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

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TISLR 2010
Purdue University

ACKNOWLEDGMENTS

- Warm thanks to:
  - bimodal bilingual children and their families
  - research assistants
- 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.

INTRODUCTION

Intermodality

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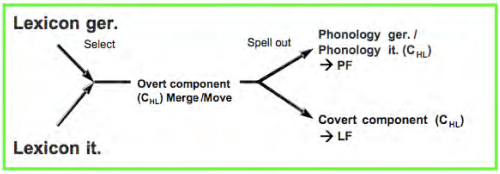
- Studies of intermodal language development can help us better understand the architecture of the human capacity for language.
- There is little conflict between the articulatory mechanisms of signed and spoken languages, so it is an excellent population in which to test questions of language design.

THEORETICAL FRAMEWORK

- One Computation
  - Lillo-Martin, Quadros, Koulidobrova & Chen Pichler (2009)
- MacSwan's (2000, 2005) Minimalist Model of Code-Switching
- Plus concepts from Distributed Morphology (Halle & Marantz 1993, Idsardi & Raimy 2010, Siddiqi 2010) – cf. Liceras et al. 2005

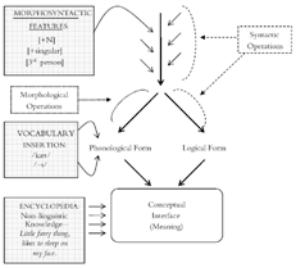
A minimalist model of code-switching

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

Data analyzed for the current presentation

Name	Lang's	Age Range	Sess'ns	# Coded Utt's
Igor	Libras / BP	2;01 – 2;11	10	3610
Ben	ASL / AE	2;01 – 2;06	2	994
Lex	ASL / AE	3;03 – 3;09	2	608
Tom	ASL / AE	2;04 – 2;07	2	398

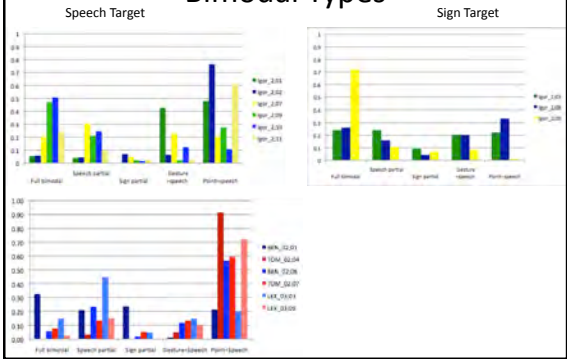
All participants have at least one Deaf parent and relatively equal exposure to both sign and spoken languages.

Bimodality under One Computation

- Modality
  - Speech
  - Sign
  - Bimodal
    - Bimodal Types
    - Bimodal Overlap
    - Bimodal Redundancy

Modality

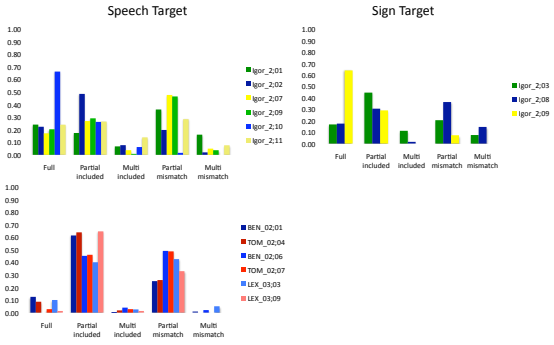
Bimodal Types



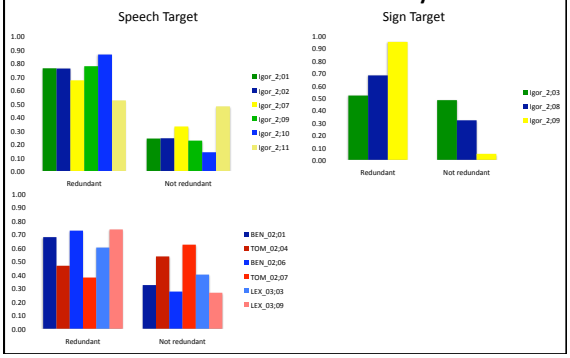
Bimodal Overlap

Full	
Partial Included	
Multi Included	
Partial Mismatch	
Multi Mismatch	

Bimodal Overlap



Bimodal Redundancy



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
- (Bennett-Kastor 1994; Huang 2010)

Potential Counterexamples – 2

- Timing overlap – Mismatches

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

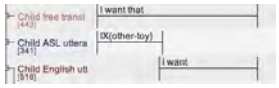
Potential Counterexamples – 3

- Non-redundancy

Ben (2;01)

Igor (2;07)

Ben (2;01)



One Proposition

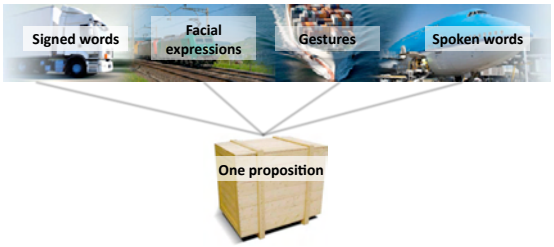
- According to our model, these are not counterexamples as long as combined they express one proposition
  - Look, she's sick
  - This one is black.
  - I want that toy.

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.



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