Constraints on Bimodal Code-Switching and -Blending

Diane Lillo-Martin
University of Connecticut & Haskins Labs
Spring 2018: Radboud University Nijmegen

ZA
23 April 2018

Acknowledgments

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.

Bilingual linguistic phenomena

- “The bilingual is not two monolinguals in one person.” (Grosjean 1989)
- Bilingual phenomena illustrate this
  - Cross-linguistic influence
  - Code-switching
  - Code-blending

  - What are the psycho/linguistic mechanisms responsible?

Cross-Linguistic Influence (CLI)

- Children developing bilingually may appear to use a mixture of structures from their two languages
- E.g., use of wh-in situ (influenced by Cantonese) in English of Cantonese+English bilinguals (Yip & Matthews 2007)
  It is for what? (Timmy, 2;05)
- Some propose that dominant language interferes with weaker one, but counter-evidence

Questions about CLI

- What are the appropriate constraints on CLI?
- Is CLI limited to children and other learners / ‘imperfect’ speakers?
- L1 Quechua-L2 Spanish (Sanchez 2015)
  - emergence of new morphemes or independent words in Spanish that are the spell out of derivational morphemes (e.g. causative) in the agglutinative languages
    Està quer-lendo hac-er-le com-er
    Is want-GER make-INF-DAT eat-INF
    “S/he is about to feed him/her.”
- Can CLI be related to code-switching?
Code-switching

- The alternate use of two languages within the same utterance
  - This morning mi hermano y yo fuimos a comprar some milk
  - “This morning my brother and I went to buy some milk”

Constraints on Code-Switching

- The students *habían visto la película italiana.*
  - “The students had seen the Italian movie.”
- *The student had visto la película italiana.*

- What are the (linguistic) constraints?

Unification of bilingual phenomena

- CLI and CS may both be options that become available based on knowledge of two lexicons with their grammatical requirements
- If (some) grammatical phenomena are determined by the features associated with lexical items (including null functional categories) …
- Selection of elements from L_A and L_B can result in CLI or CS

Code-blending

- (How) is code-blending related to code-switching (and possibly, cross-linguistic influence)?
- Similar sociolinguistic usage and functions…
- Same kind of derivation?

Bilingual phenomena in Bimodal Bilinguals

- Bilinguals using a sign language and a spoken language (“coda”)
- Studies with adults (Enmorey et al. 2008; Bishop 2010) and children (van den Bogaerde & Baker 2005; Petitto et al. 2001)
- Includes use of sign, speech, code-blending and occasional code-switching.
Bimodal bilingual cross-linguistic influence

- Use of ASL word order in English is observed - 'Coda talk'

- "Coda talk usually takes place in an all-Coda environment, and the grammatical structures often follow ASL, not English, a sort of 'spoken ASL.'" (Bishop 2010: 207)

"Many times in school me want show videos...where? YouTube. Many many computers in school block-block-block. Me say FSH."
Codata talk website: codata talk weebly.com

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.

ARCHITECTURE QUESTIONS

A model of bimodal bilingual production

Emmorey et al. (2008)

How can two languages be produced simultaneously?

- Possibility 1:
  - Potential for two different propositions expressed using two completely different derivations

- Possibility 2:
  - One proposition, but possibly two derivations

- Possibility 3:
  - One proposition, one derivation
  - With any of these, may have both linguistic and extra-linguistic constraints

Possibility 1?

- If different propositions may be expressed, analyses of blending based on content would reveal this.

- Multiple previous studies have provided evidence against this (e.g., van den Bogaerde & Baker 2000 et seq.; Petitto et al. 2001; Emmorey et al. 2008)
Possibility 2 or 3?
- Possibility 3 (one derivation) – theoretical preference
- Is the empirical evidence more consistent with 2 or 3?
- When might two derivations be needed?

Possibility 2?
- Donati & Branchini (2013)
- 6 kodas LIS+Italian
- ages 6-8
- Blending types:
  - Independent blending
  - Congruent lexicalization
  - Syntactic calque
  - Two word orders
  - Blended blending

  **Two word orders:**
  - It: Chi ha chiamato? who have.3SG call.PAST
  - LIS: CALL WHO?

  **Blended blending:**
  - It: Parla con Biancaneve talk.PRS.3SG with Snow White
  - LIS: TALK HUNTER
  - "The hunter talks to Snow White."

Two word orders
- Cases in our data – VERY RARE
- But shows up in LIS/Italian

Models for Two Word Orders
1. Simultaneous generation of two opposing structures
2. Start from identical base structures, then apply different derivations
3. One structure/derivation with two linearizations

Donati & Branchini (2013)

Language Synthesis

Code-blending in the Synthesis model (Possibility 3)
- Theoretically simpler approach
- Can it generate all results?
- Deriving the observed types
DERIVING BLENDING TYPES

Deriving types of blending

• Co-insertion (same features)
  • At Vocabulary Insertion, a morpheme is spelled-out with a Vocabulary Item from both sign and speech
  • The features of the signed item and the spoken item are the same
    HAT
    really it's a hat (Adult to 2:00)

• Co-insertion (subset of features)
  • At Vocabulary Insertion, a morpheme is spelled-out with a Vocabulary Item from both sign and speech
  • The features of either the signed item or the spoken item are a subset of the features on the abstract morphemes, while the other language might display a fuller set of features (Subset principle)
    FINISH
    are you finished (Adult to 2:00)

Blending with Depicting Signs (DS)

• Usually, the DS and the spoken VP express very similar information, but packaged differently
  • DS(curved-obj-scoops-upward)
    Is it scooping it up? (Adult to 2:00)
  • DS(handling-block-place-in-location)
    Put it right there (Adult to 2:06)
  • The blended VP should contain all necessary morphemes, but different overlapping sets will be expressed in each language

Deriving types of blending

• Both types of co-insertion can occur any number of times in an utterance
  WANT         BREAD
  I want some bread though (Adult to 2:06)
  THAT         SAY
  That’s what I said (Adult to 2:06)

Complementary Blends

• Show the need for blended syntax
  MOTHER   IX(window)
  I want Mommy (Ben, 2:00)

• ASL contributes the sentence-final IX; English subject and verb
  RABBIT PU-------
  where go (Ben, 2:00)

• ASL structure (topicalized subject) then English
**Blended structure**

When pronounced, PU is together with ‘where go’

**Adult vs. Child Blending Syntax**

<table>
<thead>
<tr>
<th>Type</th>
<th>Adults (at 2:00 &amp; 2:06) (n=41)</th>
<th>Child (2:00) (n=79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-insertion (same)</td>
<td>.63</td>
<td>.51</td>
</tr>
<tr>
<td>Co-insertion (subset)</td>
<td>.24</td>
<td>.26</td>
</tr>
<tr>
<td>DV</td>
<td>.10</td>
<td>.01</td>
</tr>
<tr>
<td>Complementary</td>
<td>.02</td>
<td>.22</td>
</tr>
</tbody>
</table>

**Synthesis Summary**

- The Synthesis model employs a single syntactic derivation with multiple outputs in phonology
- Especially straightforward for cases of co-insertion [follows grammar of Lₐ or Lₖ or both via Synthesis]
- Imperfect feature mapping and blended syntax compatible

**CASE STUDY: DEPICTING/CLASSIFIERS**

(Quadros, Davidson, Lillo-Martin & Emmorey 2017; under revision)

**Depicting Signs/Classifier Predicates**

- Common in nearly all sign languages of the world
- Involve:

  - **Handshape** that reflects the noun class of its arguments
  - **Movement and location** provide spatial information

  *Motivation for the term “classifiers”*  
  *Motivation for the term “depicting signs”*

(Supalla 1986, Emmorey 2003, Emmorey and Herzig 2003, Zwirelloiu 2012, a.o.)

**Categories of DS**
**Argument Structure (Benedicto and Brentari 2004)**

**Entity DS**
- One internal (Non-agent) argument

**Handling DS**
- Same internal + One external agent argument

**DS Argument Structure (Benedicto and Brentari 2004)**

1. \( f, f_1 = \text{handling} \)
2. \( f, f_1 = \text{whole entity, extension} \)

**Depicting signs: Formal semantics**

- Handshape that reflects the noun class of its arguments
- Based on a morphemic but "semantically light" verb (e.g. MOVE/BE-LOCATED) that agrees with noun class...

- Movement and location provide spatial information

- ... and a obligatory manner depiction/demonstration that is not morphemic

(Zucchi, Geraci, & Cecchetto 2012; Davidson 2015)

**Syntactic/Semantic structure – Entity DS**

\[
\begin{align*}
\lambda x.\text{move}(x) & : \text{book} \rightarrow \text{book} \\
\lambda x.\text{demonstrate}(x) & : \text{book} \rightarrow \text{path}
\end{align*}
\]

- "The book moves like [path movement]"

**Syntactic/Semantic structure – Handling DS**

\[
\begin{align*}
\lambda x.\text{move}(x) & : \text{book} \rightarrow \text{book} \\
\lambda x.\text{demonstrate}(x) & : \text{book} \rightarrow \text{path}
\end{align*}
\]

- "A person moves a book like [path movement]"
A demonstration code-blended DS: Sound effect/Vocal gesture

(Emmorey, Borinstein, Thompson, & Gollan 2008)

Syntactic/Semantic structure – Handling DS

Syntactic/Semantic structure – Entity DS

Bilingualism as a window into linguistic structure

Prediction 1. DS verbs involve more code switching (sign only) than non-DS verbs, and also sound effects. Predicted by demonstration element in semantics

Prediction 2. Entity DS may be code blended with verbs, objects, prepositions, adverbs, while Handling DS include subjects, too. Predicted by syntactic asymmetry

Data Collection and coding

- Adult bimodal bilinguals (Codas)
  - 3 from USA (ASL, English)
  - 1 from Brazil (LIBRAS, Brazilian Portuguese)
  - Narratives of “Canary Row” cartoon in US and narrative of Charlie Chaplin short clip in Brazil, always to other bimodal bilinguals
  - Coding in ELAN: includes utterances in each language, type of verb (e.g. plain, non-plain (including DS)), modality (sign, speech, bimodal), and timing

4 Participants

<table>
<thead>
<tr>
<th>Codas</th>
<th>Sign rating**</th>
<th>Speech rating**</th>
<th>Interpreter?</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB - Brazil</td>
<td>5</td>
<td>7</td>
<td>no</td>
</tr>
<tr>
<td>B2 - USA</td>
<td>6</td>
<td>7</td>
<td>no</td>
</tr>
<tr>
<td>M4 - USA</td>
<td>7</td>
<td>7</td>
<td>yes</td>
</tr>
<tr>
<td>M5 - USA</td>
<td>7</td>
<td>7</td>
<td>yes</td>
</tr>
</tbody>
</table>

**self-sign rating and native speaker/signer rating
DS are common, but reduced code blending compared to other verbs

<table>
<thead>
<tr>
<th>Codas</th>
<th>Total Number DS</th>
<th>Total Number other verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sign only</td>
<td>Bimodal</td>
</tr>
<tr>
<td>FB – BR</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>BR – US</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>M4 – US</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>M5 – US</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

What constituents are DS blended with?

Discussion

- Our analysis of code blends provide more evidence of the morpho-syntactic complexity of depicting signs
  - Further support for both morphemic and non-morphemic components
- Results are particularly compatible with theories of bilingualism that predict tight connection between syntax and semantics of both languages

CONCLUSIONS

Bilingualism as a window into linguistic structure

Result 1: DS verbs have more code switching (sign only) and more sound effects than non-DS verbs
Predicted by demonstration element in semantics

Result 2: Entity DS are code blended with verbs, objects, prepositions, adverbs, while Handling DS include subjects, too
Predicted by syntactic asymmetry
Future research

- Currently planning to collect more complex blending data (elicited production and grammaticality judgment) to push the limits of the ‘one derivation’ approach.
- Preliminary data indicate resistance to code-blending when English uses non-ASL structures, such as passive, causative, idioms
- Word order differences, when short, are permitted

Conclusions

- Bimodal bilinguals reveal much about the possible ways languages can be combined
- Our approach permits a unification of bilingual phenomena (CLI, CS, CB)
- Language synthesis emerges from the structure of the language faculty when more than one lexicon is available.
- Further analyses are needed, especially
  - Constraints on synthesis: current work with adult data

Thank you