noun placement in all four languages.

General Discussion – 1

- Potential bilingual effect:
  - extended use of ‘null D’ from the sign languages in the spoken languages -> missing article; wrong article; gender/number errors
- No effect observed:
  - Adjective-Noun reversals
  - Two issues ...

General Discussion – 2

- Article-related errors: Older children
  - More data (limited) – older koda children continue to omit/ misuse articles

*art in a subset of the EP participants:
- IKE (4;09) .61
- JAY (4;09) .09
- FAY (5;00) .14
- SUN (5;11) .09
- ZIG (6;01) .08

General Discussion – 3

- Why don’t the ASL/English bilingual children use N-Adj in English, as French/English bilingual children do?
- Differences between French and ASL wrt post-nominal adjectives:
  - French – noun raising
  - ASL – adjoined / reduced relatives
- Acquisition data suggests that this structure (adjoined Adj) cannot be compatible with English DP. Further research on adult ASL modifier structure needed.

Limitations / future work

- Adult ASL modifier structure
- No direct monolingual comparison data
- Still need a detailed semantic/pragmatic analysis
- Further analysis of gender/number errors
- Bimodal utterances

Conclusions

- The nominal domain is a fruitful source of information about bilingualism effects
- We see areas of potential effects and areas of no effects
- Such studies will help to constrain theories of language synthesis